NOTIFICATION OF RIGHTS UNDER THE FAMILY EDUCATIONAL RIGHTS AND PRIVACY ACT (FERPA)

The Family Educational Rights and Privacy Act (FERPA) affords students certain rights with respect to their education records. These rights include:

1. The right to inspect and review the student’s education records within 45 days of the day the University receives a request for access.

A student should submit to the registrar, dean, head of the academic department, or other appropriate official, a written request that identifies the record(s) the student wishes to inspect. The University official will make arrangements for access and notify the student of the time and place where the records may be inspected. If the records are not maintained by the University official to whom the request was submitted, that official shall advise the student of the correct official to whom the request should be addressed.

(2) The right to request the amendment of the student’s education records that the student believes are inaccurate, misleading, or otherwise in violation of the student’s privacy rights under FERPA.

A student who wishes to ask the University to amend a record should write the University official responsible for the record, clearly identify the part of the record the student wants changed, and specify why it should be changed.

If the University decides not to amend the record as requested, the University will notify the student in writing of the decision and the student’s right to a hearing regarding the request for amendment. Additional information regarding the hearing procedures will be provided to the student when notified of the right to a hearing.

Note: The challenge of a student under this paragraph is limited to information which relates directly to the student and which the student asserts is inaccurate or misleading. With regard to a student’s grade, this right does not permit the student to contest a grade on the grounds that a higher grade is deserved, but only to show that the grade has been inaccurately recorded.

(3) The right to provide written consent before the University discloses personally identifiable information from the student’s education records, except to the extent that FERPA authorizes disclosure without consent.

The University discloses education records without a student’s prior written consent under the FERPA exception for disclosure to school officials with legitimate educational interests. A school official is a person employed by the University in an administrative, supervisory, academic or research, or support staff position (including law enforcement unit personnel and health staff); contractors, consultants, volunteers and other outside parties to whom the institution has outsourced institutional services or functions instead of using University employees or officials (such as an attorney, auditor, or collection agent); a person serving on the Board of Trustees; or a student serving on an official committee, such as a disciplinary or grievance committee, or assisting another school official in performing his or her tasks.

A school official has a legitimate educational interest if the official needs to review an education record in order to fulfill his or her professional responsibilities for the University.

Upon request, the University also discloses education records without consent to officials of another school in which a student seeks or intends to enroll.

(4) The right to refuse to permit the designation of any or all of the following categories of personally-identifiable information as directory information, which is not subject to the above restrictions on disclosure: student’s full name, permanent address and telephone number, local address and telephone number, e-mail address, Clemson identification number (the number that begins with a C on the student ID card and is also referred to as a student’s XID), username, state of residence, date and place of birth, marital status, academic class, class schedule and class roster, name of advisor, major field of study, including the college, division, department or program in which the student is enrolled, participation in officially recognized activities and sports, weight and height of members of athletic teams, dates of attendance and graduation, degrees and honors and awards received including selection to a dean’s list or honorary organization and the grade point average of students selected, and the most previous educational institution attended. Photographic, video, or electronic images of students taken and maintained by the University are also considered directory information.

Directory information may be disclosed by the University for any purpose, at its discretion. Any student wishing to exercise his/her right to refuse to permit the designation of any or all of the above categories as directory information must give written notification to the Registration Services Office (E-206 Martin Hall) by the last day to register for the enrollment period concerned as published in the Clemson University calendar.

(5) The right to file a complaint with the U.S. Department of Education concerning alleged failures by the University to comply with the requirements of FERPA. The name and address of the Office that administers FERPA is Family Policy Compliance Office, U.S. Department of Education, 400 Maryland Avenue, SW, Washington, DC 20202-5901.
DISCLOSURE OF EDUCATION RECORDS IN HEALTH AND SAFETY EMERGENCIES

If the University determines that there is an articulable and significant threat to the health or safety of a student or other individuals, FERPA allows disclosure of information from education records to appropriate parties whose knowledge of the information is necessary to protect the health and safety of the student or other individuals.¹

- “Articulable and significant threat” means that if a school official can explain why, based on all the information then available, he or she reasonably believes that a student poses a significant threat, such as a threat of substantial bodily harm, to any person, including the student, the University may disclose education records to any person whose knowledge of information from those records will assist in protecting a person from that threat.
- “Appropriate parties” include parents of the student; parents may be notified when there is a health or safety emergency involving their son or daughter.

In making a determination to disclose information, the University may take into account the totality of the circumstances pertaining to a threat to the safety or health of the student or other individuals. An emergency can be related to the threat of an actual, impending, or imminent emergency, such as a terrorist attack, a natural disaster, a campus shooting, or the outbreak of an epidemic such as e-coli. An emergency can also be a situation in which a student gives sufficient, cumulative warning signs that lead the school official to believe the student may harm himself at any moment.

The FERPA recordkeeping requirements require the University to record 1) the articulable and significant threat that formed the basis for the disclosure and 2) the parties to whom the information was disclosed. This record will demonstrate what circumstances led to the determination that a health or safety emergency existed and how the disclosure was justified. The record must be made within a reasonable period of time after the disclosure was made. The record must be maintained with the education records of the student for as long as the student’s education records are maintained. After disclosing information under the FERPA health and safety exception, employee(s) must document the following information and forward the records to the dean of students.²

- Student’s name
- Name(s) of person(s) to whom the student posed a significant health or safety threat
- Description of the significant threat to health or safety
- Description of the circumstances and the information available (including relevant dates)
- Description of all the information that was disclosed
- Name(s) of person(s) to whom the information was disclosed (person(s) whose knowledge of the information would have assisted in protecting a person or persons from the threat; or student’s parents)
- Date(s) disclosure was made
- Name(s) of CU employee(s) who determined a health and safety emergency existed
- Name(s) of CU employee(s) who disclosed the information
- Date the record of disclosure was made

¹Note: The FERPA health and safety requirements do not apply to disclosures to a Clemson University employee with a legitimate educational interest in the information. Information from education records may be disclosed to University employee if the information is necessary for that employee to perform work appropriate to his or her position.
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### ACADEMIC CALENDAR 2013-2014

#### Long Summer 2013

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<thead>
<tr>
<th>Date</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>May 14, Tu</td>
<td>Late enrollment</td>
</tr>
<tr>
<td>May 15, W</td>
<td>Classes begin</td>
</tr>
<tr>
<td>May 16, Th</td>
<td>Late day to register or add a class</td>
</tr>
<tr>
<td>May 22, W</td>
<td>Last day to drop a class or withdraw from the University without a W grade</td>
</tr>
<tr>
<td>Jun 4, Tu</td>
<td>Last day to order diploma for August graduation</td>
</tr>
<tr>
<td>Jun 17-21, M-F</td>
<td>Long summer break</td>
</tr>
<tr>
<td>Jul 4, Th</td>
<td>July 4th holiday</td>
</tr>
<tr>
<td>Jul 2, Tu</td>
<td>Last day for instructors to issue midterm evaluations</td>
</tr>
<tr>
<td>Jul 9, Tu</td>
<td>Last day to drop a class or withdraw from the University without final grades</td>
</tr>
<tr>
<td>Jul 31, W</td>
<td>Last day of classes</td>
</tr>
<tr>
<td>Aug 1, Th</td>
<td>Study day</td>
</tr>
<tr>
<td>Aug 2 &amp; 5, F &amp; M</td>
<td>Examinations</td>
</tr>
<tr>
<td>Aug 6, Tu</td>
<td>2:00 p.m.–Deadline to submit candidate grades</td>
</tr>
<tr>
<td>Aug 7, W</td>
<td>9:00 a.m.–Deadline to submit other grades</td>
</tr>
<tr>
<td>Aug 8, Th</td>
<td>Candidates for graduation may access grades</td>
</tr>
<tr>
<td>Aug 9, F</td>
<td>Graduation</td>
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#### Summer I 2013

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<td>Classes begin</td>
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<tr>
<td>May 16, Th</td>
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<td>May 20, M</td>
<td>Last day to drop a class or withdraw from the University without a W grade</td>
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<tr>
<td>Jun 6, Th</td>
<td>Last day to drop a class or withdraw from the University without final grades</td>
</tr>
<tr>
<td>Jun 18, Tu</td>
<td>Last day of classes</td>
</tr>
<tr>
<td>Jun 19, W</td>
<td>Study day</td>
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<tr>
<td>Jun 20-21, Th-F</td>
<td>Examinations</td>
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<tr>
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#### Summer II 2013

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<td>Jun 27, Th</td>
<td>Last day to register or add a class</td>
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<tr>
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<td>Last day to drop a class or withdraw from the University without a W grade</td>
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<tr>
<td>Jul 15, M</td>
<td>Last day for instructors to issue midterm evaluations</td>
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<td>Aug 1, Th</td>
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<td>Aug 2 &amp; 5, F &amp; M</td>
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<td>Aug 6, Tu</td>
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#### Summer Minimester A 2013

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<tr>
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<tr>
<td>Jun 3, M</td>
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#### Summer Minimester B 2013

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<tr>
<td>Jun 4, Tu</td>
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<tr>
<td>Jun 5, W</td>
<td>Last day to drop a class or withdraw from the University without a W grade</td>
</tr>
<tr>
<td>Jun 11, Tu</td>
<td>Last day for instructors to issue midterm evaluations</td>
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<tr>
<td>Jun 13, Th</td>
<td>Last day to drop a class or withdraw from the University without final grades</td>
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<tr>
<td>Jun 20, Th</td>
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<td>Jun 21, F</td>
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<td>Jun 24, M</td>
<td>Examinations</td>
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#### Summer Minimester C 2013

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<td>Jun 25, Tu</td>
<td>Classes begin</td>
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<tr>
<td>Jun 25, Tu</td>
<td>Last day to register or add a class</td>
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<tr>
<td>Jun 26, W</td>
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<tr>
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<td>Last day for instructors to issue midterm evaluations</td>
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<td>Jul 5, F</td>
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<td>Examinations</td>
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#### Summer Minimester D 2013

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<td>Jul 17, W</td>
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<td>Jul 17, W</td>
<td>Classes begin</td>
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<tr>
<td>Jul 17, W</td>
<td>Last day to register or add a class</td>
</tr>
<tr>
<td>Jul 18, Th</td>
<td>Last day to drop a class or withdraw from the University without a W grade</td>
</tr>
<tr>
<td>Jul 24, W</td>
<td>Last day for instructors to issue midterm evaluations</td>
</tr>
<tr>
<td>Jul 26, F</td>
<td>Last day to drop a class or withdraw from the University without final grades</td>
</tr>
<tr>
<td>Aug 2, F</td>
<td>Last day of classes</td>
</tr>
<tr>
<td>Aug 5, M</td>
<td>Examinations</td>
</tr>
<tr>
<td>Aug 6, Tu</td>
<td>2:00 p.m.–Deadline to submit candidate grades</td>
</tr>
<tr>
<td>Aug 7, W</td>
<td>9:00 a.m.–Deadline to submit other grades</td>
</tr>
<tr>
<td>Aug 8, Th</td>
<td>Candidates for graduation may access grades</td>
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<tr>
<td>Aug 9, F</td>
<td>Graduation</td>
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## Fall Semester 2013

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<th>Event</th>
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<tr>
<td>Aug 19-20, M-Tu</td>
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<td>University Convocation</td>
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<td>Aug 21, W</td>
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<tr>
<td>Aug 27, Tu</td>
<td>Last day to register or add a class</td>
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<tr>
<td>Sep 3, Tu</td>
<td>Last day to drop a class or withdraw from the University without a W grade</td>
</tr>
<tr>
<td>Sep 10, Tu</td>
<td>Last day to order diploma for December graduation</td>
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<tr>
<td>Oct 11, F</td>
<td>Last day for instructors to issue midterm evaluations</td>
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<tr>
<td>Oct 14-15, M-Tu</td>
<td>Fall break</td>
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<tr>
<td>Nov 4, M</td>
<td>Registration for spring and summer terms begins</td>
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<tr>
<td>Oct 29, Tu</td>
<td>Last day to drop a class or withdraw from the University without final grades</td>
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<tr>
<td>Nov 27-29, W-F</td>
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<tr>
<td>Dec 5-6, M-F</td>
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<tr>
<td>Dec 16, M</td>
<td>9:00 a.m.–Deadline to submit candidate grades</td>
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<tr>
<td>Dec 18, W</td>
<td>Last day to drop a class or withdraw from the University without grades</td>
</tr>
<tr>
<td>Dec 18, W</td>
<td>Candidates for graduation may access grades</td>
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<tr>
<td>Dec 19, Th</td>
<td>Graduation</td>
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## Fall I 2013

<table>
<thead>
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<tbody>
<tr>
<td>Aug 19, M</td>
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<td>Aug 26, M</td>
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<tr>
<td>Aug 30, F</td>
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<tr>
<td>Sep 10, Tu</td>
<td>Last day to order diploma for December graduation</td>
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<td>Last day for instructors to issue midterm evaluations</td>
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<td>Oct 7-11, M-F</td>
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<tr>
<td>Oct 16, W</td>
<td>9:00 a.m.–Deadline to submit grades</td>
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## Fall II 2013

<table>
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<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct 14-15, M-Tu</td>
<td>Fall break</td>
</tr>
<tr>
<td>Oct 16, W</td>
<td>Late enrollment</td>
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<tr>
<td>Oct 16, W</td>
<td>Classes begin</td>
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<td>Registration for spring and summer terms begins</td>
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<td>Nov 19, Tu</td>
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<td>Dec 6, F</td>
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<td>Graduation</td>
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## Fall Minimester A 2013

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<th>Event</th>
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<tbody>
<tr>
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<tr>
<td>Aug 21, W</td>
<td>Classes begin</td>
</tr>
<tr>
<td>Aug 22, Th</td>
<td>Last day to drop a class or withdraw from the University without a W grade</td>
</tr>
<tr>
<td>Aug 30, F</td>
<td>Last day for instructors to issue midterm evaluations</td>
</tr>
<tr>
<td>Sep 3, Tu</td>
<td>Last day to drop a class or withdraw from the University without final grades</td>
</tr>
<tr>
<td>Sep 10, Tu</td>
<td>Last day of classes</td>
</tr>
<tr>
<td>Sep 10, Tu</td>
<td>Last day to order diploma for December graduation</td>
</tr>
<tr>
<td>Sep 11, W</td>
<td>Study day</td>
</tr>
<tr>
<td>Sep 12, Th</td>
<td>Examinations</td>
</tr>
<tr>
<td>Sep 16, M</td>
<td>9:00 a.m.–Deadline to submit grades</td>
</tr>
</tbody>
</table>

## Fall Minimester B 2013

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sep 17, Tu</td>
<td>Late enrollment</td>
</tr>
<tr>
<td>Sep 18, W</td>
<td>Classes begin</td>
</tr>
<tr>
<td>Sep 19, Th</td>
<td>Last day to drop a class or withdraw from the University without a W grade</td>
</tr>
<tr>
<td>Sep 27, F</td>
<td>Last day for instructors to issue midterm evaluations</td>
</tr>
<tr>
<td>Oct 1, Tu</td>
<td>Last day to drop a class or withdraw from the University without final grades</td>
</tr>
<tr>
<td>Oct 8, Tu</td>
<td>Last day of classes</td>
</tr>
<tr>
<td>Oct 9, W</td>
<td>Study day</td>
</tr>
<tr>
<td>Oct 10, Th</td>
<td>Examinations</td>
</tr>
<tr>
<td>Oct 14-15, M-Tu</td>
<td>Fall break</td>
</tr>
<tr>
<td>Oct 16, W</td>
<td>9:00 a.m.–Deadline to submit grades</td>
</tr>
</tbody>
</table>

## Fall Minimester C 2013

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct 14-15, M-Tu</td>
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<td>Oct 16, W</td>
<td>Late enrollment</td>
</tr>
<tr>
<td>Oct 16, W</td>
<td>Classes begin</td>
</tr>
<tr>
<td>Oct 17, Th</td>
<td>Last day to drop a class or withdraw from the University without a W grade</td>
</tr>
<tr>
<td>Oct 25, F</td>
<td>Last day for instructors to issue midterm evaluations</td>
</tr>
<tr>
<td>Oct 29, Tu</td>
<td>Last day to drop a class or withdraw from the University without final grades</td>
</tr>
<tr>
<td>Nov 5, Tu</td>
<td>Last day of classes</td>
</tr>
<tr>
<td>Nov 6, W</td>
<td>Study day</td>
</tr>
<tr>
<td>Nov 7, Th</td>
<td>Examinations</td>
</tr>
<tr>
<td>Nov 11, M</td>
<td>9:00 a.m.–Deadline to submit grades</td>
</tr>
</tbody>
</table>

## Fall Minimester D 2013

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov 12, Tu</td>
<td>Late enrollment</td>
</tr>
<tr>
<td>Nov 13, W</td>
<td>Classes begin</td>
</tr>
<tr>
<td>Nov 14, Th</td>
<td>Last day to drop a class or withdraw from the University without a W grade</td>
</tr>
<tr>
<td>Nov 22, F</td>
<td>Last day for instructors to issue midterm evaluations</td>
</tr>
<tr>
<td>Nov 27-29, W-F</td>
<td>Thanksgiving holidays</td>
</tr>
<tr>
<td>Nov 26, Tu</td>
<td>Last day to drop a class or withdraw from the University without final grades</td>
</tr>
<tr>
<td>Dec 6, F</td>
<td>Last day of classes</td>
</tr>
<tr>
<td>Dec 9, M</td>
<td>Examinations</td>
</tr>
<tr>
<td>Dec 16, M</td>
<td>9:00 a.m.–Deadline to submit candidate grades</td>
</tr>
<tr>
<td>Dec 18, W</td>
<td>9:00 a.m.–Deadline to submit other grades</td>
</tr>
<tr>
<td>Dec 18, W</td>
<td>Candidates for graduation may access grades</td>
</tr>
<tr>
<td>Dec 19, Th</td>
<td>Graduation</td>
</tr>
</tbody>
</table>
### Spring Semester 2014

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 6, M</td>
<td>Orientation</td>
</tr>
<tr>
<td>Jan 6-7, M-Tu</td>
<td>Late enrollment</td>
</tr>
<tr>
<td>Jan 8, W</td>
<td>Classes begin</td>
</tr>
<tr>
<td>Jan 14, Tu</td>
<td>Last day to register or add a class</td>
</tr>
<tr>
<td>Jan 20, M</td>
<td>Martin Luther King Jr. holiday</td>
</tr>
<tr>
<td>Jan 22, W</td>
<td>Last day to drop a class or withdraw from the University without a W grade</td>
</tr>
<tr>
<td>Jan 29, W</td>
<td>Last day to order diploma for May commencement</td>
</tr>
<tr>
<td>Feb 28, F</td>
<td>Last day for instructors to issue midterm evaluations</td>
</tr>
<tr>
<td>Mar 14, F</td>
<td>Last day to drop a class or withdraw from the University without final grades</td>
</tr>
<tr>
<td>Mar 17-21, M-F</td>
<td>Spring break</td>
</tr>
<tr>
<td>Mar 31, M</td>
<td>Registration for fall term begins</td>
</tr>
<tr>
<td>Apr 5-12, SaSa</td>
<td>Honors and Awards Week</td>
</tr>
<tr>
<td>Apr 24-25, Th-F</td>
<td>Classes meet; exams permitted in labs only</td>
</tr>
<tr>
<td>Apr 28-May 2, M-F</td>
<td>Examinations</td>
</tr>
<tr>
<td>May 6, Tu</td>
<td>9:00 a.m.–Deadline to submit candidate grades</td>
</tr>
<tr>
<td>May 7, W</td>
<td>9:00 a.m.–Deadline to submit other grades</td>
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<td>Candidates for graduation may access grades</td>
</tr>
<tr>
<td>May 9, F</td>
<td>Commencement</td>
</tr>
</tbody>
</table>

### Spring I 2014

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 6, M</td>
<td>Late enrollment</td>
</tr>
<tr>
<td>Jan 6, M</td>
<td>Classes begin</td>
</tr>
<tr>
<td>Jan 20, M</td>
<td>Martin Luther King Jr. holiday</td>
</tr>
<tr>
<td>Jan 13, M</td>
<td>Last day to register or add a class</td>
</tr>
<tr>
<td>Jan 21, Tu</td>
<td>Last day to drop a class or withdraw from the University without a W grade</td>
</tr>
<tr>
<td>Jan 29, W</td>
<td>Last day to order diploma for May commencement</td>
</tr>
<tr>
<td>Feb 3, M</td>
<td>Last day for instructors to issue midterm evaluations</td>
</tr>
<tr>
<td>Feb 10, M</td>
<td>Last day to drop a class or withdraw from the University without final grades</td>
</tr>
<tr>
<td>Feb 24, M</td>
<td>Last day of classes</td>
</tr>
<tr>
<td>Feb 25-28, Tu-F</td>
<td>Examinations</td>
</tr>
<tr>
<td>Mar 3, M</td>
<td>9:00 a.m.–Deadline to submit grades</td>
</tr>
</tbody>
</table>

### Spring II 2014

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mar 3, M</td>
<td>Late enrollment</td>
</tr>
<tr>
<td>Mar 3, M</td>
<td>Classes begin</td>
</tr>
<tr>
<td>Mar 10, M</td>
<td>Last day to register or add a class</td>
</tr>
<tr>
<td>Mar 14, F</td>
<td>Last day to drop a class or withdraw from the University without a W grade</td>
</tr>
<tr>
<td>Mar 17-21, M-F</td>
<td>Spring break</td>
</tr>
<tr>
<td>Mar 31, M</td>
<td>Registration for fall term begins</td>
</tr>
<tr>
<td>Apr 4, F</td>
<td>Last day for instructors to issue midterm evaluations</td>
</tr>
<tr>
<td>Apr 11, F</td>
<td>Last day to drop a class or withdraw from the University without final grades</td>
</tr>
<tr>
<td>Apr 25, F</td>
<td>Last day of classes</td>
</tr>
<tr>
<td>Apr 29-May 3, M-F</td>
<td>Examinations</td>
</tr>
<tr>
<td>May 6, Tu</td>
<td>9:00 a.m.–Deadline to submit candidate grades</td>
</tr>
<tr>
<td>May 7, W</td>
<td>9:00 a.m.–Deadline to submit other grades</td>
</tr>
<tr>
<td>May 8, Th</td>
<td>Candidates for graduation may access grades</td>
</tr>
<tr>
<td>May 9, F</td>
<td>Commencement</td>
</tr>
</tbody>
</table>

### Spring Minimester A 2014

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 6-7, M-Tu</td>
<td>Late enrollment</td>
</tr>
<tr>
<td>Jan 8, W</td>
<td>Classes begin</td>
</tr>
<tr>
<td>Jan 9, Th</td>
<td>Last day to drop a class or withdraw from the University without a W grade</td>
</tr>
<tr>
<td>Jan 20, M</td>
<td>Martin Luther King Jr. holiday</td>
</tr>
<tr>
<td>Jan 22, W</td>
<td>Last day for instructors to issue midterm evaluations</td>
</tr>
<tr>
<td>Jan 29, W</td>
<td>Last day to drop a class or withdraw from the University without final grades</td>
</tr>
<tr>
<td>Feb 28, F</td>
<td>Last day to order diploma for May commencement</td>
</tr>
<tr>
<td>Mar 30, Th</td>
<td>Study day</td>
</tr>
<tr>
<td>Jan 31, F</td>
<td>Examinations</td>
</tr>
<tr>
<td>Feb 3, M</td>
<td>9:00 a.m.–Deadline to submit grades</td>
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</tbody>
</table>

### Spring Minimester B 2014

<table>
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<tr>
<th>Date</th>
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<tbody>
<tr>
<td>Mar 3, M</td>
<td>Late enrollment</td>
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<td>Mar 3, M</td>
<td>Classes begin</td>
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<tr>
<td>Mar 4, Tu</td>
<td>Last day to register or add a class</td>
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<tr>
<td>Mar 14, F</td>
<td>Last day to drop a class or withdraw from the University without a W grade</td>
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<tr>
<td>Mar 12, W</td>
<td>Last day for instructors to issue midterm evaluations</td>
</tr>
<tr>
<td>Mar 14, F</td>
<td>Last day to drop a class or withdraw from the University without final grades</td>
</tr>
<tr>
<td>Mar 31, M</td>
<td>Examinations</td>
</tr>
<tr>
<td>Mar 3, M</td>
<td>9:00 a.m.–Deadline to submit grades</td>
</tr>
</tbody>
</table>

### Spring Minimester C 2014

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
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<tbody>
<tr>
<td>Mar 3, M</td>
<td>Late enrollment</td>
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<tr>
<td>Mar 3, M</td>
<td>Classes begin</td>
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<tr>
<td>Mar 4, Tu</td>
<td>Last day to register or add a class</td>
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<tr>
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<tr>
<td>Mar 14, F</td>
<td>Last day to drop a class or withdraw from the University without final grades</td>
</tr>
<tr>
<td>Mar 17-21, M-F</td>
<td>Spring break</td>
</tr>
<tr>
<td>Mar 28, F</td>
<td>Last day of classes</td>
</tr>
<tr>
<td>Mar 31, M</td>
<td>Registration for fall term begins</td>
</tr>
<tr>
<td>Mar 31, M</td>
<td>Examinations</td>
</tr>
<tr>
<td>Apr 7, M</td>
<td>9:00 a.m.–Deadline to submit grades</td>
</tr>
</tbody>
</table>

### Spring Minimester D 2014

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apr 7, M</td>
<td>Late enrollment</td>
</tr>
<tr>
<td>Apr 7, M</td>
<td>Classes begin</td>
</tr>
<tr>
<td>Apr 8, Tu</td>
<td>Last day to register or add a class</td>
</tr>
<tr>
<td>Apr 16, W</td>
<td>Last day for instructors to issue midterm evaluations</td>
</tr>
<tr>
<td>Apr 18, F</td>
<td>Last day to drop a class or withdraw from the University without final grades</td>
</tr>
<tr>
<td>Apr 25, F</td>
<td>Last day of classes</td>
</tr>
<tr>
<td>Apr 28, M</td>
<td>Examinations</td>
</tr>
<tr>
<td>May 6, Tu</td>
<td>9:00 a.m.–Deadline to submit candidate grades</td>
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<tr>
<td>May 8, Th</td>
<td>Candidates for graduation may access grades</td>
</tr>
<tr>
<td>May 9, F</td>
<td>Commencement</td>
</tr>
</tbody>
</table>

Note: Dates on this calendar were accurate at the time of printing. Dates, however, may change as conditions warrant. Current information is available at [www.registrar.clemson.edu/html/Acad_Cal.htm](http://www.registrar.clemson.edu/html/Acad_Cal.htm).
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Theodore J. Swann, Clemson
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J. Roger Troutman, Rock Hill
Steven K. Watt, Kennesaw, Georgia
Jonathan P. Wett, Folly Beach
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D. Leslie Tindal, Pinewood
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Louis B. Lynn, Columbia
Patricia H. McAbee, Greenville
John H. McCarter Jr., Columbia
Patricia H. McAbee, Greenville
Kim Wilkerson, Cayce

ADMINISTRATION

UNIVERSITY GOVERNANCE AND ADMINISTRATION
The University is governed by a board of 13 members, six selected by the state Legislature and seven self-perpetuating life members, in accord with the will of Thomas Green Clemson. The Board of Trustees is primarily responsible for adopting the long-range objectives of the University and the basic policies for achieving them; providing policy instruction for long-range planning; adopting the statutes of the University; electing the president of the University; employing the secretary of the board; maintaining ownership of University assets; and overseeing the evaluation of the University.

The president is the chief executive officer of the University, providing leadership to all phases of University planning, coordinating the operations of all units of the University, carrying out major University public relations functions, evaluating the results of University plans, and appointing personnel who report to the president. The day-to-day operations of the University are administered by the president and executive officers for advancement, public service and agriculture, student affairs, and research and economic development.

The provost and vice president for academic affairs is the chief academic officer of the University. The provost is responsible directly to the president for all academic matters and has administrative jurisdiction over teaching and computing services. The provost assists in administering and performing duties in coordinating graduate and undergraduate curricula; supervising computer information services, the libraries, scholarship and award programs; and other duties assigned by the provost.

Academic deans are the chief administrative officers of their individual colleges and report directly to the provost. They provide leadership in formulation and carrying out educational policy; review and make recommendations on personnel matters; and carry out and administer the academic and financial affairs of their colleges.

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D. Leslie Tindal, Pinewood
Allen P. Wood, Florence
GENERAL INFORMATION

PURPOSE OF CATALOG
This catalog gives a general description of Clemson University and provides prospective students with detailed information regarding the various colleges and departments within the University and curricula offered by the University. Inasmuch as the educational process necessitates change, the information and educational requirements in this catalog represent a flexible program that may be altered where such alterations are thought to be in the mutual interest of the University and its students.

The provisions of this catalog do not constitute a contract that may be accepted by students through registration and enrollment in the University. The University reserves the right to change without notice any fee, provision, offering, or requirement in this catalog and to determine whether a student has satisfactorily met its requirements for admission or graduation. The University further reserves the right to require a student to withdraw from the University for cause at any time.

Each curriculum shall be governed by the requirements in effect on the date of enrollment. If a student withdraws from the University and subsequently returns or does not remain continuously enrolled (summers excluded), the requirements in effect at the time of return will normally prevail.

STUDENT RESPONSIBILITY
All colleges and departments establish certain academic requirements that must be met before a degree is granted. Advisors, department chairs, and deans are available to help the student understand and meet these requirements; but the student is responsible for fulfilling them. If, at the end of a student’s course of study, the requirements for graduation have not been satisfied, the degree will not be granted. For this reason, it is important for students to acquaint themselves with all academic requirements throughout their college career and to be responsible for completing all requirements within prescribed deadlines and time limits.

VISION STATEMENT
Clemson University will be one of the nation’s top-20 public universities.

MISSION STATEMENT
Clemson University was established to fulfill our founder’s vision of a “high seminary of learning” to develop “the material resources of the State” for the people of South Carolina. Nurtured by an abiding land grant commitment, Clemson has emerged as a research university with a global vision. Our primary purpose is educating undergraduate and graduate students to think deeply about and engage in social, scientific, economic, and professional challenges of our times. The foundation of this mission is the generation, preservation, communication, and application of knowledge. The University also is committed to the personal growth of the individual and promotes an environment of good decision making, healthy and ethical lifestyles, and tolerance and respect for others. Our distinctive character is shaped by a legacy of service, collaboration, and fellowship forged from and renewed by the spirit of Thomas Green Clemson’s covenant.

UNIVERSITY DESCRIPTION
Clemson University is a selective, public, research university in a college-town setting. Clemson’s desire is to attract a capable, dedicated and diverse student body of approximately 20,000 undergraduate and graduate students, with priority to students from South Carolina. The University offers a wide array of high quality baccalaureate programs built around a distinctive core curriculum. Graduate, continuing education, doctoral and research programs contribute to the state of knowledge and to the economic future of the state, nation and world. The University provides bachelor’s, master’s and doctoral degrees in more than 100 majors through five academic colleges: the College of Agriculture, Forestry and Life Sciences; the College of Architecture, Arts and Humanities; the College of Business and Behavioral Science; the College of Engineering and Science; and the College of Health, Education and Human Development.

Clemson combines the benefits of a major research university with a strong commitment to undergraduate teaching and individual student success. Students, both undergraduate and graduate, have opportunities for unique educational experiences throughout South Carolina, as well as in other countries. Experiential learning is a valued component of the Clemson experience, and students are encouraged through Creative Inquiry, internships, study abroad, to apply their learning beyond the classroom. Electronic delivery of courses and degree programs also provide a variety of learning opportunities. Clemson’s extended campus includes teaching sites in Greenville and Charleston, five research campuses, and five public service centers throughout the state of South Carolina, as well as four international sites.

The University is committed to exemplary teaching, research and public service in the context of general education, student engagement and development, and continuing education. In all areas, the goal is to develop students’ communication and critical-thinking skills, ethical judgment, global awareness, and scientific and technological knowledge. The distinctive character of Clemson is reflected in the culture of collegiality and collaboration among faculty, students, staff, the administration, and the university board.

HISTORY
When one man of wisdom and foresight can look beyond the despair of troubled times and imagine what could be, great things can happen. That is what the University’s founder, Thomas Green Clemson, was able to do in the post-Civil War days. He looked upon a South that lay in economic ruin, once remarking that “conditions are wretched in the extreme” and that “people are quitting the land.” Still, among the ashes he saw hope. Joined by his wife, Anna Calhoun Clemson, Mr. Clemson envisioned what could be possible if the South’s youth were given an opportunity to receive instruction in scientific agriculture and the mechanical arts. He once wrote, “The only hope we have for the advancement of agriculture (in the U.S.) is through the sciences, and yet there is not one single institution on this continent where a proper scientific education can be obtained.” When he was president of the Pendleton Farmers Society in 1866, Mr. Clemson served on a committee whose purpose was to promote the idea of founding an institution for “educating the people in the sciences” and “which will in time secure permanent prosperity.”

When he died on April 6, 1888, a series of events began that marked the start of a new era in higher education in the state of South Carolina, especially in the study of science, agriculture, and engineering. Mr. Clemson’s passing set the stage for the founding of the university that bears his name—the beginning of a true “people’s university,” which opened the doors of higher education to all South Carolinians, rich and poor alike. In his will, which he signed November 6, 1886, Mr. Clemson bequeathed the Fort Hill plantation and a considerable sum from his personal assets for the establishment of an educational institution of the kind he envisioned. He left a cash endowment of approximately $80,000, as well as the 814-acre Fort Hill estate, to South Carolina for such a college. The biggest obstacle in the creation of an agricultural college—the initial expense—was removed by Mr. Clemson’s bequest.

On November 27, 1889, Governor John Richardson signed the bill accepting Thomas Clemson’s gift. Soon after, a measure was introduced to establish the Clemson Agricultural College, with its trustees becoming custodians of Morrill Act and Hatch Act funds made available for agricultural education and research by federal legislative acts. The founding of the Clemson Agricultural College supplanted the South Carolina College of Agriculture and Mechanics in Columbia, which had been designated in 1880.

Thomas Green Clemson came to South Carolina when he married Anna Maria Calhoun, daughter of South Carolina’s famous statesman John C. Calhoun. Born in Philadelphia, Mr. Clemson was educated at schools both in the United States and France, where he attended lectures at the Royal School of Mines, studied with prominent scientists in the private laboratories of the Sorbonne Royal College of France, and received his diploma as an assayer from the Royal Mint in Paris. Mr. Clemson, then in his mid-20s, returned to America greatly influenced by his European studies. He became a great advocate of the natural sciences, achieving a considerable reputation as a mining engineer and a theorist in agricultural chemistry. He also was a gifted writer whose articles were published in the leading scientific journals of his day, an artist and a diplomat who represented the U.S. government as chargé d’affaires to Belgium for almost seven years.

Mr. Clemson had a lifelong interest in farming and agricultural affairs. He served as the nation’s first superintendent of agricultural affairs (predecessor to the present secretary of agriculture position) and actively promoted the establishment and endowment of the Maryland Agricultural College in the 1850s. Though remembered today for these accomplishments, Thomas Clemson made his greatest historical contribution when, as a champion of formal scientific education, his life became intertwined with the destiny of educational and economic development in South Carolina. Although he never lived to see it, his dedicated efforts culminated in the founding of Clemson Agricultural College.

At the time of his death, Mr. Clemson was living at the Fort Hill homeplace, which today is a national historic landmark and provides a historic centerpiece for the Clemson University campus. He had inherited the house and plantation lands upon the death of Mrs. Clemson in 1875.
Clemson College formally opened in July 1893, with an enrollment of 446. From the beginning, the college was an all-male military school. It remained this way until 1955, when the change was made to “civilian” status for students and Clemson became a coeducational institution. In 1964, the college was renamed Clemson University as the state legislature and the state courts formally recognized the school’s expanded academic offerings, Ph.D. granting status and research pursuits. On November 27, 1989, the University observed the 100th anniversary of the state’s acceptance of the terms and conditions of Mr. Clemson’s bequest. The enrollment of Clemson has grown from 446 students at the opening of the University to 20,768 for the first semester 2012-2013. Since the opening of the University, 118,971 students have been awarded bachelor’s degrees. During this same period, 426 associate degrees, 32,964 master’s, 3,925 doctor’s degrees have been awarded, a total of 156,672 degrees.

Today, more than a century later, the University is much more than its founder ever could have imagined. With its diverse learning and research facilities, the University provides an educational opportunity not only for the people of the state, as Mr. Clemson dreamed, but for thousands of young men and women throughout the country and the world. THE CAMPUS

The 1,400-acre Clemson University campus is sited on the former homestead of statesman John C. Calhoun. Nestled in the foothills of the Blue Ridge Mountains and adjacent to Lake Hartwell, the campus commands an excellent view of the mountains to the north and west, some of which attain an altitude of over 5,000 feet above mean sea level.

The Norfolk and Southern Railway and U.S. highways 76 and 123 provide easy access to the city of Clemson and to the University. Oconee County Airport is four miles from the library. Both Atlanta and Charlotte are two hours driving time away.

Campus architecture is a pleasing blend of traditional and modern facilities enhanced by a beautiful landscape of towering trees, grassy expanses, and flowering plants. Academic, administrative, and student service buildings on campus represent an insured value of $627 million. Clemson University's real estate holdings include more than 32,000 acres of forestry and agricultural lands throughout the state, the majority of which are dedicated to Clemson’s research and public-service missions.

Fort Hill, the former home of John C. Calhoun inherited by Thomas Clemson, and the Hanover House are both listed on the National Register of Historic Places and are open to the public. The campus also has two recognized historic districts.

The Strom Thurmond Institute houses the institute offices, Senator Thurmond’s papers and memorabilia, and the special collections of the Cooper Library, including papers of John C. Calhoun and James Byrnes, two of the most important South Carolinians since 1787. The institute is a part of an instructional and public-service district that includes the Brooks Center for the Performing Arts and the Madren Center for Continuing Education.

Clemson offers limited graduate and undergraduate coursework in Greenville, SC. Also located in Greenville is the Clemson University International Center for Automotive Research (CU-ICAR), a 250-acre advanced-technology research campus where university, industry and government organizations collaborate.

ACCREDITATION

Clemson University is accredited by the Southern Association of Colleges and Schools Commission on Colleges to award bachelor’s, master’s, education specialist, and doctoral degrees. Contact the Commission on Colleges at 1866 Southern Lane, Decatur, Georgia 30033-4097 or call 404-679-4500 for questions about the accreditation of Clemson University.

Curricula are accredited by the Association to Advance Collegiate Schools of Business (AACSB), Accrediting Board for Engineering and Technology (ABET), American Council for Construction Education, Accreditation Council for Education in Nutrition and Dietetics (ACEND), American Society of Landscape Architects, Commission on Collegiate Nursing Education (CCNE), Council for Accreditation of Counseling and Related Education Programs (CACREP), National Architectural Accrediting Board (NAAB), National Association of Schools of Art and Design, National Council for Accreditation of Teacher Education (NCATE), National Recreation and Park Association Council on Accreditation (NRPA), Planning Accreditation Board, and Society of America Planners. Documentation of accreditation is available in the college dean’s offices.

ADVISORY POLICY

Academic advising is an ongoing educational process that connects the student to the University. Academic advising supports the University’s mission of preparing the student for learning beyond the confines of the academy. Academic advisors represent and interpret University policies and procedures to the student and help the student navigate the academic and organizational paths of the institution.

To ensure that students receive both personal and professional assistance in navigating through curriculum and University requirements toward degree completion and graduation, each student is assigned to an academic advisor (either professional or faculty advisor). Advisors are available to assist students with issues related to degree planning, course selection, withdrawals, degree requirements, academic policies, academic difficulty, campus resources, internships/practicum opportunities, and career/graduate school planning. Students are responsible for adhering to academic policies, preparing for advising meetings and taking ownership for their educational experience.

Students receive their academic advising materials and number from their advisors during their pre-registration advising meetings. Students uncertain of their assigned advisor are encouraged to seek assistance from the departmental office/advising center for their major. For more information, visit http://www.clemson.edu/academics/advising/.

LIBRARIES

The Libraries’ Web site at www.clemson.edu/library provides access to a multitude of information resources, including the library catalog, hundreds of databases, more than 40,000 electronic journals, and information regarding library services.

The Libraries’ services include circulation, reference, interlibrary loan, class instruction, and tours. Cooper Library houses a computer lab (maintained by CCIT), Java City Cyber Café, Snax & Stax convenience store, and a popular reading and audiobooks collection. Equipment available includes photocopiers, scanners, fax machines, and wireless laptops in Cooper Library and a color laser printer, engineering plotter, and large-format photocopier in the Gunnin Architecture Library.

The Clemson University Libraries consist of a main library and two branches. R.M. Cooper Library, Clemson’s main library, is a six-floor building located at the center of campus. Most of the books and journals are located there, as well as government publications, microforms, and media. The Gunnin Architecture Library in Lee Hall contains collections that focus on architecture, city and regional planning, construction science, landscape architecture, and visual arts. Special Collections, on the lower level of the Strom Thurmond Institute, houses the rare book collection, University Archives, and many manuscript collections, including the papers of John C. Calhoun and Thomas Green Clemson.

Total holdings for the library system include more than 1.8 million items, including books, periodicals, electronic resources, government publications and patents, musical recordings, DVDs and videos, audiobooks, maps, and microforms.

COMPUTING RESOURCES

Clemson Computing and Information Technology (CCIT) provides comprehensive services to students and employees, including laptop support, training, printing and plotting, computer repair, software licenses, wireless access points, network and information security, course management system, and more.

Public access computer labs across campus contain high-end Windows PCs or Macs, and black and white laser printing equipment. Students receive a specified quota of pages and plots per semester in these labs. Any printing and plotting beyond the limit is charged to the student. Lab computers provide the same access as personal student laptops using the Clemson software image. Software and access available in the labs include Internet, e-mail, Google Apps for Education, and the Microsoft Office Suite with Word, Excel, Access, Outlook, and PowerPoint applications, as well as other software. Clemson provides site licenses for several software packages, including McAfee Virus Protection and Microsoft Office. Visit the CCIT Web site for more details before purchasing expensive software that may be provided for all students.

Getting Help

The Customer Support Center, located on the second floor of Cooper Library, serves as a central point of contact for general computing assistance, laptop support and repair, and consulting services. Students may call (864) 656-3494, e-mail ITHELPER@clemson.edu, or walk in during hours of operation. Check the CCIT Web site at http://www.clemson.edu/ccit. CCIT help is also available in the Cooper Library Learning Commons on Level 4 and outside Java City on Level 5.
E-mail and Accessing Your Account
Each student’s e-mail address is userid@clemson.edu. CCIT automatically creates a Google Apps for Education account at http://g.clemson.edu for all incoming students. Google Apps offers full email functionality and large data storage, plus Google Calendar, Google Docs and Google Sites. Google Mail is the recommended student e-mail system, and it allows students to use Google’s e-mail with their Clemson e-mail address while at Clemson and following graduation. Student e-mail accounts (userid@clemson.edu) are automatically forwarded to their Google Mail accounts (userid00@college.clemson.edu). Students can change and verify their e-mail forwarding preferences at http://www.clemson.edu/email_forwarding.

Computer Training
CCIT provides computer training and support to faculty, staff and students in the use of the MyCLE portal and the Web-based course management system (Blackboard), the Clemson computer network and many desktop applications. Training is offered as part of regular University courses, short courses, special training programs and e-learning courses. Distance-learning processes and technologies are also supported. A part-time trainer is available in the Cooper Library Learning Commons for individual and group assistance. Visit the CCIT Web site for a complete list of training resources.

Wired and Wireless Access
The university computer network is accessible through wired network connections in all on-campus residences or through the University’s extensive wireless network, which provides coverage to most areas of campus. ClemsonNet is Clemson’s primary wireless network, allowing students to connect securely with their Clemson user name and password. Visit the CCIT Web site for more information and complete coverage details, including a list of compatible wireless cards.

Security
Clemson University requires all users to run virus protection and install the latest operating system patches on their computers for the security of all network users. Clemson has a site license for McAfee products, VirusScan (Windows), and McAfee’s Security Suite (MacOS). This and other licensed software options are available on the CCIT Web site.

Laptop Program
Laptops are required for all undergraduate and MBA graduate students. While students may bring any laptop that meets the minimum specifications, recommended laptops are posted on the CCIT Web site. Clemson University works with vendors to offer recommended laptops with custom warranties at special prices. Students with recommended laptops receive priority support on campus for both software and hardware issues as a part of their purchase package. Repair technicians on campus can complete warranty repairs on these laptops. Students with recommended laptops kept in Hardware Repair for an extended period of time may be able to check out a loaner laptop if available. CCIT also services and repairs many other brands of computers for a fee, or under manufacturer’s warranty, if applicable.

Additional Information
Additional information—including information about Google Apps for Education (GAE); computing and research, software licensing; IT e-mail alerts; ClemsonGuest wireless access service; the Acceptable Use Policy for Students; and the Clemson Apple Store—is available at http://www.clemson.edu/ccit or by e-mailing ITHELP@clemson.edu.

CALHOUN HONORS COLLEGE
Established in 1962, the Calhoun Honors College strives to enrich the educational experience of highly motivated, academically talented students by providing opportunities for scholarship and research not always available to undergraduates. Honors students become part of a dynamic academic community dedicated to the study of ideas and the life of the mind.

Honors students are offered the opportunity to take a wide variety of specialized honors courses. These include a series of intensive Freshman Colloquia; Calhoun Honors Seminars emphasizing multidisciplinary approaches and contemporary issues; and numerous courses satisfying general education, major or minor requirements. Honors students are also encouraged to pursue research-based programs leading to departmental honors.

Freshman admission to Calhoun Honors College requires the submission of an application separate from and in addition to the application for undergraduate admission to Clemson University. In addition to the student’s application, the Honors College requires a copy of the student’s high school transcripts and two letters of recommendation, one from a high school guidance counselor and one from a teacher. Admission is highly selective and is based, in part, on the quality of the application and the availability of space for freshmen in the Honors College.

Currently-enrolled Clemson students may apply for membership if they are full-time degree-seeking undergraduates and have earned a cumulative grade-point average of 3.50 or higher. Students must have at least four semesters remaining to complete their degree requirements.

Additional special opportunities for honors students include summer study programs in Brussels, Belgium, and India; EUREKA!, a summer research program for entering freshmen; and other study abroad opportunities. Each of these programs is competitive and requires a separate application.

The Calhoun Honors College is institutionally responsible for nationally competitive fellowships and awards, including Rhodes, Marshall, Truman, Goldwater and Fulbright.

In addition to the intellectual challenge of Honors, advantages of membership include priority course scheduling, honors housing (on a space-available basis), extended library loan privileges, a series of discussion programs, and special lectures and cultural events. Visit www.clemson.edu/cuhonors for more information.

COOPERATIVE EDUCATION PROGRAM
The Cooperative Education Program (Co-op) is an academic engaged-learning program within the Center for Career & Professional Development. The program provides students with an opportunity to alternate semesters of academic study with semesters of paid, discipline-specific experience as they work and learn under a mentor in their field of study. Co-op assignments add a contextual dimension to the curriculum and challenge students to think critically and creatively as they engage in problem-solving activities and projects within the work setting. Through this program, employers serve as Teaching Partners of the University and the co-op experience becomes an integral part of the student’s education. The student’s experience is closely monitored by the co-op faculty/academic staff throughout his/her participation in the program. Cooperative Education, as the term implies, represents a collaborative effort between the University and participating employers.

Students may qualify for the Cooperative Education Program after satisfactorily completing 30 credit hours of academic coursework. Transfer students may qualify in one semester. Students normally enter the program as sophomores or juniors and complete from two-five rotations in a co-op assignment. Completion of the co-op program is a curricular requirement for some majors, such as Packaging Science. Packaging Science students normally complete two back-to-back co-op rotations during a six-month period.

Students enrolled in the program register for the appropriate co-op course number (e.g., COOP 1010, 1020, etc.) for each rotation and receive a grade of Pass or No Pass. Students receive academic recognition on the transcript for completing the program, although no credit hours are awarded. Students pay a program participation fee each academic term that coincides with a co-op rotation. In responding to questions about student status related to health insurance, taxes, loans, etc., the University classifies a student on a co-op rotation as a full-time continuing student. Additional information is available at http://career.clemson.edu/co-op_and_internships/ or by calling the program office at 864-656-3150.

STUDY AND WORK ABROAD PROGRAMS
Through the Office of International Affairs, students may choose from a variety of study abroad programs. Program length can range from short-term, such as during spring break, to a summer session, to a full semester or year abroad. Programs vary to fulfill the academic and discipline-specific needs of students. There are programs for every academic major at Clemson. Exchange programs are available with top institutions around the world, such as ICHEC—Management School in Brussels, Belgium; the University of Aberdeen in Scotland; University of Newcastle in Australia; University of Stellenbosch in South Africa; and Universidad de Alicante in Spain. Programs are available in virtually every country in the world: Argentina, Chile, China, Czech Republic, Ecuador, England, France, Germany, Japan, Mexico, Russia, Scotland, and many more. Both Clemson-sponsored programs and exchange programs allow students to enroll and pay fees directly to Clemson while they study abroad. Transfer credit normally applies within the major with prior academic department approval. Financial aid and scholarships also transfer for many of the programs abroad.

Internships and work abroad programs are also available. Students should plan early for their study abroad experience. First priority application deadlines are usually in September/October for academic programs, in February/March for fall, academic year, and summer programs. Interested students should contact the Office of International Affairs, E-307 Martin Hall, at the beginning of each semester and throughout the academic year to explore opportunities abroad.

Additional information is available at www.clemson.edu/studyabroad or by e-mailing abroad@clemson.edu.
RESERVE OFFICERS 
TRAINING CORPS

Air Force and Army

The departments of the Air Force and the Army maintain ROTC units at Clemson University. Their mission is to produce officers of high quality for technical and nontechnical careers in the U.S. Air Force and Army. Two-, three-, and four-year programs are available. The four-year program consists of the basic course for freshmen and sophomores and the advanced course for juniors and seniors.

Scholarships, available to selected ROTC students, pay for tuition, books, and laboratory expenses, in addition to a variable stipend ranging from $300–$500 per month during the school year. Nonscholarship Cadets also receive a stipend. Basic course pay for tuition, books, and laboratory expenses, in addition to a variable stipend ranging from $300–$500 per month during the school year. Nonscholarship Cadets also receive a stipend. Basic course credit may be awarded to students having prior military service. Reserve or National Guard duty can be guaranteed by the U.S. Army.

Cadets who complete the Advanced or Professional Course and satisfy commissioning requirements are appointed Second Lieutenants. Ample opportunity exists for graduate study in both services, with temporary deferments possible.

HONOR ORGANIZATIONS

Clemson University has a number of academic honorary societies that recognize outstanding scholarship by students, faculty, and staff:

- Alpha Epsilon Delta (Premedical)
- Alpha Epsilon Lambda (Graduate Students)
- Alpha Kappa Delta (Sociology)
- Alpha Lambda Delta (Freshmen)
- Alpha Pi Mu (Industrial Engineering)
- Alpha Zeta (Agriculture)
- Beta Alpha Psi (Accounting and Financial Management)
- Beta Gamma Sigma (Business)
- Blue Key (Juniors and Seniors)
- Calhoun Honors Society (Honors College)
- Chi Epsilon (Civil Engineering)
- Eta Kappa Nu (Electrical and Computer Engineering)
- Eta Sigma Gamma (Health Education)
- Gamma Epsilon Tau (Electrical and Computer Engineering)
- Golden Key National Honor Society (Juniors and Seniors)
- Kappa Delta Pi (Education)
- Keramos (Ceramic and Materials Engineering)
- Lambda Pi Eta (Communication Studies)
- Mortar Board (Seniors)
- Mu Beta Psi (Music)
- Mu Kappa Tau (Marketing)
- Omicron Delta Epsilon (Economics)
- Omicron Delta Kappa (Leadership)
- Order of Omega (Seniors)
- Phi Beta Kappa
- Phi Kappa Phi
- Phi Psi (Textiles)
- Phi Sigma Pi (Honorary)
- Pi Delta Phi (French)
- Pi Sigma Alpha (Political Science)
- Pi Tau Sigma (Mechanical Engineering)
- Psi Chi (Psychology)
- Sigma Tau Delta (English)
- Tau Beta Pi (Engineering)
- Tau Sigma Delta
- Upsilon Pi Epsilon (Computer Science)
- Xi Sigma Pi (Forestry)

CLEMSON UNIVERSITY 
EXPERIMENT STATION

The Clemson University Experiment Station is part of a nationwide system of scientists working to improve the quality of life for people in their home states, the nation, and the world.

Both undergraduate and graduate students work with researchers to develop science-based information needed to address issues such as agricultural productivity and profitability, economic and community development, environmental conservation, food safety and nutrition and youth development. Clemson scientists have been involved in agricultural and forestry research since the University was founded in 1889. Today research is conducted in state-of-the-art laboratories, on farms and forests on Clemson’s campus, and at five research and education centers strategically located in the state’s distinct soil and climate regions.

Clemson researchers collaborate with colleagues on studies that span the globe. These include the genetic structure and functions for plants and animals, the impact of urban sprawl on the environment, techniques to reduce bullying in schools, the active ingredients in medicinal plants, and the use of nanotechnology in food packaging to detect contamination. Their work has produced more than 100 new varieties of food and fiber crops and more than 40 patents. Each year work is conducted on more than 150 projects funded through federal, state and private sources, including the U.S. Department of Agriculture, the U.S. Forest Service, the National Science Foundation, the South Carolina General Assembly, and corporate partners.

CLEMSON UNIVERSITY 
FOUNDATION

The Clemson University Foundation is a nonprofit organization that solicits, manages, and administers gifts from private sources for academic programs at Clemson University.

Chartered in 1933, the foundation is a primary component of the advancement program at the University. There are 36 elected members of the Board of Directors. Currently, 33 of those are Clemson alumni. The board also includes seven automatic directors; 15 ex officio directors, including a graduate and an undergraduate student representative; and 10 honorary directors.

The foundation operates through committees that report via an executive committee to the full board. These include the Audit, Finance, Development, Human Resources, Investment, Nominations, and Policy and Constitution Committees. Fund raising is in concert with the University and through the Development Committee and, if applicable, a Campaign Executive Committee. This includes solicitation of annual, major, planned, corporate and foundation gifts in support of University priorities and coordination of college-based fund-raising initiatives. Organizations affiliated with the foundation include the Clemson University Continuing Education/Conference Complex Corporation, the Clemson University Land Stewardship Foundation, the Clemson University Real Estate Foundation, and the Wallace F. Pate Foundation for Environmental Research and Education. As of June 30, 2012, the Clemson University foundation managed over 1,622 endowments. As of December 31, 2012, the combined CUF-CU Endowment totaled approximately $445 million.

CLEMSON ALUMNI 
ASSOCIATION

The Clemson Alumni Association’s action phrase is “Your Lifelong Connection to Clemson.” Its mission is to serve, to inform, to involve. The Alumni Association works for the more than 112,000 alumni located around the world, sponsoring programs to provide a link between students of yesterday, today, and tomorrow.

In conjunction with volunteers and traveling University staff, Clemson Clubs and Clemson activities are conducted around the world. Alumni are kept informed through the award-winning Clemson World magazine and at alumni.clemson.edu. Students, alumni, and constituency programs, as well as publications and electronic resources, form the basis for an array of services offered to alumni, students, parents, and friends of the University.

All services of the Alumni Association are coordinated out of the Alumni Center, a campus focal point built, furnished, and equipped entirely by gifts from alumni specifically for that purpose. The University Visitors Center received a gift of the Class of 1944, is adjacent to the Alumni Center and is an excellent stop for anyone visiting returning to campus.

Alumni-sponsored awards programs, such as the Distinguished Service Award, Alumni Fellows, professorships, scholarships, and awards for outstanding teaching, research, and public service, are among the prestigious awards given by the Clemson Alumni Association.

Alumni employees coordinate the Alumni Career Services program and the activities of the open-membership student organization, Student Alumni Association. From the Welcome Back Festival held each August to the Senior Picnic held each April, the Alumni Association provides a lifelong connection to Clemson.

CAMPUSS VISITS AND TOURS

One of the best ways to discover all Clemson has to offer is through a visit to the campus. The Class of 1944 Visitors Center helps host the Clemson experience of prospective students. Information, audio-visuals, and tours are all easily accessible. The Visitors Center is located just off of Highway 93 adjacent to the Alumni Center. Regular hours of operation are Monday–Friday, 8:00 a.m. –4:30 p.m.; Saturday, 9:00 a.m. –4:30 p.m.; and Sunday, 1:00–4:30 p.m. Hours vary according to the academic calendar, university holidays, and the home football schedule.

Walking tours, guided by volunteer student members of the University Guide Association, are available at 9:45 a.m. and 1:45 p.m. Monday–Saturday and 1:45 p.m. on Sundays. Tour schedules also vary based on the academic calendar, university holidays, and the home football schedule. Tours are conducted rain or shine, last about two hours, and include an information segment at the beginning. Reservations are required and can be arranged on-line at www.clemson.edu/visitors/index.html or by calling (864) 656-4789.
ADMISSION

Complete Admission information is available at www.clemson.edu/admission.

APPLICATION INFORMATION

Applicants should apply online at www.clemson.edu. Freshman candidates are especially encouraged to submit preliminary applications and sit for the SAT or ACT, including the writing test, during the spring semester of their junior year.

Candidates should understand that admission is closed when all classroom space has been committed. The majority of freshman admission decisions are communicated during the middle of February. Transfer students seeking entrance in August are usually notified between February and July. Candidates must pay a nonrefundable application fee. This fee is not applicable toward tuition and/or other University fees.

Application Deadlines

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<th>For Freshman Applicants</th>
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FRESHMEN

Admission to the University is competitive and is based primarily upon high school curriculum, grades, class standing, and SAT or ACT scores. An applicant’s intended major and state residency also receive consideration. To apply for admission, a candidate must submit a high school transcript through his/her counselor and have results of the SAT or ACT sent directly from the testing agency. In addition, all applicants for freshman admission should complete the following courses in high school:

- English—4 credits
  All four courses must have strong grammar and composition components, with at least one in English literature and at least one in American literature. College preparatory English I, II, III, and IV will meet these requirements.
- Mathematics—3 credits
  These include algebra I (for which applied mathematics I and II may count together as a substitute if a student successfully completes algebra II), algebra II, and geometry.
- Laboratory Science—3 credits
  Two must be selected from biology I, chemistry I, or physics I.
- Foreign Language—3 credits
  All three must be earned in the same language.
- Social Sciences—3 credits
  American history is required. One-half credit of government and one-half credit of economics are also recommended.

Fine Arts—1 credit

Physical Education/ROTC—1 credit

Other—2 credits

One of these must be a fourth year of mathematics, laboratory science, or foreign language. Students interested in engineering are strongly encouraged to take a fourth year of mathematics. This course should be selected from precalculus, calculus, statistics, or discrete mathematics. The second credit must be in advanced mathematics, computer science, or a combination of these; or one unit of world history, world geography, or western civilization.

The SAT or ACT examination scores, rank in class, academic preparation, and recommendation of the high school counselor will be weighed carefully in the decision-making process. The applicant’s acceptance will be confirmed upon presentation of a final high school transcript indicating continued academic progress and graduation.

TRANSFER STUDENTS

Students should have official transcript(s) sent directly to Clemson’s Admissions Office from the registrar of each college or university where credit was earned. A transcript that states “Issued to Student” is considered unofficial. Unless so stated on the transcript, the applicant should also present statements of honorable dismissal and of eligibility to return to the institution last attended. Transfer admission is moderately competitive. To increase their chances for admission, applicants should have the following qualifications:

- Completion of a year of college study after high school graduation with 30 semester hours (or 45 quarter hours) of transferable credit
- A minimum 2.5 grade-point average (3.0 preferred)
- Two of the following: American history is required. One-half credit of government and one-half credit of economics are also recommended.

American history is required. One-half credit of government and one-half credit of economics are also recommended.

Phone: (864) 656-2287
FAX: (864) 656-2464
GENERAL INFORMATION

Entrance Examinations

All freshman candidates and some transfer students must submit scores from either the SAT or ACT. For August enrollment, it is recommended that students complete the SAT or ACT no later than the preceding December. Registration materials for these tests are readily available at high schools or by contacting the College Board at (609) 771-7600 or 1-800-SAT-SCORE or www.collegeboard.com or the American College Testing Service at (319) 337-1313 or www.act.org. The College Board’s institutional code for Clemson is 5111. The ACT code for Clemson is 3842. All candidates must have their scores reported directly to Clemson by contacting the appropriate testing agency. Photocopies of student test reports or those submitted by third parties, such as high schools and colleges, are not accepted.

<table>
<thead>
<tr>
<th>IB Higher Level Examination</th>
<th>Score</th>
<th>Clemson Course(s) for Which Credit is Awarded</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology</td>
<td>4, 5, 6, 7</td>
<td>BIOL 1030/1050, 1040/1060</td>
<td>8</td>
</tr>
<tr>
<td>Business Management</td>
<td>4, 5, 6, 7</td>
<td>MGT 2010</td>
<td>3</td>
</tr>
<tr>
<td>Chemistry</td>
<td>4, 5, 6, 7</td>
<td>CH 1010 (for majors requiring organic chemistry)</td>
<td>4</td>
</tr>
<tr>
<td>Computer Science</td>
<td>4</td>
<td>CPSC 1110</td>
<td>3</td>
</tr>
<tr>
<td>Design Technology</td>
<td>4, 5, 6, 7</td>
<td>CPSC 1010</td>
<td>3</td>
</tr>
<tr>
<td>Economics</td>
<td>4, 5, 6, 7</td>
<td>CPSC 1010, 1020</td>
<td>8</td>
</tr>
<tr>
<td>English (Language A: Literature or Language Literature)</td>
<td>5, 6</td>
<td>ENGL 1010, 1030, 2120</td>
<td>9</td>
</tr>
<tr>
<td>Film</td>
<td>4, 5, 6, 7</td>
<td>ELEC 0001</td>
<td>3</td>
</tr>
<tr>
<td>Foreign Language (Language B)</td>
<td>4</td>
<td>ARAB 1010, CHIN 1010, GER 1010, ITAL 1010, JAPN 1010, LATN 1010, PORT 1010, RUSS 1010, SPAN 1010 (dependent upon language)</td>
<td>8</td>
</tr>
<tr>
<td>Geography</td>
<td>4, 5, 6, 7</td>
<td>GEOG 1010</td>
<td>3</td>
</tr>
<tr>
<td>History</td>
<td>4, 5, 6, 7</td>
<td>HIST 1030</td>
<td>3</td>
</tr>
<tr>
<td>Route 1: Higher Level Option—Europe and the Islamic World</td>
<td>4, 5, 6, 7</td>
<td>ELEC 0001</td>
<td>3</td>
</tr>
<tr>
<td>Route 2: Higher Level Option—Asia and Oceania</td>
<td>4, 5, 6, 7</td>
<td>ELEC 0001</td>
<td>3</td>
</tr>
<tr>
<td>Africa</td>
<td>4, 5, 6, 7</td>
<td>ELEC 0001</td>
<td>3</td>
</tr>
<tr>
<td>The Americas</td>
<td>4, 5, 6, 7</td>
<td>STS 1200</td>
<td>3</td>
</tr>
<tr>
<td>Information Technology in a Global Society</td>
<td>4, 5, 6, 7</td>
<td>ELEC 0001</td>
<td>3</td>
</tr>
<tr>
<td>Islamic History</td>
<td>4, 5, 6, 7</td>
<td>MTHS 1060 or MTHS 1020</td>
<td>4</td>
</tr>
<tr>
<td>Mathematics</td>
<td>4, 5, 6, 7</td>
<td>MTHS 1060 or MTHS 1020</td>
<td>8</td>
</tr>
<tr>
<td>Music</td>
<td>4, 5, 6, 7</td>
<td>ELEC 0001</td>
<td>3</td>
</tr>
<tr>
<td>Philosophy</td>
<td>4, 5, 6, 7</td>
<td>PHIL 1010</td>
<td>3</td>
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<tr>
<td>Physics</td>
<td>4</td>
<td>PHYS 2070/2090</td>
<td>4</td>
</tr>
<tr>
<td>Psychology</td>
<td>4, 5, 6, 7</td>
<td>PSYC 1010</td>
<td>3</td>
</tr>
<tr>
<td>Social and Cultural Anthropology</td>
<td>4, 5, 6, 7</td>
<td>ELEC 0001</td>
<td>3</td>
</tr>
<tr>
<td>Theatre Arts</td>
<td>4, 5, 6, 7</td>
<td>ELEC 0001</td>
<td>3</td>
</tr>
<tr>
<td>Visual Arts</td>
<td>4, 5, 6, 7</td>
<td>ART 1030</td>
<td>3</td>
</tr>
</tbody>
</table>

*For students taking the calculus sequence, MTHS 1060 and 1080, a score of 4 or 5 on the HL Mathematics examination earns placement in MTHS 1060.

*Upon completion of MTHS 1080 with a grade of C or better, credit will be given for MTHS 1060. For students taking the MTHS 1020 and 2070 calculus sequence, a score of 4 or 5 on the HL Mathematics examination earns placement in MTHS 2070. Upon completion of MTHS 2070 with a grade of C or better, credit will be given for MTHS 1060. If the student does not enroll in MTHS 1080 or 2070, or does not pass the sequential class (MTHS 2070 or 1080) with a grade of C or higher, three credits of elective (ELEC 0001) will be awarded for a score of 4 or 5 on the Mathematics HL exam.

*For students taking the calculus sequence, MTHS 1060 and 1080, a score of 4 or 5 on the HL Mathematics examination earns placement in MTHS 1060. For students taking the MTHS 1020 and 2070 calculus sequence, a score of 4 or 5 on the HL Mathematics examination earns placement in MTHS 2070. Upon completion of MTHS 2070 with a grade of C or better, credit will be given for MTHS 1060. If the student does not enroll in MTHS 1080 or 2070, or does not pass the sequential class (MTHS 2070 or 1080) with a grade of C or higher, three credits of elective (ELEC 0001) will be awarded for a score of 4 or 5 on the Mathematics HL exam.

*Scores of 4 or 5 on the HL Mathematics examination earns credit for either MTHS 1020 or 1060 but not both. Credit is awarded for a score of 4 or 5 on the Mathematics HL exam.

*Courses determined on an individual basis. See department.

International Baccalaureate (IB) Credit Policy

Clemson University endorses the International Baccalaureate (IB) Program and awards credit for IB Higher Level scores as indicated below.

College Board Advanced Placement Program

The College Board Advanced Placement Program (AP) gives highly motivated high school students an opportunity to begin their college careers during the last year or two of high school. AP participants take college-level courses in high school, sit for nationally administered examinations in the subjects concerned, and submit test grades to Clemson for credit. Credit is awarded to those earning grades of 3, 4, or 5 on AP exams.

Applicants should be sure to include their social security numbers when registering for AP examinations; this will save time and ensure that credit is automatically awarded to their Clemson academic records.

Dual Enrollment

Dual enrollment courses enable high school students to take college-level courses and earn college credit before graduating from high school. Students should have official transcript(s) sent directly to Clemson’s Admissions Office from the registrar of each college or university where credit was earned. A transcript that states “Issued to Student” is considered unofficial. Courses that have previously been evaluated are listed on the Transfer Credit Equivalency List (TCEL) at virtual.clemson.edu/groups/tcel. If a student has taken a course not listed on the TCEL, the course will be evaluated by the Office of Admissions once the student has been accepted by Clemson. Students will be notified by letter of the credit they will receive at Clemson before they enroll in the fall.

South Carolina Governor’s School for Science and Mathematics

Clemson awards college credit for selected biology, chemistry, and mathematics courses taken at the South Carolina Governor’s School for Science and Mathematics. Credit is awarded to students enrolled at Clemson University who earn A or B in the SCGSSM course(s).

Placement Tests

Mathematics Placement—All new freshman and transfer students are required to complete the Clemson Mathematics Placement Test (CMPT). Placement in a mathematics course is determined by each student’s CMPT score. Failure to complete the CMPT satisfactorily will result in placement in preparatory work that, in most cases, will not apply toward the general education mathematics requirement. Placement will be adjusted as appropriate after AP and IB scores or credits for previous mathematics courses have been received by Clemson.
Foreign Language Placement—The Department of Languages offers placement tests that students are required to take during summer orientation. Any student who has had at least one year of a foreign language and who decides to continue with the same language at Clemson, must take one of these tests. Applicants desiring advanced placement in a foreign language may take the College Board’s SAT Subject Test, Advanced Placement (AP) Examinations, or the International Baccalaureate (IB) Higher Level Examination. SAT Subject Test scores of 450 along with an official copy of the high school transcripts, or the International Baccalaureate (IB) Higher General Educational Development Testing Service GED score results must be received directly from the foreign language may take the College Board’s SAT diploma must be 19 years of age or older. Official tests. Applicants desiring advanced placement in a subject who has had at least one year of a foreign language course(s) at Clemson, must take one of these tests. Applicants presenting a better) of a qualifying course at Clemson.

GED Candidates submitting General Educational Development (GED) credentials in lieu of a high school diploma must be 19 years of age or older. Official GED score results must be received directly from the General Educational Development Testing Service along with an official copy of the high school transcript and SAT or ACT scores. Applicants presenting the GED will be reviewed by the Undergraduate Admissions Committee.

Advances Any freshman or transfer candidate who is denied admission may appeal for reconsideration provided the student (1) presents new information, such as improved grades and/or class rank, improved SAT or ACT scores; and (2) submits an on-line statement outlining the rationale for the appeal. All appeals will be reviewed by the Office of Admissions and referred to the Undergraduate Admissions Committee.

Freshman students who are accepted to and enrolled in Clemson University in a conditional admissions program through the appeals process must meet the conditions of their admission or be subject to disenrollment.

Admissions Exceptions If it is not possible to make a positive decision on the basis of previous academic performance and SAT or ACT scores, other factors, such as special talents or high school profile, may be considered. Where appropriate, the Office of Admissions will review such cases to the Undergraduate Admissions Committee. Student athletes who do not meet regular admissions standards may be admitted if they meet Atlantic Coast Conference (ACC) and National Collegiate Athletic Association (NCAA) eligibility requirements.

College Board College-Level Examination Program (CLEP) CLEP is designed primarily for adults with nontraditional learning experiences. This program has very limited recognition at Clemson. A few departments accept credit for CLEP subject-matter examinations; however, CLEP General Examinations are not recognized. Credit is awarded for introductory-level courses according to criteria established by the following departments: Chemistry, English (composition only), and Mathematical Sciences (algebra and trigonometry only). Numerical scores plus essays, required when offered as part of a CLEP examination, will be evaluated by the appropriate department.

ADMISSION DEPOSIT All accepted freshman and transfer candidates for fall semester are required to submit a nonrefundable $200 application deposit. This deposit is applicable toward tuition and other University fees and may be paid by credit card.

HOUSING All freshmen who are under the age of 21 at the time of enrollment, who do not live with parent/guardian(s) within a 50-mile radius of campus, are required to live in University housing for the fall and spring semesters.

For the purpose of this agreement, transfer students are not considered freshmen. Transfer students are housed on a space available basis.

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### ADVANCED PLACEMENT CREDIT CHART

<table>
<thead>
<tr>
<th>Discipline</th>
<th>AP Exam</th>
<th>Score</th>
<th>Clemson Course(s) for which credit is awarded</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECONOMICS</td>
<td>Microeconomics</td>
<td>3, 4, 5</td>
<td>ECON 2110</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Macroeconomics</td>
<td>3, 4, 5</td>
<td>ECON 2120</td>
<td>3</td>
</tr>
<tr>
<td>ENGLISH</td>
<td>Literature and Composition¹</td>
<td>3, 4</td>
<td>ENGL 1010</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>&amp; Composition¹</td>
<td>5</td>
<td>ENGL 1010, 1030</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Language and Composition¹</td>
<td>3, 4</td>
<td>ENGL 1010, 1030</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Both Tests</td>
<td>3, 4, 5</td>
<td>ENGL 1010, 1030</td>
<td>6</td>
</tr>
<tr>
<td>GEOGRAPHY</td>
<td>Human Geography</td>
<td>3, 4, 5</td>
<td>GEOG 1010</td>
<td>3</td>
</tr>
<tr>
<td>GOVERNMENT</td>
<td>Government &amp; Politics: United States</td>
<td>3, 4, 5</td>
<td>POSC 1010</td>
<td>3</td>
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<tr>
<td></td>
<td>Government &amp; Politics: Comparative</td>
<td>3, 4, 5</td>
<td>POSC 1040</td>
<td>3</td>
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<tr>
<td>HISTORY</td>
<td>United States History</td>
<td>3</td>
<td>HIST 1010</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>European History</td>
<td>4, 5</td>
<td>HIST 1010, 1020</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>World History</td>
<td>4, 5</td>
<td>HIST 1730</td>
<td>4</td>
</tr>
<tr>
<td>HUMANITIES</td>
<td>Music Theory</td>
<td>3, 4, 5</td>
<td>MUSC 2420, 2430</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Art History</td>
<td>3, 4, 5</td>
<td>AART 1010</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Studio Art: Drawing</td>
<td>3</td>
<td>ELEC 0001</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>ART 1010</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>ART 1050</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Studio Art: 2-D Drawing</td>
<td>3</td>
<td>ELEC 0001¹</td>
<td>3</td>
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<td></td>
<td></td>
<td>4, 5</td>
<td>ART 1010</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Studio Art: 3-D Drawing</td>
<td>3</td>
<td>ELEC 0001¹</td>
<td>3</td>
</tr>
<tr>
<td>LANGUAGES</td>
<td>Chinese Language and Culture</td>
<td>3, 4, 5</td>
<td>CHIN 1010, 1020, 2010</td>
<td>11</td>
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<tr>
<td></td>
<td></td>
<td>5</td>
<td>CHIN 1010, 1020, 2010</td>
<td>14</td>
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<tr>
<td></td>
<td>French Language and Culture</td>
<td>3, 4, 5</td>
<td>FR 1010, 1020</td>
<td>8</td>
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<tr>
<td></td>
<td>German Language and Culture</td>
<td>3, 4, 5</td>
<td>GER 1010, 1020</td>
<td>8</td>
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<tr>
<td></td>
<td>Italian Language and Culture</td>
<td>3, 4, 5</td>
<td>ITAL 1010, 1020, 2010</td>
<td>11</td>
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<tr>
<td></td>
<td>Japanese Language and Culture</td>
<td>3, 4</td>
<td>ITAL 1010, 1020, 2010</td>
<td>14</td>
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<tr>
<td></td>
<td>Latin</td>
<td>3</td>
<td>LATN 1010, 1020, 2010</td>
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<td>4, 5</td>
<td>LATN 1010, 1020, 2010</td>
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<td></td>
<td>Spanish Language</td>
<td>3, 4, 5</td>
<td>SPAN 1010, 1020</td>
<td>8</td>
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<tr>
<td></td>
<td>Spanish Literature and Culture</td>
<td>3</td>
<td>SPAN 1010</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>SPAN 1010, 2010, 2010</td>
<td>11</td>
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<td></td>
<td>5</td>
<td>SPAN 1010, 2010, 2010</td>
<td>14</td>
</tr>
<tr>
<td>MATHEMATICS</td>
<td>Calculus AB</td>
<td>3, 4, 5</td>
<td>MTHS 1060</td>
<td>4</td>
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<tr>
<td></td>
<td>Calculus BC²</td>
<td>3, 4, 5</td>
<td>MTHS 1060, 1080</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Statistics</td>
<td>3, 4, 5</td>
<td>MTHS 2030</td>
<td>3</td>
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<tr>
<td>PSYCHOLOGY</td>
<td>Psychology</td>
<td>3, 4, 5</td>
<td>PSYC 2100</td>
<td>3</td>
</tr>
<tr>
<td>SCIENCES</td>
<td>Biology</td>
<td>3</td>
<td>BIOL 1030/1050, 1040/1060</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Chemistry</td>
<td>3, 4, 5</td>
<td>CH 1010</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Computer Science A</td>
<td>3, 4, 5</td>
<td>CPSC 1010</td>
<td>4</td>
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<td></td>
<td>Environmental Science</td>
<td>3, 4, 5</td>
<td>ENSP 2000</td>
<td>3</td>
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<tr>
<td></td>
<td>Physics B¹</td>
<td>3, 4, 5</td>
<td>PHYS 2070/2090, 2080/2100</td>
<td>8</td>
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<tr>
<td></td>
<td>Physics C (Mechanics)</td>
<td>3, 4, 5</td>
<td>PHYS 1220/1240</td>
<td>4</td>
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<td>Physics C (E and M)</td>
<td>3, 4, 5</td>
<td>PHYS 2210/2230</td>
<td>4</td>
</tr>
</tbody>
</table>

¹Students who earn a score of 3 or 4 should register for ENGL 1030.

²Students who earn a score of 2 on the Calculus BC examination, but earn a score of 3 (or better) on the AB subscore of the BC examination, may receive credit for MTHS 1060.

³Students enrolling in a degree program requiring calculus-based physics (PHYS 1220, 1240, 2210, 2220, 2230, 2240), who earns a grade of 5 on Physics B, will be asked to meet with a departmental representative for further evaluation and placement counseling.

⁴ELEC 0001 is a transfer elective credit.
ORIENTATION PROGRAMS
The University offers a series of orientation programs during the summer for freshmen and transfer students and their parents/guests. All accepted students are required to attend one of the sessions. During orientation, students will have an opportunity to discuss their educational objectives with an advisor, to register for the fall semester, and to learn about student life and other co-curricular activities. All new students will register for their first semester at Clemson during orientation. For more information about the orientation programs fee structure, visit www.clemson.edu/orientation.

2013 Summer Orientation Dates

<table>
<thead>
<tr>
<th>Freshmen</th>
<th>New Transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 16–17</td>
<td>June 18 (Bridge Only)</td>
</tr>
<tr>
<td>June 19–20</td>
<td>June 25</td>
</tr>
<tr>
<td>June 23–24</td>
<td>July 9</td>
</tr>
<tr>
<td>June 26–27</td>
<td>July 16</td>
</tr>
<tr>
<td>June 30–July 1</td>
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</tr>
<tr>
<td>July 7–8</td>
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<tr>
<td>July 10–11</td>
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<tr>
<td>July 14–15</td>
<td></td>
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<tr>
<td>July 17–18</td>
<td></td>
</tr>
</tbody>
</table>

International students are expected to attend an additional session held on August 15, which is conducted by International Student Programs in the Office of Global Engagement.

INTERNATIONAL UNDERGRADUATES
Admission services for undergraduate international students are provided by the Office of Admissions. International students who come from abroad or transfer from another school must meet academic, language, and financial qualifications as determined by Clemson University. Transcripts, mark sheets, and academic records must be verified by a certified U.S. educational consultant agency. Prospective transfer students must provide translated course descriptions for coursework to be evaluated for Clemson academic credit. The SAT or ACT is required of all international applicants (freshman or transfer). The Test of English as a Foreign Language (TOEFL) is required of all international applicants (freshman or transfer). None of the usual credentials supporting an application are required of special student applicants. A cumulative maximum of 18 undergraduate credit hours may be taken. Applicants should apply online at www.clemson.edu.

SPECIAL STUDENT STATUS
The special student classification is designed for high school graduates who are 19 years of age or older and wish to take a limited number of courses for personal or professional development. This program is not appropriate for individuals who are interested in earning an undergraduate degree, and financial aid is not available. In addition, it is not a "trial admission" status or one for candidates who apply too late to submit credentials for consideration for regular admission. Applicants denied regular admission to Clemson are not eligible to apply as special students.

None of the usual credentials supporting an application are required of special student applicants. A cumulative maximum of 18 undergraduate credit hours may be taken. Applicants should apply online at www.clemson.edu.

READMISSION OF FORMER UNDERGRADUATES
Undergraduate students (not special or transient students) who have previously attended Clemson and are not currently enrolled in the current term and wish to return, must apply online at http://www.registrar.clemson.edu/html/formerStu.html. The Undergraduate Application for Re-Admission fee is $50.00 and online instructions for payment are provided in the application. Acceptance letters and registration materials are mailed to returning students shortly before registration begins. Students are readmitted to the major they were in when they last attended Clemson, unless the major has been discontinued. Change-of-major forms are available in the Enrolled Student Services Office. Former students must meet the catalog curriculum requirements for graduation in effect at the time of their return. Students are required to satisfy the University’s general education requirements in addition to curricular requirements. Any variations in curricular requirements will be considered under the substitution procedures. If all work towards a degree is not completed within six years after entrance, the student may be required to take additional courses. Other information can be obtained from the Registrar’s Office.

Any student who is classified as an in-state student for tuition and fees purposes must reaffirm his or her resident status upon application for readmission to the University. If the resident status of an individual changes, that student will be classified as out-of-state for tuition and fees purposes upon readmission to the University. If the resident status is not immediately clear, the student may be required to submit an application for resident status to the Office of Residency Certification.

ILLEGAL IMMIGRATION REFORM ACT PROCESS
Section 59-101-430 of the South Carolina Code of Laws states:

“(A) An alien unlawfully present in the United States is not eligible to attend a public institution of higher learning in this State, as defined in Section 59-103-5. The trustees of a public institution of higher learning in this State shall develop and institute a process by which lawful presence in the United States is verified. In doing so, institution personnel shall not attempt to independently verify the immigration status of any alien, but shall verify any alien’s immigration status with the federal government pursuant to 8 U.S.C. Section 1373 (c).

(B) An alien unlawfully present in the United States is not eligible on the basis of residence for a public higher education benefit including, but not limited to, scholarships, financial aid, grants, or resident tuition.”

In accordance with section 59-101-430 of the SC Code of Laws, also known as the South Carolina Illegal Immigration Reform Act, the Clemson University Board of Trustees hereby institutes the following process:

I. PROCESS

All applicants to Clemson University are required to verify on their application whether they are a U.S. citizen, Permanent Legal Resident or will be lawfully present in the United States at the time of enrollment on some other grounds. Enrollment at Clemson University for both undergraduate and graduate students is conditioned upon verification of lawful presence in the United States.

South Carolina Code of Law section 59-101-430 prohibits Clemson University from independently verifying the status of any legal alien. An alien’s status must be verified with the federal government. Therefore, Clemson University will use either the Student and Exchange Visitor Program (SEVIS), a Web-based technology that tracks and monitors schools and programs, students, exchange visitors and their dependents throughout the duration of approved participation with the U.S. education system, or the Systematic Alien Verification for Entitlements (SAVE) program, Homeland Security’s online system of alien status determination or any federal source of information about lawful alien presence that becomes available to Clemson University.

The Board of Trustees delegates responsibility for administering the details of this process to the Provost and the Office of Academic Affairs.
FINANCIAL INFORMATION

The annual State Appropriation Act imposes the general requirement that student fees be fixed by the University Board of Trustees. The act imposes two specific requirements on the board: (1) In fixing fees applicable to academic and general maintenance and operation costs, the board must maintain a minimum student fee not less than the fee charged the previous year. (2) In fixing fees applicable to residence hall rental, dining halls, laundry, infirmary, and all other personal subsistence expenses, the Board must charge students an amount sufficient to cover fully the cost of providing such facilities and services.

The tuition and fees for all students—full or part time and auditing—are available at www.clemson.edu/cfo/student_financials/. Satisfactory settlement of all expenses is a requirement for completing each semester’s class registration, and no student is officially enrolled until all past due accounts have been satisfied. Financial aid cannot be used to satisfy balances forward from a prior academic year.

Currently enrolled students who expect to continue enrollment may make housing reservations by preregistering on-line during the spring semester at a time designated by the Housing Office.

New students who are offered on-campus housing accommodations must pay a nonrefundable $100 housing application fee and a $200 admission deposit. The admissions deposit is deducted from the amount otherwise due for the first semester expenses. (Note: Policies regarding priority to/offering of on-campus housing are subject to change.)

All College of Business and Behavioral Science majors, and other non-majors taking 3000- and 4000-level courses offered by the college, are required to pay a differential fee to fund significant infrastructure and program enhancements. Additional information about this fee is available at business.clemson.edu/special/enhanced/enhanced_fees.htm.

TUITION AND FEES

Detailed tuition and fee information is available at www.clemson.edu/cfo/student_financials/. Note: A late payment fee will be assessed if fees are not satisfied by published deadlines.

Full-Time Fees

Students must be enrolled in 12 semester hours to pay full-time fees. Students enrolled in less than 12 hours or who drop below 12 hours may become ineligible for some student services, financial aid, or other programs.

Part-Time Fees

Students taking less than 12 semester credit hours will be charged according to the schedule at www.clemson.edu/cfo/student_financials/. These fees do not provide for admission to athletic events, concert series, and other such activities.

Notice to Customers Making Payment by Check

If a check is mailed for payment, it may be converted into an electronic funds transfer (EFT). This means a copy of the check will be made and the account information will be used to debit the bank account electronically for the amount of the check. The debit from the bank account will usually occur within 24 hours and will be shown on the drawer’s bank account statement. The original check will not be returned to the drawer. It will be destroyed, but Student Financial Services will retain a copy of it. If the EFT cannot be processed for technical reasons, the drawer authorizes the University to process the copy in place of the original check. If the EFT cannot be completed due to insufficient funds, the University may try twice more to make the transfer. A returned item fee of $30 will be charged and collected by EFT.

Returned Checks, EFTs, and Credit Card Payments

A check, EFT, or credit card given in payment of University expenses that is returned unpaid by the bank creates an indebtedness to the University.

Student Financial Services will re-present returned items for payment of academic fees. A $30 fee will be charged for each returned item. If a check is returned or dishonored for any reason, the student’s account may be debited electronically for the amount of the check plus the $30 returned item fee.

If the item is returned to the University in a timely manner with no dispute from the student or drawer, a written request to disenroll the student will be made to the Registrar. If the request is approved, the percentage of refund will be applied to the debt. If the item is not returned prior to the mid-point of the semester without response, a decision will be made by the Director of Student Financial Services and the Registrar as to the effect of disenrollment. The University may restrict subsequent payment for academic and other fees by accepting only cash, certified checks, or money orders.

Any individual who uses a two-party check for payment of University expenses will be held responsible for that check if it is returned unpaid by the bank. Items used as payment for various University services such as meal plans, housing, etc., that are later returned unpaid by the bank, give the University the right to cancel such services and cause forfeiture of any refund.

Any returned items not collected by the above procedures may be turned over to a collection agency and the indebtedness reported to a credit bureau. All collection costs will be added to the debt. Transcripts and diplomas will be withheld pending payment, and the debt may be deducted from state income tax refunds.

Abuse of check payment privileges may result in the restriction of such privileges for an indefinite period of time based on the frequency and/or dollar amount, as determined by Student Financial Services.

Past Due Accounts

Any indebtedness to the University that becomes past due, immediately jeopardizes the student’s enrollment, and no such student will be permitted to re-enroll for an ensuing semester or summer term. Billing fees and/or collection costs may be added to the indebtedness. Further, any student who fails to pay all indebtedness, including collection costs, to the University may not be issued a transcript or diploma. Unresolved debts may be turned over to a collection agency, reported to a credit bureau, and deducted from state income tax refunds. Debts include, but are not limited to, parking violations, library fines, rent, and academic fees.

Refund of Academic Fees

(Tuition, University Fee, and Health Fee) for Students Withdrawing, Dropping to Part Time, or Part-Time Students Dropping Credit Hours

No refunds will be made on a semester’s tuition and fees after four weeks from the last day to register. In the case of a withdrawal from the University, refunds will be based on the effective date of the withdrawal. In the case of a withdrawal from a course, refunds will be based on the date the student drops the course using the on-line registration system. To be eligible for a refund, the student’s request must be received by Student Financial Services prior to the beginning of the next fall/spring semester or subsequent summer term. Beginning with the day following the last day to register, refunds for periods of four weeks or less during fall/spring semester shall be made on the following basis. Students receiving Title IV Financial Aid follow a different policy.

<table>
<thead>
<tr>
<th>Period of Enrollment</th>
<th>Percent Refund</th>
</tr>
</thead>
<tbody>
<tr>
<td>After last day to register:</td>
<td></td>
</tr>
<tr>
<td>One week or less</td>
<td>80%</td>
</tr>
<tr>
<td>More than 1 but not more than 2 weeks</td>
<td>60%</td>
</tr>
<tr>
<td>More than 2 but not more than 3 weeks</td>
<td>40%</td>
</tr>
<tr>
<td>More than 3 but not more than 4 weeks</td>
<td>20%</td>
</tr>
<tr>
<td>More than 4 weeks</td>
<td>0%</td>
</tr>
</tbody>
</table>

Refund of Dining Hall Fees

See the section on Dining Services on page 22.
Cancellations of the Housing Contract for All New Students

Cancellation of the Contract Prior to July 31, 2013

Students who sign contracts after July 31, 2013 are subject to all cancellation procedures and charges outlined below.

If cancellation request is received by the Housing Office on or before this date, the contract is cancelled with no additional charge. New freshman may only use this option if commuting from home [living with parent/guardian(s)] and only within a 50-mile radius of campus.

Cancellation of the Contract After July 31, 2013

(a) The contract may be terminated after July 31, 2013 for the following reasons: withdrawal from school; marriage (no more than four weeks prior to the wedding date); or, circumstances determined by the University to be sufficiently extenuating as to warrant cancellation (documentary evidence will be required).

(b) Students who sign contracts after April 15, 2013 are subject to all cancellation procedures and charges outlined below.

(b) Any bill, for students qualifying for cancellation under paragraph 5(a), will be adjusted appropriately based on the current Housing cancellation fee schedule and the circumstances of cancellation.

Appeals Committee

Students are encouraged first to contact the Assignments Office with concerns regarding the contract cancellation process. If the concerns are not resolved satisfactorily, the student is encouraged to submit such concerns to the Appeals Committee.

Proper Notice of Cancellation Request

Students who desire to request cancellation of this contract must contact University Housing at (864) 656-2295 or clemsonhome@clemson.edu for instructions.

Refunds of Financial Aid for Students Withdrawing from the University

Students receiving Title IV Funds (Federal Pell Grant, Federal SEOG, Federal Perkins, Federal Direct Loans–unsub or sub) or Federal PLUS Loans who withdraw from the University are subject to the Return of Title IV Funds regulations. Students with funds from non-federal programs, including off-campus living expenses, may be required to repay a portion of those funds to the federal programs. Failure to return aid owed to the federal aid programs may result in loss of eligibility for federal aid assistance.

Refunds of Financial Aid for Students Withdrawal (documentary evidence will be required). If student withdraws prior to completing 60% of a term, a prorated portion of the federal financial aid dollars must be considered unearned and returned to the federal programs and could cause students to owe the University a significant amount upon withdrawal.

In addition to the amount of federal aid that Clemson must return, students who received financial aid for other educational costs, including off-campus living expenses, may be required to repay a portion of those funds to the federal programs. Failure to return aid owed to the federal aid programs may result in loss of eligibility for federal aid assistance.

Federal aid funds to be returned are distributed to the programs in the following order:

• Unsubsidized Federal Direct Loan
• Subsidized Federal Direct Loan
• Federal Perkins Loan
• Federal PLUS Loan
• Federal Pell Grant
• Federal SEOG
• Other Title IV Programs
• Non-Title IV Programs

After the refund has been applied to the Title IV and non-Title IV programs, any refund balance will be refunded to the student.

If debts were incurred before withdrawing, such as bad checks, unpaid traffic or library fines, etc., the refund will cover these obligations first. Academic fees, housing, and meal plan refunds for students withdrawing will be paid to the student.

RESIDENT TUITION AND FEES

Application for Resident Status

Any undergraduate student or prospective student whose status concerning entitlement to payment of in-state tuition and fees is uncertain has the responsibility of securing a ruling from the University by providing all relevant information on special application forms. These forms can be obtained online, and are to be completed and returned to that office prior to the first day of class for any semester or summer term for which the student is attending to qualify for payment of the in-state tuition and fee rate. For more information, visit clemson.edu/financial-aid/residency/index.html.

Entitlement

Eligibility for payment of in-state tuition and fees shall be determined under the provisions of Sections 59-112-1 through 59-112-100, South Carolina Code of Laws, 1976, as amended. This law is set forth in its entirety as follows (subject to further amendment by the General Assembly).

Statutes

59-112-10—Definitions. As used in this chapter:

A. The words “State Institution” shall mean those post-secondary educational institutions under the jurisdiction of the following: (1) Board of Trustees, Clemson University; (2) Board of Trustees, Medical University of South Carolina; (3) Board of Trustees, South Carolina State College; (4) State College Board of Trustees; (5) Board of Visitors, The Citadel; (6) Board of Trustees, University of South Carolina; (7) Board of Trustees, Winthrop University; and (8) State Board of Technical and Comprehensive Education.

B. The word “student” shall mean any person enrolled for studies in any state institution.

C. The word “residence” or “reside” shall mean continuous and permanent physical presence within this State, provided, that temporary absences for short periods of time shall not affect the establishment of a residence.

D. The word “domicile” shall mean a person’s true, fixed, principal residence and place of habitation; it shall indicate the place where such person intends to remain, and to which such person expects to return upon leaving without establishing a new domicile in another state. For purposes of this section one may have only one legal domicile; one is presumed to abandon automatically an old domicile upon establishing a new one. Housing provided on an academic session basis for students at State institutions shall be presumed not to be a place of principal residence, as residency in such housing is by nature temporary.

E. The words “in-state rates” shall mean charges for tuition and fees established by State Institutions for persons who are domiciled in South Carolina in accordance with this act; the words “out-of-state rates” shall mean charges for tuition and fees established by...
State Institutions for persons who are not domiciled in South Carolina in accordance with this act.

F. The words "independent person" shall mean a person in his majority, or an emancipated minor, whose predominant source of income is his own earnings or income from employment, investments, or payments from trusts, grants, scholarships, loans, or payments of alimony or separate maintenance made pursuant to court order.

G. The words "dependent" or "dependent person" mean: (1) one whose financial support is provided not through his own earnings or entitlements, but whose predominant source of income or support is payments from a parent, spouse, or guardian, and who qualifies as a dependent or an exemption on the federal tax return of the parent, spouse, or guardian; or (2) one for whom payments are made, under court order, for child support and the cost of his college education by an independent person meeting the provisions of Section 59-112-20 A or B. However, the words "dependent" or "dependent person" do not include a spouse or former spouse who is the recipient of alimony or separate maintenance payments made pursuant to court order.

H. The word "minor" shall mean a person who has not attained the age of eighteen years; and the words "emancipated minor" shall mean a minor whose parents have entirely surrendered the right to the care, custody and earnings of such minor and are no longer under any legal obligation to support or maintain such minor.

I. The word "parent" shall mean a person's natural or adoptive father or mother; or if one parent has custody of the child, the parent having custody; or if there is a guardian or other legal custodian of such person, then such guardian or legal custodian; provided, however, that where circumstances indicate that such guardianship or custodianship was created primarily for the purpose of conferring South Carolina domicile for tuition and fee purposes on such child or dependent person, it shall not be given such effect.

J. The word "spouse" shall mean the husband or wife of a married person.

59-112-20—South Carolina Domicile Defined for Purposes of Rates of Tuition and Fees. South Carolina domicile for tuition and fee purposes shall be established as follows in determinations of rates of tuition and fees to be paid by students entering or attending State Institutions:

A. Independent persons who reside in and have been domiciled in South Carolina for a period of no less than twelve months with an intention of making a permanent home therein, and their dependents, may be considered eligible for in-state rates.

B. Independent persons who reside in and have been domiciled in South Carolina for fewer than twelve months but who have full-time employment in the State, and their dependents, may be considered eligible for in-state rates for as long as such independent person is employed on a full-time basis in the State.

C. Where an independent person meeting the provisions of Section 59-112-20 B above, is living apart from his spouse, or where such person and his spouse are separated or divorced, the spouse and dependents of such independent person shall have domiciliary status for tuition and fee purposes only under the following circumstances: (1) if the spouse requesting domiciliary status for tuition and fee purposes remains domiciled in South Carolina although living apart or separated from his or her employed spouse, (2) if the dependent requesting domiciliary status for tuition and fee purposes is under the legal custody or guardianship, as defined in Section 59-112-101 above, of an independent person who is domiciled in this State; or if such dependent is claimed as an income tax exemption by the parent not having legal custody but paying child-support, so long as either parent remains domiciled in South Carolina.

D. The residence and domicile of a dependent minor shall be presumed to be that of the parent of such dependent minor.

59-112-30—Effect of Change of Residence. When the domicile of a student or of the person upon whom a student is financially dependent changes after enrollment at a State Institution, tuition charges shall be adjusted as follows:

A. Except as provided in Section 59-112-20B above, when domicile is taken in South Carolina, a student shall not become eligible for in-state rates until the beginning of the next academic session after expiration of twelve months from date of domicile in this State.

B. When South Carolina domicile is lost, eligibility for in-state rates shall end on the last day of the academic session in which the loss occurs; however, application of this subsection shall be at the discretion of the institution involved.

C. Notwithstanding the other provisions of this section, any dependent person who has been domiciled with his family in South Carolina for a period of not less than three years immediately prior to his enrollment may enroll in in-state supported institution of higher learning at the in-state rate and may continue to be enrolled at such rate even if the parent, spouse, or guardian upon whom the dependent moves his domicile from this State.

59-112-40—Effect of Marriage. Except as provided in Section 59-112-20 above, marriage shall affect determinations of domicile for tuition and fee purposes with insofar as it operates to evidence an intention by the parties to make a permanent home in South Carolina.

59-112-50—Military Personnel and Their Dependents. Notwithstanding other provisions of this act, during the period of their assignment to duty in South Carolina of the armed services of the United States stationed in South Carolina and their dependents may be considered eligible for in-state rates. When such armed service personnel are ordered away from the State, their dependents may continue for an additional twelve months to have this eligibility at the State Institutions where they have been domiciled in South Carolina for a period of twelve months immediately preceding their discharge.

59-112-60—Faculty, Administrative Employees and Dependents Thereof. Full-time faculty and administrative employees of State Institutions, and the spouses and children of such persons, shall be excluded from the provision of this act.

59-112-70—Abatement of Rates for Nonresidents on Scholarship. Notwithstanding other provisions of this act, the governing boards listed in Section 59-112-10A above, are authorized to adopt policies for the abatement of any part or all of the out-of-state rates for students who are recipients of scholarship aid.

59-112-80—Administration of Chapter; Burden of Proving Eligibility of Students. Each State Institution shall designate an official to administer the provisions of this act. Students making application to pay tuition and fees at in-state rates shall have the burden of proving to the satisfaction of the aforesaid officials of State Institutions that they have fulfilled the requirements of this act before they shall be permitted to pay tuition and fees at such rate.

59-112-90—Penalties for Willful Misrepresentation. Where it appears to the satisfaction of officials charged with administration of these provisions that a person has gained domiciliary status improperly by making or presenting willful misrepresentations of fact, such persons should be charged tuition and fees in full and at the out-of-state rate, plus interest at a rate of eight percent per annum, plus any penalty amounting to twenty-five percent of the out-of-state rate for one semester; and until these obligations have been paid no such student shall be allowed to receive transcripts or graduate from any State Institution.

59-112-100—Regulations. The Commission on Higher Education may prescribe uniform regulations for application of the provisions of this act and may provide for annual review of such regulations.

ARTICLE V

Determination of Rates of Tuition and Fees

(Statutory Authority: 1976 Code Sections 59-112-10 to 59-112-100)

62-600. Rates of Tuition and Fees.

A. Resident classification is an essential part of tuition and fee determination, admission regulations, scholarship eligibility, and other relevant policies of the state. It is important that institutions have fair and equitable regulations that can be administered consistently and are sensitive to the interests of both students and the state. The Commission on Higher Education hereby establishes regulations for the Statute Governing Residency for Tuition and Fee Purposes to be applied consistently by all South Carolina institutions of higher education. These regulations do not address residency matters relating to in-county categories used within the State's technical colleges.

B. Institutions of higher education are required by the Statute to determine the residence classification of applicants. The initial determination of one’s resident status is made at the time of admission. The determination made at that time, and any determination made thereafter, prevails for each subsequent semester until information becomes available that would impact the existing residency status and the determination is successfully challenged. The burden of proof rests with the students to show evidence as deemed necessary to establish and maintain their residency status.
62-601. Code of Laws Governing Residence. Rules regarding the establishment of legal residence for tuition and fee purposes for institutions of higher education are governed by Title 59, Chapter 112 of the 1976 South Carolina Code of Laws, as amended.

62-602. Definitions. A. "Academic Session" is defined as a term or semester of enrollment. (62-607.B) B. "Continue to be Enrolled" is defined as continuous enrollment without an interruption that would require the student to pursue a formal process of readmission to that institution. Formal petitions or applications for change of degree level shall be considered readmissions. (62-607.A)

C. "Dependent Person" is defined as one whose predominant source of income or support is from payments from a parent, spouse, or guardian, who claims the dependent person on his/her federal income tax return. In the case of those individuals who are supported by family members who do not earn enough reportable income for taxation purposes, a dependent person can be defined as one who qualifies as a dependent or exemption on the federal income tax return of the parent, spouse, or guardian. A dependent person is also one for whom payments are made, under court order, for child support and the cost of the dependent person's college education. A dependent person's residency is based upon the residence of the person upon whom they are dependent. (62-602.G) (62-602.N) (62-603.B) (62-605.C) (62-607.A)

D. "Domicile" is defined as the true, fixed, principal residence and place of habitation. It shall indicate the place where a person intends to remain, or to where one expects to return upon leaving without establishing a new domicile in another state. For purposes of this section, one may have only one legal domicile. One is presumed to abandon automatically an old domicile upon establishing a new one. Housing provided on an academic session basis for student at institutions shall be presumed not to be a place of principal residence, as residency in such housing is by its nature temporary. (62-602.B) (62-602.G) (62-602.M) (62-602.N) (62-603.A) (62-603.B) (62-605.B) (62-605.C) (62-607.A) (62-607.B) (62-607.C) (62-607.A)


F. "Full time employment" is defined as employment that consists of at least thirty seven and one half hours a week on a single job in a full time status, with gross earnings of at least minimum wage. However, a person who works less than thirty seven and one half hours a week receives or is entitled to receive full time employee benefits shall be considered to be employed full time if such status is verified by the employer. A person who meets the eligibility requirements of the Americans with Disabilities Act must present acceptable evidence that they satisfy their prescribed employment specifications in order to qualify as having full time employment. (62-605.C) (62-609.A.2) (62-609.A.3) (62-609.A.3) (62-609.A.4) (62-609.A.4)

G. "Guardian" is defined as one legally responsible for the care and management of the person or property of a minor child based upon the five tests for dependency prescribed by the Internal Revenue Service; provided, however, that where circumstances indicate that such guardianship or custodianship was created primarily for the purpose of conferring South Carolina domicile for tuition and fee purposes on such child or dependent person, it shall not be given such effect. (62-602.C) (62-602.E) (62-602.I)

H. "Immediatly Prior" is defined as the period of time between the offer of admission and the first day of the term for which the offer was made, not to exceed one calendar year. (62-607.A)

I. "Independent Person" is defined as one in his/her majority (eighteen years of age or older) or an emancipated minor, whose predominant source of income is his/her own earnings or income from employment, investments, or payments from trusts, grants, scholarships, commercial loans, or payments made in accordance with court order. An independent person must provide more than half of his/her support during the twelve months immediately prior to the date that classes begin for the semester for which resident status is requested. An independent person cannot claim the domicile of another individual as their own for the purposes of establishing intent to become a South Carolina resident. An independent person must have established his/her own domicile for twelve months prior to receiving instate tuition and fees. An independent person cannot be claimed as a dependent or exemption on the federal tax return of his/her parent, spouse, or guardian for the year in which resident status is requested. (62-602.N) (62-603.A) (62-605.C) (62-607.B) (62-608.B) (62-608.B)

J. "Minor" is defined as a person who has not attained the age of eighteen years. An "emancipated minor" shall mean a minor whose parents have entirely surrendered the right to the care, custody and earnings of such minor and are no longer under any legal obligation to support or maintain such minor. (62-602.G) (62-602.G)

K. "Nonresident Alien" is defined as a person who is not a citizen or permanent resident of the United States. By virtue of their non-resident status, "nonresident aliens" generally do not have the capacity to establish domicile in South Carolina. (62-602.M) (62-604.A)


M. "Reside" is defined as continuous and permanent physical presence within the State, provided that absences for short periods of time shall not affect the establishment of residence. Excluded are absences associated with requirements to complete a degree, absences for military training service, and absences associated with requirements to complete a transition or for class. (62-602.A)


P. "Temporary Absence" is defined as a break in enrollment during a fall or spring semester (or its equivalent) during which a student is not registered for class. (62-606.A)

Q. "Terminal Leave" is defined as a transition period following active employment and immediately preceding retirement (with a pension or annuity), during which the individual may use accumulated leave. (62-609.A.4)


S. "Trust" is defined as a legal entity created by a settlor for the benefit of designated beneficiaries under the laws of the state and the valid trust instrument. However, that where circumstances indicate that such trust was created primarily for the purpose of conferring South Carolina domicile for tuition and fee purposes on such child or independent person, it shall not be given such effect.

62-603. Citizens and Permanent Residents. A. Independent persons who have physically resided and been domiciled in South Carolina for twelve continuous months immediately preceding the date the classes begin for the semester for which resident status is claimed may qualify to pay in state tuition and fees. The twelve month residency period starts when the independent person establishes the intent to become a South Carolina resident per Section 62-605 entitled "Establishing the Requisite Intent to Become a South Carolina Domiciliary." The twelve month residency period cannot start until the absence of indicia in other states is proven. Absences from the State during the twelve month period may affect the establishment of permanent residence for tuition and fee purposes.

B. The resident status of a dependent person is based on the resident status of the person who provides more than half of the dependent person's support and claims or, only in the case of those individuals who are supported by family members who do not earn enough reportable income for taxation purposes, qualifies to claim the dependent person as a dependent for federal income tax purposes. Thus, the residence and domicile of a dependent person shall be presumed to be that of their parent, spouse, or guardian.

C. In the case of divorced or separated parents, the resident status of the dependent person may be based on the resident status of the parent who claims the dependent person as a dependent for tax purposes or based on the resident status of the parent who has legal custody or legal joint custody of the dependent person; or based on the resident status of the person who makes payments under a court order for child support and at least the cost of his/her college tuition and fees.
A. Except as otherwise specified in this section or as provided in Section 62-609 (1) & (2), independent non-citizens and non-permanent residents of the United States will be assessed tuition and fees at the non-resident, out of state rate. Independent non-resident aliens, including refugees, asylees, and parolees may be entitled to resident, in state classification once they have been awarded permanent resident status by the U.S. Department of Justice and meet all the statutory residency requirements provided that all other domiciliary requirements are met. Time spent living in South Carolina immediately prior to the awarding of permanent resident status does not count toward the twelve month residency period. Certain non resident aliens present in the United States in specified visa classifications are eligible to receive in state residency status for tuition and fee purposes as prescribed by the Commission on Higher Education. They are not, however, eligible to receive state sponsored tuition assistance/scholarships.

B. Title 8 of the Code of Federal Regulations (CFR) serves as the primary resource for defining visa categories.

62-605. Establishing the Requisite Intent to Become a South Carolina Domiciliary.
A. Resident status may not be acquired by an applicant or student while residing in South Carolina for the primary purpose of enrollment in an institution or for access to state supported programs designed to serve South Carolina residents. An applicant or student from another state who comes to South Carolina usually does so for the purpose of attending school. Therefore, an applicant or student who enrolls as a non-resident in an institution is presumed to remain a non-resident throughout his or her attendance and does not qualify under any of the residency provisions.

B. If a person asserts that his/her domicile has been established in this State, the individual has the burden of proof. Such persons should provide to the designated residency official of the institution to which they are applying any and all evidence the person believes satisfies the burden of proof. The residency official shall consider any and all evidence provided concerning such claim of domicile, but will not necessarily regard any single item of evidence as conclusive evidence that domicile has been established.

C. For independent persons or the parent, spouse, or guardian of dependent persons, examples of intent to become a South Carolina resident may include, although any single indicator may not be conclusive, the following indicia:
(1) Statement of full time employment;
(2) Designating South Carolina as state of legal residence on military record;
(3) Possession of a valid South Carolina driver’s license, or if a non-driver, a South Carolina identification card. Failure to obtain this within 90 days of the establishment of the intent to become a South Carolina resident will delay the beginning date of residency eligibility until the South Carolina driver’s license is obtained;
(4) Possession of a valid South Carolina vehicle registration card. Failure to obtain this within 45 days of the establishment of the intent to become a South Carolina resident will delay the beginning date of residency eligibility until the applicant obtains a South Carolina vehicle registrations card;
(5) Maintenance of domicile in South Carolina;
(6) Paying South Carolina income taxes as a resident during the past tax year, including income earned outside of South Carolina from the date South Carolina domicile was claimed;
(7) Ownership of principal residence in South Carolina; and
(8) Licensing for professional practice (if applicable) in South Carolina.

D. The absence of indicia in other states or countries is required before the student is eligible to pay in state rates.

A. A person’s temporary absence from the State does not necessarily constitute loss of South Carolina residence unless the person has acted inconsistently with the claim of continued South Carolina residence during the person’s absence from the State. The burden is on the person to show retention of South Carolina residence during the person’s absence from the State. Steps a person should take to retain South Carolina resident status for tuition and fee purposes include:
(1) Continuing to use a South Carolina permanent address on all records;
(2) Maintaining South Carolina driver’s license;
(3) Maintaining South Carolina vehicle registration;
(4) Satisfying South Carolina resident income tax obligation. Individuals claiming permanent residence in South Carolina must report for payment of income taxes on their total income from the date that they established South Carolina residence. This includes income earned in another state or country.

B. Active duty members of the United States Armed Forces and their dependents are eligible to pay in state tuition and fees as long as they continuously claim South Carolina as their state of legal residence during their military service. Documentation will be required in all cases to support this claim. South Carolina residents who change their state of legal residence while in the military lose their South Carolina resident status for tuition and fee purposes.

A. Notwithstanding other provisions of this section, any dependent person of a legal resident of this state who has been domiciled with his/her family in South Carolina for a period of not less than three years and whose family’s domicile in this state is terminated immediately prior to his/her enrollment may enroll at the in state rate. Any dependent person of a legal resident of this state who has been domiciled with his/her family in South Carolina for a period of not less than three years and whose family’s domicile in this state is terminated after his/her enrollment may continue to receive in state rates for the year immediately preceding such claim of domicile, but will not necessarily regard any single item of evidence as conclusive evidence that domicile has been established.

B. If a dependent or independent person voluntarily leaves the state, and information becomes available that would impact the existing residency status, eligibility for in state rates shall end on the last day of the academic session during which domicile is lost. Application of this provision shall be at the discretion of the institution involved. However, a student must continue to be enrolled and registered for classes (excluding summers) in order to maintain eligibility to pay in state rates in subsequent semesters.

A. In ascertaining domicile of a married person, irrespective of gender, such a review shall be determined just as for an unmarried person by reference to all relevant evidence of domiciliary intent.

B. If a non-resident marries a South Carolina resident, the non-resident does not automatically acquire South Carolina resident status. The non-resident may acquire South Carolina resident status if the South Carolina resident is an independent person and the non-resident is a dependent of the South Carolina resident.

C. Marriage to a person domiciled outside South Carolina shall not be the sole reason for precluding a person from establishing or maintaining domicile in South Carolina and subsequently becoming eligible or continuing to be eligible for residency.

A. Persons in the following categories qualify to pay in state tuition and fees without having to establish a permanent home in the state for twelve months. Persons who qualify under any of these categories must meet the conditions of the specific category on or before the first day of class of the term for which payment of in state tuition and fees is requested. The following categories apply only to in state tuition and do not apply to State supported scholarships and grants. Individuals who qualify for in state tuition and fees under the following exceptions do not automatically qualify for LIFE, SC HOPE or Palmetto Fellows Scholarships.

(1) “Military Personnel and their Dependents”: Members of the United States Armed Forces who are permanently assigned in South Carolina on active duty and their dependents are eligible to pay in state tuition and fees when such personnel are transferred from the State, their dependents may continue to pay in state tuition and fees as long as they are continuously enrolled. Such persons (and their dependents) may also be eligible to pay in state tuition and fees as long as they are continuously enrolled after their discharge from the military, provided they have demonstrated an intent to establish a permanent home in South Carolina and they have resided in South Carolina for a period of at least twelve months immediately preceding their discharge. Military personnel who are not stationed in South Carolina and/or former military personnel who intend to establish South Carolina residency must fulfill the twelve month “physical presence” requirement for them or their dependents to qualify to pay in state tuition and fees.

(2) “Faculty and Administrative Employees with Full Time Employment and their Dependents”: Full time faculty and administrative employees of South Carolina state supported colleges and universities and their dependents are eligible to pay in state tuition and fees.

Financial Information
(3) “Residents with Full Time Employment and their Dependents.” Persons who reside, are domiciled, and are full time employed in the State and who continue to work full time until they meet the twelve month requirement and their dependents are eligible to pay in-state tuition and fees, provided that they have taken steps to establish a permanent home in the State. Steps an independent person must take to establish residency in South Carolina are listed in Section 62-635 entitled (“Establishing the requisite intent to become a South Carolina Domiciliary”).

(4) “Retired Persons and their Dependents.” Retired persons who are receiving a pension or annuity who reside in South Carolina and have been domiciled in South Carolina as prescribed in the Statute for less than a year may be eligible for in-state rates if they maintain residence and domicile in this State. Persons on terminal leave who have established residency in South Carolina may be eligible for in-state rates even if domiciled in the State for less than one year if they present documentary evidence from their employer showing they are on terminal leave. The evidence should show beginning and ending dates for the terminal leave period and that the person will receive a pension or annuity when he/she retires.

A. Persons applying for a change of resident classification must complete a residency application/petition and provide supporting documentation prior to reclassification deadline as established by the institution.

B. The burden of proof rests with those persons applying for a change of resident classification who must show required evidence to document the change in resident status.

62-611. Incorrect classification.

A. Persons incorrectly classified as residents are subject to reclassification and to payment of all nonresident tuition and fees not paid. If incorrect classification results from false or concealed facts, such persons may be charged tuition and fees past due and unpaid at the out of state rate. The violator may also be subject to administrative, civil, and financial penalties. Until these charges are paid, such persons will not be allowed to receive transcripts or graduate from a South Carolina institution.

B. Residents whose resident status changes are responsible for notifying the Residency Official of the institution attended of such changes.

62-612. Inquiries and Appeals.

A. Inquiries regarding residency requirements and determinations should be directed to the institutional residency official.

B. Each institution will develop an appeals process to accommodate persons wishing to appeal residency determinations made by the institution’s residency official. Each institutions appeal process should be directed by that institutions primary residency officer, in conjunction with those individuals who practice the application of State residency regulations on a daily basis. The professional judgment of the residency officer and administrators will constitute the institutional appeal process. Neither the primary residency official nor appellate officials may waive the provisions of the Statute or regulation governing residency for tuition and fee purposes.

DINING

The University provides a variety of meal plans to meet student needs. The meal plan dining halls, Harcombe, Schillette, and Clemson House, are located in different areas of the campus and feature an all-you-care-to-eat policy per meal. Meals may also be purchased on a cash basis or by using a debit/credit card, Paw Points, or TigerStripe account. Meal Plans become effective when University housing is opened for occupancy at the beginning of each semester. Meal Plans expire after the evening meal on the day of graduation at the end of each semester. Meal Plans are not effective during official University breaks.

Eastside Food Court, Canteen, Fernow Street Café, Einstein Bros. Bagels, and Java City provide a wide assortment of dining selections on an a la carte basis. Nationally branded concepts are available in dining facilities on campus: Papa John’s and Subway in the Eastside Food Court, Chick-fil-a in the Campus Plaza, and Harcombe Dining Hall. All retail dining facilities and dining halls accept cash, debit/credit, Paw Points, and TigerStripe.

All first-year students who live in University Housing, excluding apartments with kitchens (Clemson House does not fulfill the apartment exception), are required to subscribe to a first-year resident meal plan for their first two semesters. All other students may choose a meal plan on a semester basis or pay for individual meals. First-year students living in University Housing (excluding the aforementioned housing) may terminate their meal plan for one of the following reasons ONLY:

- withdrawal from the University
- change in housing assignment to an apartment with kitchen facilities
- medical condition with dietary requirements that cannot be met by Dining Services. Documentation from a medical doctor must be provided along with specific dietary requirements. This documentation will be reviewed by the Dining Services Food Administrator
- other circumstances determined by the University to be beyond the student’s control

First-year students must provide the necessary documentation for any of the above reasons before cancellation of their meal plan will be considered. Upperclassmen may terminate their meal plans for any reason on the prescribed dates listed below only. Failure to participate in a meal plan does not automatically release a student from the first-year student requirements listed above, all first-year students who live on campus are required to participate in one of the two meal plans listed above.

If a first-year student living on campus does not sign up for one of the required resident choices, a meal plan will be assigned. All meal plans for all meal plan participants will automatically rollover to the spring semester. If an upperclassmen chooses to not to subscribe to a meal plan for the spring semester they must opt out before payment of the spring tuition statement.

Students may change meal plans at the Tiger One Card Office in 111 Hendrix Student Center during certain dates. Visit the University Housing and Dining Website for applicable dates. All adjustments will be proportioned. Students may upgrade meal plans at anytime.

Meal plans cancelled for any reason after service of the first meal will result in a refund of advance payment, minus a $35 termination charge, and a weekly charge for meals available. The meals available charge applies to the meals that have been prepared, not those that have been eaten by the individual student. Paw Points, which are associated with Plus plans, are not refundable; however, they do carry forward to the next semester. Students will be responsible for all service charges related to changes or termination of a meal plan. Note: Meal plans may not be shared with other students. Only the meal plan purchaser may utilize his/her meal plan.

Information is available at www.clemson.edu/dining or call (864) 656-1237. More information is available at www.tigerone.clemson.edu, by calling (864) 656-0763, or emailing tigerone-card@lists.clemson.edu

TIGERSTRIPE ACCOUNT

The TigerStripe account is equivalent to a prepaid debit card. Items are purchased from any of the more than 200 locations that accept TigerStripe, both on and off campus, the amount spent is deducted from the TigerStripe account balance. All students are eligible. Funds may be added to the account via the online TigerOne Card Services Office at: t1online.clemson.edu. Students may also pay in person at the TigerOne Card Services Office with cash, check, or credit card. They may call (864) 656-0763 to pay with American Express, Discover, MasterCard or Visa. Office hours are Monday-Friday, 8:00 a.m.-4:30 p.m. TigerStripe accounts are non-refundable except for students withdrawing, graduating, or not returning to the University. TigerStripe cannot be used for the payment of tuition; however, when paying tuition, students may add up to $2,500 to their TigerStripe account. Transactions are limited to $250 per day in the Student Financial Services Office for the payment of incidental fees. Credit balances at the end of each semester will carry forward to the next term. (Students withdrawing must go to E-103 Martin Hall. Balances greater than $50 will be refunded.) Any indebtedness to the University will be deducted from refunds. All graduating students are required to request a refund by emailing tigeronecard@lists.clemson.edu two weeks prior to graduation. Any account that remains dormant for 18 months or longer will have the balance transferred to a University scholarship account.

More information is available at clemson.edu/tigerone, or by calling (864) 656-0763, or emailing tigeronecard@lists.clemson.edu.
Financial Information

FINANCIAL AID
The Office of Student Financial Aid administers and coordinates various types of undergraduate financial aid administered by Clemson University: scholarships, loans, grants, and work-study employment. The office works jointly with the University Scholarships and Awards Committee.

Students may apply after January 1 for financial assistance for the next academic year. Financial aid requests, based on financial need, must be supported by a processed Free Application for Federal Student Aid (FAFSA) and renewed annually. No application is required for the LIFE Scholarship.

The FAFSA must be submitted by March 1 for need-based scholarship consideration and by April 1 for continuing students for the Federal Supplemental Educational Opportunity Grant (FSEOG), Federal WorkStudy, Federal Perkins Loan, and South Carolina State Need-Based Grant. April 1 is the suggested deadline for application for the Federal Pell Grant and the Federal Direct Loan. June 15 is the suggested deadline for application for private/alternative loans and the Federal PLUS Loan. PLUS and private loans require a separate online application.

Transfer students applying for student loans will be considered as entering freshmen in determining maximum loan limits. Following enrollment, after the credit evaluation process has been completed, students may submit a request for additional funds due to changes in class standing.

Information regarding financial aid programs at Clemson University is available at www.clemson.edu/finaid or from the Office of Student Financial Aid, G-01 Sikes Hall, Box 345123, Clemson, SC 29634-5123.

Satisfactory Academic Progress for Financial Aid Eligibility
Students must maintain satisfactory academic progress to be eligible for financial aid. This policy contains both qualitative (grade-point average) and quantitative (credit hours completed) requirements. Students must meet the grade-point average requirement as stated under the Academic Eligibility Policy and must complete their degrees within 150% of the published time frame. Details are available at www.clemson.edu/finaid. Students wishing to appeal their academic progress status may submit a letter to the Office of Student Financial Aid. This appeals process is separate from the Appeals Committee on Academic Eligibility.

Educational Benefits for Veterans, War Orphans, and Children of Deceased or Disabled Law Enforcement Officers or Fire Fighters
The Veterans Administration provides educational assistance for veterans and children of deceased or totally disabled veterans who meet requirements of applicable laws and regulations. Any veteran or child of a deceased or totally disabled veteran should communicate with the nearest Veterans Administration Office to determine whether he/she is entitled to any educational benefits. Free tuition is available to children of South Carolina law enforcement officers or fire fighters who were totally disabled or killed in the line of duty. Certification is required from the agency of the parent’s employment. Upon presentation of proof of eligibility, a student shall not become eligible for educational assistance until the beginning of the next academic term.

Educational Benefits for Senior Citizens
South Carolina residents who are at least 60 years of age may qualify for free tuition. Applicants who are auditing classes must obtain an audit card and waiver application form from the Registrar’s Office in 102 Sikes Hall to initiate enrollment each semester. Degree-seeking students must complete a waiver application form through the financial aid office in G-01 Sikes Hall each semester. The waiver must be submitted prior to the first day of class and is not retroactive to prior terms. All questions should be directed to the Office of Student Financial Aid at (864) 656-2280.
STUDENT SERVICES

HOUSING

Single Student Housing

University Housing provides a “home away from home” for approximately 6,300 single students in 24 residence halls, and three apartment complexes. Most rooms are double occupancy, but there are a limited number of single rooms available. Most two-bedroom apartments accommodate four students. All University housing is equipped to meet the needs of today’s college student. Approximately two weeks after acceptance to the University, housing information will be mailed to the students. Incoming freshmen should apply for on-campus housing at www.clemson.edu/housing. Transfer students and former students returning are offered on-campus housing if space is available.

REDFERN HEALTH CENTER

Medical Services

Redfern Health Center, an outpatient facility, operates Monday–Friday, 8:00 a.m.–5:00 p.m. (summer and break hours, 8:00 a.m.–4:30 p.m.) Students are seen on an appointment basis. Appointments can be made online by accessing MyHealth-e from the Redfern Web page or by calling the appointment line. Students without appointments are seen in the Nurses Clinic. The student health center offers outpatient ambulatory care for illnesses and injury, pharmacy, lab, x-ray, and specialty clinics, including women’s health, orthopedic injury and allergy/immunization clinics.

Medical clearance is required for all students enrolled at the University. For information regarding immunization requirements, visit the Redfern Health Center Website at www.clemson.edu/redfern and click on “Immunization Requirements.” An Intradermal Gamma Release Assay (IGRA) screening is required for all students coming from countries identified as being high risk for tuberculosis by the U.S. Centers for Disease Control and Prevention (CDC). The IGRA screening must be done in the United States. TB screenings performed outside of the U.S. will not be accepted. Students not in compliance with immunization requirements will not be allowed to complete registration for the next semester and may be subject to a late fee.

After Hours

Emergency 911 services are available after hours. Students with questions about their health care needs should call the NurseLine at 656-2233, option 2. A registered nurse is available by telephone to answer questions and offer advice about health care needs.

Students requiring the care of a physician after hours can choose from area emergency rooms and urgent care facilities, including Clemson Health Center (an urgent care facility), Oconee Medical Center, AnMed Health, Baptist Easley Hospital, and Greenville Memorial Hospital. Medical costs incurred are the student’s responsibility. Students should contact Redfern the next business day for follow-up care.

The University ambulance transports on-campus medical emergencies to the closest community medical resource. The University ambulance is staffed with licensed emergency medical personnel 24 hours a day. Students are required to pay for off-campus ambulance transportation.

Counseling and Psychological Services (CAPS)

CAPS provides comprehensive mental health services from a holistic perspective. Students are seen within their context and developmental stages as psychotherapy/counseling is delivered in individual, group, or couples format. Specialized services are delivered by a psychiatrist, registered dietician, and addictions counselors. All services are confidential.

CAPS offers a walk-in clinic Monday through Friday, from 10:00 a.m.–2:30 p.m. for the initial access to services. Students complete paperwork and are seen for this initial brief evaluation on a first-come, first-served basis. Students who cannot meet the walk-in clinic times may call 656-2451 for an appointment during the 8:00 a.m.–5:00 p.m. hours of operation.

The Assessment, Choices, Transitions and Training (ACTT) Program assists students with substance misuse/abuse concerns. CAPS also provides counseling, advocacy, referral, education, and support services for students with concerns about relationship and sexual violence. Students with eating concerns/disorders are treated from a multidisciplinary approach that involves psychological, medical, and nutritional perspectives. CAPS conducts a limited number of psychological evaluations for learning disabilities and attention disorders on a first-come, first-served basis each semester.

In case of emergency assistance and consultation are available by calling 656-2451 during regular business hours. After hours and on weekends, the on-call counselor can be reached through the University Police Department at 656-2222.

Health Promotion

The Health Promotion Office provides health information and resources to students in the student health center, on Redfern’s Web site, and through the electronic health record system (Point n Click). Face-to-face consultation is provided about a variety of health concerns, such as nutrition, tobacco cessation, and sexual health, to individuals and groups of students. HIV counseling and testing is also available. Students are invited to participate in promoting healthy behaviors by joining the Student Health Advisory Committee (SHAC), which plans and organizes campus awareness events on sexual responsibility, tobacco use, nutrition, and HIV/AIDS, among other topics.

Healthy Campus

Healthy Campus collaborates with stakeholders in the campus community to ensure that Clemson University’s campus is optimally and sustainably organized to support, strengthen and enhance health, enabling students to achieve, learn and serve.

Health Campus provides student leadership learning experiences that frame the concepts of health and sustainability in a global context and challenge students to be leaders for a healthy and sustainable future. Areas of focus are policies, systems and environments that positively impact:

• Health and safety
• Alcohol use
• Sustainability and intergenerational equity
• Leadership and change agent capacity

Health Fee

University policy requires that all students registered for six or more credit hours on campus during the fall or spring semester or three or more on-campus credit hours during a summer session pay the University health fee. The health fee provides access to the professional service of physicians, nurse practitioners, psychologists, counselors, and health educators at no additional cost; reduced costs for medical diagnostics; and an after-hours urgent care excess insurance benefit. Students pay for pharmaceuticals, orthopedic equipment, specialty clinics, and psychological testing. Payment is expected at the time of service and may be made by cash, check, MasterCard, or TigerStripe.

Health Insurance

The University offers a student health insurance plan to help cover major medical expenses. Information is available at www.studentinsurance.com. Students are strongly encouraged to have comprehensive health insurance coverage during their tenure at the University.

ACADEMIC SUCCESS CENTER

The Academic Success Center (ASC) provides comprehensive academic support programs and services that enhance students’ learning potential, thereby promoting academic success and personal growth. The ASC provides a nurturing environment in which students are better able to learn how to learn as well as enhance their collegiate experiences. The Center serves as a catalyst to help achieve University goals by promoting high graduation rates, promoting excellence in advising, providing support systems to all students, and increasing freshmen retention. The ASC offers the following programs and services to all students at no charge:

• Supplemental Instruction (SI) allows students enrolled in high-risk courses to work in a study group setting with peer leaders who have successfully completed the course and who have been trained to facilitate SI help sessions.
• Course specific tutoring is offered each week, Sunday through Friday, in a group setting on a walk-in basis. The ASC Tutor Request Policy allows students in need of tutoring for a course not listed in the tutoring or SI schedule to request a tutor.
• Academic Skills Workshops are held throughout the academic year to enhance the learning experience and build academic skills.
• One-on-one academic counseling sessions help students evaluate their study skills and develop strategies for academic success.

• Individual academic coaching sessions provide structure, support, and feedback to help students stay on course for success. The Academic Coach also coordinates Tiger Success, a program to help students on probation regain good academic standing at Clemson.

CAREER CENTER

The Michelin® Career Center, in the Center for Career & Professional Development, assists undergraduate and graduate students in selecting appropriate fields of study, furthering their education, learning effective job searching strategies, and making connections with employers.

Students can utilize a complete range of services and career development resources in the career resource center in both print and electronic formats. Career counselors are available to meet one-on-one with students to explore career or educational options, devise résumés and cover letters, hone interviewing techniques, conduct searches for internships and full-time jobs, and ready themselves for interviewing with employers. In addition, students may utilize ClemsonJobLink, the Career Center’s on-line recruiting system, to view part-time jobs, internships, and full-time job postings and to sign up for on-campus interviews.

Experiential learning opportunities are designed to provide students with an experience in which they are required to be active and intentional learners. The goal is for students to transfer their knowledge and experiences from the classroom and apply them in work environments outside the classroom. The Michelin® Career Center’s Internship Program is geared to bringing students and employers together to facilitate an academically viable and mutually beneficial work experience. This program offers zero-credit-hour internship courses (INT 1010 and INT 2010) for students in majors that do not offer internship credit. Students may participate in either part-time or full-time internships.

Major events sponsored by the Career Center include a fall and spring Career Fair and the University Placement/Recruitment for Educators Program (UPREP) Teacher Fair.

Other information can be obtained from the Career Center’s website at career.clemson.edu or by calling 656-6000.

DISABILITY SERVICES

Student Disability Services (SDS) coordinates the provision of reasonable accommodations for students with physical, psychological, attentional, or learning disabilities. Accommodations are individualized, flexible, and confidential based on the nature of the disability and the academic environment in compliance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990.

Students are encouraged to consult with the Student Disability Services staff as early as possible, preferably prior to the first day of classes. Current documentation of a specific disability from a licensed professional is needed. For additional information or to schedule an appointment, contact Student Disability Services at (864) 656-6848 or sds-l@clemson.edu. Details on policies and procedures are available at www.clemson.edu/sds.
Advanced Placement and Credit by Examination

In addition to earning credit by the usual method involving classroom attendance, a student may receive credit toward his/her degree by completing a course successfully by examination only. Freshmen interested in exempting some elementary courses in this manner should participate in the College Board Advanced Placement or International Baccalaureate Program and have the results of these tests sent to Clemson.

Certain departments will also grant credit for successful completion of College-Level Examination Program (CLEP) subject examinations, which are administered by the College Board.

Enrolled students may earn credit by means of a special examination without the necessity of class attendance subject to the following requirements:

1. The applicant must present evidence that he/she has received training or taken work which is approximately equivalent to that given in the course at Clemson for which an examination is requested.

2. The applicant must have previously failed or audited the course at Clemson.

3. The applicant must apply in writing for the examination; the request must be approved by the instructor, chair of the department in which the course is taught, and the Enrolled Student Services Office. Application forms are available to the Enrolled Student Services Office, 104 Sikes Hall.

Credit (CR) will be awarded for acceptable work in lieu of letter grades in recognition of college-level achievement as determined by College Board Advanced Placement Examination, International Baccalaureate Program, College-Level Examination Program, subject examination, institutional special examinations, and similar instruments.

Transfer Credit

Courses completed with a grade of C or better by currently enrolled Clemson students at other regionally accredited institutions, including correspondence courses, telecourses, online courses, and exempted courses, will be evaluated for transfer in terms of equivalent courses included in the Clemson curriculum of the student’s choice. This does not guarantee that all courses taken at other institutions will be accepted for transfer. The acceptability of each course or exemption will be based on an evaluation by the Office of Admissions. Students should obtain approval from the academic advisor for a course prior to enrolling in the course. By obtaining advance approval, the student is assured of receiving proper credit at Clemson upon satisfactory completion of the course. Information and forms relative to this approval may be obtained in the Enrolled Student Services Office, 104 Sikes Hall. Coursework completed at different institutions will not be joined to equate with one Clemson course. No course taken at a nonbaccalaureate-degree granting institution may be used as an equivalent or substitute for any 3000- or 4000-level Clemson course. Relative to academic eligibility, graduation, and transcripts, only grades earned at Clemson are used in computing the student’s grade-point average. Grades earned in qualifying (i.e., non-remedial) transfer courses will be used in calculating the student’s grade-point average for South Carolina LIFE Scholarship awards. Non-remedial college classes completed while in high school are also included in this calculation.

Learning experiences including, but not limited to, military service schools, non-collegiate sponsored instruction, work-related experiences, etc., will not be evaluated for transfer; however, enrolled students may request credit by examination for any non-transferable learning experience. For additional information, see Advanced Placement and Credit by Examination above.

Learning Experiences

All “for credit” learning experiences conducted with organizations other than accredited higher education institutions must be regularly supervised by appropriate members of the Clemson University faculty or staff. The student must be enrolled at the time the credit is generated, and the level of credit (grade) is the responsibility of the faculty member(s) in the discipline from which the grade originates.

External Education Experiences

In all “for credit” external educational programs that Clemson University may have with professional, vocational, technical, clinical, and foreign study, the agreements are to be agreed to through signature of the provost and the president. In such cases, learning experiences for which credit is awarded must be under the ultimate control and supervision of Clemson University.

GRADING SYSTEM

The grading system is as follows:

A—Excellent indicates work of a very high character, the highest grade given.

B—Good indicates work that is definitely above average, though not of the highest quality.

C—Fair indicates work of average or medium character.

D—Pass indicates work below average and unsatisfactory, the lowest passing grade.

F—Failed indicates that the student knows so little of the subject that it must be repeated in order that credit can be received.

I—Incomplete indicates that a relatively small part of the semester’s work remains undone. Grade I is not given a student who made a grade F on his/her daily work. The incomplete grade is calculated as an F in the student’s grade-point average until the work is made up and a final grade is assigned. Students are allowed thirty days after the beginning of the next scheduled session, excluding summers and regardless of the student’s enrollment status, to remove the incomplete grade. Normally, only one extension for each I may be granted, and this under unusual circumstances. The extension must be approved in writing by the instructor of the course and the chair of the department in which the course was taken. The extension will indicate the nature and amount of work to be completed and the time limit. (Students under this policy are prohibited from removing the I by repeating the course.) A letter grade of I converts to F unless the incomplete is removed within the time specified.
W—Withdraw indicates that the student withdrew from the course or was withdrawn by the instructor after the first two weeks of classwork and prior to the last five weeks of classes, not including the examination period. Proportionate time periods apply during summer and other shortened sessions. Financial aid purposes, enrollment is defined and satisfactory academic progress levels are established as of midnight on the last day to drop without a W grade. Withdrawal can negatively impact financial aid eligibility if a student does not complete a sufficient number of hours. Details are available at www.clemson.edu/financialaid.

Grade-Point Average
In calculating a student’s grade-point average, the total number of grade points accumulated by the student is divided by the total number of credit hours attempted at Clemson during the semester, session, or other period for which the grade-point average is calculated. For each credit hour, the student receives grade points as follows: A–4, B–3, C–2, D–1. No grade points are assigned for grades F, I, P, NP or W.

Pass/No Pass Option
Only courses to be used as electives may be taken optionally as Pass/No Pass. If a degree program includes elective credit(s), a student may apply up to 12 elective credits earned using the Pass/No Pass option. If a degree program does not include elective credits, a student may take courses using the Pass/No Pass option but the credits will not apply to the degree.

Registration in Pass/No Pass courses will be handled in the same manner as letter-graded courses. Departmental approval must be obtained for the Pass/No Pass option via approval form and returned to the Registration Services Office by the last day to register or add a class, as stipulated in the Academic Calendar.

Instructors will submit letter grades to the Registration Services Office. These grades will be converted as follows: A, B, C to P (Pass); D, F to NP (No Pass). Only P (minimum letter grade of C) or NP will be shown on a student’s permanent record and will not affect the grade-point average.

If a student changes to a major that requires a previously passed course and this course has been taken Pass/No Pass, he/she may request either to take the course on a letter grade basis, that the Pass/No Pass, he/she may request either to take the course or was withdrawn by the instructor after the first two weeks of classwork and prior to the last five weeks of classes, not including the examination period. Proportionate time periods apply during summer and other shortened sessions. Financial aid purposes, enrollment is defined and satisfactory academic progress levels are established as of midnight on the last day to drop without a W grade. Withdrawal can negatively impact financial aid eligibility if a student does not complete a sufficient number of hours. Details are available at www.clemson.edu/financialaid.

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Only courses to be used as electives may be taken optionally as Pass/No Pass. If a degree program includes elective credit(s), a student may apply up to 12 elective credits earned using the Pass/No Pass option. If a degree program does not include elective credits, a student may take courses using the Pass/No Pass option but the credits will not apply to the degree.

Registration in Pass/No Pass courses will be handled in the same manner as letter-graded courses. Departmental approval must be obtained for the Pass/No Pass option via approval form and returned to the Registration Services Office by the last day to register or add a class, as stipulated in the Academic Calendar.

Instructors will submit letter grades to the Registration Services Office. These grades will be converted as follows: A, B, C to P (Pass); D, F to NP (No Pass). Only P (minimum letter grade of C) or NP will be shown on a student’s permanent record and will not affect the grade-point average.

If a student changes to a major that requires a previously passed course and this course has been taken Pass/No Pass, he/she may request either to take the course on a letter grade basis, that the P be changed to a C, or that another course be substituted.

Dropping Classwork
A subject dropped after the first two weeks of classwork and prior to the last five weeks during the fall and spring semesters is recorded as W—Withdrawal. Proportionate time periods apply during summer sessions and other shortened sessions.

Mid-Term Evaluation
Once, near mid-term, but no later than ten days before the last day students can drop courses without receiving final grades, instructors of every undergraduate course shall make available for each student (a) that student’s numerical course grade or (b) that student’s letter ranking to date in that course (A–F or P/ NP). More frequent feedback is strongly encouraged.

Both student and instructor are to recognize that this feedback reflects the student’s performance up to that point in time, and as such, that student’s final course grade may change based upon subsequent coursework performance(s).

The policy includes all undergraduate courses and applies to all terms, including summer sessions.

Final Examinations
The standing of a student in his/her work at the end of a semester is based upon daily class work, tests or other work, and final examinations. Faculty members may excuse from final examinations all students having the grade of A on the coursework prior to the final examination. For all other students, examinations are required in all subjects at the end of each semester, except in courses in which final examinations are not deemed necessary as approved by the department faculty.

Final examinations must be given or due on the dates and at the times designated in the final examination schedule, except in laboratory and one-credit-hour courses for which the final exam will be given at the last class meeting.

All courses (including online courses) will specify a standard day of the week and standard meeting time are assigned a final exam date and time during each week. All courses in regular terms that do not specify a standard day of the week and standard meeting time are not assigned a final exam date and time, and the final exam must be given during examination week at a date and time determined by the instructor. This date and time must be stipulated in the syllabus.

Grade Reports
Students may access their end-of-term grades online. Final grade reports are mailed to undergraduate students on academic probation and to other students upon request. Request forms are available in the Registration Services Office.

Academic Eligibility Policy
All students are expected to study and perform to the best of their abilities. The academic eligibility standards listed below represent minimum levels to remain enrolled at the University. A student who fails to meet these standards is not making satisfactory academic progress and should seek additional assistance from an academic advisor, the Academic Recovery Program, or other appropriate University resources.

Academic Eligibility Definitions
The following terms identify levels of academic difficulty pertinent to a student’s academic eligibility.

Academic Alert: A student who earns a semester grade-point average below 1.5, regardless of cumulative grade-point average, is placed on academic alert. No notation concerning academic alert will appear on the student’s permanent record.

Academic Probation: A student who fails to maintain a cumulative grade-point average of 2.0 or higher is placed on academic probation. No notation concerning probation will appear on the student's permanent record. A student on academic probation may enroll in a maximum of 16 credit hours, unless permission for a higher course load is granted by the academic advisor. Students on academic probation are expected to participate in the Academic Recovery Program.

Academic Suspension: A suspended student is ineligible to enroll in classes for the fall or spring semester immediately following the suspension notification. Suspension is for one semester only, and the student is eligible to reenroll the following semester.

Academic Dismissal: A student who enrolls after a suspension is subject to dismissal at the end of the next semester in which he/she does not meet the academic eligibility criteria listed below. The period of dismissal is for one calendar year and readmission is by appeal only. A dismissed student who is readmitted and again fails to meet academic eligibility standards will be permanently dismissed. Permanent dismissal may not be appealed, and a student permanently dismissed may not apply for Academic Renewal.

A student on academic probation for two consecutively enrolled semesters is evaluated to determine academic eligibility. Eligibility for continued enrollment is evaluated at the end of each semester unless otherwise indicated in this policy. Students with only one complete semester will not be evaluated.

The evaluation for academic eligibility is separate from the evaluation for satisfactory academic progress required for Student Financial Aid. Further information on satisfactory academic progress for financial aid purposes is available in the Financial Information section of this catalog and at www.clemson.edu/financialaid.

Academic Eligibility Standards
A student on academic probation (cumulative grade-point average below 2.0) will remain academically eligible if one of the following conditions is met.

1. The student passes at least 12 credit hours and earns a 2.4 or higher semester grade-point average. Duplicate credits do not count as credits passed unless otherwise required to meet an alternative departmental standard.

2. The student achieves the Minimum Cumulative Grade-Point Average (MC GPA) below.

<table>
<thead>
<tr>
<th>Total Attempted Hours</th>
<th>MC GPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-29</td>
<td>1.75</td>
</tr>
<tr>
<td>30-59</td>
<td>1.85</td>
</tr>
<tr>
<td>60-89</td>
<td>1.95</td>
</tr>
<tr>
<td>90+</td>
<td>2.00</td>
</tr>
</tbody>
</table>

*Total Attempted Hours includes all credit hours attempted at Clemson, plus any advanced standing received from transfer credits and credits based on approved examination programs. Only grade points earned at Clemson are used to calculate the MC GPA.

3. The student achieves a cumulative grade-point average of 2.0 or higher.
Academic Eligibility Evaluation

Academic eligibility criteria are different for students who have completed fewer than three semesters, students who have completed at least three semesters, students who have been suspended, and students returning on appeal, as described below. Conditions of academic eligibility standards are described in the previous section.

1. A student who has completed fewer than three fall and spring semesters will be evaluated at the end of his/her first spring semester, unless he/she entered the university that semester. If the student has two consecutive semesters on academic probation, he/she is eligible to enroll in the subsequent summer and fall semester, but must meet academic eligibility standards at the end of fall semester to avoid suspension for the following spring semester.

2. After a student has completed three regular (fall and spring) semesters, he/she will be evaluated at the end of each fall and spring semester. If the student has two consecutive semesters on academic probation and fails to meet academic eligibility standards, he/she will be suspended for the next regular (fall or spring) semester. A student subject to suspension at the end of spring semester may enroll in summer school and will avoid suspension if he/she meets academic eligibility standards.

3. A student enrolled after being suspended is evaluated at the end of each fall and spring semester until a cumulative grade-point average of 2.0 or higher is achieved. A previously suspended student on academic probation who fails to meet academic eligibility standards will be dismissed at the end of the following fall or spring term for one calendar year and permitted to enroll only as a result of a successful appeal.

4. A student permitted to reenroll due to a successful appeal of suspension or dismissal is evaluated at the end of each fall and spring semester until a cumulative grade-point average of 2.0 or higher is achieved. A student who fails to meet academic eligibility standards will be suspended or dismissed, according to his/her academic situation.

Appealing Suspension or Dismissal

In the event a student subject to suspension or dismissal is unable to achieve one of the above outcomes as a result of extenuating circumstances, the student may file a written appeal with the Appeals Committee on Academic Eligibility. If this appeal is denied, the student may file subsequent appeals for readmission after any subsequent semester.

The Appeals Committee on Academic Eligibility meets approximately one week after final examinations in the fall, spring, and second summer session. Students should contact the Office of Undergraduate Studies for further information on the appeals process. Appeals will be granted only in the most exceptional cases and may require the student to adhere to additional criteria in order to remain enrolled at the University.

Grade Protests

A student wishing to protest a final course grade must first try to resolve any disagreement with the instructor. If unable to avoid a resolution, the student may follow the procedures listed under Academic Grievance Policy. Grievances must be filed within 30 calendar days (exclusive of summer vacation) of the date of the last exam for the term involved.

Repeating Courses Passed

A student may repeat a course passed with a grade lower than B. Repeating a course graded D or C does not erase the original D or C grade. If a student elects to apply Academic Forgiveness to a course graded D, the Academic Forgiveness Policy below will apply. Otherwise, both grades appear on the record and are computed in the cumulative grade-point average. A course graded C cannot be forgiven. Credit for the same course will be counted only once toward the number of hours required for graduation.

For academic eligibility purposes, duplicate credits do not count as credits passed. For financial aid purposes, duplicate credits do not count as credits completed for satisfactory progress. If a student repeats a course passed with grade of B or better, the credits and grade points earned in the repeat attempt will be removed from the cumulative summary.

Repeating Courses Failed

A student who has failed a course cannot receive credit for that course until it has been satisfactorily repeated for the number of hours required for graduation. For academic eligibility purposes, duplicate credits do not count as credits passed. For financial aid purposes, duplicate credits do not count as credits completed for satisfactory progress. If a student repeats a course passed with grade B or better, the credits and grade points earned in the repeat attempt will be removed from the cumulative summary.

Academic Forgiveness Policy

The Academic Forgiveness Policy (AFP) allows a student enrolled beginning Fall 2013 or after to eliminate from the GPA calculation up to three courses in which a D or F was earned. Students enrolled prior to Fall 2013 who were under the former Academic Redemption Policy will be allowed academic forgiveness on a modified scale. Detailed information is available at www.registrar.clemson.edu.

The following conditions apply:

Courses taken prior to fall semester 2003 may not be considered for academic forgiveness. While D or F grades in required courses may be eliminated before the course is repeated, the required course must be repeated satisfactorily at Clemson University before graduation. Both grades will remain on the transcript, degree progress report, and other official documents. For financial aid purposes, courses repeated under this policy resulting in duplicate credit do not count for satisfactory academic progress.

The AFP shall apply only to courses taken at Clemson University. Course substitutions are not permitted.

Students may not invoke the AFP after they have graduated. After graduation, students may repeat coursework, but both grades will be calculated in the grade-point average.

The AFP may not be applied to a course taken on a Pass/No Pass basis or to any course in which the student was previously found in violation of the academic integrity policy.

Course Prerequisites

Prerequisites for each course are enumerated in the Courses of Instruction section of this catalog. In addition to these requirements, colleges and departments may also establish other standards as conditions for enrollment. It is the student’s responsibility to refer to individual college and curricular information for specific standards.

Course Substitutions

A student may request substitution of a course, whether Clemson credits or transfer credits, for a curriculum requirement in the major, the minor, or General Education. Course substitutions will be applied toward degree requirements only after approval by all the appropriate academic signatories. Students should initiate the request with their assigned academic advisor using the Form to Request Substitution for an Academic Requirement, available on the Registrar’s Web site, www.registrar.clemson.edu.

All requests for course/requirement substitutions must be submitted and approved as early as possible and prior to the start of the student’s final semester at Clemson University (i.e., the graduation semester). It is the student’s responsibility to ensure that the necessary forms have been processed and signed. Failure to follow these guidelines may result in the student’s graduation being delayed to at least the following semester.

Attendance Policy

The academic resources of Clemson University are provided for the intellectual growth and development of students. Class attendance is critical to the educational process; therefore, students should attend classes and other official documents. For financial aid purposes, course repeated under this policy resulting in duplicate credit do not count for satisfactory academic progress.

The AFP shall apply only to courses taken at Clemson University. Course substitutions are not permitted.

Students may not invoke the AFP after they have graduated. After graduation, students may repeat coursework, but both grades will be calculated in the grade-point average.

The AFP may not be applied to a course taken on a Pass/No Pass basis or to any course in which the student was previously found in violation of the academic integrity policy.

Course instructors must implement fair grading procedures and provide an opportunity to make up missed assignments and examinations that does not unfairly penalize the student when an excessive absence is accepted. Such make-up work shall be at the same level of difficulty with the missed assignment or examination. Course instructors shall hold
all students with excused absences to the same standard for making up missed assignments or examinations. While course instructors should seek to make reasonable accommodation for a student involved in University-sponsored activities, students should understand that not every course can accommodate absences and that absences do not lessen the need to meet all course objectives.

Absence from class is detrimental to the learning process, so course instructors may use reasonable academic penalties which reflect the importance of work missed because of unexcused absences. Course instructors who penalize students for unexcused absences must specify attendance requirements as related to grading in the course syllabus and must keep accurate attendance records. Course instructors are obligated to honor exceptions to the university attendance policy for students covered by the Americans with Disabilities Act, as verified through paperwork issued by Student Disability Services.

Enrollment

Only students who are officially registered and have paid appropriate fees may attend classes. Students have the responsibility to insure that drop/add transactions are completed in a timely manner. Registered students who cease attending class will be assigned a failing grade.

All students are required to attend the first scheduled day of classes and labs. Students who cannot attend the first class are responsible for contacting the instructor to indicate their intent to remain in that class. If a student does not attend the first class meeting or contact the course instructor by the second meeting or the last day to add, whichever comes first, the course instructor has the option of dropping that student from the roll. Students must not assume that course instructors are obligated to drop them if they fail to attend the first few days of class.

Anticipated Absences

Students should use the Notification of Absence module in Blackboard, or other reasonable means, to notify the course instructor of a future absence from class. This communication is only for information and does not verify the student’s reason for absence or impact the course instructor’s evaluation of the student’s academic work. The student must make personal contact with the course instructor as soon as possible.

If a student realizes in the first two weeks of classes that an anticipated number of absences will exceed the number of excused absences permitted in the course, the student should discuss the situation with the course instructor, the student’s adviser, and/or the academic Associate Dean in the college in which the student is enrolled. A suitable resolution should be reached before the end of the second week of the semester.

Students are encouraged to inform course instructors of known conflicts as soon as possible, but no later than one week before the date of any assignment or exam.

Unanticipated Absences

Students should use the Notification of Absence module in Blackboard to notify the course instructor. This communication is only for information and does not verify the student’s reason for absence or impact the course instructor’s evaluation of the student’s academic work. If the student is unable to contact course instructors, the student (or representative) should contact the Office of the Dean of Students, who will notify the course instructors of the circumstances, providing a liaison in cases limited by medical confidentiality. A student may be excused from attending class in cases of emergency or other compelling reasons deemed appropriate by the course instructor. Excuses for emergency absences must be reported to the course instructor as soon as possible (for example, through e-mail), but not more than one week after the return to class. In certain cases, the Dean of Undergraduate Studies (or designee) may provide a letter verifying the student’s absence as excused. Course instructors are expected to excuse absences for reasons including:

1. Injury or illness too severe or contagious for the student to attend class, when certified by an attending physician. Physicians and staff at Redfern Health Center do not provide written excuses; however, students should retain paper work of medical visits affirming date and time. Whenever possible, students should visit Redfern as outpatients without missing class. An absence for a non-acute medical service does not constitute an excused absence. Course instructors may, at their discretion, require documentation of medical absences.

2. Death, serious illness, or emergency in a student’s immediate family (course instructors may require documentation).

3. Participation in authorized University-sponsored activities, not to include practice for the activities. Course instructors may require documentation from the course instructors or staff advisor of the sponsored University group.

4. Religious observances and practices which prevent a student from being present during a class period (advance consultation/approval by the instructor is necessary).

5. Participation in court-imposed legal proceedings (e.g., jury duty or subpoena).

6. Required participation in military obligations as certified by the student’s commanding officer.

In the event of a regional or national emergency (e.g., pandemic, hurricane, etc.), students missing classes may not be charged with unexcused absences if the nature and extent of the emergency is defined and disseminated by the Provost (or designee).

Appeals

Any student who feels that a grade has been affected by a legitimate absence that an instructor did not excuse may appeal the grade through the Academic Grievance process. Students may appeal, in writing, a course instructor’s decision not to excuse an absence to the academic Associate Dean of the academic unit offering the course. Before taking action, the Associate Dean should request that the course instructor explain his or her denial in writing.

Dead Days

During the last two class days of the fall and spring semesters, commonly referred to as Dead Days, all regularly scheduled classes are conducted; however, course testing on these days is limited to scheduled laboratory and one-semester-hour course final exams and make-up tests. Dead Days are observed during fall and spring semesters only. Dead Days do not apply to courses numbered 6000 or above.

Auditing Policies

Qualified students may audit courses upon written approval of the instructor. Auditors are under no obligation of regular attendance, preparation, recitation, or examination and receive no credit. Participation in classroom discussion and laboratory exercises by auditors is at the discretion of the instructor. A student who has previously audited a course is ineligible for credit by examination.

Undergraduate and graduate students enrolled in 12 or more hours may audit courses at no additional charge. Others interested in auditing should verify their eligibility through the Registrar’s Office.

Combined Bachelor’s/Master’s Plan

Students may reduce the time necessary to earn both degrees by applying graduate credits to both undergraduate and graduate program requirements. To be eligible, the student must have completed the bachelor’s curriculum through the junior year (minimum 90 credits) and have a minimum overall grade-point average of 3.4. A maximum of 12 credit hours of graduate courses in the master’s program may be applied to the bachelor’s program. As determined by the participating bachelor’s program, graduate courses may be applied to the bachelor’s degree as electives or technical requirements or by substitution of 7000- or 8000-level courses for required undergraduate courses. Under no circumstances can 6000-level counterparts of 4000-level courses required for the bachelor’s degree be counted toward master’s requirements. Combined bachelor’s/master’s plan students are not eligible for graduate appointments for financial aid until their bachelor’s degrees have been awarded.

Procedure for Students

Since neither all undergraduate nor graduate programs participate in this academic option, seniors should consult both their academic advisor and the graduate program coordinator of the master’s program they wish to pursue. Students must officially request participation in the combined bachelor’s/master’s program by completion of Form GS6BS/MS, “Request for Combined Bachelor’s/Master’s Education Plan,” available online at www.grad.clemson.edu/forms/GeneralForms.php. Endorsements by the program coordinator or department chair of both programs are required.

Procedure for Departments

Departments and graduate programs desiring to participate in the combined bachelor’s/master’s program should submit a written notification to the dean of the Graduate School identifying the date on which they intend to make this option available to their students.
Senior Enrollment in Graduate Courses
Clemson University seniors meeting the accepted academic standard for graduate work (3.0 cumulative grade-point average) are eligible to request enrollment in graduate level courses. Enrollment of seniors in any graduate course is subject to approval by the department offering the course and the Graduate School. The total course workload for the semester must not exceed 18 hours, and the cumulative graduate credits earned by seniors shall not exceed 12 semester hours. The credits and quality points associated with senior enrollment in graduate courses will be part of the undergraduate record. Graduate courses that are not satisfying undergraduate requirements cannot be used to meet enrollment requirements for financial aid.

Seniors with a 3.4 or Higher GPA
Seniors with 3.4 or higher grade-point averages are eligible for participation in the combined bachelor’s/master’s plan (see “Combined Bachelor’s/Master’s Plan”).

Seniors with a 3.0 or Higher GPA
Seniors with 3.0 or higher grade-point averages are eligible to request enrollment in graduate level courses to meet requirements for the bachelor’s degree; however, courses used for this purpose cannot be counted later towards an advanced degree. Alternatively, these students may also take courses in excess of the requirements for their undergraduate degrees and may request that these courses be included as a part of their graduate program if they are subsequently admitted to the Graduate School. Courses cannot be taken at the 6000 level if their 4000 level counterparts are required for the undergraduate degree in the same academic major as the proposed graduate degree.

Procedure for Students
Prior to registration, the Graduate School will approve and register the student in the graduate level courses requested on the GS6 or GS68/MS form. Senior enrollment forms, GS6, Request for Senior Enrollment, and GS68/MS, are available at www.grad.clemson.edu/forms/Grad Forms.php.

GRADUATION REQUIREMENTS
A candidate for an undergraduate degree is a student who has submitted a completed diploma application by the deadline prescribed in the University calendar for a particular graduation date. Candidates who do not apply by the deadline will be subject to a late fee.

Only candidates who have completed all graduation requirements are permitted to participate in the graduation ceremony.

Residence Requirement
To qualify for an undergraduate degree, a student must complete through instruction from Clemson a minimum of 37 of the last 43 credits presented for the degree. A waiver may be obtained for approved study abroad experiences through the Undergraduate Studies Office, E-103 Martin Hall. (To qualify for the five-year professional undergraduate degree in Landscape Architecture, a student must complete through instruction from Clemson, a minimum of 42 of the last 48 credits presented for the degree.)

Make-up of Incompletes Received in Last Semester
A candidate for a degree who receives one or more grades of ‘I’ in the semester immediately prior to graduation shall have an opportunity to remove the unsatisfactory grades provided the final grades are received in the Registration Services Office, E-206 Martin Hall, by the time grades for candidates for graduation are due. A student who qualifies for graduation under this regulation will be awarded his/her degree on the regular date for the award of degrees.

Special Requirements
A cumulative grade-point average of 2.0 is required for graduation. Candidates for graduation must be officially accepted in the major in which they are applying for a degree no later than the date applications for diplomas are due.

Bachelor of Arts degree programs require completion of a minor and four semesters (through 2020) of a modern foreign language.

ePortfolio
All undergraduate students will complete the general education section of the Clemson University ePortfolio prior to the final semester before graduation. Completion of the general education section of the ePortfolio is a requirement for graduation.

Awarding of Degrees Posthumously
An undergraduate student may be awarded a degree posthumously on the recommendation of the faculty of the college concerned, subject to the following conditions:
1. The student had at least a 2.0 grade-point average at the date of last enrollment;
2. Including credits scheduled in the term of last enrollment, the student a) had satisfied 75% of the degree requirements and b) met the residence requirement for a degree, which requires that 37 of the last 43 credits presented for a degree be earned at Clemson University; and
3. The student’s death occurred within two years of the end of the term of last enrollment at Clemson University.

Credit Limitation
If all work toward a degree is not completed within six years after entrance, the student may be required to take additional courses.

Academic Honors
Honor Graduates
To be graduated with honors, a student must have a minimum cumulative grade-point average as follows: Cum Laude—3.40, Magna Cum Laude—3.70, and Summa Cum Laude—3.90. Beginning January 1, 2014, students must meet the following standards to be graduated with honors: Cum Laude—3.70, Magna Cum Laude—3.85, Summa Cum Laude—3.95.

Honors Lists
At the end of the fall and spring semesters, the following lists shall be compiled of undergraduate students who have achieved grade-point averages of 3.50–4.00 on a minimum of 12 semester hours, exclusive of Pass/No Pass coursework.
Dean’s List—3.50 to 3.99 grade-point average
President’s List—4.00 grade-point average

Honors and Awards
The University offers a number of awards for outstanding achievement in specific fields and endeavors. Recipients are chosen by selection committees and are announced at the annual Honors and Awards Day program or other appropriate ceremonies. Detailed information relating to such awards is available in the offices of the academic deans and department chairs.

Preprofessional Studies
Clemson University will award the degree of Bachelor of Arts or Bachelor of Science in Preprofessional Studies to a student who is pursuing a degree in a professional school. The student must have also satisfactorily completed three years of undergraduate work in an appropriate curriculum and the first year of work in an accredited medical, dental, veterinary, or other accredited professional school, provided the student fulfills the requirements for the three-year program as follows and the other specified conditions are met.

1. At least two of the three years of preprofessional work, excluding the third year, must be taken in residence at this University.
2. A minimum of three years of undergraduate work (i.e., preprofessional school credit) must be presented.
3. Normal progress must have been made toward fulfilling the degree requirement of the curriculum in which the student is enrolled at Clemson.
4. The student applying for the Bachelor of Arts or Bachelor of Science in Preprofessional Studies must be recommended by the college at Clemson in which the curriculum that he/she is majoring as a Clemson student is located or by the college in which three years of normal progress toward a degree can be identified.
5. If the combination of preprofessional work taken and the work in the first year of professional school is equivalent to that which is required in some other bachelor’s degree program at Clemson, the college concerned may recommend the other bachelor’s degree.

The above requirements and conditions became effective July 1, 1974, and will apply to all students who satisfy these requirements and conditions after that date.

A Clemson student having left the University before receiving the bachelor’s degree (prior to July 1, 1974) and having enrolled immediately in an accredited professional postgraduate school may apply for a bachelor’s degree from Clemson and have his/her application considered on an individual basis. The college(s) at Clemson considering the application is authorized to examine the student’s entire record in both preprofessional and professional studies and exercise its own judgment concerning the three-year requirement for Preprofessional Studies.

Second Baccalaureate Degree
To complete a second baccalaureate degree, a student must complete a minimum of 30 semester hours at Clemson in addition to the greater number of hours required for either degree and satisfy all course and grade requirements for the second degree.
Double Major
A student in a Bachelor of Arts degree program may be awarded a single baccalaureate degree with a double major. The two majors may be within a single college or may involve two colleges but are limited to Bachelor of Arts degree programs. All major requirements for both programs must be satisfied.

Graduate Degrees
Graduate degrees are available from all five colleges in addition to several interdisciplinary programs. Clemson University offers more than 100 graduate degree programs. The degrees of Doctor of Philosophy, Education Specialist, Master of Arts, Master of Science, Master of Agricultural Education, Master of Architecture, Master of Arts in Teaching, Master of Business Administration, Master of City and Regional Planning, Master of Construction Science and Management, Master of Education, Master of Fine Arts, Master of Forest Resources, Master of Human Resource Development, Master of Landscape Architecture, Master of Parks, Recreation and Tourism Management, Master of Professional Accountancy, Master of Public Administration, and Master of Real Estate Development are awarded to students who complete prescribed graduate programs.

Additional information is available from the Graduate School.

ACADEMIC RECORDS
The student's permanent academic record is maintained in the Registrar's Office and contains personal identifying information, grades, and credits. Where appropriate, statements of a corrective nature, withdrawals, suspension for failure to meet academic standards, suspension for disciplinary reasons, and graduation data are added. The academic record is a historical record of the student's academic progress.

Classification
All new students are classified as freshmen unless they have attended another college prior to entrance. Students who have completed college work elsewhere will be classified on the basis of semester hours accepted at Clemson rather than the amount of work presented. To be classified as a member of any class other than freshman, students must meet the credit-hour requirements below:

- Sophomore—minimum 30 credit hours
- Junior—minimum 60 credit hours
- Senior—minimum 90 credit hours

Change of Major
Any undergraduate student who meets the Academic Eligibility Policy after attempting 12 credit hours at Clemson University (or who is allowed to continue by virtue of a semester 2.4 grade-point average on 12 earned credits or who is allowed to continue through appeal to the Appeals Committee on Academic Eligibility or by other authorization of this committee) may transfer from one major to another. Any college or department that seeks an exception to this policy must have the approval of the collegiate dean and the provost.

Withdrawal from the University
A student may withdraw from the University subject to the restrictions in the section on W-Withdraw. All University withdrawals (including withdrawing from the only course in which a student is enrolled) must be processed by the Associate Dean of Undergraduate Studies. Students should report to E-103 Martin Hall. Students receiving financial aid who withdraw from the University may have to repay significant portions of their financial aid. Students should report to G-08 Sikes Hall to determine the amount. For financial aid purposes, enrollment is defined and satisfactory academic progress levels are established as of midnight on the last day to drop without a W grade. Withdrawing from the University can negatively impact financial aid eligibility if a student has not completed a sufficient number of hours. Details are available at www.clemson.edu/finaid.

Academic Renewal
The student who has not enrolled at Clemson for a period of two or more academic years may apply to the Appeals Committee on Academic Eligibility for readmission under special conditions known as academic renewal, unless the student has been permanently dismissed. Under the academic renewal conditions, the previous credits attempted and grade-point deficit will not constitute a liability in new grade-point computation; however, no credits passed or their attending grade points will be available to the student for a degree at Clemson, and any courses previously passed may not be validated by special examination. The previous record will appear on the permanent record as well as the notation of readmission under the policy of academic renewal. Students returning under the academic renewal policy who apply for financial aid should submit written notification of their status in the Office of Student Financial Aid in order to update their academic progress record. For financial aid purposes, terms enrolled prior to academic renewal are still counted when evaluating satisfactory academic progress.

Transcripts
Official transcripts are issued only at the authorized, written request of the student. Requests should be directed to Transcripts, 104 Sikes Hall, Box 345125, Clemson, SC 29634-5125. Transcript Request forms may be downloaded at http://www.registrar.clemson.edu/html/transcript.htm. Payment in advance is required and may be made by Discover, MasterCard, American Express, VISA and TigerStripe. The following must be included with the transcript request: full name (including any names used while at Clemson), social security number, current address, date of birth, date the student last attended Clemson, where the transcript is to be sent, student signature, and payment of $12 per transcript. Telephone requests will not be honored. Transcript requests are normally processed within 48 hours, but additional processing time may be required at the end of a semester. Information is available from the Enrolled Student Services Office at the address above or by telephone at (864) 656-2173. Official transcripts are not issued for those who are indebted to the University.

UNDERGRADUATE ACADEMIC INTENSITY
As members of the Clemson University community, we have inherited Thomas Green Clemson’s vision of this institution as a “high seminary of learning.” Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form.

I. Academic Integrity Policy
A. Any breach of the principles outlined in the Academic Integrity Statement is considered an act of academic dishonesty.

B. Academic dishonesty is further defined as:
   1. Giving, receiving, or using unauthorized aid, including the inappropriate use of electronic devices, on any work submitted to fulfill academic requirements. In examination situations, all electronic devices must be off and stowed unless otherwise announced by the instructor;
   2. Plagiarism, which includes the intentional or unintentional copying of language, structure, or ideas of another and attributing the work to one’s own efforts;
   3. Attempts to copy, edit, or delete computer files that belong to another person or use of computer accounts that belong to another person without the permission of the file owner or account owner;
   C. All academic work submitted for grading or to fulfill academic requirements contains an implicit pledge and may contain, at the request of an instructor, an explicit pledge by the student that no unauthorized aid has been received.
   D. It is the responsibility of every member of the Clemson University community to enforce the Academic Integrity Policy.

II. Academic Integrity Committee
The power to hear cases of academic dishonesty is vested in an Academic Integrity Committee.

A. Structure—The Academic Integrity Committee is composed of twenty members as follows:
   1. Ten tenured members of the faculty; two members from each college selected by their respective collegiate faculties. Faculty members will be elected on a staggered term basis, serving for a period of two years after initiation of staggered terms. Terms commence with fall semester late registration.
   2. Ten members of the undergraduate student body; two from each college. Student members are nominated by the Student Body President, through an application and interview process in the spring semester, approved by the Senate Student, and appointed by the provost for terms of two years. Students must have a 3.0 grade-point average at the time of appointment and must have completed 30 hours by the end of the spring semester. Nominations will be made in the spring semester with terms of service commencing with fall semester late registration.
3. The committee is divided into four standing boards, hereafter referred to as hearing boards, which will hear the cases of academic dishonesty. Hearing boards convene on a weekly, rotational basis unless there are no cases to be heard. For summer sessions, the Associate Dean of Undergraduate Studies must maintain at least one hearing board to hear cases.

4. Hearing boards are composed of two faculty members, two students, and one chairperson. Quorum, for a hearing board, is one student, one faculty member, and a chairperson. Decisions by the hearing board will be by majority vote.

5. Chairpersons will be elected from within the Committee’s membership. Two chairpersons are selected from the faculty membership and two from the student membership.

6. Before hearing any cases, a new member of the committee must undergo a training session(s) with the Associate Dean of Undergraduate Studies.

7. The Associate Dean of Undergraduate Studies is the administrative coordinator of the Academic Integrity Committee.

B. Procedures

1. When, in the opinion of a course instructor, there is evidence that a student has committed an act of academic dishonesty, that person must make a formal written charge of academic dishonesty, including a description of the misconduct, to the Associate Dean of Undergraduate Studies. The reporting person may, at his/her discretion, inform each involved student privately of the nature of the alleged charge.

In cases of plagiarism (I.B.2.) instructors may, as an option, the Plagiarism Resolution Form available from the Office of Undergraduate Studies.

2. When, in the opinion of a student, there is evidence that another student has committed an act of academic dishonesty, he/she should contact the instructor for the course to discuss the incident. After being contacted, if, in the opinion of the instructor, there is evidence that a student has committed an act of academic dishonesty, the instructor must make a formal written charge of academic dishonesty, including a description of the misconduct, to the Associate Dean of Undergraduate Studies. The instructor may, at his/her discretion, inform each involved student privately of the nature of the alleged charge.

3. If, for any reason, the person who first discovered the misconduct is not available to present a charge, the department chair (or designee) or college Associate Dean for the department in which the course is taught may submit the charge to the Associate Dean of Undergraduate Studies.

4. When the Associate Dean of Undergraduate Studies has received a formal charge of an alleged violation, he/she will contact the student involved privately to notify him/her of the charge and will provide the student with a copy of the charge and a copy of the procedures that the Academic Integrity Committee has adopted, pursuant to number 7 below. If a student is charged with academic dishonesty, he/she may not withdraw from the course unless he/she is exonerated of the charge. Students may not forgive a hearing board under the Academic Forgiveness Policy if that grade was the penalty for violation of the Academic Integrity Policy. If the student fails to respond to the Associate Dean’s requests for a meeting within ten university working days, the student is considered to have waived his/her right to a hearing, thus admitting to being in violation of the Academic Integrity Policy.

5. After informing the student involved, the Associate Dean of Undergraduate Studies will convene one of the boards of the Academic Integrity Committee within 14 calendar days (exclusive of University holidays) from the date that the accused student provides a written rebuttal to the charge. The student will provide the rebuttal no later than five university working days following notification of the charge from Undergraduate Studies. (Students charged in the spring term, but not enrolled in summer sessions, may be given a continuance to the next fall term.) Should the University schedule be interrupted due to emergency circumstances, academic integrity cases will be resolved as soon as possible once classes resume. If the student fails to provide his/her rebuttal to the Associate Dean within five university working days, the student is considered to have waived his/her right to a hearing, thus admitting to being in violation of the Academic Integrity Policy. All students will be presumed not in violation of a charge until found in violation by a hearing board. Each party is responsible for having present at the hearing all witnesses that he/she wishes to speak on his/her behalf. Witnesses must have firsthand knowledge of the events under discussion.

6. A charge of academic dishonesty in a course must be made within thirty days after the beginning of the next term, exclusive of summer session. For cases that are not resolved before course grades are due, instructors will assign a grade of I (Incomplete) as a placeholder for the grade. This I grade will be replaced with the course grade once the case is resolved.

7. The Academic Integrity Committee will adopt its procedures, to be followed by all hearing boards, prior to the first case heard by a hearing board. In addition to providing the student with a copy of the procedures as stated in number 4 above, the Associate Dean of Undergraduate Studies will provide a copy of the procedures to the involved course instructor and also the hearing board members. The Associate Dean of Undergraduate Studies will also retain copies of these procedures. The procedures must afford both instructors and students the opportunity to present their cases and the opportunity for rebuttal.

8. In cases in which there is a finding of “in violation,” the course instructor may consult with the Associate Dean of Undergraduate Studies to consider any past precedent established regarding academic penalties levied in similar cases. Instructors must inform the Associate Dean of Undergraduate Studies of the academic penalty for a student found “in violation” by a hearing board.

9. The Associate Dean of Undergraduate Studies is responsible for notifying the registrar and all other appropriate University personnel of the finding of “in violation” and the academic penalty. The Associate Dean of Undergraduate Studies retains all records of academic dishonesty cases and their findings in accordance with the University’s Records Retention Policy.

C. Penalties

1. Upon a finding of “not in violation” by a hearing board, the student’s record will not reflect the incident.

2. If a student is found to have violated the integrity policy in connection with a class assignment or requirement, the offense will be recorded and the Associate Dean of Undergraduate Studies will notify the student and course instructor of the decision immediately. If the offense is the first for the student, then the instructor has the ability to determine the academic penalty, which shall not exceed a grade of F for the course. If such first offense occurs in connection with either (non-course) University-affiliated activities such as but not limited to ePortfolios, essay competitions, or undergraduate conferences, the offense shall be recorded by the Associate Dean of Undergraduate Studies and penalized by requiring the student to enroll in and successfully complete a course or program on Academic Integrity, as determined by the Associate Dean.

3. If the finding of “in violation” is not the student’s first offense, the student will receive a grade of F in the instance of coursework, and, in all cases, will be suspended from the University for one or more semesters, and may be permanently dismissed from the University. The hearing board will determine the period for which the student will be suspended or expelled, permanently dismissed. If the accused student waives his/her right to a hearing and the incident is not a first offense, the student will receive a grade of F in the case of coursework and, in all cases, will be suspended from the University for one or more semesters or will be permanently dismissed, at the discretion of the Associate Dean of Undergraduate Studies. Suspension or dismissal requires the approval of the President of the University.

D. Appeals

1. Students do not have the option to appeal a decision rendered by the hearing board, whether it is the first, second, or any subsequent offense. Students do not have the option to appeal the penalty determined by the course instructor or the Associate Dean of Undergraduate Studies for first offenses or to appeal the grade of F for the course given for second or subsequent offenses.

2. For offenses resulting in suspension or permanent dismissal, students have the option to present written information to the Dean of Undergraduate Studies to appeal the length of the suspension or to appeal a decision of permanent dismissal. Students must present information in their defense, as allowed in this paragraph, to the Dean within five university working days after receipt of written notification of the suspension or dismissal. However, as stated in number 1 above, students cannot appeal a decision rendered by the hearing board.

ACADEMIC GRIEVANCE POLICY

I. Purpose

Clemson University is dedicated to the fair and impartial review of grievances by students against faculty and staff. The Academic Grievance Board is responsible for reviewing and adjudicating allegations by undergraduate students of unfairness or inequity in the assigning of final grades. Only grievances that contest a final grade are considered by the Academic Grievance Board.
II. Structure
The Academic Grievance Board comprises three separate entities: a seven-person Academic Grievance Panel, a 25-person Academic Grievance Committee, and a three-person Academic Grievance Expedited Committee.

The Academic Grievance Panel is responsible for the initial review of grievances and for determining which grievances will go forward to the Academic Grievance Committee (see section IV.4 below). There are five faculty representatives to the Academic Grievance Panel, one from each of the five colleges. The faculty members of the Academic Grievance Panel are appointed by the Dean of Undergraduate Studies for three-year terms. In addition, there are two undergraduate student representatives to the panel appointed for two-year terms. Undergraduate student representatives are selected on a rotating basis from each of the five colleges. The student representatives are appointed to the Academic Grievance Panel by the President of the Student Senate. The Academic Grievance Panel will elect a chair each year, chosen from among the faculty members on the Academic Grievance Panel.

The Academic Grievance Committee is responsible for hearing student grievances, proposing resolutions to grievances, and, in the case of appeals, forwarding recommendations to the Dean of Undergraduate Studies. Grievances are heard by three-person subcommittees, appointed by the Chair of the Academic Grievance Committee. The Academic Grievance Committee may hear a grievance only if a recommendation for a hearing is made by the Academic Grievance Panel. The Academic Grievance Committee consists of 15 faculty representatives, three from each college, and ten student representatives, two from each college. Faculty representatives are elected by their colleges and serve three-year terms. Student representatives are appointed by the President of the Student Senate and serve two-year terms. The Chair of the Academic Grievance Committee is appointed by the Dean of Undergraduate Studies.

Before hearing any cases, a new member of the Academic Grievance Board must undergo a training session(s) with the Associate Dean of Undergraduate Studies.

The Academic Grievance Expedited Committee is responsible for hearing certain grievances for students that are to be graduating in the same semester in which the contested grade is presented to the committee (see section V). The Academic Grievance Expedited Committee comprises the Dean of Undergraduate Studies, and two available members (one faculty, one student) of the Academic Grievance Committee. The Academic Grievance Expedited Committee will only follow the procedure established under "Supplementary Procedure for Graduating Seniors" (see section V below).

III. Grounds for Academic Grievances
The Academic Grievance Board provides for hearings on academic grievances that are based on either or both of the following claims:

A. The method used for arriving at a student’s final grade was in clear violation of the method described in the instructor’s course syllabus.

B. The method used for arriving at a student’s final grade was in clear violation of departmental, college or university policy.

The Academic Grievance Board will not attempt to substitute its judgment for an instructor’s on such matters as a) quality of the instructor’s teaching, b) quality of the student’s work, or c) quality of course content. The Academic Grievance Committee shall not hear any grievances including allegations of discrimination based on age, color, disability, gender, national origin, race, religion, sexual orientation, or veteran’s status even if the grievance falls within one of the categories noted above. All such discrimination complaints should be submitted to the Office of Access and Equity in 110 Holtzendorf, 656-3181. The Academic Grievance Committee shall refer any such discrimination complaints it receives to the Office of Access and Equity.

IV. Rules and Procedures for Academic Grievances

1. Any student filing a grievance must first attempt to resolve it by consulting with the involved faculty member. In the event that the student and faculty member cannot arrive at a resolution, the student shall consult with the department chair or the faculty member and the Dean of the college of the faculty member. The department chair and Dean shall make every effort to help the student and the faculty member arrive at a resolution to the problem. Until a formal complaint is filed, the student may consult with the Undergraduate Student Ombudsman.

2. If the grievance remains unresolved, the student may bring the grievance before the Academic Grievance Board. The student must first meet with the Associate Dean of the Office of Undergraduate Studies. The Associate Dean will describe the grievance process to the student. If the student wishes to proceed with the grievance, the student will provide a written statement detailing the grievance to the Academic Grievance Board. The written statement must specify the specific policy, departmental, college or university policy that the student alleges to have been violated. In addition, the student will secure, from the Office of Undergraduate Studies, a grievance checklist form. On this form, identified by complaint number, the student will document the following: (a) the dates of those consultations described in procedure IV.1 above, (b) the names of those persons consulted, and (c) the signature of the colleague Dean attesting that no resolution could be reached. The completed checklist form will then be returned to the Associate Dean for signature. Both the written statement and the completed checklist form must be delivered to the Office of Undergraduate Studies within the first 30 calendar days (exclusive of summer vacation) of the term following that in which the student alleges to have been aggrieved. The failure of a student to file a grievance within the 30-day period will cause him/her to forfeit his/her right to file a grievance under this procedure.

3. When all procedures described in item IV.2 have been completed, the Office of Undergraduate Studies will forward a copy of the grievance to the chair of the Academic Grievance Panel. The chair of the Academic Grievance Panel shall, upon receipt of the grievance, convene the Academic Grievance Panel to review the grievance. The Office of Undergraduate Studies shall retain the original documents.

4. The Academic Grievance Panel will review the grievance and ascertain whether the complaint meets the criteria for "Grounds for Academic Grievances" (III above). The Academic Grievance Panel will handle each case in a confidential manner.

5. Following the complaint review, the Academic Grievance Panel, within 14 days of receiving the complaint, will (a) make a written recommendation to the Associate Dean to dismiss the grievance, with the grievance identified by complaint number, or (b) make a written recommendation to the Academic Grievance Committee to hear the grievance and arrive at a recommendation. In the case that the Academic Grievance Panel recommends that the grievance be heard by the Academic Grievance Committee, a copy of the recommendation, identified by complaint number, will be forwarded to the Office of Undergraduate Studies.

6. If the Academic Grievance Panel recommends dismissal of the case, the Associate Dean will notify the student, the involved faculty member, and the involved collegiate Dean.

7. If the Academic Grievance Panel recommends a hearing, the Chair of the Academic Grievance Committee shall, upon receipt of the recommendation from the Academic Grievance Panel and all relevant documents, appoint a three-person subcommittee to hold a hearing on the grievance. The subcommittee will be selected from among the members of the Academic Grievance Committee. The subcommittee will consist of a faculty member assigned to serve as the subcommittee chairperson, another faculty member, and a student representative to the subcommittee.

The Chair of the Academic Grievance Committee may serve as one of the two faculty representatives to the subcommittee. If possible, the subcommittee shall include members who are not in the same college as the grievant or the faculty member against whom the grievance has been filed.

8. Prior to chairing a hearing (see item 9 below) the chairperson of the subcommittee will contact the student who has filed the grievance as well as the faculty member against whom the grievance has been filed. The chairperson of the subcommittee will provide copies of the grievance to both parties, answer any procedural questions that the parties have, and also ask each party if they have anything to add to the written record prior to the hearing. If additional written materials are submitted prior to the hearing, the chairperson of the subcommittee will distribute copies to all subcommittee members and to all parties to the grievance. The chairperson of the subcommittee will, to the extent possible, handle each case in a confidential manner.

9. Academic Grievance hearings shall convene at a standardized location and time, as defined by the Office of Undergraduate Studies. The hearing shall take place during the next available standard meeting time after the subcommittee has received the necessary materials.

10. The hearing on the grievance will be informal and shall be closed to the public. The Associate Dean of Undergraduate Studies shall, as facilitator, take whatever action is necessary to ensure an equitable, orderly and expeditious hearing. All parties to the grievance shall be given an opportunity to be heard. In addition, the chairperson may request the presence of any other person who can supply information per-
tinent to the grievance. Witnesses shall not be present during the hearing proceedings except when they are called to speak before the committee. The parties shall be permitted to question all individuals who are heard by the committee. If any witness is unable to be present at the hearing, the chairman may, at his/her discretion, accept a written statement from that witness to be presented at the hearing. The parties shall be accorded the right to assistance of counsel of their own choice; however, counsel shall not be permitted to participate actively in the proceedings.

11. Upon conclusion of the hearing, the subcommittee shall reach, by majority vote, a posed solution to the grievance. The subcommittee chairperson shall then formulate the findings in writing and seek to obtain from the parties involved in the grievance signed acceptance of the recommended solution to the grievance. If all parties to the grievance accept the solution posed by the subcommittee, the matter of the grievance will be considered closed when the solution has been implemented. Copies of the written findings and recommended solution will be forwarded by the subcommittee chairperson to both parties to the grievance for acceptance via return receipted certified mail. Each party will be asked to indicate acceptance of the posed solution by signing and returning the letter within 14 calendar days of its date. Failure to respond within 14 calendar days will constitute acceptance. Proper notification of the solution arrived at by the subcommittee will then be mailed by the subcommittee chairperson to the involved faculty member, the department chair of the faculty member, the involved collegiate Dean, the Chair of the Academic Grievance Committee, and the Associate Dean of Undergraduate Studies. In the event that both parties agree to a change in grade, the Chair of the Academic Grievance Committee will also notify the Office of Records and Registration of the decision.

12. If, after the conclusion of the hearing on the grievance, the chairperson cannot secure acceptance of the posed solution, the grievance shall be referred to the Dean of Undergraduate Studies. The subcommittee chairperson shall submit the subcommittee’s recommended solution to the grievance along with all supporting evidence previously submitted to the subcommittee. When grievances are referred in this manner, the Dean of Undergraduate Studies, on behalf of the University, shall make the final decision on the solution to the grievance and will then notify the student, the involved faculty member, the department chair of the involved faculty member, the involved collegiate Dean, the Chair of the Academic Grievance Committee, and the Associate Dean of Undergraduate Studies. When grievances are referred in this manner, the Dean of Undergraduate Studies, on behalf of the University, shall make the final decision on the solution to the grievance and will then notify the student, the involved faculty member, the department chair of the involved faculty member, the involved collegiate Dean, the Chair of the Academic Grievance Committee, and the Associate Dean of Undergraduate Studies. In the event that the Dean of Undergraduate Studies decides in favor of a change in grade, the Dean of Undergraduate Studies will also notify the Office of Records and Registration of the University’s decision.

13. To the extent permitted by law, the Associate Dean of Undergraduate Studies shall keep in confidence all records pertinent to grievances. Records shall be available to succeeding chairpersons of the Academic Grievance Committee.

14. The Academic Grievance Committee shall make every reasonable effort to resolve each grievance by the end of the semester that follows the semester in which the student received the grade that is being contested (summers not included).

15. These procedures can be changed by the Academic Council. Such changes shall not affect any case under consideration at the time of the change. Notification of any changes to the procedure shall be given to the Dean of Undergraduate Studies of the University via the Academic Council.

V. Supplementary Procedure for Graduating Seniors

The purpose of this supplementary procedure is to offer an expedited method for graduating students to file an academic grievance that would impact their ability to graduate, as determined by the Dean of Undergraduate Studies. To be eligible for the following procedure, the student must file an academic grievance with the Office of Undergraduate Studies no later than noon the day after final grades are posted. The following procedure shall be made available for Fall, Spring, and Summer graduations.

1. Any student filing an expedited grievance should first attempt to resolve it by consulting with the involved faculty member. Until a formal complaint is filed, the student may consult with the Undergraduate Student Ombudsman.

2. In the event that the student and faculty member cannot arrive at a resolution, the student may bring the grievance before the Academic Grievance Expedited Committee. The student must first meet with the Associate Dean in the Office of Undergraduate Studies. If the student wishes to proceed with the grievance, the student must provide written statement and grievance; (check list form V.2.2 above).

3. The student and involved faculty member shall be notified of the time and place of the hearing by 6:00 pm, two days prior to graduation. Hearings will begin at 2:00 pm, one day prior to graduation. In the case that the involved faculty member cannot attend the hearing, he or she may appoint an appropriate representative.

4. Hearings shall follow the same format as established in IV.10.

5. Following the hearing, the Academic Grievance Expedited Committee shall vote on a proposed resolution. A majority vote constitutes as a passed resolution. This decision is final, and the student and involved faculty member will be notified of the resolution. In the event that the Academic Grievance Expedited Committee decides in favor of a change in grade, the Dean of Undergraduate Studies will also notify the office of Records and Registration of the University’s decision.

ACADEMIC MISCONDUCT BY FORMER STUDENTS

It is possible that an act of academic misconduct will remain undiscovered until after a degree is awarded. In such a case, Clemson University reserves the right to revoke any degree based on new revelations about scholarly issues including, but not restricted to, admissions credentials, all forms of coursework, research, theses, dissertations, or other final projects.

I. Submission of Fraudulent Admissions Credentials

The submission of fraudulent admissions credentials in the student’s application or any other documents submitted for admission to Clemson University may result in initiation of action under the Policy and Procedure on Revocation of Academic Degrees.

II. Academic Dishonesty in Coursework

A. In the event that the act is alleged to have occurred within the context of a course and is consistent with the general definition of academic dishonesty presented in Sections I of the Academic Integrity Policy, the same procedures in that policy will apply except for academic misconduct listed in III below.

B. Graduate Students—If the resulting penalty is either the assignment of a grade of D or F in a required graduate course, or the issuance of any grade that causes the student not to possess a cumulative B average in both graduate courses and in all courses, action under the Policy and Procedures on Revocation of Academic Degrees may be initiated.

C. Undergraduate Students—If the resulting penalty causes the student to no longer have the necessary credit hours, coursework, or grade average for receiving a degree, action under the Policy and Procedures on Revocation of Academic Degrees may be initiated.

III. Falsification of Data and Plagiarism in Theses, Dissertations, or Other Final Projects

Data falsification, plagiarism (as defined in the Academic Integrity Policy) and other acts of academic dishonesty in a thesis, dissertation, or other final project are serious acts of misconduct. Allegations of this type of misconduct may result in initiation of action under the Policy and Procedure on Revocation of Academic Degrees.

REVOCA TION OF ACADEMIC DEGREES

Preamble

Academic institutions have a critical responsibility to provide an environment that promotes integrity, while at the same time encouraging openness and creativity among scholars. Care must be taken to ensure that honest error and ambiguities of interpretation of scholarly activities are distinguishable from outright misconduct. This policy is applicable to fraudulent or other misconduct in obtaining an academic degree which is so egregious that a mechanism for revoking an academic degree, either graduate or undergraduate, must be undertaken. The Clemson University Board of Trustees has the sole authority to revoke any degree previously awarded.

Definitions

As used herein, the following terms shall apply:

A. When the degree holder was an undergraduate student:

1. “Dean” shall mean the Dean of the academic college where student was enrolled.

2. “Committee of Investigation and Recommendation” shall be composed of the members of the standing University Undergraduate Academic Eligibility Appeals Committee. An undergraduate student will be appointed to the Committee of Investigation and Recommendation by the President of the Student Body within ten (10) calendar days of notification by the President of the Faculty Senate. Any member of the Academic Eligibility Appeals Committee who is a faculty member in the department which awarded the degree involved shall not be a member of the Committee of Investigation and

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Recommendation for that particular investigation. If there are fewer than three (3) non-disqualified faculty members, the President of the Faculty Senate shall appoint additional faculty members to bring the number of faculty committee members up to three (3). If the President of the Faculty Senate is from the same department that awarded the degree involved, the President-Elect of the Faculty Senate shall appoint the additional member.

B. When the degree holder was a graduate student:
1. “Dean” shall mean the Dean of the Graduate School.
2. “Committee of Investigation and Recommendation” shall be composed of the members of the standing University Graduate Admissions and Continuing Enrollment Appeals Committee, except for the Associate Dean of the Graduate School who shall not be a member of the Committee of Investigation and Recommendation. A graduate student will be appointed to the Committee of Investigations and Recommendation by the President of Graduate Student Government within ten (10) calendar days of notification by the President of the Faculty Senate. Any member of the Graduate Admissions and Continuing Enrollment Appeals Committee who is a faculty member in the department which awarded the degree involved shall not be a member of the Committee of Investigation and Recommendation for that particular investigation. If there are fewer than three (3) non-disqualified faculty members, the President of the Faculty Senate shall appoint additional faculty members to bring the number of faculty committee members up to three (3). If the President of the Faculty Senate is from the same department that awarded the degree involved, the President-Elect of the Faculty Senate shall appoint the additional member.

Complaint
An allegation or complaint involving the possibility of misconduct can be raised by anyone. The allegation should be made in writing to the Dean.

Initial Review
The Dean will conduct the initial review to determine whether or not the allegation has merit. The Dean may discuss the matter with the former student's advisory committee (if any) and other faculty as appropriate. The Dean may also contact persons outside the University who may be able to provide factual information on the alleged misconduct or who may otherwise have expertise concerning issues involved in the alleged misconduct. If the Dean determines that the allegation has no merit, he/she will terminate the investigation. If the Dean determines that serious academic misconduct is suspected, the Dean will notify the President of the Faculty Senate in writing in a confidential manner. The Dean shall also notify the Vice President for Academic Affairs and Provost of the charge but will not discuss any details of the charge.

Committee of Inquiry
The President of the Faculty Senate shall, within (10) calendar days of receipt of the notification from the Dean, appoint three (3) faculty members to the Committee of Inquiry and notify the President of Graduate Student Government or the President of the Student Body, as appropriate, who shall appoint a graduate or undergraduate student, as appropriate, to the Committee of Inquiry within ten (10) calendar days of notification. The President of the Faculty Senate shall also notify the degree holder of the formation of a Committee of Inquiry.

If the Faculty Senate President is from the same department that awarded the degree involved, the President-Elect of the Faculty Senate shall appoint the Committee of Inquiry. The faculty members will be appointed from departments which did not award the degree involved. The Committee will elect its chairman from the faculty members on the Committee.

For each allegation, the Committee of Inquiry will review the complaint and any other information provided by the Dean and determine whether there is sufficient evidence to warrant a formal charge of academic misconduct and further investigation under this policy. While the Committee of Inquiry shall not make a recommendation as to whether a degree should be revoked, the purpose is to provide a review to separate frivolous, unjustified or mistaken allegations from those requiring a more detailed and formal investigation. The Committee of Inquiry will review the evidence and must determine that the alleged misconduct more probably than not occurred in order for the committee to recommend a formal charge and further investigation.

Within thirty (30) calendar days of the formation of the Committee of Inquiry, the Committee of Inquiry will submit a written report to the President of the Faculty Senate. If the Committee of Inquiry’s report finds that the investigation should not proceed, the President of the Faculty Senate shall terminate the investigation and notify the appropriate persons. If the Committee of Inquiry’s report finds that a formal charge and further investigation are warranted, the President of the Faculty Senate shall, within ten (10) calendar days of receipt of the report of the Committee of Inquiry, send a copy of that report to the Dean and to the Committee of Investigation and Recommendation. The President of the Faculty Senate shall also immediately notify the President of Graduate Student Government or President of the Student Body (whichever is appropriate) that a student representative needs to be appointed to the Committee of Investigation and Recommendation. The President of the Faculty Senate shall also notify the Vice President for Academic Affairs and Provost of the Committee of Inquiry’s recommendation. No details of the charge will be discussed. Note: A majority vote of the Committee of Inquiry is necessary to recommend that a formal charge and further investigation are warranted. A tie vote means that the investigation is terminated as stated herein.

Notification to Degree Holder
The Dean shall issue in writing, within ten (10) calendar days of receipt of the report of the Committee of Inquiry, a formal charge of academic misconduct to the degree holder. This written notice shall detail the factual allegations for the charge and the evidence supporting the charge. This written notice shall also inform the degree holder that if the charges are substantiated, the degree holder’s degree could be revoked. This written notice shall also inform the degree holder of his/her right to appear at a hearing as stated in this policy. The Dean shall also send with this notice a copy of this Policy and Procedure on Revocation of Academic Degrees to the degree holder. This notice shall be delivered to the accused in person or sent by certified mail, return receipt requested.

Committee of Investigation and Recommendation
The Committee of Investigation and Recommendation shall extend to the degree holder the following process:
1. Notice of the nature of the complaint
2. Notice of the evidence supporting the complaint
3. Notice of the hearing
4. The opportunity to present evidence, including testimony
5. The opportunity to hear the testimony against the degree holder
6. The opportunity to ask questions of all witnesses
7. The opportunity to have an attorney or advisor present at the hearing; however, the role of the attorney or advisor shall be solely to assist the party, and the attorney or advisor shall not be permitted to participate actively in the proceedings.

The degree holder shall not be entitled to know the identity of the person(s) who originally made the complaint unless that person agrees that his/her identity can be revealed.

The chair of the Committee of Investigation and Recommendation shall inform the degree holder of the time and date of the hearing.

The Dean or his/her designee shall present the accusation against the degree holder at the hearing and may have one additional representative present during the hearing. Under this section the term “Dean” is understood to include the Dean’s designee, if such a designation is made.

The degree holder and the Dean may submit written materials to the Committee of Investigation and Recommendation prior to the hearing. The chair of the Committee of Investigation and Recommendation shall make available the materials received to the other party and to all committee members.

The hearing before the Committee of Investigation and Recommendation shall be held no sooner than thirty (30) calendar days and no later than ninety (90) calendar days after receipt of the report of the Committee of Inquiry unless the degree holder and the Dean agree to a different date. All matters pertaining to the hearing shall be kept as confidential as possible and the hearing shall be closed to the public. A verbatim record of the hearing will be made and shall be made a part of the hearing record. The degree holder and the Dean shall be responsible for having any witnesses they wish to testify at attendance at the hearing. Witnesses will be present only while testifying.

The chair of the Committee of Investigation and Recommendation shall take whatever action is necessary during the hearing to ensure a fair, orderly, and expeditious hearing. No formal rules of evidence will be followed. If any objection is made to any evidence being offered, the decision of the majority of the committee shall govern. Irrelevant, immaterial, or unduly repetitive evidence shall be excluded.

The degree holder and the Dean shall be permitted to offer evidence and witnesses pertinent to the issues.
The Dean shall present the case against the accused first. The accused shall then present his/her response.

The chair will allow each party to ask questions of the other party and will allow each party to ask questions of the other party’s witnesses at the appropriate time during the hearing as determined by the chair. Members of the committee may ask questions of any party or any witness at any time during the hearing.

Within fifteen (15) calendar days of the conclusion of the hearing, the Committee of Investigation and Recommendation shall submit a written report to the Vice President for Academic Affairs and Provost. The report shall contain findings and a recommendation as to whether the degree holder’s degree should be revoked. The Committee of Investigation and Recommendation must find clear and convincing evidence that serious academic misconduct has been committed in order to recommend the revocation of the degree holder’s degree. If the Committee of Investigation and Recommendation does not find clear and convincing evidence of serious academic misconduct, the Committee of Investigation and Recommendation cannot recommend revocation of the degree holder’s degree and the matter shall be closed. Note: A majority vote of the Committee of Investigation and Recommendation is necessary to recommend the revocation of a degree holder’s degree. This means that a tie vote will result in the matter being closed.

At the same time that the report is sent to the Vice President for Academic Affairs and Provost, the chair of the Committee of Investigation and Recommendation shall send a copy of the report to the degree holder, the Dean, and other appropriate persons involved in the process.

If the Committee of Investigation and Recommendation recommends that the degree holder’s degree be revoked, the chair shall also send a complete copy of the hearing record to the Vice President for Academic Affairs and Provost. The hearing record shall consist of the transcript of the hearing and all documents that were submitted to the committee. The chair of the Committee of Investigation and Recommendation shall label which documents were submitted by each party when forwarding this information to the Vice President for Academic Affairs and Provost.

If the Committee of Investigation and Recommendation recommends that the degree holder’s degree be revoked, the chair shall also send a copy of the transcript of the hearing to the Dean and the Dean at the same time that it is sent to the Vice President for Academic Affairs and Provost.

Vice President for Academic Affairs and Provost

If the Committee of Investigation and Recommendation recommends that the degree be revoked, the Vice President for Academic Affairs and Provost shall review the hearing record and the report of the Committee of Investigation and Recommendation. If the Vice President for Academic Affairs and Provost decides that the degree holder’s degree should not be revoked, he/she shall notify the degree holder, the Dean, the Committee of Investigation and Recommendation and other appropriate persons involved in the process, in writing, within twenty-one (21) calendar days of receipt of the transcript of the hearing, and the matter shall be closed. If the Vice President for Academic Affairs and Provost decides to recommend that the degree holder’s degree should be revoked, the Vice President for Academic Affairs and Provost shall send that recommendation in writing to the President of the University within twenty-one (21) calendar days of receipt of the transcript of the hearing. The Vice President for Academic Affairs and Provost shall send to the President, along with his/her recommendation, the Committee of Investigation and Recommendation’s report and the hearing record. The Vice President for Academic Affairs and Provost shall send a copy of his/her recommendation to the degree holder, the Dean, the Committee of Investigation and Recommendation, and other appropriate persons involved in the process.

If the Vice President for Academic Affairs and Provost is disqualified from reviewing the case, the Dean of Undergraduate Studies shall be substituted for the Vice President for Academic Affairs and Provost.

President

If the Vice President for Academic Affairs and Provost recommends to the President that the degree holder’s degree should be revoked, the President shall transmit that recommendation along with the report of the Committee of Investigation and Recommendation and the hearing record to the Executive Secretary of the Board of Trustees within thirty (30) calendar days of receipt. If the President wishes to make a recommendation, he/she shall review the recommendation of the Vice President for Academic Affairs and Provost, the report of the Committee of Investigation and Recommendation, and the hearing record and forward that recommendation to the Executive Secretary of the Board of Trustees within thirty (30) calendar days of receiving the recommendation of the Vice President for Academic Affairs and Provost.

Board of Trustees

The Executive Secretary of the Board of Trustees shall send to all trustees the hearing record, the recommendation of the Vice President for Academic Affairs and Provost, the report of the Committee of Investigation and Recommendation, and the recommendation of the President, if any. A majority vote by the Board of Trustees, at a duly constituted Board meeting, is required to revoke an academic degree. The decision of the Board of Trustees shall be final.

Guiding Principles

All actions taken by committees shall be effective by a majority vote.

All investigations, hearings, and actions shall be kept as confidential as possible except for notice of any revocation approved by the Board of Trustees.

A decision not to proceed at any stage of the proceedings set forth in this policy does not necessarily mean that the original complaint was groundless.

For good cause shown, at the request of either party and the approval of the other, the Vice President for Academic Affairs and Provost shall extend any time limit set forth in this policy. Any such time extension shall be communicated in writing to all appropriate parties.

Administrative Action if Degree is Revoked

If a degree is revoked by the Board of Trustees, the former student’s transcript will be modified to reflect that the degree was revoked, and the former student will be informed of the revocation and requested to return the diploma. If the former student was enrolled in a program requiring a thesis or dissertation, all bound copies will be removed from the Clemson University Library. In addition, for doctoral students, University Microfilms, Inc. will be notified and requested to take appropriate action.

Students whose degrees have been revoked may be eligible to reapply for admission according to normal University procedures and policies in effect at the time of reaplication.
GENERAL EDUCATION

An undergraduate student whose enrollment in a curriculum occurs after May 15, 2005, must fulfill the general education requirements in effect at that time. If a student withdraws from the University and subsequently returns or does not remain continuously enrolled (summers excluded), the requirements in effect at the time of return will normally prevail. Any variation in curricular or general education requirements shall be considered under the curriculum year change or the substitution procedure.

MISSION STATEMENT

Academic institutions exist for the transmission of knowledge, the pursuit of truth, the intellectual and ethical development of students, and the general well-being of society. Undergraduate students must be broadly educated and technically skilled to be informed and productive citizens. As citizens, they need to be able to think critically about significant issues. Students also need to be prepared to complete undergraduate work and a major course of study. The mission requires a high level of knowledge about and competence in the following areas:

General Education Competencies

A. Arts and Humanities
Demonstrate an understanding of the arts and humanities in historical and cultural contexts.

B. Mathematics
Demonstrate mathematical literacy through solving problems, communicating concepts, reasoning mathematically, and applying mathematical or statistical methods, using multiple representations where applicable.

C. Natural Sciences
Demonstrate scientific literacy by explaining the process of scientific reasoning and applying scientific principles inside and outside of the laboratory or field setting.

D. Social Sciences
Demonstrate an understanding of social science methodologies in order to explain the consequences of human actions.

E. Cross-Cultural Awareness
Demonstrate the ability to critically compare and contrast world cultures in historical and/or contemporary contexts.

F. Science and Technology in Society
Demonstrate an understanding of issues created by the complex interactions among science, technology, and society.

G. Communication
Effective oral and written communication is the means by which all competencies will be demonstrated.

H. Critical Thinking
Demonstrate the ability to assemble information relevant to a significant, complex issue, evaluate the quality and utility of the information, and use the outcome of the analysis to reach a logical conclusion about the issue.

I. Ethical Judgment
Demonstrate an ability to identify, comprehend, and deal with ethical problems and their ramifications in a systematic, thorough, and responsible way.

REQUIREMENTS—33 credit hours

To meet general education competencies, 33 total credit hours are required, distributed as follows: I. General Education Coursework—31 credit hours; II. Distributed Coursework—2 credit hours; and III. Documentation of general education competencies, including examples of student work that document the student’s achievement of general education competencies via an ePortfolio.

I. General Education Coursework—31 hours required

General education requirements in some curricula are more restrictive than those shown below. Science and Technology in Society and Cross-Cultural Awareness requirements may be satisfied by other General Education courses, as indicated in the footnotes below, as long as the student completes a total of 31 hours in area I. and satisfies requirements A-F below:

A. Communication: at least 6 credits

English Composition .................................................. 3 credits
ENGL 1030 (ENGL 1020 for transfer students)

Oral Communication ............................................... 3 credits
COMM 1500, 2500, HON 2230, or an approved cluster of courses such as AS 3090, 3100, 4070, 4080, 4090 or ML 1010, 1020

*May be satisfied either by the courses above or by an approved departmental cluster of course, see II. Distributed Coursework. Students taking clusters must still earn at least 31 hours from the General Education Coursework list.

B. Mathematical, Scientific, and Technological Literacy: at least 10 credits

Mathematics ............................................................ 3 credits
MATH 1010, 1020, 1060, 1070, 1080, 2070, 3010, 3090. For Early Childhood Education, Elementary Education, and Special Education majors only, the approved cluster of MTHS 1150, 1160 and 2160 satisfies the requirement.

Natural Science with Lab ......................................... 4 credits
ASTR 1010/1020, 1030/1040, BIOL 1030/1050, 1040/1060, 1090, 1100, 1110, 1200, 1200/1220, 1200/1230, 1200, CH 1010, 1020, 1050, 1060, GEOL 1010/1030, 1020, 1120, 1140, PHSC 1070, 1080, 1170, 1180, PHYS 1220/1240, 2070/2090, 2080/2100, 2210/2230, 2220/2240

Mathematics or Natural Science ........................................ 3 credits
Any general education Mathematics or Natural Science course listed above or AGR (ENSP) 3150, BIOL 2000, 2010, 2040, 2100, ENT 2000, ENSP 2000, (AGR) 3150, GEOL 1200, 3000, PHYS 2400, 2450, 2800, PLPA 2130, STS 2160

C. Arts and Humanities: at least 6 credits

Literature .............................................................. 3 credits
Any 2000-level ENGL literature course (ENGL 2020, 2120, 2130, 2140, 2150), CHIN 4010, FR 3000, 3040, GER 2600, 3060, 3600, 3610, HON 1900, 2210, ITAL 3010, 3020, JAPN 4010, 4060, RUSS 3600, 3610, SPAN 3110, 3130

Non-Literature ......................................................... 3 credits
AAH 1030, 2100, ASL 3050, CAAH 2010, CHIN (PHIL) 3120, (PHIL) 3130, 4990, COMM 3030, 3040, 3080, 3090, 4020, ENGL (GW) 3010, 3550, 3570, (LANG) 4540, FR 3070, GW (ENGL) 3010, 4050, GER 3400, HON 1910, 2010, 2030, 2100, 2220, HUM 3010, 3020, 3060, 3090, JAPN 3070, 3080, LANG 3400, 3420, 3560, (ENGL) 4540, LARC 1160, MUSC 2100, 3080, 3090, 3110, 3120, 3130, 3140, 3170, 3610, 3620, 3630, 3640, 3690, 3700, 3710, 3720, PHIL 1010, 1020, 1030, 1240, 2100, (CHIN) 3120, (CHIN) 3130, 3160, 3170, 3180, 3220, 3240, 3250, 3260, 3270, 3440, 3450, REL 1010, 1020, 3010, 3020, 3030, 3060, 3070, 3150, RUSS 3400, STS 1010, 1020, 3010, 3030, SPAN 3070, 3080, 3080, 3090, 3150, 3160, 3170, WS 3010
D. Social Sciences: at least 6 credits

Selected from two different fields ................................................. 6 credits
ANTH 2010, APEC 2020, 2570, ECON 2000, 2110, 2120, GEOG 1010,
1030, 1060, HIST 1010, 1020, 1220, 1240, 1720, 1730, 1930, HON
1920, 2020, 2200, PAS 3010, POSC 1010, 1020, 1030, 1040, PSYC 2010,
2500, 2750, RS 3010, SOC 2010, 2020

Note: APEC and ECON are considered the same field.

NOTE: Science and Technology in Society and Cross-Cultural Awareness
requirements may be satisfied by other General Education courses, as
indicated in the footnotes below, as long as the student completes a total
of 31 hours in area I.

E. Cross-Cultural Awareness: at least 3 credits

AAH 2100, ASL 3050, ANTH 2010, APEC 2050, CAAH 2010, GEOG
1030, HIST 1720, 1730, 1930, HON 1930, 2090, HUM 3090, IS 1010,
2100, LANG 2500, 2540, MUSC 2100, 3140, PAS 3010, 1040,
PSYC 2500, REL 1010, 1020, WS 1030, or through a University-approved
cross-cultural experience

F. Science and Technology in Society: at least 3 credits

AGR (ENSP) 3150, AGED (EDF) 4800, APEC 2050, (ECON) 4570,
AVS 3150, 4150, BIOL 2000, 2010, 2040, 2100, 2110, 2200, 4730, CH
1050, 1060, COMM 1070, 3070, CTE 1150, 2210, ECE 1010, ECON
3190, (APEC) 4570, EDF (AGED) 4800, ENR 3120, (FOR) 4160, ENSP
(GEOID) 1250, 2000, (AGR) 3150, 4000, ENGL 3490, ENT 2000, EXST
2220, FDSC 2140, FOR (ENR) 4160, GEOL 1120, 1200, (ENSP) 1250,
2700, 3000, HCG (NURS) 3330, HIST 1220, 1240, 3210, 3230, 3920,
4240, 4910, HILTH 4310, HON 1940, 2010, 2060, IE 4880, LARC 3150,
MKT 4450, MSE 1010, MUSC 3180, NURS 1400, (HCG) 3330, NUFR
2030, 2100, PHIL 1240, 2100, 3240, 3260, 3280, 3400, 3450, PHYS
2450, PSCS 3680, PLPA 2130, PRTM 2110, PSYC 2750, RS (SOC)
4010, STS 1010, 1020, 1200, 1710, 2150, 2160, 3010, 3030, 4090, 4090,
SOC (RS) 4010, 4030

1This course also satisfies the Science and Technology in Society Requirement.
2This course also satisfies the Cross-Cultural Awareness Requirement.

II. Distributed Coursework: 2 credits

A. Academic and Professional Development: at least 2 credits
Departmental courses approved by the Undergraduate Curriculum
Committee addressing the general academic and professional development
of the student.

B. Distributed Competencies Coursework
Courses in general education and the disciplines incorporate critical
thinking, ethical judgment, and both written and oral communication skills
into the curriculum. Some curricula use a cluster of courses to meet the oral
communication competency.

III. Documentation of General Education Competencies

Students must provide appropriate documentation of achievement of their
General Education competencies as outlined above. The documentation
is provided through an ePortfolio. Students should include an example
of their best work in each of the following eight areas: arts and humanities,
mathematics, natural science, social science, cross-cultural awareness, science
and technology in society, ethical judgment, and critical thinking. Excellent
communication is an overarching competency and should be demonstrated
in every ePortfolio artifact.
A minor consists of at least 15 semester hours, with no fewer than nine credits at the 3000 level or higher. A student cannot major and minor in the same field or acquire a minor that is not allowed by the degree program. In programs that require a minor, courses may not be used to fulfill both the major and minor requirements. Courses that count towards a student’s major, but are outside the major’s course rubric, may also be used to fulfill minor requirements. Students are encouraged to contact the department offering the minor for advising. Specific requirements are detailed below.

Note: Some courses in the minors have prerequisite courses. Students should select a minor and take any prerequisites as early as possible in their academic careers.

**Accounting**
A minor in Accounting requires ACCT 2010, 2040, 3110, 3120, and nine hours selected from 3000- or 4000-level accounting courses. Students planning to pursue the Master of Professional Accountancy degree program should select courses in consultation with the school’s graduate coordinator.

**Adult/Extension Education**
A minor in Adult/Extension Education requires AGED 4030, 4400, and nine additional credits selected from the following: AGED 4070, 4280, EDF (AGED) 4820, PRTM 3080.

**Aerospace Studies**
A minor in Aerospace Studies requires AS 1090, 1100, 2090, 2100, 3090, 3100, 4090, and 4100. Completion of AS Leadership Laboratory and participation in cadet activities are mandatory. Students must complete an application and be accepted into the Professional Officer Course before enrolling in AS 3090.

**Agricultural Business Management**
A minor in Agricultural Business Management requires APEC 3020, 3090, 3190, and at least two courses selected from APEC 3080, 3510, 4020, 4090, 4520, 4560, 4600.

**Agricultural Mechanization and Business**
A minor in Agricultural Mechanization and Business requires credit hours selected from AGM 2050, 2060, 2210, 3010, 3030, AGED 3030, and nine credit hours from AGM 4020, 4050, 4060, 4100, 4520, 4560, 4720.

**American Sign Language Studies**
A minor in American Sign Language Studies requires 15 credit hours in ASL at the 3000 or 4000 level.

**Animal and Veterinary Sciences**
A minor in Animal and Veterinary Sciences requires AVS 1500 and 1510; one course selected from AVS 2000, 2010, 2030, 2040, 2060, 2090; and nine hours selected from any 3000- or 4000-level AVS courses. A maximum of three credits of AVS 3600, 4410, 4420, 4430 or 4910 may be used.

**Anthropology**
A minor in Anthropology requires ANTH 2010 and at least six hours selected from ANTH 3010, 3310, (BIOL) 3510, LANG (ANTH) 3710. Nine additional hours may be selected from any other Anthropology course, but at least three hours must be from a 4000-level course. No more than three credits of ANTH 4960 may be counted toward the minor.

**Architecture**
A minor in Architecture requires ARCH 1010, 4710, 4720, and DSGN 3700. ARCH 4710, 4720, and DSGN 3700 are only offered during the summer at study abroad locations.

**Art**
A minor in Art requires ART 1030, 1510 or 1520; AAH 1010, 1020 or 2100; at least nine hours of ART or AAH courses at the 2000 level or above; and at least three hours of ART or AAH courses at the 3000 or 4000 level.

**Athletic Leadership**
A minor in Athletic Leadership requires 17 credit hours arranged as follows: AL 3490, 3500, 3530, 3610, 3620, 3760, and one of the following: AL 3710, 3720, 3730, 3740, 3750, 3770. Students must complete a coaching internship or athletic administrative internship (AL 4000) with the approval of the Athletic Leadership Coordinator.

**Biochemistry**
A minor in Biochemistry requires three credits of GEN 3000 or 3050 and nine additional credits of BCHM 3010 or 3050 and nine credits of 4000 level Biochemistry courses.

**Biological Sciences**
A minor in Biological Sciences requires BIOL 1030/1050, 1040/1060, or BIOL 1100 and 1110 and 12 additional credits selected from BIOL courses at the 3000 level or above, BCHM 3050, GEN 3000, or MICR 3560.

**Business Administration**
A minor in Business Administration requires ACCT 2010, ECON 2110, 2120, FIN 3060, LAW 3220, MGT 2010, MKT 3010.

**Chemistry**
A minor in Chemistry requires CH 1010, 1020, and 15 additional credits in Chemistry, at least nine of which must be at the 3000 or 4000 level, selected in consultation with the Department of Chemistry.

**Cluster**
The Cluster minor allows students a somewhat wider choice of course materials than is possible with the conventional subject-matter minor. The general requirement for the Cluster minor is 15 credits in courses numbered higher than 3000, except where noted differently, chosen according to one of the plans below. Courses within the student’s major area may not be included in the Cluster minor.

**Crop and Soil Environmental Science**
A minor in Crop and Soil Environmental Science requires AGR 1040, CSEN 2020, and nine or more CSEN credits at the 3000 level or higher.

**Digital Production Arts**
A minor in Digital Production Arts requires DPA 3070 and completion of one of the following options:
- Group I (for Architecture or Visual Arts majors)—DPA 4000, 4010 and six credits selected from CPSC 4040, 4050, and 4160.
- Group II (for Computer Science, Computer Engineering, and Computer Information Systems majors)—DPA 4020, 4030, and six credits selected from ART 2050, 2130, 4210, GC 1020, and 3400.
- Group III (for all other majors)—DPA 4000, 4010, 4020, and three credits selected from CPSC 4040, 4050, and 4160.

**East Asian Studies**
A minor in East Asian Studies requires 15 credits, of which at least six credits must be at the 4000 level, distributed as follows: three courses from Group I, six additional credits selected from Group I or from Group II, and six credits from Group III:
- Group I—CHIN (ANTH) 4180, HIST 3340, JAPN (ANTH) 4170, POSC 3720
- Group II—HIST 3300, 3330, PHIL (CHIN) 3120, (CHIN) 3310, POSC 4720, 4770, REL 3140, or any other approved courses selected from department list
- Group III—EAS 1230, JAPN 4010, 4990, any Chinese or Japanese language course, or any other approved courses selected from department list

Courses in Groups II and III must represent a combination of Chinese and Japanese courses.
Economics
A minor in Economics requires ECON 3140, 3150, and nine additional credits from economics courses numbered 3000 or higher.

Education
A minor in Education requires EDF 3010, 3020, 3340 or 3350, EDSP 3700, and three hours from any AL, CTE, EDC, NURS, PRTM, PHIL, POSC, PSYC, or SOC course at the 2000 level or higher. This minor does not meet the requirements for teacher certification and is not intended for persons who plan to teach in grades K–12.

English
A minor in English requires 15 credits in English above the sophomore level, arranged as follows:

Shakespeare—ENGL 4110

British—Three credits from ENGL 3960, 3970, 4070, 4080, 4010, 4140, 4150, 4160, 4170, 4180, 4330, 4440

American—Three credits from ENGL 3980, 3990, 4200, 4210, 4250, 4260, 4550

Electives—Six additional credits above the sophomore level, including at least three credits from the 4000 level

Entomology
A minor in Entomology requires ENT (BIOL) 3010 and 12 credits in entomology courses at the 3000 level or higher.

Entrepreneurship
A minor in Entrepreneurship consists of 15 credits including the following: ELE 3010 and MGT (ELE) 3150. Nine credit hours from the following courses are also required: ECON (ELE) 3210, ELE 4010, 4990, MGT 4970, MKT (ELE) 3140, MKT 4200, 4250, 4260, 4270, 4280, 4290, 4300, SOC (ELE, POSC, PSYC) 3560.

Environmental Engineering
A minor in Environmental Engineering requires at least 15 credits as follows: EES 4010, at least six credits selected from Group I, and at least three credits from Group II. The remaining three credits may be selected from either group. All courses are to be chosen in consultation with the Department of Environmental Engineering and Earth Sciences.

Group I—EES 4020, 4100, 4110, 4300, (BE) 4840, 4850, 4860

Group II—BE 3220, CE 3420, 4470, CH 2230, 4110, 4130, CHE 4040, 4550, CSEN (ETOX, GEOL) 4850, ENSP 4000, 4000, EETO 4000, 4300, GEOL 4080, MIR 3050, 4100

Environmental Science and Policy
A minor in Environmental Science and Policy requires at least 18 credits including ENSP 2000, 4000, and at least 12 credits from the following:

Group I—Science and Engineering: at least six credits selected from BIOL 4100, 4410, 4420, 4430, 4460, CH 4130, CSEN 2020, (BE) 4080, 4750, 4900, EES 4010, 4020, 4300, 4850, ENT 3000, EETO 4000, 4210, 4300, FOR 2060, WFB 4140

Group II—Resource Management: at least two credits selected from AGR (ENSP) 3150, BE 4640, CRD (APEO) 3570, CSEN 4040, ECON 3190, EES (BE) 4840, FOR 3150, 4060, GEOL 3000, MSE 4330, WFB 3060, (BIOL) 3150, 3500, 4120, 4620

Group III—Environmental Policy and Social Impacts: at least two credits selected from ENSP 4720, HIST 3920, HLTH 4310, PHIL 3450, PSYC 3550, RS (SOC) 4010, WFB 4300

Equine Business
A minor in Equine Business requires AVS 1500, 1510, and 2040; three hours selected from any graded (not Pass/No Pass) 3000- or 4000-level AVS courses; and six hours selected from AVS 2080, 3090, 3850, 3860, 4120, or 4160.

Film Studies
A minor in Film Studies requires 15 credits in ENGFL at or above the sophomore level, arranged as follows: ENGFL 3570, 4500, (COMM) 4510, 4520; and one of the following: ART 2130, 3130, ENGL (THEA) 4300, ENGL 4530, 4590, 4830, or other course approved by the departmental Director of Undergraduate Studies.

Financial Management
A minor in Financial Management requires FIN 3050, 3070, 3080, 3110 and 3120.

Food Science
A minor in Food Science requires FDSC 2140, 4010, and nine additional credits in POSC or NUTR courses numbered 3000 or higher.

Forest Products
A minor in Forest Products requires 15 credits, including at least four courses selected from FOR 2050, 2060, 3050, and at least seven additional credits of forestry courses at the 3000 level or above may be selected with a Forest Products advisor’s approval.

Forest Resource Management
A minor in Forest Resource Management requires FOR 2050, 2060, 3050, and at least seven additional credits of forestry courses at the 3000 level or higher. Credit hours include at least two credits selected from ENSP 4720, HIST 4330, WFB 3060, (BIOL) 3130, 3500, 4120, 4620 other than those at the 2000 level or above may be selected with a Forest Products advisor’s approval.

Global Politics
A minor in Global Politics requires POSC 1020 or 1040, 3610; and 12 additional credits chosen from the list below. At least three of these credits must be from Group I and at least three credits from Group II:

Group I—Comparative Politics: POSC 3710, 3720, 4660, 4710, 4720, 4730, 4760, 4770, 4780, (LANG) 4850

Group II—International Relations: POSC 3620, 3630, 3670, 3750, 4280, 4290, 4560, 4570, 4590, 4610

With the approval of the Political Science department, at least one course for each of the three credit blocks may be selected from Group II.

Students majoring in Political Science may not minor in Global Politics.

Great Works
The Great Works minor requires GW (ENGL) 3010 plus one course from each of the following groups. A minimum of nine credits must be at the 4000 level.

Group I—Classical Civilization: Three credits from ENGL 4030, 4290, (COMM) 4910, HIST 3540, 3550, 4500, PHIL 3150

Group II—Post-Classical Literature: Three credits from ENGL 4080, 4110, 4140, 4160, FR 4000, GW 4030, SPAN 3130, 4010

Group III—Philosophy, Religion, and Social Thought: Three credits from ENGL 3550, HIST 4950, PHIL 3160, 3170, POSC 4500, REL 3010, 3020, 4010

Group IV—The Arts: Three credits from AAH 4230, 4240, HUM 3010, 3020, MUSC 4150, 4160, THEA 3150, 3160

Group V—The Sciences: BIOL 4860, ENGL 4340, GW 4020, 4050

History
A minor in History requires 15 credits in history at the 3000 and 4000 level. Three credits at the 4000 level must be included.

Horticulture
A minor in Horticulture requires HORT 1010 and 12 additional credits of horticulture courses (excluding HORT 4080 and 4710), nine credits of which must be at the 3000 level or higher. HORT 2710 is highly recommended.

Human Resource Management
A minor in Human Resource Management requires 15 credit hours, including MGT 3070, 4000, 4310 and 4350, and three additional credit hours selected from MGT 4160 or 4250.

International Engineering and Science
The minor in International Engineering and Science, open to students in any major in the College of Engineering and Science, requires

1. Completion of a foreign language through at least 2020 and

2. Either (a) nine credits of engineering or science courses at the 3000 level or higher transferred from a foreign institution during an approved study abroad program of at least three months duration, plus nine credits chosen from the following list: 3000-level or higher foreign language courses; ECON 3100, 4120, 4130; POSC 3610, 3620, 3710, 3750, 4720, 4770, 4780.
The international study, internship, or research program must be approved in advance by the Associate Dean for Undergraduate Studies of the College of Engineering and Science.

**Legal Studies**

A minor in Legal Studies requires 15 credits at the 3000–4000 level, with at least six credits selected from Group I, at least six credits selected from Group II, and the remaining three credits selected from either group at the student’s option:

Group I—HIST 3280, 3290, 4960, PHIL 3430, POSC 4370, 4380, SOC 3880

Group II—ECON 4020, LAW 3220, 3330, 4050, 4200, 4990

Additional courses may be approved by a committee composed of representatives selected by the Dean of the College of Architecture, Arts and Humanities and by the Dean of the College of Business and Behavioral Science.

**Management**

A minor in Management requires 15 credits as follows: MGT 2010, 3070, 3100, 3180, 3900.

**Management Information Systems**

A minor in Management Information Systems requires 15 credits as follows: ACCT 3220 or MGT 3180; MGT 4110, 4520, and two of the following: MGT 3120, 4540, 4550, 4560.

**Mathematical Sciences**

A minor in Mathematical Sciences requires MTHS 2080 and 12 additional credits in MTHS or EXST courses numbered 3000 or higher with the exception of 3010.

**Microbiology**

A minor in Microbiology requires MICR 3050 and 11 additional credits selected from 4000-level microbiology courses.

**Military Leadership**

A minor in Military Leadership requires at least 15 credits, including ML 3010, 3020, 4010, 4100, and one of the following: HIST 3900, ML 3900, POSC 4580, or POSC 6580. Completion of Leadership Laboratory and participation in cadet activities is mandatory. (ML 1000 and 2000 levels may be taken concurrently in the sophomore year.)

**Modern Languages**

A minor in Modern Languages requires 15 credits from one modern language (Chinese, French, German, Italian, Japanese, or Spanish) from courses at the 3000 and 4000 levels, including at least one literature course at the 4000 level. In French, one of the 3000-level courses must be FR 3050, FR 4380, and FR 4390, and Span 4380 and 4390 may not be used to satisfy requirements for the French, Japanese, or Spanish minor.

**Music**

A minor in Music requires MUSC 1420, 1430, 1510, 1520, 2510, 2520, 4150 or 4160; four semesters of ensemble, totaling four credits, selected from MUSC 3230, 3610, 3620, 3630, 3690, 3700, 3710, 3720; and one three-hour MUSC course at the 3000–4000 level. All four semesters of applied music and large ensemble must be on the student’s primary instrument.

**Natural Resource Economics**

A minor in Natural Resource Economics requires APEC 4570; CRD (APEC) 3570; and three courses selected from APEC 3520, 4090, 4210, 4520, 4750, CRD (APEC) 4120, ECON 3190.

**Nonprofit Leadership**

A minor in Nonprofit Leadership requires NPL 3000, 3900, 4900, and one course selected from each of the following areas:

- Group I—COMM 3480, 4800, PRTM 3080
- Group II—EDF 3340, 3350, PSYC 3400, SOC 3500
- Group III—HLTH 4100, MKT 4280, 4290, PRTM 4210
- Group IV—MGT 3070, POSC 4270, PSYC 3680
- Group V—HLTH 4400, PHIL 3440, POSC 3210, PRTM 3050, 3210

**Packaging Science**

A minor in Packaging Science requires PKSC 1020, 2020, 2040, and 2060; and at least nine credits selected from the following: FDSC 4100, 4200, FOR 4410, 4420, GC 4060, PKSC 3200, 3680, 4010, 4010, 4040, 4200, 4300, 4400, 4540, 4640.

**Pan African Studies**

A minor in Pan African Studies requires 18 credits as follows: HIST 3110 or 3120, PAS 3010, and 12 credits arranged as follows:

- Group I—Three credits from GEOG 3300, HIST 3370, 3380, 3390, 4380, 4390, or POSC 3100, 4990
- Group II—Three credits from ENGL 3470, 4830, POSC 3810, SOC 4000, THEA 3560
- Group III—Three credits in any 3000–4000-level course in the social sciences approved by the Director of the Pan African Studies Program

**Political Science**

A minor in Political Science requires POSC 1010 or 1020 or 1030 and 15 additional credits at the 3000–4000 level, nine of which must be selected from three different fields of political science as follows:

- American Politics—POSC 4030, 4050, 4160, 4360, 4420
- Comparative Politics—POSC 3710, 3720, 4660, 4710, 4760, 4770, 4780
- International Relations—POSC 3610, 3620, 3630, 3750, 4290
- Political Theory—POSC 4480, 4490, 4500, 4530, 4550
- Public Policy and Public Administration—POSC 3020, 3210, 4210, 4230, 4240, 4270, 4300

At least one 4000-level course must be included. No more than a total of three credits from POSC 3050, 3100, 3110, 3120, 3130, 4090, 4100 may be applied to the requirements for a Political Science minor.

**Psychology**

A minor in Psychology requires PSYC 2010 and 15 credits from PSYC 2750 and/or 3000 and 4000-level psychology courses. At least nine hours from courses other than PSYC 4970 and 4980 must be taken.

**Public Policy**

A minor in Public Policy requires POSC 3210, 4210, and 4300, plus nine credit hours in courses dealing with specific policy domains and approved by the Department of Political Science.

**Religion**

A minor in Religion requires 15 credits, nine of which must be at the 3000 level or above. PHIL 3030 and POSC 4070 may be included.

**Russian Area Studies**

A minor in Russian Area Studies requires 15 credit hours of which three credits must be in Russian language courses at the 2000 level or above. The remaining twelve credits are distributed as follows:

- Group I—Three credits from RUSS 3070, 3400, 3600, 3610, 3980, 4600
- Group II—Three credits from HIST 3850, 3860, 3870, 4940
- Group III—Three credits from POSC 4710, 4730
- Group IV—Three additional credits from any of the courses listed above

**Science and Technology in Society**

A minor in Science and Technology in Society requires 15 credits, at least six of which must be at the 4000 level. See History Department advisor for list of approved courses.

**Screenwriting**

A minor in Screenwriting requires 15 credits in ENGL above the sophomore level as follows: ENGL 3570, 4480 (six credits); and one of the following: ENGL 4500, (COMM) 4510, 4520, 4530, THEA (ENGL) 3470, or other course approved by the departmental Director of Undergraduate Studies.

**Sociology**

A minor in Sociology requires SOC 2010 and 15 credits from sociology and rural sociology courses numbered 3000 or higher. At least one 4000-level course must be included.
Spanish-American Area Studies
A minor in Spanish-American Area Studies requires the equivalent of SPAN 2020, ECON 4100, and 12 credits distributed as follows: six credits from GEOG 3400, HIST 3400, 3410, 3420, 4400; and six credits from POSC (SPAN) 3820, SPAN 3080, 3110, 4030, 4220, 4350.

Theatre
A minor in Theatre requires 20 credits arranged as follows: three credits of dramatic literature and history (ENGL) 4100, 4110, 4290, 4300; THEA (ENGL) 3470; three credits of theatre history (THEA 3150, 3160, 3170, 3180); six credits in a sequence (THEA 2780/4790, THEA (ENGL) 3470/4470, THEA 3720/4720, 3760/4760; 2880 or 3770 and one of the following: 4770, 4870 or 4970); six credits in THEA at the 3000–4000 level; and two credits of THEA 2790.

Therapeutic Recreation
A minor in Therapeutic Recreation requires PRTM 3010, 3110, 4170, and at least two courses selected from PRTM 3170, 4160, 4180, 4200.

Travel and Tourism
A minor in Travel and Tourism requires PRTM 3010, 3420, and nine additional credits from PRTM 3430, 3440, 3490, 3920, 3980, (GEOG) 4300, 4410, 4440, 4450, 4460, 4470, 4980.

Turfgrass
A minor in Turfgrass requires CSEN 2020, HORT 2120, 4120, and two of the following: AGM 4020, HORT (CSEN) 4330, PLPA (ENT) 4060.

Urban Forestry
A minor in Urban Forestry requires a minimum of 16 credits, distributed as follows:

Group I—FOR (HORT) 4270, 4500, 4800, HORT 2080
Group II—A minimum of three credits selected from CRP 4010, HORT 3080
Group III—A minimum of three credits selected from ENT 4010 or HORT 3030

Wildlife and Fisheries Biology
A minor in Wildlife and Fisheries Biology requires WFB 3000, 3500; and nine additional hours selected from 3000-level or higher WFB courses, except 4630.

Women’s Studies
A minor in Women’s Studies requires 15 credits at the 3000 and 4000 level, distributed as follows:

Group I—Six credits: WS 3010 and any 4000-level WS course
Group II—Six credits from courses that deal entirely with women and gender issues: COMM 4550, ENGL 3800, HIST 3180, PHIL (WS) 3490, PSYC 4080, SOC 4610, SPAN 4030, and any additional courses approved for Group II
Group III—Three credits may be earned by taking any approved Women’s Studies minor course.

Courses selected in Groups II and III must represent at least two disciplines. Courses are to be scheduled in consultation with the appropriate advisor. The Women’s Studies Director will provide all affected advisors with a list of approved courses prior to registration each semester.

Writing
A minor in Writing requires 15 credits as follows:

Business and Technical Option—APEC 3510 or GC 1040, CPSC 1200, ENGL 3040 or 3140, 4900, 4950

Media Studies Option—ENGL 2310, 3320, 3330, 4780; and one of the following: ENGL 4750, 4890, (COMM) 4910, (COMM) 4920, or any course approved by the Chair of the English Department

Writing Pedagogy Option—ENGL 3120, 4000, 4010, (EDSC) 4850, and any 3000- or 4000-level writing course offered by the Department of English

Creative Writing Options

Drama—ENGL (THEA) 4300, THEA (ENGL) 3470, (ENGL) 4470 (six credits), and one of the following: ENGL 3120, 4100, 4110

Fiction—ENGL 3450, 4320, 4450 (six credits), and one of the following: ENGL 3120, 4180, 4250, 4260, 4280

Poetry—ENGL 3460, 4310, 4460 (six credits), and one of the following: ENGL 3120, 4160, 4170, 4280, 4440
COLLEGE OF AGRICULTURE, FORESTRY AND LIFE SCIENCES

The College of Agriculture, Forestry and Life Sciences (CAFLS) supports Clemson University’s land-grant mission to provide education, research and service to the public. The College of Agriculture, Forestry and Life Sciences serves more than 3,800 graduate and undergraduate students.

The College of Agriculture, Forestry and Life Sciences will be a new model for a 21st Century, multidisciplinary college of life-based sciences that prepares students to be leaders and innovators in their chosen careers. The shared biological foundation of the CAFLS Departments and School will stimulate student learning and undergraduate research across disciplines; will increase opportunities for team-based faculty research across departments, colleges and institutions; and will make available the latest scientific knowledge for the greater benefit of society.

To assist students in achieving these goals, the William B. Bookhart Jr. Student Services Center provides academic advising and developmental services to promote success for students in the related degree programs. These services involve recruitment and retention, academic advising, multicultural affairs, study abroad, career development, and placement.

The College of Agriculture, Forestry and Life Sciences is impacting the world one graduate at a time—from cell research to food production to packaged materials to the globe—developing partnerships for the future to make the world greener, healthier, tastier, and wealthier.

AGRICULTURAL EDUCATION

Bachelor of Science

Agricultural Education provides broad preparation in agricultural sciences and professional education, including communications and human relations skills. In addition to required courses, students may select a minor (see page 63).

The Bachelor’s degree prepares students for professional education positions in the mainstream of agriculture, including teaching, cooperative extension service, and government agricultural agencies. The Agricultural Education degree also prepares students for other educational work, such as agricultural missionary, public relations, and training officers in agricultural industry.

In consultation with the departmental advisor, students choose one of the following emphasis areas: Communications, Leadership, or Teaching.

Freshman Year
First Semester
1. AGED 1020 Agric. Ed. Freshman Seminar
2. AGED 1030 Multiculturalism in Agric. Ed.
3. AVS 1500 Introduction to Animal Science
4. AVS 1510 Introduction to Animal Science Lab.
5. BIOL 1030 General Biology I
6. BIOL 1050 General Biology Lab. I
7. HORT 1010 Horticulture
8. Mathematics Requirement
9. 12
Second Semester
1. AGED 1000 Orientation and Field Experience
2. AGM 2050 Principles of Fabrication
3. BIOL 1040 General Biology II
4. BIOL 1060 General Biology Lab. II
5. ENGL 1030 Accelerated Composition
6. Social Science Requirement
7. 17

Sophomore Year
First Semester
1. AGED 2020 Intro. to Agricultural Education
2. AGED 2040 Applied Agriculture Calculations
3. BT 2200 Biosystems Technology I
4. CH 1010 General Chemistry
5. HORT 2120 Introduction to Turfgrass Culture

Second Semester
1. CH 1020 General Chemistry
2. COMM 1010 Communication Academic and Professional Development
3. EDSP 3700 Introduction to Special Education
4. EXST 3010 Introductory Statistics
5. PHYS 2070 General Physics I
6. Technical Requirement
7. 17

Junior Year
First Semester
1. AGED 3030 Multiculturalism in Agric. Ed.
2. AGM 2210 Surveying
3. COMM 3010 Intro. to Communication Studies
4. CSEN 2020 Soils
5. Arts and Humanities (Non-Lit.) and STS Requirement
6. 17

Second Semester
1. AGED 3010 Mech. Technology for Agric. Ed.
2. AGM 2210 Surveying
3. CSEN 2020 Soils
4. ENR 3020 Natural Resources Measurements
5. HORT 4040 Plant Propagation
6. Leadership Education
7. 19

Senior Year
First Semester
1. AGED 4150 Leadership of Volunteers
2. AGED 4160 Ethics and Issues in Agriculture
3. MGT 2010 Principles of Management
4. Oral Communication Requirement
5. Technical Requirement
6. 18

LEADERSHIP EMPHASIS AREA

Junior Year
First Semester
1. AGED 3030 Mech. Technology for Agric. Ed.
2. AGM 2210 Surveying
3. CSEN 2020 Soils
4. HORT 4040 Plant Propagation
5. Leadership Education
6. 19

Second Semester
2. AGED 4150 Leadership of Volunteers
3. AGED 4160 Ethics and Issues in Agriculture
4. MGT 2010 Principles of Management
5. Arts and Humanities (Literature) Requirement
6. Technical Requirement
7. 18

Senior Year
First Semester
2. AGED 4150 Leadership of Volunteers
3. AGED 4160 Ethics and Issues in Agriculture
4. MGT 2010 Principles of Management
5. Arts and Humanities (Literature) Requirement
6. Technical Requirement
7. 18

COMMUNICATIONS EMPHASIS AREA

Junior Year
First Semester
1. AGED 3030 Mech. Technology for Agric. Ed.
2. AGM 2210 Surveying
3. COMM 3010 Intro. to Communication Studies
4. CSEN 2020 Soils
5. Arts and Humanities (Non-Lit.) and STS Requirement
6. 17

Second Semester
1. AGED 3010 Mech. Technology for Agric. Ed.
2. AGM 2210 Surveying
3. CSEN 2020 Soils
4. ENR 3020 Natural Resources Measurements
5. HORT 4040 Plant Propagation
6. Leadership Education
7. 19

Senior Year
First Semester
2. AGED 4150 Leadership of Volunteers
3. AGED 4160 Ethics and Issues in Agriculture
4. MGT 2010 Principles of Management
5. Arts and Humanities (Literature) Requirement
6. Technical Requirement
7. 18
### Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 - AGED 4070 Internship in Extension and Leadership Education</td>
<td></td>
</tr>
</tbody>
</table>

133-134 Total Semester Hours

### TEACHING EMPHASIS AREA

#### Junior Year

**First Semester**
- 3 - AGED 3030 Mech. Technology for Agric. Ed.
- 3 - AGM 2210 Surveying
- 3 - CSEN 2020 Soils
- 3 - HORT 3030 Landscape Plants
- 3 - Advanced Writing Requirement

**Second Semester**
- 3 - AGED 4160 Ethics and Issues in Agriculture and the Food and Fiber System
- 3 - EDF 3020 Educational Psychology
- 3 - ENR 3020 Natural Resources Measurements
- 3 - HORT 4040 Plant Propagation
- 3 - HORT 4050 Plant Propagation Techniques Lab.
- 3 - Oral Communication Requirement

16 Total Semester Hours

### Senior Year

**First Semester**
- 1 - AGED 4000 Supervised Field Experience II
- 3 - AGED 4010 Instructional Methods in Ag. Ed.
- 3 - AGED 4030 Principles of Adult/Ext. Education
- 3 - AGM 4000 Principles of Advanced Adult Ed.
- 3 - Arts and Humanities (Literature) Requirement
- 3 - Arts and Humanities (Non-Lit) and STS Requirement

16 Total Semester Hours

**Second Semester**
- 12 - AGED 4060 Directed Teaching
- 2 - AGED 4250 Teaching Agricultural Mechanics

130-131 Total Semester Hours

### AGRICULTURAL MECHANIZATION AND BUSINESS

#### Bachelor of Science

The Agricultural Mechanization and Business major provides a program for students who desire training in areas relevant to dynamic agricultural enterprises. The program is organized with strength in both business management and technical support of agriculture and agribusiness. To produce well-rounded individuals with good communication skills, the curriculum includes courses in the humanities, social sciences, English composition, and public speaking.

Graduates in Agricultural Mechanization and Business find meaningful and remunerative employment in a variety of situations directly and indirectly related to agricultural production, processing, marketing, and the many services connected therewith. Farming and technical sales in the agricultural, industrial, and heavy equipment industries are frequently chosen career paths.

By completing this curriculum, graduates will have fulfilled the requirements for an Agricultural Business Management minor or other selected minor. Contact the Enrolled Student Services Office to have the minor recorded.

Additional information is available from the departmental offices or can be found at www.clemson.edu/cafls/safes/agmeec/minors.html.

#### Freshman Year

**First Semester**
- 1 - AGM 1010 Intro. to Agr. Mech. and Business
- 3 - AGM 2050 Principles of Fabrication
- 3 - APEC 2020 Agricultural Economics or
- 3 - ECON 2110 Principles of Microeconomics
- 1 - BIOL 1050 General Biology Lab. I
- 3 - MTHS 1020 Intro. to Mathematical Analysis

14 Total Semester Hours

**Second Semester**
- 3 - ACCT 2010 Financial Accounting Concepts
- 1 - BIOL 1060 General Biology Lab. II
- 3 - AGM 1500 Intro. to Human Comm. or
- 3 - COMM 2500 Public Speaking
- 3 - ENGL 1030 Accelerated Composition
- 3 - Elective

16 Total Semester Hours

#### Sophomore Year

**First Semester**
- 3 - AGM 2190 Agribusiness and Food Systems
- 3 - AGM 2210 Surveying
- 4 - CH 1010 General Chemistry
- 2 - ENGR 2080 Engr. Graphics and Machine Design
- 2 - ENGR 2090 Intro. to Engineering/Computer Graphics
- 4 - PHYS 2000 Introductory Physics or
- 3 - PHYS 2070 General Physics I and
- 1 - PHYS 2090 General Physics I Lab.

16 Total Semester Hours

#### Junior Year

**First Semester**
- 3 - AGM 3010 Soil and Water Conservation
- 3 - AGM 3190 Agribusiness Decision Analysis
- 3 - AGM 4050 Environmental Control in Animal Structures
- 3 - APEC 3020 Economics of Farm Management or
- 3 - MGT 2010 Principles of Management

16 Total Semester Hours

**Second Semester**
- 3 - AGM 4020 Drainage and Irrigation
- 3 - AGM 4250 Mobile Power
- 2 - EXST 3010 Introductory Statistics or
- 3 - MTHS 2030 Elem. Statistical Inference
- 3 - Arts and Humanities (Non-Lit) Requirement
- 3 - Oral Communication Requirement

15 Total Semester Hours

#### Senior Year

**First Semester**
- 1 - AGM 4000 Senior Seminar in AgM
- 3 - AGM 4060 Mechanical and Hydraulic Systems
- 3 - AGM 4600 Electrical Systems
- 3 - APEC 3190 Agribusiness Management or
- 3 - MGT 2010 Principles of Management
- 3 - MKT 3010 Principles of Marketing or
- 3 - APEC 3090 Econ. of Agricultural Marketing
- 3 - Minor Requirement

16 Total Semester Hours

**Second Semester**
- 3 - AGM 4100 Precision Agriculture Technology
- 3 - AGM 4720 Capstone or
- 3 - AGM 4190 Agribusiness Innov./Enrepren.
- 3 - Minor Requirement
- 3 - Plant/Crop or Soil Science Requirement
- 3 - Social Science Requirement

15 Total Semester Hours

124 Total Semester Hours

1Required for students minoring in Business Administration.
2AGR 1040, CSEN 4050, 4210, 4220, 4230, 4260, HORT 1030, 2100, 2110, 2120, 4050, 4330, 4550, 4560, PLPA 3100, 4060, 4180, or 4900. If applicable, these courses may also be used to satisfy minor requirement.
3MG 2010 can count for either of the APEC 3020 or 3190 requirement but not for both.
4See General Education Requirements. Three of these credit hours must also satisfy the Cross-Cultural Awareness and three must satisfy the Science and Technology in Society Requirements.
5RIG 1040 must switch the course order with a fall listing.
6AGM 4190 is a full-only course. Students electing to take AGM 4190 must switch the course order with a fall listing.
7CSEN 4030, 4460, 4520, 4850, 4900. If applicable, these courses may also be used to satisfy minor requirement.
## ANIMAL AND VETERINARY SCIENCES

### Bachelor of Science
The Animal and Veterinary Sciences curriculum provides students with both a basic and applied understanding of the scientific principles needed for successful careers in the scientific, technical, and business phases of livestock and poultry production, processing, and marketing. Strengths of this program include extensive hands-on instruction at Clemson’s five animal farms, personalized advising, and the opportunity for valued-added experiences, including involvement in research, teaching, extension, international travel, and internships. Students choose from three concentrations.

The Animal Agribusiness Concentration prepares students for careers in the many facets of the animal industries, including production, sales and marketing, business management, advertising, and extension. The Equine Business Concentration prepares students for such professions as trainers, managers, riding instructors, sales or media representatives, breed association representatives or for equine entrepreneurial careers such as owners of tack shops, boarding facilities, or riding schools. The Pre-veterinary and Science Concentration prepares students to meet the requirements for most veterinary schools, graduate schools, and medical and dental schools. Students with South Carolina residency may compete for contract seats at Mississippi State, Tuskegee, and University of Georgia Colleges of Veterinary Medicine. Experienced preprofessional advising is provided for all students pursing advanced degrees.

### Change of Major into Animal and Veterinary Sciences
Students who change majors into Animal and Veterinary Sciences must have a 2.5 minimum cumulative grade-point average.

## ANIMAL AGROBUSINESS CONCENTRATION

### Freshman Year
**First Semester**
- 1 - AVS 1000 Orientation to Animal and Vet. Sci.
- 3 - AVS 1500 Introduction to Animal Science
- 1 - AVS 1510 Introduction to Animal Science Lab.
- 3 - BIOL 1030 General Biology I and
- 1 - BIOL 1050 General Biology Lab. I or
- 5 - BIOL 1100 Principles of Biology I
- 4 - CH 1010 General Chemistry
- 3 - Arts and Humanities (Non-Lit.) Requirement1
- 1 - BIOL 1060 General Biology Lab. II
- 2 - AVS Techniques Requirement2
- 3 - Elective

**Second Semester**
- 3 - AVS 3010 Anat. and Phys. of Domestic Animals
- 3 - AVS 3700 Principles of Animal Nutrition
- 3 - AVS 4700 Animal Genetics
- 3 - CSEN 4230 Field Crops—Forages
- 3 - ECON 2120 Principles of Microeconomics
- 3 - AVS Experience-Based Activity4
- 3 - AVS Techniques Requirement2

### Sophomore Year
**First Semester**
- 4 - AVS 3010 Anat. and Phys. of Domestic Animals
- 3 - AVS 4130 Animal Products
- 3 - AVS 4530 Animal Reproduction
- 3 - LAW 3220 Legal Environment of Business
- 3 - Elective

**Second Semester**
- 3 - AVS 3750 Applied Animal Nutrition
- 3 - AVS 4380 Animal Products
- 3 - AVS 4400 Animal Reproduction
- 3 - MGT 2010 Principles of Management
- 3 - Elective

### Junior Year
**First Semester**
- 4 - AVS 3010 Anat. and Phys. of Domestic Animals
- 3 - AVS 4810 Animal Nutrition
- 3 - AVS 4170 Animal Agribusiness Development
- 3 - AVS 4100 Domestic Animal Behavior
- 3 - AVS 4150 Contemporary Issues in Animal Sci.
- 3 - AVS 3010 Anat. and Phys. of Domestic Animals
- 3 - AVS Experience-Based Activity4
- 2 - AVS Techniques Requirement2

**Second Semester**
- 3 - AVS 3010 Anat. and Phys. of Domestic Animals
- 3 - AVS 3700 Principles of Animal Nutrition
- 3 - AVS 4700 Animal Genetics
- 3 - CSEN 4230 Field Crops—Forages
- 3 - ECON 2120 Principles of Microeconomics
- 3 - AVS Experience-Based Activity4
- 3 - AVS Techniques Requirement2

### Senior Year
**First Semester**
- 4 - AVS 3010 Anat. and Phys. of Domestic Animals
- 3 - AVS 4810 Animal Nutrition
- 3 - AVS 4170 Animal Agribusiness Development
- 3 - AVS 4100 Domestic Animal Behavior
- 3 - AVS 4150 Contemporary Issues in Animal Sci.
- 3 - AVS 3010 Anat. and Phys. of Domestic Animals
- 3 - AVS Experience-Based Activity4
- 2 - AVS Techniques Requirement2

**Second Semester**
- 3 - AVS 3010 Anat. and Phys. of Domestic Animals
- 3 - AVS 4810 Animal Nutrition
- 3 - AVS 4170 Animal Agribusiness Development
- 3 - AVS 4100 Domestic Animal Behavior
- 3 - AVS 4150 Contemporary Issues in Animal Sci.
- 3 - AVS 3010 Anat. and Phys. of Domestic Animals
- 3 - AVS Experience-Based Activity4
- 2 - AVS Techniques Requirement2

### Equine Business Concentration

### Freshman Year
**First Semester**
- 1 - AVS 1000 Orientation to Animal and Vet. Sci.
- 3 - AVS 1500 Introduction to Animal Science
- 1 - AVS 1510 Introduction to Animal Science Lab.
- 3 - BIOL 1030 General Biology I and
- 1 - BIOL 1050 General Biology Lab. I or
- 5 - BIOL 1100 Principles of Biology I
- 4 - CH 1010 General Chemistry
- 3 - Arts and Humanities (Non-Lit.) Requirement1

**Second Semester**
- 3 - BIOL 1100 Principles of Biology I
- 3 - BIOL 1110 Principles of Biology II
- 5 - BIOL 1110 Principles of Biology II
- 4 - CH 1020 General Chemistry
- 3 - ENGL 1030 Accelerated Composition
- 3 - MTHS 1030 General Biology Lab. I or
- 5 - BIOL 1100 Principles of Biology I
- 4 - CH 1010 General Chemistry
- 3 - Arts and Humanities (Non-Lit.) Requirement1

### Sophomore Year
**First Semester**
- 2 - AVS 4100 Domestic Animal Behavior
- 3 - AVS 4130 Animal Products
- 3 - AVS 4530 Animal Reproduction
- 3 - LAW 3220 Legal Environment of Business
- 3 - Elective

**Second Semester**
- 3 - ECON 2120 Principles of Microeconomics
- 3 - CSEN 4230 Field Crops—Forages
- 3 - AVS 4700 Animal Genetics
- 3 - AVS 3700 Principles of Animal Nutrition
- 3 - AVS Techniques Requirement2

### Junior Year
**First Semester**
- 4 - AVS 3010 Anat. and Phys. of Domestic Animals
- 3 - AVS 4810 Animal Nutrition
- 3 - AVS 4170 Animal Agribusiness Development
- 3 - AVS 4100 Domestic Animal Behavior
- 3 - AVS 4150 Contemporary Issues in Animal Sci.
- 3 - AVS 3010 Anat. and Phys. of Domestic Animals
- 3 - AVS Experience-Based Activity4
- 2 - AVS Techniques Requirement2

**Second Semester**
- 3 - ECON 2120 Principles of Microeconomics
- 3 - CSEN 4230 Field Crops—Forages
- 3 - ECON 2120 Principles of Microeconomics
- 3 - AVS 4700 Animal Genetics
- 3 - AVS 3700 Principles of Animal Nutrition
- 3 - AVS Techniques Requirement2

### Senior Year
**First Semester**
- 4 - AVS 3010 Anat. and Phys. of Domestic Animals
- 3 - AVS 4810 Animal Nutrition
- 3 - AVS 4170 Animal Agribusiness Development
- 3 - AVS 4100 Domestic Animal Behavior
- 3 - AVS 4150 Contemporary Issues in Animal Sci.
- 3 - AVS 3010 Anat. and Phys. of Domestic Animals
- 3 - AVS Experience-Based Activity4
- 2 - AVS Techniques Requirement2

**Second Semester**
- 3 - ECON 2120 Principles of Microeconomics
- 3 - CSEN 4230 Field Crops—Forages
- 3 - ECON 2120 Principles of Microeconomics
- 3 - AVS 4700 Animal Genetics
- 3 - AVS 3700 Principles of Animal Nutrition
- 3 - AVS Techniques Requirement2

### Change of Major into Animal and Veterinary Sciences
Students who change majors into Animal and Veterinary Sciences must have a 2.5 minimum cumulative grade-point average.
### Senior Year

**First Semester**
- AVS 1100 Animal Health
- AVS 4000 Animal and Veterinary Sciences
- Professional Development
- AVS 4060 Seminars and Related Topics
- AVS 4150 Contemporary Issues in Animal Sci.
- AVS 4160 Equine Exercise Physiology
- AVS Experience-Based Activity

**Second Semester**
- AVS 4100 Domestic Animal Behavior
- AVS 4120 Advanced Equine Management
- AVS 4170 Animal Agribusiness Development
- Elective

121–124 Total Semester Hours

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### Junior Year

**First Semester**
- AVS 3010 Anat. and Phys. of Domestic Animals
- AVS 3100 Animal Health
- AVS 3700 Principles of Animal Nutrition
- BCHM 3010 Molecular Biochemistry or
- BCHM 3050 Essential Elements of Bioch. or
- BCHM 4060 Physiological Chemistry
- Departmental Requirement

**Second Semester**
- AVS 3750 Applied Animal Nutrition
- AVS 4530 Animal Reproduction
- GEN 3000 Fundamental Genetics
- MICR 3050 General Microbiology
- AVS Experience-Based Activity

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### Sophomore Year

**First Semester**
- AVS 1000 Orientation to Animal and Vet. Sci.
- BIOL 1100 Principles of Biology I
- CH 1010 General Chemistry
- Arts and Humanities (Non-Lit.) Requirement

**Second Semester**
- AVS 1050 General Biology Lab.
- BIOL 1030 General Biology I and
- BIOL 1050 General Biology Lab. I or
- CH 1010 General Chemistry
- Arts and Humanities (Non-Lit.) Requirement

16–17

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### College of Agriculture, Forestry and Life Sciences

The program provides an excellent background for students to meet specific career objectives. By completing this curriculum, graduates will have fulfilled the requirements for an approved minor in the college, allowing students to tailor the program to meet their specific career objectives.

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### AGROBUSINESS EMPHASIS AREA

**Freshman Year**

**First Semester**
- AVS 1000 Orientation to Animal and Vet. Sci.
- CH 2230 Organic Chemistry
- CH 2270 Organic Chemistry Lab.
- PHYS 2070 General Physics I
- PHYS 2090 General Physics I Lab.
- Arts and Humanities (Literature) Requirement
- AVS Techniques Requirement
- Social Science Requirement

**Second Semester**
- CH 2240 Organic Chemistry
- CH 2280 Organic Chemistry Lab.
- EXST 3010 Introductory Statistics or
- MTHS 2030 Elem. Statistical Inference
- PHYS 2080 General Physics II
- PHYS 2100 General Physics II Lab.
- AVS Techniques Requirement
- Oral Communication Requirement

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**Second Semester**
- AVS 3010 Anat. and Phys. of Domestic Animals
- AVS 3100 Animal Health
- AVS 3700 Principles of Animal Nutrition
- BCHM 3010 Molecular Biochemistry or
- BCHM 3050 Essential Elements of Bioch. or
- BCHM 4060 Physiological Chemistry
- Departmental Requirement

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**Second Semester**
- AVS 3750 Applied Animal Nutrition
- AVS 4530 Animal Reproduction
- GEN 3000 Fundamental Genetics
- MICR 3050 General Microbiology
- AVS Experience-Based Activity

14

122–125 Total Semester Hours

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**Senior Year**

**First Semester**
- AVS 4000 Animal and Veterinary Sciences
- Professional Development
- AVS 4060 Seminars and Related Topics
- AVS 4170 Contemporary Issues in Animal Sci.
- AVS Techniques Requirement
- Departmental Requirement
- Elective

**Second Semester**
- AVS 4130 Animal Products
- AVS 4100 Domestic Animal Behavior
- BCHM 4060 Physiological Chemistry
- CH 2280 Organic Chemistry Lab.
- ECON 2110 Principles of Macroeconomics
- APEC 2020 Agricultural Economics
- APEC 3020 Economics of Farm Management
- ACCT 2010 Financial Accounting Concepts
- MGT 2010 Principles of Management
- Arts and Humanities (Literature) Requirement

15

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**Sophomore Year**

**First Semester**
- ACCT 2010 Financial Accounting Concepts
- APEC 3020 Economics of Farm Management
- ECON 2120 Principles of Macroeconomics
- MGT 2010 Principles of Management
Second Semester
3 - ACCT 2020 Managerial Accounting Concepts
3 - APEC 3570 Natural Resource Economics
3 - Leadership Requirement¹
3 - Minor Requirement¹
3 - Social Science Requirement¹
15

Junior Year
First Semester
3 - AGM 3190 Agribusiness Decision Analysis
3 - APEC 3090 Econ. of Agricultural Marketing or MKT 3010 Principles of Marketing
3 - ECON (MGT) 3060 Managerial Economics or ECON 3140 Intermediate Microeconomics
3 - ENGL 3140 Technical Writing
3 - Minor Requirement¹
15

Second Semester
3 - APEC 3080 Quantitative Applied Economics
3 - APEC 3190 Agribusiness Management
3 - APEC 4210 Globalization or ECON 3100 International Economy
3 - ECON 3020 Money and Banking or ECON 3150 Intermediate Macroeconomics
3 - Minor Requirement¹
15

Senior Year
First Semester
3 - APEC 4090 Commodity Futures Markets
3 - APEC (CRD) 4120 Regional Economic Dev.
3 - APEC 4600 Agricultural Finance
3 - LAW 3220 Legal Environment of Business
3 - Minor Requirement¹
15

Second Semester
3 - APEC 4020 Production Economics
3 - APEC 4520 Agricultural Policy
3 - APEC 4560 Prices
3 - Internship, Creative Inquiry or Selected Topics³
3 - Minor Requirement¹
15

121 Total Semester Hours
¹See General Education Requirements.
²Select from AGED 3550, 4150, CRD 3350.
³See CAFLS approved minors.
⁴APEC 4900, 4910, 4940

BIOCHEMISTRY
Bachelor of Science
Biochemistry is the study of the molecular basis of life. To comprehend current biochemical information and make future contributions to our molecular understanding of life processes, students must obtain a broad background in biology and a firm foundation in chemistry, mathematics, and physics. This is the basis of the biochemistry curriculum.

The program provides an excellent educational background for professional school (medicine, dentistry, or veterinary medicine) and graduate school in biochemistry, molecular biology, or another biological science discipline. Graduates will find employment opportunities in the research and service programs of universities, medical schools, hospitals, research institutes, and industrial and government laboratories.

Freshman Year
First Semester
1 - BCHM 1030 Careers in Biochem. and Genetics
5 - BIOL 1100 Principles of Biology I
4 - CH 1010 General Chemistry
4 - MTHS 1060 Calculus of One Variable I
14
Second Semester
1 - BIOL 1110 Principles of Biology II
4 - CH 1020 General Chemistry
4 - ENGL 1030 Accelerated Composition
4 - MTHS 1080 Calculus of One Variable II
16

Sophomore Year
First Semester
3 - CH 2230 Organic Chemistry
1 - CH 2270 Organic Chemistry Lab.
3 - GEN 3020 Molecular and General Genetics
2 - GEN 3030 Molecular and Gen. Genetics Lab.
3 - PHYS 1220 Physics with Calculus I
1 - PHYS 1240 Physics Lab. I
3-4 - Advanced Mathematics Requirement
16-17
Second Semester
3 - BCHM 3010 Molecular Biochemistry
3 - CH 2240 Organic Chemistry
1 - CH 2280 Organic Chemistry Lab.
3 - COMM 3500 Intro. to Human Comm. or COMM 3550 Public Speaking
3 - PHYS 2210 Physics with Calculus II
1 - PHYS 2230 Physics Lab. II
3 - Arts and Humanities (Literature) Requirement²
17

Junior Year
First Semester
3 - BCHM 4310 Physical Approach to Biochem.
2 - BCHM 4930 Senior Seminar
3 - CH 3300 Introduction to Physical Chemistry³
3 - Science Requirement³
4 - Elective³
15
Second Semester
3 - BCHM 4320 Biochemistry of Metabolism
2 - BCHM 4340 General Biochemistry Lab. II
3 - BCHM 4360 Molecular Biol.; Genes to Proteins
3 - PHIL 3260 Science and Values
3 - Science Requirement³
14

Senior Year
First Semester
3 - BIOL 4610 Cell Biology
3 - GEN (BCHM) 4400 Bioinformatics
3 - Social Science Requirement³
4 - Elective³
13

Second Semester
2 - BCHM 4930 Senior Seminar
3 - Science Requirement³
3 - Social Science Requirement³
6 - Elective³
14
120-121 Total Semester Hours
²EXST 3010, MTHS 2060, 3010, or 3020
³See General Education Requirements.
⁴BIOL 2220, 2230, or any courses at 3000 level or above in BCHM, BIOE, BIOL, CH, EXST, GEN, MICR, MTHS, PHYS, PLPA, and PLPH. Other courses must be approved by advisor.
⁵See General Education Requirements. Three of these credit hours must also satisfy the Cross-Cultural Awareness Requirement.
²Two semesters of a foreign language are strongly recommended.

Notes:
1. A student is allowed to enroll in science and mathematics courses only when all prerequisites have been passed with a grade of C or higher.
2. A minimum grade of C is required in all science and mathematics courses. No student may exceed a maximum of two attempts, excluding a W, to complete successfully any science or mathematics course.

BIOLOGICAL SCIENCES
Bachelor of Science
Biochemistry encompasses the broad spectrum of the modern life sciences, including the study of all aspects of life from the structure and function of the whole organism down to the subcellular levels and up through the interactions of organisms to the integrated existence of life on the entire planet. Descriptive, structural, functional, and evolutionary questions are explored through the hierarchy of the organization of life. Applications of current advances to the health and well-being of man and society, to nature and the continuation of earth as a balanced ecosystem, and to an appreciation of the place of natural science in our cultural heritage receive emphasis.

Majors in Biological Sciences receive classroom, laboratory, and field training in biology with an emphasis on chemistry, mathematics, and physics as necessary tools. The Bachelor of Science in Biological Sciences curriculum prepares students for graduate study in any of the life science areas (such as agricultural sciences, biochemistry, botany, cell and molecular biology, conservation, ecology and environmental science, entomology, forestry, genetics, industrial and regulatory biology, microbiology, morphology, physiology, wildlife biology, and zoology; for the health professions (medicine, dentistry, etc.), veterinary medicine; and for science teaching.

Combined Bachelor of Science in Biological Sciences/Master of Science in Bioengineering
Under this plan, students may reduce the time necessary to earn both degrees by applying graduate credits to both undergraduate and graduate program requirements. See Academic Regulations in this catalog for enrollment guidelines and procedures. Students are encouraged to obtain the specific requirements for the dual degree from the Department of Biological Sciences or Bioengineering as early as possible in
their undergraduate program as a number of required courses have prerequisites not normally taken by Biological Sciences majors.

**Freshman Year**

**First Semester**
1. BIOL 1010 Frontiers in Biology I
2. CH 1010 General Chemistry
3. COMM 1500 Intro to Human Comm. or COMM 2500 Public Speaking
4. MTHS 1060 Calculus of One Variable I

**Second Semester**
5. BIOL 1110 Principles of Biology I
6. CH 1020 General Chemistry
7. ENGL 1030 Accelerated Composition
8. MATH 1060 Calculus of One Variable II

**Sophomore Year**

**First Semester**
1. BIOL 2230 Organic Chemistry and
2. CH 2270 Organic Chemistry Lab. or
3. CH 2210 Survey of Organic Chemistry
4. GEN 3000 Fundamental Genetics
5. Arts and Humanities (Literature) Requirement
6. Organismal Diversity Requirement
7. Elective
8. Elective

**Second Semester**
1. BIOL 3350 Evolutionary Biology
2. BIOL 2230 Organic Chemistry
3. ENGL 3150 Scientific Writing and Comm.
4. MTHS 1050 Calculus of One Variable II
5. Elective

**Junior Year**

**First Semester**
1. BIOL 4610 Cell Biology
2. BIOL 4620 Cell Biology Laboratory
3. PHYS 2070 General Physics I and
4. PHYS 2090 General Physics I Lab. or
5. PHYS 1220 Physics with Calculus I and
6. PHYS 1240 Physics Lab. I
7. Ecology Requirement
8. Entomology Requirement
9. Elective

**Second Semester**
1. BIOL 1010 Frontiers in Biology I
2. BIOL 1110 Principles of Biology I
3. CH 2270 Organic Chemistry and
4. CH 2210 Survey of Organic Chemistry
5. Gen 3000 Fundamental Genetics
6. Arts and Humanities (Non-Lit.) Requirement
7. Entomology Requirement
8. Elective

**Senior Year**

**First Semester**
1. BIOL 4930 Senior Seminar
2. BIOL 4930 Senior Seminar
3. Elective
4. Elective
5. Social Science Requirement
6. Social Science Requirement
7. Major Requirement
8. Major Requirement
9. Elective

**Second Semester**
1. BIOL 1010 Frontiers in Biology I
2. BIOL 1110 Principles of Biology I
3. CH 2270 Organic Chemistry and
4. CH 2210 Survey of Organic Chemistry
5. Gen 3000 Fundamental Genetics
6. Arts and Humanities (Literature) Requirement
7. Elective

**ENTOMOLOGY EMPHASIS AREA**

See College of Agriculture, Forestry and Life Sciences curriculum for freshman year requirements.

**Sophomore Year**

**First Semester**
1. BIOL 2230 Organic Chemistry
2. BIOL 2230 Organic Chemistry Lab.
3. PHYS 2070 General Physics I and
4. PHYS 2210 Physics with Calculus I II
5. Arts and Humanities (Non-Lit.) Requirement
6. Functional Biology Requirement
7. Major Requirement
8. Major Requirement
9. Elective

**Second Semester**
1. BIOL 3350 Evolutionary Biology
2. BCHM 3010 Molecular Biochemistry
3. BCHM 3050 Essential Elements of Bioch.
4. BIOl 3350 Evolutionary Biology
5. Major Requirement
6. Social Science Requirement
7. Elective

**Junior Year**

**First Semester**
1. BIOL 4610 Cell Biology
2. BIOL 4620 Cell Biology Laboratory
3. PHYS 2070 General Physics I and
4. PHYS 2090 General Physics I Lab. or
5. PHYS 1220 Physics with Calculus I and
6. PHYS 1240 Physics Lab. I
7. Ecology Requirement
8. Entomology Requirement
9. Elective

**Second Semester**
1. BIOL 1010 Frontiers in Biology I
2. BIOL 1110 Principles of Biology I
3. CH 2270 Organic Chemistry and
4. CH 2210 Survey of Organic Chemistry
5. Gen 3000 Fundamental Genetics
6. Arts and Humanities (Non-Lit.) Requirement
7. Entomology Requirement
8. Elective

**Senior Year**

**First Semester**
1. BIOL 4930 Senior Seminar
2. BIOL 4930 Senior Seminar
3. Elective
4. Elective
5. Social Science Requirement
6. Social Science Requirement
7. Major Requirement
8. Major Requirement
9. Elective

**Second Semester**
1. BIOL 1010 Frontiers in Biology I
2. BIOL 1110 Principles of Biology I
3. CH 2270 Organic Chemistry and
4. CH 2210 Survey of Organic Chemistry
5. Gen 3000 Fundamental Genetics
6. Arts and Humanities (Non-Lit.) Requirement
7. Entomology Requirement
8. Elective

**ENTOMOLOGY EMPHASIS AREA**

See College of Agriculture, Forestry and Life Sciences curriculum for freshman year requirements.
PREPHARMACY EMPHASIS AREA

Freshman Year
First Semester
1 - BIOL 1010 Frontiers in Biology I
2 - BIOL 1100 General Biology I
3 - BIOL 2100 General Physiology I Lab. I
4 - CH 1100 General Chemistry
5 - COMM 1500 Intro. to Human Comm. or
6 - COMM 2500 Public Speaking
7 - MATH 1060 Calculus of One Variable I

Second Semester
3 - BIOL 1040 General Biology II
1 - BIOL 1060 General Biology Lab. II
4 - CH 1120 General Chemistry
3 - ENGL 1030 Accelerated Composition
4 - MATH 1400 Calculus of One Variable II

Sophomore Year
First Semester
3 - CH 2130 Organic Chemistry
1 - CH 2270 Organic Chemistry Lab. or
4 - CH 2210 Survey of Organic Chemistry
3 - GEN 3000 Fundamental Genetics
3 - Arts and Humanities (Literature) Requirement
3 - Organismal Diversity Requirement
2 - Elective

Second Semester
3 - BCHM 3010 Molecular Biochemistry or
3 - BCHM 3050 Essential Elements of Bioch.
3 - BIOL 3010 Evolutionary Biology
3 - CH 2240 Organic Chemistry and
1 - CH 2280 Organic Chemistry Lab.
3 - Social Science Requirement
3 - Elective

Junior Year
First Semester
4 - BIOL 3150 Functional Human Anatomy
3 - BIOL 4610 Cell Biology
2 - BIOL 4620 Cell Biology Laboratory
3 - PHYS 2070 General Physics I and
1 - PHYS 2090 General Physics I Lab. or
3 - PHYS 2210 Physics with Calculus II and
1 - PHYS 2230 Physics Lab. II
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Economics Requirement

Second Semester
3 - BCHM 3010 Molecular Biochemistry or
3 - BCHM 3050 Essential Elements of Bioch.
3 - CH 2230 Organic Chemistry
4 - CH 2210 Survey of Organic Chemistry
4 - Organismal Diversity Requirement
Partial Differential Equations Requirement
2 - Elective

Senior Year
First Semester
2 - BIOL 4930 Senior Seminar
3 - Ecology Requirement
3 - Major Requirement
5 - Elective

Second Semester
4 - MICR 3050 General Microbiology
3 - Major Requirement
6 - Elective

121-122 Total Semester Hours

TOXICOLOGY EMPHASIS AREA
See Bachelor of Science curriculum for freshman year requirements.

Sophomore Year
First Semester
3 - CH 2230 Organic Chemistry
1 - CH 2270 Organic Chemistry Lab. or
4 - CH 2210 Survey of Organic Chemistry
3 - GEN 3000 Fundamental Genetics
3 - Arts and Humanities (Literature) Requirement
3 - Organismal Diversity Requirement
2 - Elective

Second Semester
3 - BCHM 3010 Molecular Biochemistry or
3 - BCHM 3050 Essential Elements of Bioch.
3 - BIOL 3010 Evolutionary Biology
3 - CH 2240 Organic Chemistry and
1 - CH 2280 Organic Chemistry Lab.
3 - Social Science Requirement
3 - Elective

Junior Year
First Semester
4 - BIOL 3150 Functional Human Anatomy
3 - BIOL 4610 Cell Biology
2 - BIOL 4620 Cell Biology Laboratory
3 - PHYS 2070 General Physics I and
1 - PHYS 2090 General Physics I Lab. or
3 - PHYS 2210 Physics with Calculus II and
1 - PHYS 2230 Physics Lab. II
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Economics Requirement

Second Semester
3 - BIOL 4930 Senior Seminar
3 - Ecology Requirement
3 - Major Requirement
5 - Elective

Second Semester
4 - BIOL 4280 Quantitative Biology
3 - ENGL 3150 Scientific Writing and Comm.
3 - PHYS 2080 General Physics II and
1 - PHYS 2100 General Physics II Lab. or
3 - PHYS 2210 Physics with Calculus II and
1 - PHYS 2230 Physics Lab. II
3 - Arts and Humanities (Literature) Requirement
3 - Ecology Requirement

12 Total Semester Hours

College of Agriculture, Forestry and Life Sciences
Second Semester
3 - BCHM 3010 Molecular Biochemistry or
3 - BCHM 3050 Essential Elements of Bioch, 4
3 - BIOL 3350 Evolutionary Biology
4 - Major Requirement11
3 - Social Science Requirement6
3 - Elective
16

Junior Year
First Semester
- BIOL 4610 Cell Biology
- BIOL 4620 Cell Biology Laboratory
- ETOX 4500 Toxicology
- PHYS 2070 General Physics I and
- PHYS 2090 General Physics I Lab. or
- PHYS 1220 Physics with Calculus I and
- PHYS 1240 Physics Lab. I
3 - Ecology Requirement6
3 - Elective
15

Second Semester
- ENGL 3150 Scientific Writing and Comm.
- PHYS 2080 General Physics II and
- PHYS 2100 General Physics II Lab. or
- PHYS 2210 Physics with Calculus II and
- PHYS 2230 Physics Lab. II
3 - Arts and Humanities (Literature) Requirement6
3 - Functional Biology Requirement6
2 - Elective
15

Senior Year
First Semester
- BIOL 4930 Senior Seminar
- CH 3170 Quantitative Analysis Lab.
3 - Social Science Requirement6
5 - Elective
15

Second Semester
- CH 4130 Chemistry of Aqueous Systems or
- ETOX 4500 Accelerated Composition
3 - Arts and Humanities (Non-Lit.) Requirement6
3 - Toxicology Requirement6
2 - Elective
12

121-122 Total Semester Hours

BIOL 1100 and 1110 are strongly recommended; however, BIOL 1030/1050 may substitute for BIOL 1100, and BIOL 1040/1060 may substitute for BIOL 1110. The remaining 1-2 credits required must be completed at the 2000 level or higher. 

At least one course selected from BIOL 4410, 4420, 4430, 4460, 4700, or MICR 4010.

At least one course selected from BIOL 3160, 4010, 4080, 4590, 4750, or 4800.

Any 400-level ETOX course.

Junior Year
First Semester
- BIOL 3350 Evolutionary Biology
- BIOL 4610 Cell Biology
- BIOL 4620 Cell Biology Laboratory
- ENGL 3150 Scientific Writing and Comm.
- Foreign Language Requirement7
- Minor Requirement11
17

Second Semester
- Arts and Humanities (Non-Lit.) Requirement6
- Foreign Language Requirement7
- Ecology Requirement7
- Minor Requirement11
- 15

Senior Year
First Semester
- BIOL 4930 Senior Seminar
- PHYS 2070 General Physics I
- PHYS 2090 General Physics I Lab.
- Functional Biology Requirement
- Social Science Requirement6

Second Semester
- PHYS 2080 General Physics II
- PHYS 2100 General Physics II Lab.
- 6 - Minor Requirement11
- 15

Double Major in Biological Sciences/Science Teaching—Biological Sciences
The Bachelor of Arts Degree in Biological Sciences and Science Teaching—Biological Sciences prepares students for teaching biology on the secondary school level and for graduate studies in any of the life science areas. See page 114 for the curriculum.

Freshman Year
First Semester
1 - BIOL 1010 Frontiers in Biology I
5 - BIOL 1100 Principles of Biology II
4 - CH 1010 General Chemistry
3 - COM 1500 Intro to Human Comm. or
3 - COMM 2500 Public Speaking
4 - MTHS 1060 Calculus of One Variable I
17

Second Semester
5 - BIOL 1100 Principles of Biology II
4 - CH 1010 General Chemistry
3 - ENGL 3150 Scientific Writing and Comm.
3 - MTHS 1060 Calculus of One Variable II
15

Sophomore Year
First Semester
3 - CH 2230 Organic Chemistry I and
1 - CH 2270 Organic Chemistry Lab or
4 - CH 2010 Survey of Organic Chemistry
3 - GEN 3000 Fundamental Genetics
3 - Arts and Humanities (Literature) Requirement6
4 - Foreign Language Requirement2
3 - Social Science Requirement6
17

Second Semester
3 - BCHM 3010 Molecular Biochemistry or
3 - BCHM 3050 Essential Elements of Bioch.
3 - BCHM 3050 Essential Elements of Bioch.
4 - Foreign Language Requirement2
4 - Major Requirement6
4 - 15

Four credit hours must be selected from BIOL or MICR courses at the 3000 level or above or CH 2240/2280, or from the department-approved list.

At least one lecture and associated laboratory selected from BIOL 3010, 3020/3060, 3030/3070, 3040/3080, 3200, 4060/4070, 4250/4260 or other approved coursework at the 2000 level or higher.

See General Education Requirements. Six of these credit hours must also satisfy the Cross-Cultural Awareness and the Science and Technology in Society Requirements.
Second Semester
3 - ENGL 3140 Technical Writing
3 - ENR 3020 Natural Resources Measurements
3 - Ecology Requirement\(^1\)
3 - Physiology Requirement\(^2\)
3 - Taxonomy/Habitat Requirement\(^3\)
3 - Elective
15

Senior Year
First Semester
3 - FOR (ENR) 4340 GIS for Landscape Planning
3 - Conservation Policy/Law Requirement\(^1\)
3 - Internship, Creative Inquiry or Directed Research\(^3\)
3 - Social Science Requirement\(^1\)
3 - Taxonomy/Habitat Requirement\(^3\)
3 - Elective
15

Second Semester
3 - APEC 4750 Wildlife Economics
3 - ENSP 4000 Studies in Environmental Science
3 - EXST 4620 Statistics Applied to Economics
3 - Macroeconomics Requirement\(^2\)
3 - Natural Science Requirement\(^1\)
15

Senior Year
First Semester
3 - APEC 4570 Natural Resource Use, Technology, and Policy
3 - ECON 3190 Environmental Economics
6 - Applied Economics Requirement\(^4\) or
3 - Applied Economics Requirement\(^6\) and
3 - Minor Requirement
3 - Internship, Creative Inquiry or Directed Research Requirement\(^6\)
15

Second Semester
3 - ENR 4500 Conservation Issues
6 - Applied Economics Requirement\(^4\) or
3 - Applied Economics Requirement\(^6\) and
3 - Minor Requirement
3 - Internship, Creative Inquiry or Directed Research Requirement\(^6\)
120 Total Semester Hours

See General Education Requirements. Three of these credit hours must also satisfy the Cross-Cultural Awareness Requirement. (Note: Social Science Requirement must be in an area other than economics or applied economics.)

\(^1\)GEOG 1060, GEOL 1010, or PHYS 2400
\(^2\)AGM 3010, BIOL 3020/3060, 3030/3070, 3040/3080, 3050/3090, 3200, 4060/4070, 4100/4110, 4170, 4420, 4640, 4660, 4670, 4770, 4860, CSEN 4040, ENT (BIOL) 3010, (BIOL, WFB) 4690, FOR 2310, 4060, GEOL 3120, 3140, 2100, 4030, MICR 4030, WFB 3020, 4400, 4460 or 4760. At least four of the courses must be laboratories or courses with a required laboratory component.
\(^3\)BIOL 4410, 4420, 4430, 4460, 4700, or FOR 4660
\(^4\)APEC 4330, 4750, CRD (APEC) 3570, or FOR 3040
\(^5\)AVS 1010, BIOL 4010/4020, 4580, 4750, or (AVS) 4430
\(^6\)ENR 4290, FOR 4000, (ENR) 4160, or WFB 4302
\(^7\)Internship (FNRF 4900), Creative Inquiry (APEC 4910), or Directed Research (WFB 4630); or Senior Honors Thesis (FOR 4910).

NATURAL RESOURCE AND ECONOMIC POLICY CONCENTRATION

Sophomore Year
First Semester
3 - APEC 2570 Natural Resources, Environment and Economics or
3 - ECON 2110 Principles of Microeconomics
3 - POSC 1010 American National Government or
3 - POSC 1020 Intro. to International Relations
3 - Geography Requirement\(^7\)
3 - Natural Science Requirement\(^3\)
3 - Elective
15

Second Semester
3 - APEC (CRD) 3570 Natural Res. Economics
3 - ECON 2120 Principles of Macroeconomics
3 - Arts and Humanities (Literature) Requirement\(^4\)
3 - Arts and Humanities (Non-Lit.) Requirement\(^3\)
3 - Elective
15

Junior Year
First Semester
3 - ECON 3140 Intermediate Microeconomics
3 - ENR 4290 Environmental Law and Policy
3 - Advanced Writing Requirement\(^2\)
3 - Applied Economics Requirement\(^6\)
3 - Natural Science Requirement\(^1\)
15

Second Semester
3 - APEC 4750 Wildlife Economics
3 - ENSP 4000 Studies in Environmental Science
3 - Macroeconomics Requirement\(^2\)
3 - Natural Science Requirement\(^1\)
15

Junior Year
First Semester
3 - APEC 2570 Natural Resources, Environment and Economics or
3 - ECON 2110 Principles of Microeconomics
4 - BIOL 3200 Field Botany or
3 - BIOL 4060 Intro. Plant Taxonomy and
1 - BIOL 4070 Plant Taxonomy Lab.
3 - ENR 4290 Environmental Law and Policy or
3 - FOR 4000 Public Relations in Natural Res.
3 - Minor Requirement\(^2\)
3 - Elective
16

Second Semester
3 - FOR (ENR) 4160 Forest Policy and Admin.
3 - FOR (ENR) 4340 GIS for Landscape Planning
3 - Internship, Creative Inquiry or Directed Research Requirement\(^6\)
3 - Minor Requirement\(^2\)
3 - Elective
15

122 Total Semester Hours

NATURAL RESOURCES MANAGEMENT CONCENTRATION

Sophomore Year
First Semester
4 - FNR 2040 Soil Information Systems or
4 - CSEN 2020 Soils
2 - FOR 2050 Dendrology
3 - FOR 2210 Forest Biology
3 - WFB 3000 Wildlife Biology
3 - Arts and Humanities (Literature) Requirement\(^4\)
15

Second Semester
3 - ENR 3020 Natural Resources Measurements
3 - FOR 2060 Forest Ecology
3 - WFB 3500 Principles of Fish and Wildlife Biol.
3 - Arts and Humanities (Non-Lit.) Requirement\(^1\)
3 - Social Science Requirement\(^1\)
15

Junior Year
First Semester
3 - APEC 2570 Natural Resources, Environment and Economics or
3 - ECON 2110 Principles of Microeconomics
4 - BIOL 3200 Field Botany or
3 - BIOL 4060 Intro. Plant Taxonomy and
1 - BIOL 4070 Plant Taxonomy Lab.
3 - ENR 4290 Environmental Law and Policy or
3 - FOR 4000 Public Relations in Natural Res.
3 - Minor Requirement\(^2\)
3 - Elective
16

Second Semester
3 - ENR 4500 Conservation Issues
3 - ENGL 3140 Technical Writing
2 - FOR 4060 Forested Watershed Management
1 - FOR 4980 Senior Portfolio or
1 - WFB 4980 Senior Portfolio
3 - WFB (BIOL) 3130 Conservation Biology
3 - Minor Requirement\(^2\)
15

122 Total Semester Hours

3 See General Education Requirements. Three of these credit hours must also satisfy the Cross-Cultural Awareness Requirement. (Note: Social Science Requirement must be in an area other than economics or applied economics.)

A minor is required and must be selected from the following: Biochemistry; Biological Sciences; Chemistry; Crop and Soil Environmental Science; Environmental Science and Policy; Forest Resource Management; Geology; Horticulture; Legal Studies; Microbiology; Natural Resource Economics; Nonprofit Leadership; Park and Protected Area Management; Therapeutic Recreation; Travel and Tourism; Urban Forestry; Wildlife and Fisheries Biology.

Internship (FNRF 4900), Creative Inquiry (FNR 4910), or Directed Research (WFB 4630 or FOR 4910).
### FOOD SCIENCE

#### Bachelor of Science

Food Science majors apply principles of basic and applied sciences to design and manufacture safe and quality foods in addition to identifying the relationship between nutrients and human health. The curriculum allows flexibility for concentrating in one of two areas:

In the Food Science and Technology Concentration, students may emphasize business, culinary science (one of three national programs that have been approved by the Research Chef’s Association as Culinology™), engineering, food packaging, and additional sciences that complement requirements of the Institute of Food Technologists.

Food processing industries, ingredient manufacturers, and packaging suppliers employ graduates in new food product development, quality assurance, production management, and technical sales. State and federal agencies also need graduates for food safety and regulatory positions.

The Nutrition and Dietetics Concentration prepares students for graduate study in nutrition and a variety of health-related fields as well as dietetic internship programs to become a Registered Dietitian.

Examples of career opportunities include employment as dietitians, nutritionists, consultants, and food specialists. The Nutrition and Dietetics curriculum is accredited by the Accreditation Council for Education of Nutrition and Dietetics (ACEND).

The Department of Food, Nutrition and Packaging Sciences also offers an accelerated five-year combined bachelor's/master's program that allows students to count up to twelve hours of graduate credit toward both the BS degree in Food Science and the MS degree in Food, Nutrition and Culinary Sciences. Details are available from the Department of Food, Nutrition and Packaging Sciences or at www.clemson.edu/tnps.

### FOOD SCIENCE AND TECHNOLOGY CONCENTRATION

#### Freshman Year

**First Semester**
- 3 - BIOL 1010 General Biology I and
- 1 - BIOL 1050 General Biology Lab I or
- 5 - BIOL 1100 Principles of Biology I
- 4 - CH 1010 General Chemistry
- 3 - COMM 1500 Intro. to Human Comm. or
- 3 COMM 2500 Public Speaking
- 1 - FDSC 1010 Epochs in Man’s Struggle for Food
- 3 - MTHS 1020 Intro. to Math. Analysis or
- 4 - MTHS 1060 Calculus of One Variable I

**Second Semester**
- 3 - BIOL 1040 General Biology II and
- 1 - BIOL 1060 General Biology Lab. II or
- 5 - BIOL 1110 Principles of Biology II
- 4 - CH 1020 General Chemistry
- 3 - ENGL 1030 Accelerated Composition
- 1 - FDSC 1020 Perspectives in Food and Nutrition Sciences
- 1 - FDSC 4500 Creative Inquiry
- 3 - PSYC 2010 Introduction to Psychology

**Sophomore Year**

**First Semester**
- 4 - CH 2010 Survey of Organic Chemistry or
- 3 - CH 2230 Organic Chemistry and
- 1 - CH 2270 Organic Chemistry Lab.
- 1 - FDSC 4500 Creative Inquiry
- 3 - PHYS 1220 Physics with Calculus I and
- 1 - PHYS 1240 Physics Lab. I or
- 4 - PHYS 2000 Introductory Physics or
- 3 - PHYS 2070 General Physics I and
- 1 - PHYS 2090 General Physics Lab.
- 3 - Arts and Humanities (Literature) Requirement
- 3 - Social Science Requirement

**Second Semester**
- 3 - BCHM 3050 Essential Elements of Biochemistry
- 2 - BIOL 4340 Biological Chemistry Lab. Techniq.
- 3 - EXST 3010 Introductory Statistics
- 1 - FDSC 2140 Food Resources and Society
- 1 - FDSC 4500 Creative Inquiry
- 3 - Arts and Humanities (Non-Lit.) Requirement
- 2 - Electives

**Junior Year**

**First Semester**
- 1 - FDSC 3010 Food Regulations and Policy
- 1 - FDSC 4170 Seminar
- 1 - FDSC 4500 Creative Inquiry
- 4 - MCHS 3100 General Microbiology
- 3 - NUTR 4510 Human Nutrition
- 3 - Departmental Requirement
- 2 - Emphasis Area Requirement

**Second Semester**
- 3 - BCHM 3050 Essential Elements of Biochemistry
- 2 - BIOL 4340 Biological Chemistry Lab. Techniq.
- 3 - EXST 3010 Introductory Statistics
- 1 - FDSC 4010 Food Chemistry I
- 4 - MCHS 4070 Food and Dairy Microbiology
- 3 - Emphasis Area Requirement

**Senior Year**

**First Semester**
- 3 - FDSC 3060 Food Service Operations or
- 3 - FDSC 3070 Restaurant Food Service Mgmt.
- 3 - FDSC 4010 Food Chemistry I
- 3 - FDSC 4040 Food Preservation and Processing
- 2 - FDSC 4070 Quantity Food Production
- 1 - FDSC 4500 Creative Inquiry
- 3 - Emphasis Area Requirement

**Second Semester**
- 3 - FDSC 4020 Food Chemistry II
- 4 - FDSC 4080 Food Process Engineering
- 3 - FDSC 4090 Total Quality Mgt. for the Food and Packaging Industries
- 1 - FDSC 4500 Creative Inquiry
- 3 - Emphasis Area Requirement

124–127 Total Semester Hours

*See General Education Requirements. Three of these credit hours must also satisfy the Cross-Cultural Awareness Requirement.

### NUTRITION AND DIETETICS CONCENTRATION

#### Freshman Year

**First Semester**
- 3 - BIOL 1030 General Biology I and
- 1 - BIOL 1050 General Biology Lab I or
- 5 - BIOL 1100 Principles of Biology I
- 4 - CH 1010 General Chemistry
- 3 - COMM 1500 Intro. to Human Comm. or
- 3 COMM 2500 Public Speaking
- 1 - FDSC 1010 Epochs in Man’s Struggle for Food
- 3 - MTHS 1020 Intro. to Math. Analysis or
- 4 - MTHS 1060 Calculus of One Variable I

**Second Semester**
- 3 - BIOL 1040 General Biology II and
- 1 - BIOL 1060 General Biology Lab. II or
- 5 - BIOL 1110 Principles of Biology II
- 4 - CH 1020 General Chemistry
- 3 - ENGL 1030 Accelerated Composition
- 1 - FDSC 1020 Perspectives in Food and Nutrition Sciences
- 3 - PSYC 2010 Introduction to Psychology

**Sophomore Year**

**First Semester**
- 3 - APEC 2020 Agricultural Economics or
- 3 - ECON 2110 Principles of Microeconomics or
- 3 - ECON 2120 Principles of Macroeconomics
- 4 - CH 2010 Survey of Organic Chemistry or
- 3 - CH 2230 Organic Chemistry and
- 1 - CH 2270 Organic Chemistry Lab.
- 1 - NUTR 2160 Current Issues in Nutrition
- 3 - NUTR 2030 Principles of Human Nutrition
- 3 - PHYS 1220 Physics with Calculus I and
- 1 - PHYS 1240 Physics Lab. I or
- 4 - PHYS 2000 Introductory Physics or
- 3 - PHYS 2070 General Physics I and
- 1 - PHYS 2090 General Physics Lab.

**Second Semester**
- 3 - BCHM 3050 Essential Elements of Biochemistry
- 2 - BIOL 4340 Biological Chemistry Lab. Techniq.
- 3 - EXST 3010 Introductory Statistics
- 3 - NUTR 2040 Life Cycle Nutrition
- 3 - Arts and Humanities (Literature) Requirement
- 3 - Arts and Humanities (Non-Lit.) Requirement
### Junior Year

**First Semester**
- 4 - BIOL 2220 Human Anatomy and Phys. I
- 1 - FDSC 3010 Food Regulations and Policy
- 1 - FDSC 4500 Creative Inquiry
- 4 - MICR 3050 General Microbiology
- 3 - NUTR 4510 Human Nutrition
- 2 - Elective

15

**Second Semester**
- 4 - BIOL 2230 Human Anatomy and Phys. II
- 3 - FDSC 3060 Food Service Operations
- 1 - FDSC 4500 Creative Inquiry
- 4 - MICR 4070 Food and Dairy Microbiology
- 1 - NUTR 4180 Professional Dev. in Dietetics or
  1 - NUTR 4190 Professional Dev. In Nutrition
- 3 - NUTR 4550 Nutrition and Metabolism

15

### Senior Year

**First Semester**
- 3 - ENGL 3040 Business Writing or
  3 - ENGL 3140 Technical Writing
- 3 - FDSC 4010 Food Chemistry I
- 3 - FDSC 4040 Food Preservation and Processing
- 2 - FDSC 4070 Quantity Food Production
- 4 - NUTR 4240 Medical Nutrition Therapy I

16

**Second Semester**
- 3 - FDSC 4020 Food Chemistry II
- 2 - FDSC 4030 Food Chemistry and Analysis
- 3 - FDSC (PKSC) 4090 Total Quality Mgt. for the Food and Packaging Industries
- 4 - NUTR 4250 Medical Nutrition Therapy II
- 3 - NUTR 4260 Community Nutrition
- 1 - NUTR 4270 Nutrition Counseling

16

124–127 Total Semester Hours

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### College of Agriculture, Forestry and Life Sciences

The curriculum, accredited by the Society of American Foresters, provides a strong program in the basic knowledge and skills required of a professional forester. Forest Resource Management majors will select a minor (see page 63). The curriculum also provides the necessary prerequisites for graduate study.

For students interested in conservation biology, water, and natural resources, the School of Agricultural, Forest and Environmental Sciences also administers the Conservation Biology Concentration and the Natural Resources Management Concentration within the Environmental and Natural Resources degree program. See pages 51-52 for program details.

### Freshman Year

**First Semester**
- 3 - BIOL 1030 General Biology I
- 1 - BIOL 1050 General Biology Lab. I
- 4 - CH 1010 General Chemistry
- 1 - ENR 1010 Intro. to Environ. and Natural Res. I
- 3 - MTHS 1020 Intro. to Mathematical Analysis

3 - Oral Communication Requirement

15

**Second Semester**
- 3 - BIOL 1040 General Biology II
- 1 - BIOL 1060 General Biology Lab. II
- 3 - ENGL 1030 Accelerated Composition
- 3 - EXST 3010 Introductory Statistics
- 1 - FNR 1020 FNR Freshman Portfolio
- 4 - Departmental Science Requirement

15

### Sophomore Year

**First Semester**
- 4 - FNR 2040 Soil Information Systems
- 1 - FOR 2050 Dendrology
- 3 - Arts and Humanities (Literature) Requirement
- 3 - Economics Requirement

15

**Second Semester**
- 3 - ENGL 3140 Technical Writing
- 3 - FOR 2210 Forest Biology
- 3 - MTHS 1020 Intro. to Mathematical Analysis
- 3 - Oral Communication Requirement

15

### Forestry Summer Camp

1 - FOR 2510 Forest Communities
- 1 - FOR 2520 Forest Operations
- 1 - FOR 2530 Forest Mensuration
- 1 - FOR 2540 Forest Products

8

### Junior Year

**First Semester**
- 2 - FOR 3020 Forest Biometrics
- 3 - FOR 3040 Forest Resource Economics
- 3 - FOR 3410 Wood Procurement Practices in the Forest Industry
- 4 - FOR 4130 Integrated Forest Pest Management
- 3 - FOR (ENR) 4340 GIS for Landscape Planning
- 1 - Internship, Creative Inquiry or Directed

Research Requirement

15

**Second Semester**
- 2 - FOR 3080 Remote Sensing in Forestry
- 3 - FOR 4080 Wood and Paper Products
- 3 - FOR 4180 Forest Resource Valuation
- 4 - FOR 4650 Silviculture
- 3 - Minor Requirement
- 1 - Internship, Creative Inquiry or Directed

Research Requirement

16

### Senior Year

**First Semester**
- 4 - FOR 4100 Harvesting Processes
- 3 - FOR (ENR) 4160 Forest Policy and Admin.
- 3 - FOR 4170 Forest Resource Mgt. and Regulation
- 2 - FOR 4180 Recreation Resource Planning in Forest Management
- 3 - Minor Requirement
- 1 - Internship, Creative Inquiry or Directed

Research Requirement

16

### LAND SURVEYING

**EMPHASIS AREA**

### Freshman Year

**First Semester**
- 3 - BIOL 1030 General Biology I
- 1 - BIOL 1050 General Biology Lab. I
- 4 - CH 1010 General Chemistry
- 1 - ENR 1010 Intro. to Environ. and Natural Res. I
- 3 - MTHS 1020 Intro. to Mathematical Analysis

3 - Oral Communication Requirement

15

**Second Semester**
- 3 - BIOL 1040 General Biology II
- 1 - BIOL 1060 General Biology Lab. II
- 3 - ENGL 1030 Accelerated Composition
- 3 - EXST 3010 Introductory Statistics
- 1 - FNR 1020 FNR Freshman Portfolio
- 4 - Departmental Science Requirement

15

131 Total Semester Hours

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3See General Education Requirements. Three of these credit hours must also satisfy the Cross-Cultural Awareness Requirement.

4NUTR 4190 is recommended for students not pursuing registered dietitian (RD) status.

5FOR 4700, 4900, or FOR 4190.

6To be selected by the middle of the sophomore year.

7FNR 4000, 4900, or FOR 4190.

8See advisor. CH 1020 or PHYS 2000 or higher level general physics course.

9APEC 2570, ECON 2000, 2110, or 2120.

10To be selected in an area other than economics or applied economics.)

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### Bachelor of Science

The Forest Resource Management curriculum combines a broad education in the arts and sciences with applied forest sciences. This combination provides the necessary foundation for the scientific management of forest resources, products, and services.

Foresters are qualified for a broad spectrum of employment opportunities in the public and private sectors. They may be engaged as managers, administrators, or owners of forest lands or forest-based businesses; as technical specialists in the production of timber, usable water, wildlife, and aesthetic values, and in the recreational use of the forest; or as professionals in other areas where the conservation of natural resources is a concern. Foresters earning advanced degrees find employment in academic work and in research conducted by public and private agencies.
Sophomore Year
First Semester
4 - FNR 2040 Soil Information Systems
2 - FOR 2050 Dendrology
3 - FOR 2210 Forest Biology
3 - Arts and Humanities (Literature) Requirement1
3 - Economics Requirement1
15

Second Semester
2 - ENGR 2100 Engr. Graphics for Civil Engr.
3 - ENGL 3140 Technical Writing
3 - FOR 2060 Forestry Ecology
3 - Arts and Humanities (Non-Lit.) Requirement1
3 - Social Science Requirement1
14

Forestry Summer Camp
2 - FOR 2510 Forest Communities
1 - FOR 2520 Forest Operations
4 - FOR 2530 Forest Mensuration
1 - FOR 2540 Forest Products
8

Junior Year
First Semester
2 - FOR 3020 Forest Biometrics
3 - FOR 3040 Forest Resource Economics
3 - FOR 3410 Wood Procurement Practices in the Forest Industry
4 - FOR 4130 Integrated Forest Pest Management
3 - FOR (ENR) 4340 GIS for Landscape Planning
15

Second Semester
3 - AGM 2210 Surveying: Earthwork and Area Measurements
2 - FOR 3080 Remote Sensing in Forestry
3 - FOR 4080 Wood and Paper Products
3 - FOR 4180 Forest Resource Economics
2 - ENGR 2100 Engr. Graphics for Civil Engr.
3 - Surveying: Earthwork and Area Measurements
15

Summer
3 - FNR 4900 Field Training in Natural Resources1

Senior Year
First Semester
4 - FOR 4100 Harvesting Processes
3 - FOR (ENR) 4160 Forest Policy and Admin.
3 - FOR 4170 Forest Resource Mgt. and Regulation
2 - FOR 4310 Rec. Resource Plan. in Forest Mgt.
3 - FOR 4330 GIS Applications
15

Second Semester
3 - BE 3220 Small Watershed Hydrology and Sedimentology
1 - FNR 4990 Natural Resources Seminar
2 - FOR 4060 Forested Watershed Management
3 - FOR 4150 Forest Wildlife Management
2 - FOR 4250 Forest Resource Management Plans
1 - FOR 4980 Senior Portfolio
1 - LAW 3330 Real Estate Law
15
130 Total Semester Hours

Second Semester
3 - BCHM 3010 Molecular Biochemistry
2 - BCHM 3020 Molecular Biochemistry Lab.
3 - CH 2240 Organic Chemistry
1 - CH 2280 Organic Chemistry Lab.
3 - EXST 3010 Introductory Statistics
3 - Arts and Humanities (Literature) Requirement2
3 - Social Science Requirement2
18

Junior Year
First Semester
3 - GEN 4200 Molecular Genetics and Gene Reg.
2 - GEN 4210 Molecular Genetics and Gene Regulation Lab.
3 - GEN (BCHM) 4400 Bioinformatics
3 - Science Requirement3
3 - Elective4
14

Second Semester
3 - BIOL 4610 Cell Biology
3 - GEN 4100 Population and Quantitative Gen.
2 - GEN 4111 Population and Quantitative Genetics Lab.
3 - FPH 3260 Science and Values
3 - Genetics Requirement3
3 - Elective4
17

Senior Year
First Semester
3 - GEN 4500 Comparative Genetics
3 - Science Requirement3
3 - Social Science Requirement2
6 - Elective4
15

Second Semester
2 - GEN 4930 Senior Seminar
6 - Genetics Requirement3
3 - Science Requirement3
4 - Elective4
16

123 Total Semester Hours

Notes:
1. A student is allowed to enroll in science and mathematics course only when all prerequisites have been passed with a grade of C or better.
2. A minimum grade of C is required in all science and mathematics courses. No student may exceed a maximum of two attempts, excluding a W, to complete successfully any science or mathematics course.
HORTICULTURE

Bachelor of Science

Horticulture connects plants and people to improve our world, be it through the enhancement of the foods we eat, the creation of healthy natural living spaces, the economic and aesthetic enhancement of our homes and communities, or the application of green solutions to the challenges of environmental quality. The plants of horticulture are the foundation of human and environmental well-being, and it is horticulture professionals who have the knowledge, skills, and passion to utilize those plants for the betterment of humankind.

The Horticulture degree program includes courses in science, mathematics, business, leadership, law, and communication, combined with a strong foundation in horticultural sciences and arts. The curriculum provides the flexibility to choose courses within those categories that best support the student’s personal interests, goals, and success. Career opportunities are endless.

Students work closely with faculty in creative inquiry groups to investigate and implement solutions to real problems. Internships are excellent opportunities to learn and explore potential careers.

Freshman Year

First Semester
- 3 - HORT 3030 Sustainable Landscape Garden Design
- 3 - Business Requirement
- 3 - Horticulture Specialization Requirement
- 3 - Oral Communication Requirement
- 3 - Related Science Requirement

Second Semester
- 3 - HORT 4010 Plant Physiology Lab
- 3 - HORT 4040 Plant Propagation Lab
- 3 - Horticulture Specialization Requirement
- 3 - Social Science Requirement
- 1 - Elective

Senior Year

First Semester
- 3 - HORT 4090 Senior Capstone Course
- 3 - Business Requirement
- 3 - Horticulture Specialization Requirement
- 3 - Related Science Requirement
- 3 - Elective

Second Semester
- 3 - Horticulture Specialization Requirement
- 3 - Elective
- 3 - Related Science Requirement
- 1 - Elective

MICROBIOLOGY

Bachelor of Science

Microbiology deals with the study of bacteria, viruses, yeasts, filamentous fungi, protozoa, and unicellular algae. Microbiologists seek to describe these organisms in terms of their structures, functions, and processes of reproduction, growth, and death at both the cellular and molecular levels. They are also concerned with their ecology, particularly in regard to their pathologcal effects on man, and with their economic importance.

The Microbiology major provides a thorough training in the basic microbiological skills. Further, students receive instruction in mathematics, physics, chemistry, and biochemistry, all essential to the training of a modern microbiologist. Students can prepare for a variety of careers through a wide choice of electives. The Microbiology curriculum with a Biomedicine Concentration is recommended for students planning postgraduate programs. Microbiology graduates may enter graduate school in microbiology, biochemistry, bioengineering, or related disciplines; they may enter medical or dental schools or pursue careers in one of the many industries or public service departments dependent upon microbiology. Some of these are the fermentation and drug industries, medical and public health microbiology, various food industries, and agriculture.

Microbiology majors planning to apply for admission to a medical or dental school should inform their advisors immediately upon entering the program.

Freshman Year

First Semester
- 5 - BIOL 1100 Principles of Biology I
- 4 - CH 1010 General Chemistry
- 3 - COMM 1500 Intro. to Human Comm. or COMM 2500 Public Speaking
- 1 - MICR 1010 Microbes and Human Affairs
- 4 - MTHS 1060 Calculus of One Variable I

Second Semester
- 5 - BIOL 1110 Principles of Biology II
- 4 - CH 1020 General Chemistry
- 3 - ENGL 1030 Accelerated Composition
- 3 - Mathematical Sciences Requirement

Sophomore Year

First Semester
- 3 - CH 2270 Organic Chemistry
- 1 - CH 2270 Organic Chemistry Lab.
- 3 - ENGL 3150 Scientific Writing and Comm.
- 3 - Arts and Humanities (Literature) Requirement
- 3 - Social Science Requirement
- 3 - Elective

Second Semester
- 3 - HORT 4010 Plant Physiology Lab
- 3 - HORT 4040 Plant Propagation Lab
- 3 - Horticulture Specialization Requirement
- 3 - Social Science Requirement
- 3 - Elective

Junior Year

First Semester
- 3 - MICR 4010 Microbial Diversity and Ecology
- 3 - PHYS 2070 General Physics I
- 1 - PHYS 2090 General Physics I Lab. or
- 3 - PHYS 1220 Physics with Calculus I and
- 1 - PHYS 1240 Physics Lab. I
- 6 - Microbiology Requirement
- 3 - Elective

Second Semester
- 3 - MICR 4120 Bacterial Physiology
- 2 - MICR 4500 Advanced Micro Lab I
- 3 - Microbiology Requirement
- 3 - Social Science Requirement
- 3 - Elective
Senior Year

First Semester
3 - BIOL 4610 Cell Biology
3 - MCR 4150 Microbial Genetics
2 - MCR 4510 Advanced Micro Lab II
3 - Virology Requirement
3 - Elective
14

Second Semester
2 - MCR 4520 Advanced Micro Lab III
2 - MCR 4930 Senior Seminar
3 - Microbiology Requirement
2 - Elective
16

124–125 Total Semester Hours

1BIOL 1100 and 1110 are strongly recommended; however, BIOL 1030/1050 may substitute for BIOL 1100, and BIOL 1040/1060 may substitute for BIOL 1110. The remaining 1-2 credits required must be satisfied by completing 1-2 extra credits from departmental course offerings at the 3000 level or above. See advisor.

2MTHS 1040/1060 may substitute for BIOL 1110. The remaining 1-2 credits required must be satisfied by completing 1-2 extra credits from departmental course offerings at the 3000 level or above. See advisor.

3See General Education Requirements. Six of these credit hours must also satisfy the Cross-Cultural Awareness and Science and Technology in Society Requirements.

4See advisor. Medical and dental schools have different mathematics requirements.

5BIOL 1100 and 1110 are strongly recommended; however, BIOL 1030/1050 may substitute for BIOL 1100, and BIOL 1040/1060 may substitute for BIOL 1110. The remaining 1-2 credits required must be satisfied by completing 1-2 extra credits from departmental course offerings at the 3000 level or above. See advisor.

6Students changing majors to Packaging Science must take PHYS 2100 and 2110 during the second semester of their junior year.

BIOMEDICINE CONCENTRATION

Freshman Year

First Semester
5 - BIOL 1100 Principles of Biology I
4 - CH 1010 General Chemistry
3 - COMM 1500 Intro. to Human Comm. or
3 - COMM 2500 Public Speaking
1 - MCR 1010 Microbes and Human Affairs
4 - MTHS 1060 Calculus of One Variable I
17

Second Semester
5 - BIOL 1110 Principles of Biology II
4 - CH 1020 General Chemistry
3 - ENGL 1030 Accelerated Composition
3 - Mathematical Sciences Requirement
15-16

Sophomore Year

First Semester
3 - CH 2230 Organic Chemistry
1 - CH 2270 Organic Chemistry Lab.
3 - ENGL 3150 Scientific Writing and Comm.
3 - Arts and Humanities (Literature) Requirement
3 - Social Science Requirement
3 - Elective
16

Second Semester
3 - CH 2240 Organic Chemistry
1 - CH 2280 Organic Chemistry Lab.
3 - Arts and Humanities (Non-Lit.) Requirement
1 - Biochemistry Requirement
3 - Biomedicine Requirement
4 - General Microbiology Requirement
17

Junior Year

First Semester
3 - BIOL 4610 Cell Biology
2 - BIOL 4620 Cell Biology Lab.
3 - MCR 4100 Microbial Diversity and Ecology
3 - PHYS 2070 General Physics I and
1 - PHYS 2090 General Physics I Lab.
3 - PHYS 1220 Physics with Calculus I
1 - PHYS 1240 Physics Lab. I
1 - Genetics Requirement
15

Second Semester
3 - MCR 4120 Basic Immunology
2 - MCR 4520 Advanced Micro Lab I
3 - PHYS 2040 General Physics II and
1 - PHYS 2060 General Physics II Lab, or
3 - PHYS 2220 Physics with Calculus II and
1 - PHYS 2230 Physics Lab. II
3 - Social Science Requirement
3 - Elective
12

Senior Year

First Semester
3 - MCR 4140 Basic Immunology
3 - MCR 4150 Microbial Genetics
3 - MCR 4160 Introductory Virology
2 - MCR 4510 Advanced Micro Lab II
3 - Biomedicine Requirement
14

Second Semester
3 - MCR 4110 Pathogenic Bacteriology
3 - MCR 4170 Molecular Mechanisms of Carcinogenesis and Aging
2 - MCR 4520 Advanced Micro Lab III
2 - MCR 4930 Senior Seminar
3 - Biomedicine Requirement
3 - Elective
16

125–126 Total Semester Hours

1BIOL 1100 and 1110 are strongly recommended; however, BIOL 1030/1050 may substitute for BIOL 1100, and BIOL 1040/1060 may substitute for BIOL 1110. The remaining 1-2 credits required must be satisfied by completing 1-2 extra credits from departmental course offerings at the 3000 level or above. See advisor.

Combined Bachelor of Science/Master of Science Degree Program

The Department of Food, Nutrition and Packaging Sciences also offers an accelerated five-year combined bachelor’s/master’s program that allows students to count up to twelve hours of graduate credit toward both the BS degree in Packaging Science and the MS degree in Packaging Science. Details are available from the Department of Food, Nutrition and Packaging Sciences or at www.clemson.edu/fnps.

Freshman Year

First Semester
3 - BIOL 1030 General Biology I
1 - BIOL 1050 General Biology Lab. I
4 - CH 1010 General Chemistry
4 - MTHS 1060 Calculus of One Variable I
1 - PKSC 1010 Packaging Orientation
3 - Social Science Requirement
16

20-21
### College of Agriculture, Forestry and Life Sciences

#### Second Semester
- 3 - BIOL 1040 General Biology II
- 1 - BIOL 1060 General Biology Lab. II
- 4 - CH 1020 General Chemistry
- 3 - COMM 2500 Public Speaking
- 3 - ENGL 1030 Accelerated Composition
- 2 - PKSC 1020 Intro. to Packaging Science

#### First Semester
- 3 - PKSC 4160 Appl. of Polymers in Packaging
- 6 - PKSC 4030 Packaging Career Preparation
- 3 - PKSC 4200 Package Design and Development
- 3 - Arts and Humanities (Non-Lit.) Requirement

<table>
<thead>
<tr>
<th>First Year</th>
<th>Sophomore Year</th>
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<tbody>
<tr>
<td>124 Total Semester Hours</td>
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<th>Summer</th>
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<tbody>
<tr>
<td>0 - COOP 1010 Cooperative Education</td>
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<th>Junior Year</th>
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<tbody>
<tr>
<td>First Semester</td>
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<tr>
<td>3 - ENGL 3140 Technical Writing</td>
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<td>4 - GC 1030 Graphic Comm. I for Packaging</td>
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<td>3 - PKSC 4040 Mechanical Properties of Packages and Principles of Protective Packaging</td>
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<tr>
<td>1 - PKSC 4540 Product and Package Eval. Lab.</td>
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<td>3 - Emphasis Area Requirement</td>
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<th>Second Semester</th>
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<tbody>
<tr>
<td>3 - PKSC 3200 Package Design Fundamentals</td>
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<td>3 - PKSC 3680 Packaging and Society</td>
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<td>3 - PKSC 4010 Packaging Machinery</td>
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<td>3 - PKSC 4300 Converting for Flexible Packaging</td>
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<td>3 - PKSC 4400 Packaging for Distribution</td>
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<tr>
<th>Senior Year</th>
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<tbody>
<tr>
<td>First Semester</td>
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<tr>
<td>3 - EXST 3010 Introductory Statistics</td>
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<tr>
<td>4 - PKSC 4160 Appl. of Polymers in Packaging</td>
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<tr>
<td>4 - PKSC 4040 Food and Health Care Pkg. Syst.</td>
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<td>3 - Emphasis Area Requirement</td>
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</table>

### PREPROFESSIONAL HEALTH STUDIES

#### Non-degree

The health professions need individuals with a diversity of educational backgrounds and a wide variety of talents and interests. The philosophies of education, the specific preprofessional course requirements, the noncognitive qualifications for enrollment, and the systems of training vary among the professional health schools; but all recognize the desirability of a broad education—a good foundation in the natural sciences, highly developed communication skills, and a solid background in the humanities and social sciences. The absolute requirements for admission to professional health schools are limited to allowing latitude for developing individualized undergraduate programs of study; however, most schools of medicine and dentistry require 16 semester hours of chemistry, including organic chemistry, eight hours of biological sciences, eight hours of physics, and six hours of mathematics. These requirements should be balanced with courses in vocabulary building, the humanities, and social sciences. The basic requirements in the natural sciences and as many of the courses in the humanities and social sciences as possible should be completed by the third year so students are prepared to take the Dental Admission Test or the Medical College Admission Test prior to applying to a professional school.

Undergraduates may also prepare to study optometry, podiatry, and other health professions. While the basic requirements for these professional schools are essentially the same as those for schools of medicine and dentistry, specific requirements for individual schools in these professions vary somewhat; consequently, interested students are advised to consult the health professionals advisor.

At Clemson, rather than having a separate, organized preprofessional health studies program, students are allowed to major in any curriculum, as long as the basic entrance requirements of the professional health school are fulfilled. These schools are not as concerned about a student’s major as they are about academic performance in whichever curriculum the student chooses. Professional health schools have neither preferences nor prejudices concerning any curriculum, which is evidenced by the fact that their entering students represent a broad spectrum of curricula. The emphasis is placed on the student’s doing well in the curriculum chosen, and this becomes critical as competition increases for the limited number of places available in professional health schools.

#### PREPHARMACY

The two-year Prepharmacy program requires 66–72 credit hours, depending on the pharmacy school of interest. Upon completion of the program, students will be eligible to apply to a college of pharmacy, usually the South Carolina College of Pharmacy (MUSC and USC campuses), and may be eligible to apply for the Bachelor of Science in Preprofessional Studies. The degree in Pharmacy is awarded by the institution attended. It is important for students to work closely with their advisor as there are variations in courses required by the pharmacy schools.

For financial aid purposes, students in the Prepharmacy program are considered to be enrolled in a degree-seeking program.

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<tbody>
<tr>
<td>3 - BIOL 1030 General Biology I</td>
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<tr>
<td>1 - BIOL 1050 General Biology Lab. I</td>
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<td>4 - CH 1010 General Chemistry</td>
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<td>4 - MTHS 1060 Calculus of One Variable I</td>
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<td>3 - PSYC 2010 Introduction to Psychology</td>
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<tbody>
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<td>3 - BIOL 1040 General Biology II</td>
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<td>1 - BIOL 1060 General Biology Lab. II</td>
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<td>4 - CH 1020 General Chemistry</td>
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<td>3 - ECON 2000 Economic Concepts</td>
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<td>3 - ENGL 1030 Accelerated Composition</td>
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<td>3 - EXST 3010 Introductory Statistics</td>
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<td>1 - Elective</td>
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</table>
Second Year
First Semester
4 - BIOL 2220 Human Anatomy and Phys. I
3 - CH 2230 Organic Chemistry
1 - CH 2270 Organic Chemistry Lab.
3 - PHYS 2070 General Physics I
1 - PHYS 2090 General Physics I Lab.
3 - Arts and Humanities (Literature) Requirement2
3 - History or Philosophy Requirement1
1 - Elective
18

Second Semester
4 - BIOL 2230 Human Anatomy and Phys. II
3 - CH 2240 Organic Chemistry
1 - CH 2280 Organic Chemistry Lab.
3 - COMM 1500 Intro. to Human Comm. or 3 - COMM 2500 Public Speaking
3 - PHYS 2080 General Physics II
1 - PHYS 2100 General Physics II Lab.
3 - Science and Tech. in Society Requirement4
17

Third Year5
72–90 Total Semester Hours

1AH 2100 or MUSC 2100
2Select any ENGL course from General Education Arts and Humanities (Literature) Requirement.
3See advisor.
4See General Education Requirements.
5Students planning to receive the Bachelor of Science in Preprofessional Studies degree are required to complete a minimum of 18 additional credit hours which must include MCR 3050, and successfully complete a year at an accredited pharmacy school. See advisor for requirements.

PREHABILITATION SCIENCES
The Prehabilitation Sciences major includes concentrations in physical therapy, occupational therapy, communication sciences and disorders, as well as in physician assisting and allied health areas. This curriculum is designed to meet the requirements of the programs in the College of Health Professions at the Medical University of South Carolina and other professional schools. The program requires a minimum of 90 semester hours of undergraduate coursework. In addition, students must apply to a professional school for acceptance into its program.

Because preparation for some of the concentrations, such as the physical therapy, occupational therapy, and communication sciences and disorders programs at MUSC, requires a baccalaureate degree in any area, students are advised to select a major with similar requirements after consultation with the Prehabilitation Sciences advisor. The following curriculum fulfills the general requirements for those fields requiring less than a baccalaureate degree. Electives should be chosen after consultation with the advisor. Professional schools may change their requirements at any time, so it is imperative that students in this major stay in close contact with their advisor.

For financial aid purposes, students in the Prehabilitation Sciences program are considered to be enrolled in a degree-seeking program.

First Year
First Semester
3 - BIOL 1030 General Biology I
1 - BIOL 1050 General Biology Lab. I
1 - CH 1010 General Chemistry
4 - PSYC 2010 Introduction to Psychology
3 - Arts and Humanities (Non-Lit.) Requirement1
3 - Science and Technology in Society Req.1
17

Second Semester
3 - BIOL 1040 General Biology II
1 - BIOL 1060 General Biology Lab. II
4 - CH 1020 General Chemistry
3 - ENGL 1030 Accelerated Composition
3 - EXST 3010 Introductory Statistics
3 - SOC 2100 Introduction to Sociology
1 - Elective
1 - Elective
18

Second Year
First Semester
4 - BIOL 2220 Human Anatomy and Phys. I
3 - PHYS 2070 General Physics I
1 - PHYS 2090 General Physics I Lab.
3 - PSYC 3400 Lifespan Developmental Psych.
1 - Arts and Humanities (Literature) Requirement2
3 - Arts and Humanities Requirement1
17

Second Semester
4 - BIOL 2230 Human Anatomy and Phys. II
3 - COMM 1500 Intro. to Human Comm. or 3 - COMM 2500 Public Speaking
3 - CPSC 1210 Intro. to Information Technology
3 - PHYS 2080 General Physics II
1 - PHYS 2100 General Physics II Lab.
1 - Mathematics Requirement1
17

Third Year6
90 Total Semester Hours

1See General Education Requirements. Three of these credit hours must also satisfy the Cross-Cultural Awareness Requirement.
2Select any ENGL course from General Education Arts and Humanities (Literature) Requirement.
3See advisor.
4Students planning to receive the Bachelor of Science degree must transfer to a degree-granting major. See advisor for requirements.

PREVETERINARY MEDICINE
Under a regional plan, the South Carolina Prevetinary Advisory Committee coordinates a program for South Carolina residents who are interested in pursuing careers in veterinary medicine. South Carolina residents attending any college or university may apply through the Veterinary Medical College Application Service (VMCAS) to the University of Georgia College of Veterinary Medicine. Currently the University of Georgia admits up to 17 students each year through arrangements with the Southern Regional Education Board. The State of South Carolina has a contract with Mississippi State University to admit up to five South Carolina residents. The State of South Carolina also has a contract with Tuskegee University to admit up to four South Carolina residents. Application must be made directly to Tuskegee University.

Minimum requirements for admission to a college of veterinary medicine generally include the satisfactory completion of prescribed courses in a well-rounded undergraduate degree program. Specific requirements for admission to the University of Georgia College of Veterinary Medicine include the following undergraduate courses: six credits of English, 14 credits of humanities and social studies, eight credits of physics, eight credits of general biology, eight credits of advanced biology, three credits of biochemistry, and 16 credits of organic and inorganic chemistry. Chem- istry and physics courses must be at the premedical level; they may not be survey courses.

To be in the best competitive position, applicants should complete courses in animal agriculture, genetics, nutrition, biochemistry, and advanced biology. Considerations for selection are character, scholastic achievement, personality, experience with large and small animals, general knowledge, and motivation. In the past, competition has been keen, and only those applicants who have shown exceptional ability have been admitted. Specific considerations may include a minimal grade-point average and completion of standardized tests such as the Graduate Record Examination and the Veterinary College Admis- sion Test.

Since out-of-state students attending Clemson are ineligible to apply to the University of Georgia or Tuskegee University under the South Carolina quota, they should contact the college(s) of veterinary medi- cine to which they plan to apply. They may apply at the University of Georgia for at-large admission.

Veterinary schools accept students with a broad range of academic backgrounds; therefore, it is recommended that the beginning university student select any undergraduate major and simultaneously complete the courses required for veterinary school entrance and those required for completion of a BS or BA degree. For students selecting Animal and Veterinary Sciences or Biological Sciences at Clemson University, the basic curriculum has been designed to accommodate Georgia’s entrance re- quirements. Further information is available from the Department of Animal and Veterinary Sciences at (864) 656-3427.

SOILS AND SUSTAINABLE CROP SYSTEMS
Bachelor of Science
The BS degree program in Soils and Sustainable Crop Systems is a multidisciplinary program that educates students with expertise in soils, crop sciences, and applied agricultural biotechnology. It offers students a rigorous, science-based degree with educational opportunities related to management of agricultural commodities and natural resources, as well as soil and water resources. Students can tailor the program to fit their professional and academic goals by selecting one of three concentrations.
The Agricultural Biotechnology Concentration integrates conventional disciplines with molecular advances in plants, pathogens, and biosystem interactions and responds to the educational void between the rapid adoption of biotechnology products into agricultural production and the intermediate- and end-users, farmers, and consumers. Graduates in this concentration will be competitive as scientists in emerging agricultural biotechnology industries, as educators, and as policy makers and officers in regulatory agencies.

Students with a concentration in Soil and Water Environmental Science can address compelling problems such as land application of agricultural and industrial wastes, reduction of contamination of ground and surface waters, establishment of functional septic drain fields, and production of food and fiber crops. Graduates will be able to establish careers in traditional agrarian fields such as soil scientists and conservationists, extension agents, and farm consultants, and in the broader environmental arenas of DHEC, consulting engineering firms, and environmental consulting. Graduates will be well prepared for graduate work in fields ranging from soil science to environmental engineering and law.

Students with a concentration in Sustainable Crop Production will graduate with comprehensive knowledge to increase farm profits by decreasing the costs of crop and production; build soil tilth and fertility through rotations, multiple cropping, and nutrient cycling; protect the environment by minimizing or more efficiently using synthetic agrichemicals; manage crop pests and weeds with integrated, ecologically sound strategies; develop strategies for profitable marketing of agricultural commodities; and create a strong, diversified agriculture that is stable through crop production and the intermediate- and end users.

### Freshman Year

**First Semester**
- BIOL 1100 Principles of Biology
- CH 1010 General Chemistry
- MTHS 1020 Intro. to Math. Analysis
- MTHS 1060 Calculus of One Variable
- SSCS 1010 Survey of Soils and Sustainable Crop Systems
- Arts and Humanities (Non-Lit.) Requirement

**Second Semester**
- BIOL 1110 Principles of Biology
- CH 1020 General Chemistry
- ENGL 1030 Accelerated Composition
- EXST 3010 Introductory Statistics
- MTHS 1080 Calculus of One Variable
- MTHS 2070 Multivariable Calculus

### Second Year

**Sophomore Year**

**First Semester**
- CH 2230 Organic Chemistry
- CH 2270 Organic Chemistry Lab.
- COMM 1500 Intro. to Human Comm. or
- COMM 2500 Public Speaking
- ECON 2000 Economic Concepts or
- ECON 2110 Principles of Microeconomics
- GEN 3000 Fundamental Genetics
- Arts and Humanities (Literature) Requirement

**Second Semester**
- APEC 2050 Agriculture and Society
- BIOL 3350 Evolutionary Biology
- CH 2240 Organic Chemistry
- CH 2280 Organic Chemistry Lab.
- CSEN 4550 Seminar
- Concentration Requirement

### Junior Year

**First Semester**
- BCHM 3050 Essential Elements of Biochem.
- BIOL 3040 Biology of Plants
- BIOL 3070 Biological Ocean Lab. Tech
- CSEN 4520 Major World Crops
- SSCS 3350 Agricultural Biotechnology
- Social Science Requirement

**Second Semester**
- CSEN (SSCS) 3500 Practicum
- ENGL 3150 Scientific Writing and Comm.
- JELA 3100 Principles of Plant Pathology
- LPH (BIOL) 3400 Plant Med. and Magic
- SSCS 4010 Academic and Professional Dev.
- Concentration Requirement

### Senior Year

**First Semester**
- BIOL 4010 Plant Physiology
- BIOL 4020 Plant Physiology Lab.
- CSEN (SSCS) 3500 Practicum
- ENT (BIOL) 3010 Insect Biology and Diversity
- SSCS 4450 Regulatory Issues and Policies
- SSCS 4500 Agric. Biosystems and Risk Assess.
- Concentration Requirement

**Second Semester**
- CSEN (SSCS) 3500 Practicum
- CSEN 4900 Biology of Invasive Plants
- Concentration Requirement

122–124 Total Semester Hours

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1. BIOL 1100 and 1110 are strongly recommended; however, BIOL 1030/1050 may substitute for BIOL 1100, and BIOL 1040/1060 may substitute for BIOL 1110.
2. MTHS 1060 is recommended for students in the Agricultural Biotechnology Concentration.
3. See General Education Requirements. PHIL 1032 is recommended for students in the Agricultural Biotechnology Concentration.
4. Select from a department approved list. Courses to support proficiency in a foreign language also are encouraged.

### Soil and Water Environmental Science Concentration

**Sophomore Year**

**First Semester**
- CH 2230 Organic Chemistry
- CH 2270 Organic Chemistry Lab.
- MTHS 1060 Calculus of One Variable
- MTHS 2070 General Physics I and
- PHYS 2090 General Physics I Lab. or
- PHYS 1220 Physics with Calculus I and
- PHYS 1240 Physics Lab.

**Second Semester**
- APEC 2050 Agriculture and Society
- BIOL 3350 Evolutionary Biology
- CH 2240 Organic Chemistry
- CH 2280 Organic Chemistry Lab.
- CSEN 4550 Seminar
- Concentration Requirement

**Junior Year**

**First Semester**
- COMM 1500 Intro. to Human Comm. or
- COMM 2500 Public Speaking
- MIR 3050 General Microbiology
- Concentration Requirement
- Plant Science Requirement

**Second Semester**
- CSEN 4900 Beneficial Soil Organisms in Plant Growth
- ENGL 3150 Scientific Writing and Comm.
- GEO 4080 Geohydrology
- SSCS 4010 Academic and Professional Dev.
- Social Science Requirement

**Senior Year**

**First Semester**
- CSEN (SSCS) 3500 Practicum
- CSEN 4450 Regulatory Issues and Policies
- Applied Spatial Technology Requirement
- Concentration Requirement
- Field Scale Environmental Mgt. Requirement

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<td>SSCS 1010</td>
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<td>Applied Spatial Technology Requirement</td>
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<td>Field Scale Environmental Mgt. Requirement</td>
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College of Agriculture, Forestry and Life Sciences
Second Semester
3 - AGR (ENSP) 3150 Environment and Agric.
3 - BIOL 4010 Plant Physiology and
1 - BIOL 4020 Plant Physiology Lab.
3 - CSEN (BE) 4080 Land Treatment of Wastewater and Sludges
3 - Concentration Requirement ¹
3 - Social Science Requirement ²
16

123–125 Total Semester Hours

1See General Education Requirements.
2Selected from department-approved list.
1CH 2230/2270, and 2240/2280 are strongly recommended.
1BIOI 4410, CSEN 4210, 4220, 4230, (APEC) 4260, or HORT 4560.
1AGM 4050, OR 4330, or other course approved by advisor.
1AGM 4010, ETUO 4210, or other course approved by advisor.

SUSTAINABLE CROP PRODUCTION
CONCENTRATION

Sophomore Year
First Semester
3 - APEC 2020 Agricultural Economics or
3 - ECON 2110 Principles of Microeconomics
3 - CH 2230 Organic Chemistry ¹
1 - CH 2270 Organic Chemistry Lab ¹ or
4 - CH 2100 Survey of Organic Chemistry
3 - CSEN 2020 Soils
3 - PLPA 3100 Principles of Plant Pathology
14
Second Semester
3 - APEC 2050 Agriculture and Society
3 - CH 2240 Organic Chemistry ¹ and
1 - CH 2280 Organic Chemistry Lab ¹ or
2 - BCHM 3050 Essential Elements of Biochemistry, and
2 - BOL 4340 Biol. Chem. Lab Techniques
3 - COMM 1500 Intro. to Human Comm.
3 - COMM 2500 Public Speaking
3 - SSCS 3330 Agricultural Genetics
3 - Plant Science Requirement ²
16–17
Summer
3 - PLPA 4110 Plant Disease Diagnosis
1
Junior Year
First Semester
4 - ENT (BIOL) 3010 Insect Biology and Diversity
3 - IPM 4010 Principles of Integrated Pest Mgr.
3 - Concentration Requirement ³
3 - Plant Science Requirement ²
3 - Social Science Requirement ²
16
Second Semester
3 - BIOL 4010 Plant Physiology
1 - BIOL 4020 Plant Physiology Lab.
3 - CSEN 4050 Plant Breeding
3 - CSEN 4090 Biology of Invasive Plants
3 - ENGL 3140 Technical Writing or
3 - ENGL 3150 Scientific Writing and Comm.
1 - SSCS 4010 Academic and Professional Dev.
14
Senior Year
First Semester
3 - CSEN 4900 Beneficial Soil Organisms in Plant Growth
4 - ENT 4070 Applied Agricultural Entomology ¹
6 - Concentration Requirement ¹
13
Second Semester
3 - CSEN (SSCS) 3500 Practicum
3 - CSEN 4520 Soil Fertility and Management
1 - CSEN 4530 Soil Fertility Lab.
1 - CSEN 4550 Seminar
3 - Arts and Humanities (Literature) Requirement ⁴
6 - Concentration Requirement ¹
17
124–126 Total Semester Hours

¹See General Education Requirements.
²Selected from department-approved list.
²CH 2230/2270, and 2240/2280 are strongly recommended.
²BIOI 3040, CSEN 4220, 4230, HORT 3100, 4550, 4560, or other department-approved course.
²See General Education Requirements.

TURFGRASS

Bachelor of Science
Turfgrass is a major part of our built environment and daily life, including home lawns, sports fields, and golf courses. Graded areas are aesthetically attractive and provide many environmental benefits, including the prevention of soil erosion, noise reduction, improved water quality, and reduced injuries from sports.

Graduates pursue careers in management of professional golf courses and sports fields and in lawn care, production and sale of seed, sod, supplies, and equipment; or as technicians for businesses or government agencies. The curriculum provides a strong foundation in science, advanced business, and environmental and leadership skills that are needed for success in today's competitive environment. Courses in horticulture also provide a background for turfgrass managers who may have responsibilities for landscaped areas.

Students work closely with faculty in creative inquiry groups to investigate and implement solutions to real problems. Student interns experience a wide range of turf facilities, businesses, and public institutions to develop skills and experience needed for successful careers. In addition, the University's golf course (Walker Golf Course) and athletic fields offer great employment and learning opportunities.

Freshman Year
First Semester
4 - CH 1010 General Chemistry
1 - HORT 1010 Horticulture
3 - MTHS 1020 Intro to Math Analysis
4 - Spanish Language Requirement ⁵
14
Second Semester
3 - BIOL 4090 Senior Capstone Course
3 - HORT 4120 Advanced Turfgrass Management
3 - Business Requirement ⁶
3 - Horticulture Specialization Requirement ³
3 - Oral Communication Requirement ³
18
Second Semester
3 - BIOL 4010 Plant Physiology
1 - BIOL 4020 Plant Physiology Lab.
3 - HORT 4200 Applied Turfgrass Physiology
2 - PLPA (ENT) 4060 Diseases and Insects of Turfgrasses
3 - Horticulture Specialization Requirement ³
3 - Related Science Requirement ³
16
Summer
1 - PLPA (ENT) 4080 Diseases and Insects of Turfgrasses Laboratory
1
Junior Year
First Semester
3 - Arts and Humanities (Non-Lit.) Requirement ³
3 - Business Requirement ⁶
3 - Related Science Requirement ³
3 - Social Science Requirement ³
1 - Elective
16
Second Semester
3 - BIOL 4010 Plant Physiology
1 - BIOL 4020 Plant Physiology Lab.
3 - HORT 4200 Applied Turfgrass Physiology
2 - PLPA (ENT) 4060 Diseases and Insects of Turfgrasses
3 - Horticulture Specialization Requirement ³
3 - Oral Communication Requirement ³
15
Summer
1 - PLPA (ENT) 4080 Diseases and Insects of Turfgrass Laboratory
1
Senior Year
First Semester
3 - HORT 2120 Introduction to Turfgrass Culture
1 - HORT 2130 Turfgrass Culture Lab.
3 - HORT 3030 Landscape Plants
3 - MTHS 1010 Essential Math for Informed Soc.
3 - Plant Biology Requirement ³
14
Second Semester
4 - CSEN 2020 Soils
3 - Arts and Humanities (Literature) Requirement ²
3 - Business Requirement ³
3 - Related Science Requirement ³
3 - Social Science Requirement ³
16
Summer
3 - HORT 2710 Internship ³ or
3 - HORT 4710 Advanced Internship ³
Academic Regulations can be found under the respective majors. Enrollment guidelines and procedures can be normally taken by Wildlife and Fisheries Biology students as early as possible in their undergraduate program, as agricultural, forest, and environmental sciences require dual degrees from the School of Environmental and Natural Resources. Students are encouraged to obtain the specific requirements for both undergraduate and graduate program requirements. Coursework may be repeated as often as necessary to achieve the minimum grade.

### WILDLIFE AND FISHERIES BIOLOGY

**Bachelor of Science**

Increased interest in conservation of natural resources and the environment and demand for seafood products has resulted in these areas becoming increasingly technical and requiring highly qualified wildlife and fisheries biologists. Greatest demands for graduates are in the areas of management, research, survey, and regulatory positions with state and federal agencies; industrial research and quality control laboratories; conservation, recreation, and other public service agencies; and private enterprises.

The Bachelor of Science degree program in Wildlife and Fisheries Biology provides a solid foundation for many careers in the sciences. The curriculum is strong in basic and applied sciences, communication skills, and the social sciences. In addition, three credit hours are available for field training with appropriate natural resource agencies. Students may satisfy coursework requirements for professional certification by the Wildlife Society and/or the American Fisheries Society.

For students interested in conservation biology, water, and natural resources, the School of Agricultural, Forest, and Environmental Sciences also administers the Conservation Biology and Natural Resources Management concentrations within the Environmental and Natural Resources degree program. See pages 51-52 for program details.

### Combined Bachelor of Science/Master of Science Degree Program

Under this plan, students may reduce the time necessary to earn both degrees by applying graduate credits to both undergraduate and graduate program requirements. Students are encouraged to obtain the specific requirements for the dual degree from the School of Agricultural, Forest, and Environmental Sciences as early as possible in their undergraduate program, as a number of required courses have prerequisites not normally taken by Wildlife and Fisheries Biology majors. Enrollment guidelines and procedures can be found under Academic Regulations in this catalog.

### Freshman Year

**First Semester**
- 3 - BIOL 1030 General Biology I
- 1 - BIOL 1050 General Biology Lab. I
- 4 - CH 1010 General Chemistry
- 1 - ENR 1010 Intro. to Env. and Natural Res. I
- 3 - MTHS 1020 Intro. to Mathematical Analysis
- 3 - Oral Communication Requirement

**Second Semester**
- 3 - BIOL 1040 General Biology II
- 1 - BIOL 1060 General Biology Lab. II
- 4 - CH 1060 Chemistry in Context II or
- 4 - PHYS 2000 Introductory Physics
- 3 - ENGL 1030 Accelerated Composition
- 3 - EXST 3010 Introductory Statistics
- 1 - FNR 1020 FNR Freshman Portfolio

### Sophomore Year

**First Semester**
- 4 - FNR 2040 Soil Information Systems
- 2 - FOR 2050 Dendrology
- 3 - FOR 2210 Forest Biology
- 3 - WFB 3000 Wildlife Biology
- 1 - WFB 3010 Wildlife Biology Lab.
- 3 - Arts and Humanities (Non-Lit.) Requirement

**Second Semester**
- 3 - ENGL 3140 Technical Writing
- 3 - FOR 2060 Forest Ecology
- 3 - GEN 3000 Fundamental Genetics
- 3 - WFB 3500 Principles of Fish and Wildlife Biol.
- 3 - Social Science Requirement

### Junior Year

**First Semester**
- 3 - WFB 4160 Fishery Biology
- 3 - WFB 4100 Wildlife Management Techniques
- 3 - Approved Requirement
- 3 - Arts and Humanities (Literature) Requirement

**Second Semester**
- 3 - WFB (BIOL) 3130 Conservation Biology
- 3 - WFB 4120 Wildlife Management
- 3 - WFB 4160 Fishery Biology
- 3 - WFB 4400 Non-Game Wildlife Management
- 3 - WFB 4620 Wetland Wildlife Biology

### Senior Year

**First Semester**
- 3 - APEC 2570 Natural Resources, Environment, and Economics
- 4 - AVS 3010 Anat. and Phys. of Domestic Animals
- 3 - FOR (ENR) 4340 GIS for Landscape Planning
- 1 - WFB 4980 Senior Portfolio
- 4 - Approved Requirement

**Second Semester**
- 1 - FNR 4990 Natural Resources Seminar
- 3 - WFB 4300 Wildlife Conservation Policy
- 8 - Approved Requirement
- 3 - Policy and Law Requirement

122 Total Semester Hours

1See General Education Requirements. Six of these credit hours must also satisfy the Cross-Cultural Awareness and the Science and Technology in Society Requirements.

2Select from department-approved list.
MINORS

Following are minors acceptable for students in the College of Agriculture, Forestry and Life Sciences. Students cannot major and minor in the same field or acquire a minor that is not allowed by the degree program.

Accounting
Adult/Extension Education
Aerospace Studies
Agricultural Business Management
Agricultural Mechanization and Business
American Sign Language Studies
Animal and Veterinary Sciences
Anthropology
Architecture
Art
Athletic Leadership—not open to Marketing majors.
Biochemistry
Biological Sciences
Business Administration
Chemistry
Cluster
Communication Studies
Computer Science
Crop and Soil Environmental Science
Digital Production Arts
East Asian Studies
Economics
Education
English
Entomology
Entrepreneurship
Environmental Engineering
Environmental Science and Policy
Equine Business—not open to Animal and Veterinary Sciences majors
Film Studies
Financial Management
Food Science
Forest Resource Management
Genetics
Geography
Geology
Global Politics
Great Works
History
Horticulture—not open to Turfgrass majors
Legal Studies
Management
Management Information Systems
Mathematical Sciences
Microbiology
Military Leadership
Modern Languages
Music
Natural Resource Economics
Nonprofit Leadership
Packaging Science
Pan African Studies
Park and Protected Area Management
Philosophy
Physics
Plant Pathology
Political Science
Psychology
Public Policy
Religion
Russian Area Studies
Science and Technology in Society
Screenwriting
Sociology
Spanish-American Area Studies
Theatre
Therapeutic Recreation
Travel and Tourism
Turfgrass—not open to Horticulture majors
Urban Forestry
Wildlife and Fisheries Biology
Women’s Studies
Writing

See pages 39-42 for details.
COLLEGE OF ARCHITECTURE, ARTS AND HUMANITIES

By uniting the humanities with the disciplines of design and building and the arts, the College of Architecture, Arts and Humanities offers one-of-a-kind opportunities for interdisciplinary exploration and achievement—opportunities that are at once rigorous and imaginative, classical and innovative. Students and faculty see their ideas expressed in a myriad of forms—as buildings and landscapes, as the written word, as music and drama, as paintings, pots, prints and photographs. They work in the very oldest media and the very newest. They work alone. They work together. They seek not only the imaginative answers, but the enduring questions.

The College of Architecture, Arts and Humanities is organized into three schools. The School of the Arts includes the departments of Art and Performing Arts. The School of Design and Building includes the School of Architecture, the Department of Construction Science and Management, and the Department of Planning and Landscape Architecture. The School of the Humanities includes the departments of Communication Studies; English; History, Languages; and Philosophy and Religion. In addition to the undergraduate and graduate degrees offered by the ten departments, an array of interdisciplinary programs is housed in the Office of the Dean, including the doctoral programs in Planning, Design and the Built Environment; and in Rhetorics, Communication and Information Design.

SCHOOL OF DESIGN AND BUILDING AND SCHOOL OF THE ARTS

The Bachelor of Arts in Architecture degree is the preprofessional preparation for graduate study leading to the Master of Architecture degree, which is the fully accredited professional degree in the field. The accredited Bachelor of Science in Construction Science and Management program prepares students for careers as professional managers in the construction industry. A graduate program is also offered leading to the Master of Construction Science and Management. The Visual Arts program offers professional study in the studio visual arts leading to the Bachelor of Fine Arts degree. A graduate program leading to the Master of Fine Arts is also offered. The accredited five-year Bachelor of Landscape Architecture degree program prepares students for careers as professional landscape architects. The Bachelor of Arts in Production Studies in Performing Arts is a distinctive degree program that combines practical hands-on experiences in performing arts production technologies with classes in music and theatre performance, history, and theory. A graduate program in City and Regional Planning is housed within the school and accepts graduates from a variety of baccalaureate programs and prepares them for careers in both public and private sector planning through its Master of City and Regional Planning degree. The Master of Science in Historic Preservation degree is a professional degree program designed for students who will specialize in working with historic buildings, landscapes, and the decorative arts. The Master of Real Estate Development is a full-time, two-year professional degree jointly offered by the Department of Planning and Landscape Architecture and the Department of Finance in the College of Business and Behavioral Science.

In addition to the facilities housed on the Clemson campus, the College offers third- and fourth-year Architecture and fourth-year Landscape Architecture students the opportunity to earn credit toward their degrees at three off-campus sites. Students may spend a semester at the Charleston Architecture Center earning credit from both Clemson University and the College of Charleston. Additionally, the Charles E. Daniel Center for Building Research and Urban Studies in Genoa, Italy, and the Barcelona Program in Barcelona, Spain, provide students with an intensive program of study and travel in Europe.

Architecture Charleston Program
Located in Charleston, South Carolina, this program is available to qualified undergraduates in Architecture, Construction Science and Management, Landscape Architecture, and Visual Arts. Studio work is oriented toward design within the historic seaport setting. Students also enroll in classes at the College of Charleston. The program is enriched by visiting scholars and professionals from the area.

Architecture Overseas Program
The Daniel Center for Building Research and Urban Studies in Genoa, Italy, is available to qualified Bachelor of Arts in Architecture, Master of Architecture, Construction Science and Management, Fine Arts, City and Regional Planning, and professional year Landscape Architecture students. The Barcelona program in Barcelona, Spain, is available to qualified Bachelor of Arts in Architecture and professional year Landscape Architecture students. In both Genoa and Barcelona, studio and classroom work is enriched by visiting scholars and complemented by scheduled field trips in the country of program origin and in continental Europe.

Entrance Requirements
Admission to degree programs in the School of Design and Building and the School of the Arts is based on academic performance and is limited based on space availability in the various programs. Students seeking admission are advised to apply to the Admissions Office early in the fall of their senior year in high school. They are also encouraged to visit the school during their senior year. Faculty are available to meet with them and their parents informally and answer questions and discuss individual programs in more detail. Prospective students may schedule appointments by calling the individual department.

Advancement in Architecture
Students enrolled in second-, third-, or fourth-year design studios and theory courses must attain at least a 2.0 grade-point average in each year level (by repeating one or both semesters, if necessary) to qualify for advancement to the next year level or, in the case of fourth-year Architecture studios, to qualify for the Architecture degree, or in Landscape Architecture at the fifth year, to qualify for the Bachelor of Landscape Architecture degree.

SCHOOL OF HUMANITIES

The Bachelor of Arts degree is offered in Communication Studies, English, History, Language and International Trade, Modern Languages, and Philosophy. The Bachelor of Science degree is offered in Language and International Health.

To achieve depth as well as breadth in their education experiences, students majoring in Communication Studies, English, History, Modern Languages, or Philosophy complete at least 24 semester hours from courses above the sophomore level. As soon as feasible and not later than the end of the sophomore year, students in these fields also select a minor consisting of at least 15 additional semester hours. Courses satisfying the major may not also be included in the minor. A second major (a double major) may substitute for the minor, provided all requirements are fulfilled for each major.

The foreign language requirement is a proficiency requirement. Students must complete through 2020 in Arabic, Chinese, French, German, Italian, Japanese, Latin, Portuguese, Russian, or Spanish.

Students enrolled in degree programs offered in the humanities who expect to teach in the public schools may elect education courses required for teaching certificates by the South Carolina Department of Education. Such courses are to be approved by their own department advisors.

Students may transfer into the Undeclared category in the humanities only if they have completed 45 or fewer credit hours. For more information, contact the College of Architecture, Arts and Humanities Advisement Center in 101 Strode Tower.

ARCHITECTURE

Bachelor of Arts

The Bachelor of Arts in Architecture prepares students for subsequent professional education by providing a sound general education, focused design studies, complementary support courses, and the requirement to study in an off campus location. The School of Architecture emphasizes the relationship of buildings to the rest of the environment: built, natural, and cultural. The curriculum includes seven semesters of studio in addition to complementary courses in architectural history and theory and building technology. The first three studios are collaborative, taught by faculty in Architecture, and Communication Studies. The Bachelor of Arts also includes requirements for a minor and foreign language.

In the first two years of the program, students learn to apply the thinking and communications skills needed to pursue higher-level work in the discipline. The curriculum in the first two years also allows students to complete most of the University’s general education requirements. In the junior year, students must select an off-campus, location-specific studio and co-required coursework in order to fulfill their off-campus study requirement. The final studio focuses on reflection and synthesis.
Accreditation and Registration
In the United States, most state registration boards require a degree from an accredited professional degree program as a prerequisite for licensure. The National Architectural Accrediting Board (NAAB), which is the sole agency authorized to accredit U.S. professional degree programs in architecture, recognizes three types of degrees: the Bachelor of Architecture, the Master of Architecture, and the Doctor of Architecture. A program may be granted a 6-year, 3-year, or 2-year term of accreditation, depending on the extent of its conformance with established educational standards.

Doctor of Architecture and Master of Architecture degree programs must consist of a pre-professional undergraduate degree and a professional graduate degree that, when earned sequentially, constitute an accredited professional education. However, the pre-professional degree is not, by itself, recognized as an accredited degree.

Clemson University, College of Architecture, Arts and Humanities, School of Architecture offers the following NAAB-accredited degree programs:
M.Arch. (pre-professional degree + 60 graduate credits)
M.Arch. (pre-professional degree + 61 credits)
Architecture + Health
M.Arch. (non-pre-professional degree + 90 credits)
M.Arch (non-pre-professional degree + 91 credits)
Architecture + Health

The next accreditation visit for all programs will be in 2017.

Freshman Year
First Semester
3 - AAH 1010 Survey of Art and Arch. History I
3 - ARCH 1010 Introduction to Architecture
3 - ENGL 1030 Accelerated Composition
4 - MTHS 1060 Calculus of One Variable I
3 - PHYS 2070 General Physics I
1 - PHYS 2090 General Physics I Lab.
17
Second Semester
3 - AAH 1020 Survey of Art and Arch. History II
5 - ARCH 1510 Architecture Communication
3 - BIOL 2030 Environment, Energy and Society
4 - Foreign Language Requirement
15
Sophomore Year
First Semester
3 - ARCH 2040 History and Theory of Mod. Arch
6 - ARCH 2510 Architecture Foundations I
3 - ENGL 2120 World Literature
3 - Foreign Language Requirement
15
Second Semester
6 - ARCH 2520 Architecture Foundations II
3 - ARCH 2700 Structures I
3 - Foreign Language Requirement
3 - Social Science Requirement
15
Junior Year
First Semester
3 - Architecture History/Theory Requirement
3 - Building Technology Requirement
6 - Studio Requirement
3 - Elective
15
Second Semester
3 - ARCH 4010 Architectural Portfolio
6 - Minor Requirement
6 - Studio Requirement
15
Senior Year
First Semester
3 - Minor Requirement
3 - Social Science Requirement
6 - Studio Requirement
15
Second Semester
6 - ARCH 4520 Synthesis Studio
3 - Minor Requirement
6 - Elective
15
122 Total Semester Hours
1Three semesters (through 2020) in the same foreign language are required.
2See General Education Requirements. These 3-credit hours must also satisfy the Cross-Cultural Awareness Requirement.
ARCH 4030, 4040, 4050, 4120, or 4122
ARCH 2710, 4140, 4160, 4210, 4770, CMS 2020, 2030, 2050, 3040, or 3500
ARCH 3510, 3520, 3530, 3540, or 3550
4See advisor.

COMMUNICATION STUDIES
Bachelor of Arts
The Bachelor of Arts in Communication Studies provides a thoroughly integrated yet individual degree program that prepares students for careers in business, government, and public sectors. In addition, the program provides a foundation for graduates who wish to pursue advanced degrees in the humanities, social sciences, business, and law. Through their coursework and extracurricular experiences, Communication Studies majors develop a set of skills in oral, written, and visual communication that enables them to research, design, present, and evaluate messages across diverse contexts and from a variety of platforms, including digital communication technology.

Students may change majors into the Communication Studies program based on approval of a committee of faculty from the Department of Communication Studies. The deadline for applying for a change of major during the fall semester is September 15, with decisions made by October 1. For spring semester changes of major, the deadline is February 15, with decisions made by March 1. The Department of Communication Studies accepts a maximum of 30 changes of major per year. To qualify for acceptance, applicants should have completed 15 credit hours including ENGL 1030 and COMM 210 (with a C or better). All students requesting a transfer into the Communication Studies program must have a grade-point average of 2.5 or higher. An application form and a writing sample are also required. Detailed information is available from the Communication Studies Department, 408 Strode Tower or the department Web site: www.clemson.edu/caah/communication.

Freshman Year
First Semester
1 - COMM 1010 Communication Academic and Professional Development I
3 - ENGL 1030 Accelerated Composition
4 - Foreign Language Requirement
3 - Mathematics Requirement
2 - Social Science Requirement
14
Second Semester
4 - COMM 2100 Intro to Communication Studies
3 - COMM 2500 Public Speaking
4 - Foreign Language Requirement
3 - Mathematics or Natural Science Requirement
6 - Elective
17
Sophomore Year
First Semester
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Emphasis Area Requirement
4 - Foreign Language Requirement
4 - Natural Science Requirement
3 - Social Science Requirement
16
Second Semester
3 - COMM 3100 Communication Theory I or
2 - COMM 3101 Mass Comm. Theory or
3 - COMM 3150 Critical Discourse Theory
3 - Arts and Humanities (Literature) Requirement
3 - Foreign Language Requirement
6 - Elective
15
Junior Year
First Semester
3 - Communication Requirement
3 - Emphasis Area Requirement
3 - Minor Requirement
6 - Elective
15
Second Semester
3 - COMM 3060 Discourse, Criticism and Soc. or
3 - COMM 3100 Quantitative Research Methods in Communication Studies or
3 - COMM 3110 Qualitative Research Methods in Communication Studies
3 - Communication Requirement
6 - Minor Requirement
3 - Elective
15
Senior Year
First Semester
6 - Emphasis Area Requirement
3 - Minor Requirement
6 - Elective
15
Second Semester
3 - COMM 4950 Senior Capstone Seminar
1 - COMM 4980 Communication Academic and Professional Development II
3 - Minor Requirement
6 - Elective
13
120 Total Semester Hours

*The foreign language requirement is a proficiency requirement. Students must complete through 2020 in Arabic, Chinese, French, German, Italian, Japanese, Latin, Portuguese, Russian, or Spanish.

**EXST 2220 or 3010 or MTHS 2030

See General Education Requirements. Six of these credit hours must also satisfy the Cross-Cultural Awareness Requirement and, if EXST 2220 is not selected, the Science and Technology in Society Requirement.

*See advisor. Emphasis area consists of 12 credit hours of COMM coursework at the 3000-4000 level with a single theme.

CONSTRUCTION SCIENCE AND MANAGEMENT

Bachelor of Science
As the largest single industry in the United States and one of the most important, construction offers unlimited opportunities to highly motivated and professionally skilled graduates. Future professionals must be skilled in managing people, equipment, and capital, in addition to having a thorough knowledge of construction materials and methods and the complex technologies of modern construction. The Bachelor of Science in Construction Science and Management curriculum is the basis for a career in construction or as a developer or building management specialist.

Change of major requests are considered only once a year, in late May or early June. Students who wish to change their major to Construction Science and Management must have completed at least 30 credit hours (with a minimum of 24 credit hours taken at Clemson University) with a minimum grade-point average of 2.7; and must have successfully completed ENGL 1030, PHYS 2070/2090, and the mathematics requirement (MTHS 1020 or 1060) by the end of the spring semester of the year the change-of-major request is made. Students should contact the Construction Science and Management Department, 122 Lee Hall. The Department’s Faculty Admissions Committee will consider all requests in late May or early June and select the top students by cumulative grade-point average based on space availability. Students who do not meet the minimum requirements at the end of spring semester will not be considered.

Freshman Year
First Semester
3 - CSM 1000 Intro. to Construction Sci. and Mgt.
3 - ENGL 1030 Accelerated Composition
3 - MGT 2180 Management Personal Computer Applications
4 - MTHS 1060 Calculus of One Variable I
3 - PHYS 2070 General Physics I
1 - PHYS 2090 General Physics II Lab.
17
Second Semester
3 - AAH 2100 Introduction to Art and Architecture
3 - CSM 1500 Construction Problem Solving
3 - CSM 1500 Intro. to Human Comm. or 3 - CSM 2500 Public Speaking
3 - MTHS 3090 Introductory Business Statistics
3 - PHYS 2080 General Physics II
1 - PHYS 2100 General Physics II Lab.
16

Sophomore Year
First Semester
3 - AGM 2210 Surveying
3 - CSM 2010 Structures I
3 - CSM 2030 Materials and Methods of Constr. I
3 - ECON 2110 Principles of Microeconomics
3 - Arts and Humanities (Literature) Requirement
2

Second Semester
3 - ACCT 2210 Financial Accounting Concepts
4 - CSM 2200 Structures II
3 - CSM 2040 Contract Documents
3 - CSM 2050 Materials and Methods of Constr. II
3 - ECON 2120 Principles of Macroeconomics
16

Junior Year
First Semester
3 - CSM 3030 Soils and Foundations
3 - CSM 3040 Environmental Systems I
3 - CSM 3510 Construction Estimating
3 - ENGL 3040 Business Writing
1 - ENGL 3140 Technical Writing
3 - Social Science Requirement
15
Second Semester
3 - CSM 3050 Environmental Systems II
3 - CSM 3520 Construction Scheduling
3 - CSM 3530 Construction Estimating II
3 - LAW 3230 Legal Environment of Business
3 - MGT 3070 Human Resource Management
15

Senior Year
First Semester
3 - CSM 4100 Safety in Building Construction
1 - CSM 4500 Construction Internship
3 - CSM 4530 Construction Project Management
3 - CSM 4610 Construction Economics Seminar
6 - Major Requirement
16
Second Semester
6 - CSM 4540 Construction Capstone
6 - Major Requirement
3 - Science and Tech. in Society Requirement
15
125 Total Semester Hours

*A sequence of MTHS 1020, 2070 and 3090 may be substituted.

**See General Education Requirements.

NOTE: Six credit hours must be in business.

Note: A minimum of 800 hours of construction experience will be required prior to graduation.

ENGLISH
Bachelor of Arts
The core courses of the English major help students acquire an understanding of literature as a humanistic study; develop an appreciation and practical knowledge of the modes of literary expression, research, and criticism; and improve the ability to communicate effectively and intelligently.

By the end of the sophomore year, students choose between two emphasis areas: Literature or Writing and Publication Studies. The Literature Emphasis Area offers an extensive exploration of American and British literature, literary theory, and related disciplines such as creative writing and film. The Writing and Publication Studies Emphasis Area focuses on digital publishing, professional communication, rhetoric, creative writing, and writing about the arts. By teaching students to read closely, think critically, and communicate effectively, both emphasis areas prepare English majors for work in a variety of professional and academic fields.

The standard program of study consists of courses stipulated in the map below, which includes 24 credit hours of core courses and 15 hours chosen from one of the two emphasis areas.

Core Courses
ENGL 3000 and 3100 and 18 additional credits selected from the following:

Literature Survey Requirement—Six credit hours from ENGL 3960, 3970, 3980, 3990
Shakespeare—ENGL 4110
Language, Criticism, and Theory—Three credits from ENGL 4000, 4010, 4350, (WS) 4360, 4400, 4420, (COMM) 4910, (COMM) 4920
Advanced Writing—Three credits selected from ENGL 3040, 3120, 3140, 3150, 3450, 3460
(THEA) 3470
Major Electives—Three credits from 3000- or 4000-level ENGL courses
Capstone Seminar—ENGL 4960

Literature Emphasis Area
Literature I (to 1699)—Three credits from ENGL 4030, 4070, 4080, 4100, 4140, 4200, 4290, 4440, 4630
Literature II (1700–1899)—Three credits from ENGL 4150, 4160, 4170, 4180, 4210, 4250, 4260, 4640
Literature III (from 1900)—Three credits from ENGL 4280, (THEA) 4300, 4310, 4320, 4330, 4340, 4550, 4650
Diversity—Three credits from ENGL 3530, 3800, 4190, (HUM) 4560, 4820, 4830
Major Electives—Three additional credits from 3000- or 4000-level ENGL courses

Writing and Publication Studies
Emphasis Area
ENGL 4990 plus 12 additional credits selected from the following:

Language, Criticism, and Theory—Three credits in addition to core requirements from ENGL 4000, 4010, 4350, (WS) 4360, 4400, 4420, (COMM) 4910, (COMM) 4920

College of Architecture, Arts and Humanities
Advanced Writing—Three credits, in addition to the Core Advanced Writing Requirement, selected from ENGL 3040, 3120, 3140, 3150, 3450, 3460, (THEA) 3470, 4450, 4460, (THEA) 4470, 4480, 4900

WPS Courses—Six credits from ENGL 3320, 3870, 4410, 4600, 4750, 4780, 4950

Freshman Year
First Semester
3 - ENGL 1030 Accelerated Composition
3 - HIST 1720 The West and the World I
4 - Foreign Language Requirement1
3 - Mathematics Requirement2
3 - Mathematics or Natural Science Requirement2
16

Second Semester
3 - ENGL 2120 World Literature
2 - ENGL 3000 Professional Development
3 - HIST 1730 The West and the World II
4 - Foreign Language Requirement1
4 - Natural Science Requirement2
16

Sophomore Year
First Semester
3 - ENGL 3100 Critical Writing About Literature
3 - Arts and Humanities (Non-Lit.) Requirement3
3 - English Literature Survey Requirement4
3 - Fine Arts Requirement5
3 - Foreign Language Requirement1
3 - History/Philosophy Requirement6
15

Second Semester
3 - COMM 1500 Intro. to Human Comm. or
3 - COMM 2500 Public Speaking
3 - English Literature Survey Requirement4
3 - Fine Arts Requirement1
3 - Foreign Language Requirement1
3 - History/Philosophy Requirement6
15

Junior Year
First Semester
6 - Major Requirement7
3 - Minor Requirement
3 - Science and Tech. in Society Requirement2
3 - Social Science Requirement6
15

Second Semester
6 - Major Requirement7
6 - Minor Requirement
4 - Elective
16

Senior Year
First Semester
9 - Major Requirement7
3 - Minor Requirement
3 - Elective
12

SECOND SEMESTER
120 Total Semester Hours

1The foreign language requirement is a proficiency requirement. Students must complete through 2020 in American Sign Language, Arabic, French, German, Italian, Japanese, Latin, Portuguese, Russian, or Spanish.
2See General Education Requirements. Three of these credit hours must also satisfy the Science and Technology in Society Requirement.
3See General Education Requirements. Select from courses in philosophy.
4See General Education Requirements. Must be in an area other than history.
5The Bachelor of Arts Degree in History and Second-Education—Social Studies (History) Double Major in History/Secondary Education—Social Studies (History)
The Bachelor of Arts Degree in History and Secondary Education—Social Studies (History) prepares students for teaching at the secondary school level and for graduate studies in History. See page 117 for the curriculum.

Freshman Year
First Semester
3 - ENGL 1030 Accelerated Composition
3 - HIST 1720 The West and the World I
4 - Foreign Language Requirement1
4 - Natural Science Requirement2
2 - Elective
16

Second Semester
3 - HIST 1730 The West and the World II
4 - Foreign Language Requirement1
3 - Geography Requirement7
3 - Mathematics Requirement2
3 - Mathematics or Natural Science Requirement2
16

Sophomore Year
First Semester
3 - Arts and Humanities (Literature) Requirement7
3 - Arts and Humanities (Non-Lit.) Requirement2
3 - Foreign Language Requirement1
3 - Major Requirement8
3 - Elective
15

Second Semester
4 - HIST 2990 Seminar: The Historian’s Craft
3 - Advanced Humanities Requirement6
3 - Foreign Language Requirement1
3 - Major Requirement8
2 - Minor Requirement
15

Junior Year
First Semester
3 - Advanced Humanities Requirement5
6 - Major Requirement4
3 - Minor Requirement
3 - Elective
15

Second Semester
3 - Literature Requirement6
6 - Major Requirement6
3 - Minor Requirement
3 - Elective
15

Senior Year
First Semester
3 - 4000-Level History Requirement4
3 - Advanced Humanities Requirement5
3 - Major Requirement8
3 - Minor Requirement
3 - Elective
15

Second Semester
3 - HIST 4900 Seminar or
3 - HIST 4980 Senior Honors Thesis
3 - Major Requirement8
3 - Minor Requirement
3 - Elective
12

120 Total Semester Hours

1The foreign language requirement is a proficiency requirement. Students must complete through 2020 in American Sign Language, Arabic, French, German, Italian, Japanese, Latin, Portuguese, Russian, or Spanish.
2See General Education Requirements. Three of these credit hours must also satisfy the Science and Technology in Society Requirement.
3See advisor. Students must take three hours each of U.S. History, European history, and non-Western history, in addition to three hours of history at the 4000 level. No more than six hours of 1000- and 2000-level history courses (in addition to HIST 2990 or HIST 2100 for students in the Public History Emphasis Area) may be counted towards the Major Requirements.
LANDSCAPE ARCHITECTURE

Bachelor of Landscape Architecture

The profession of landscape architecture is broad and interdisciplinary. Practicing landscape architects work on a wide range of project types, including, but not limited to, urban design, community design, historic preservation, ecological restoration, parks and park systems, institutional landscapes, memorials, cemeteries, industrial site reclamation, golf courses, wilderness areas and trails, residential landscapes, and gardens.

The profession is both an art and a science. Successful landscape architects are creative professionals who hold an environmental imperative and a social conscience. They are also excellent facilitators, able to bring numerous disciplines and professions together to work on complex projects in the landscape. Landscape Architecture students gain an understanding of this diverse range of subjects by participating in Clemson University’s Creative Inquiry Initiative. As a consequence of numerous creative inquiry experiences within the program, students develop greater skills in teamwork, creative thinking, problem solving, and communication.

Clemson’s Landscape Architecture program is noted for a special emphasis on the art of design. Consequently, the landscape architecture design studio experience is at the center of the student’s education—42 hours of studio are required. The five-year program leads to a nationally accredited Bachelor of Landscape Architecture degree. The program is generalist, covering the major areas of practice and building from design basics to sophisticated studio experiences, such as large scale landscape planning; parks, recreation, and open space planning; and regional, urban, and community design. The studio experience is supported by other courses inside and outside the Landscape Architecture curriculum that provide the necessary grounding in landscape history and social, cultural, environmental, and aesthetic theories. Students may also choose to focus elective credits on one of three areas: cultural issues, environmental issues, or professional development. Outstanding fifth-year students may apply for admission into a shortened Master of City and Regional Planning, Master of Landscape Architecture, or Master of Real Estate Development program.

Any undergraduate student who meets the Academic Eligibility Policy after attempting 12 credit hours at Clemson University (or who is allowed to continue by virtue of a semester 2.4 grade-point average on 12 earned credits or who is allowed to continue through appeal to the Appeals Committee on Academic Eligibility or by other authorization of this committee) may transfer from one major to another. Any college or department that seeks an exception to this policy must have the approval of the collegiate dean and the provost.

Freshman Year

First Semester
3 - AAH 2100 Intro. to Art and Architecture
3 - BIOL 1030 General Biology I
1 - BIOL 1050 General Biology Lab. I
3 - ENGL 1030 Accelerated Composition
3 - LARC 1280 Technical Graphics
3 - LARC 1510 Basic Design I
16
Second Semester
3 - BIOL 1040 General Biology II
1 - BIOL 1060 General Biology Lab. II
3 - HORT 1010 Horticulture
3 - LARC 1160 History of Landscape Arch.
3 - LARC 1520 Basic Design II
3 - MTHS 1020 Intro. to Mathematical Analysis
16
Sophomore Year

First Semester
3 - AGM 2210 Surveying: Earthwork and Area Measurements
3 - COMM 1500 Intro. to Human Comm. or
3 - COMM 2500 Public Speaking
3 - HORT 3030 Landscape Plants
3 - LARC 2510 Landscape Architecture Design Fundamentals
3 - LARC 4280 Landscape Architecture Computer Aided Design
18
Second Semester
6 - LARC 2520 Site Design in Landscape Arch.
3 - LARC 2520 Design Implementation I
3 - WFB (BIOL) 3130 Conservation Biology1
3 - Elective
21
Summer
3 - LARC 4650 Urban Genesis and Form
15
Junior Year

First Semester
3 - GEOL 1010 Physical Geology
3 - GEOL 1030 Physical Geology Lab.
3 - LARC 3510 Regional Design and Ecology
3 - LARC 3620 Design Implementation II
3 - LARC 5030 Landscape Architecture Portfolio
16
Second Semester
3 - FOR (HORT) 4270 Urban Tree Care
3 - GEOG 1010 Introduction to Geography
6 - LARC 3520 Urban Design Studio
3 - LARC 5810 Land. Arch. Professional Practice
3 - Foreign Language Requirement2
18
Summer
2 - LARC 2930 Field Studies Internship or
2 - LARC 4930 Prof. Office Internship3
10
Senior Year

First Semester
1 - LARC 4180 Off-Campus Study Seminar
6 - LARC 4510 Community Design Studio
3 - Arts and Humanities (Literature) Requirement4
3 - Foreign Language Requirement2
13
Second Semester
3 - AAH 3950 Special Topics in Visual Studies—Abroad I or
3 - AAH 3960 Special Topics in Visual American Studies I
3 - LARC 4190 Off-Campus Field Study
6 - LARC 4520 Off-Campus Studio
12
Professional Year

First Semester
3 - LARC 4530 Key Issues in Landscape Arch.
3 - Social Science Requirement4
8 - Elective
14
Second Semester
6 - LARC 5520 Landscape Arch. Exit Project
6 - Elective
12
155 Total Semester Hours

1Other ecology courses from a department-approved list may be substituted.
2Two semesters (2010 and 2020) in the same foreign language are required.
3Two hours of internship credit are required. A maximum of six hours credit of internship may be scheduled.
4See General Education Requirements.

LANGUAGE AND INTERNATIONAL HEALTH

Bachelor of Science

The Bachelor of Science program in Language and International Health is jointly administered by the Department of Languages and the Department of Public Health Sciences in the College of Health, Education and Human Development. Students acquire knowledge in public health theory and practice, including the history and philosophy of public health and medicine, the organization, management, and financing of health services; the social and behavioral aspects of health, epidemiology, health evaluation methods, and health communications. Students also acquire communicative competence in the target language and its culture, literatures, health environments, and multicultural issues.

The program requires the completion of a semester internship abroad. Graduates will be qualified to assume positions in a variety of settings, including integrated hospital systems, consulting firms, managed care organizations, pharmaceutical companies, as well as multicultural community centers. They can also pursue graduate degrees in community health, epidemiology/biostatistics, health administration, health systems and research.
In addition to the curriculum requirements below, students in the Language and International Health program will be required to pass a noncredit examination and submit a noncredit senior dossier to assess their language competence in various areas. Both assessments take place in the student’s last full semester at the University.

Students who have completed fewer than 50 credit hours may change majors into Language and International Health with a minimum cumulative grade-point average of 2.5. Students with 50 or more credit hours may apply for a change of major into Language and International Health, based on space availability, with a minimum cumulative grade-point average of 2.75.

**Freshman Year**

*First Semester*
- 3 - BIOL 1030 General Biology I
- 4 - CHIN 1010 Elementary Chinese or
- 4 - SPAN 1020 Elementary Spanish or
- 4 - SPAN 1040 Basic Spanish
- 3 - ENGL 1030 Accelerated Composition
- 3 - HLTH 2020 Introduction to Public Health
- 1 - LIH 1270 Introduction to LIH

*Second Semester*
- 4 - CHIN 1020 Elementary Chinese or
- 3 - SPAN 2010 Intermediate Spanish
- 3 - EXST 3010 Introductory Statistics
- 3 - HLTH 2980 Human Health and Disease
- 3 - Emphasis Area Requirement
- 3 - Elective

15-16

**Sophomore Year**

*First Semester*
- 4 - CH 1010 General Chemistry or
- 4 - CH 1050 Chemistry in Context I
- 3 - CHIN 2010 Intermediate Chinese or
- 3 - SPAN 2020 Intermediate Spanish
- 3 - COMM 1500 Intro. to Human Commun.
- 3 - COMM 2500 Public Speaking
- 3 - HLTH 4700 International Health
- 3 - Social Science Requirement

16

*Second Semester*
- 4 - CH 1020 General Chemistry or
- 4 - CH 1060 Chemistry in Context II
- 3 - CHIN 2020 Intermediate Chinese or
- 3 - SPAN 3020 Inter. Span. Grammar and Comp. or
- 3 - SPAN 3050 Inter. Span. Conv. and Comp. I, or
- 3 - SPAN 3060 Span. Comp. for Business
- 3 - HLTH 2400 Determinants of Health Behavior
- 3 - Arts and Humanities (Non-Lit.) Requirement
- 3 - Emphasis Area Requirement

16

**Junior Year**

*First Semester*
- 4 - BIOL 2220 Human Anatomy and Phys. I
- 3 - CHIN 3050 Chinese Conversation and Composition or
- 3 - SPAN 4150 Spanish for Health Professionals
- 3 - CHIN 4010 Premodern Chinese Literature or
- 3 - SPAN 3040 Int. to Hisp. Literary Forms or
- 3 - SPAN 3110 Survey of Spanish-Amer. Lit. or
- 3 - SPAN 3130 Survey of Spanish Lit. I
- 3 - HLTH 3800 Epidemiology
- 3 - HLTH 4800 Community Health Promotion or
- 3 - HEHD 4100 Leadership Behavior and Civic Engagement or
- 3 - RS (SOC) 4590 The Community or
- 3 - SOC 3310 Urban Sociology

15

*Second Semester*
- 3 - CHIN 3060 Chinese Conversation and Composition or
- 3 - SPAN 3070 The Hispanic World: Spain or
- 3 - SPAN 3080 The Hispanic World: Latin America or
- 3 - SPAN 3180 Spanish Through Culture or
- 3 - SPAN 4350 Contemporary Hispanic Culture
- 3 - CHIN (ANTH) 4180 Chinese Culture and Society or
- 3 - SPAN 4180 Technical Spanish for Health Management Professionals
- 3 - HLTH 4900 Research and Evaluation Strategies for Public Health
- 3 - LIH 4000 Internship Abroad
- 3 - Advanced Chinese Requirement or
- 3 - Advanced Spanish Requirement or
- 3 - Advanced Health Requirement

16

**Senior Year**

*First Semester*
- 4 - BIOL 2230 Human Anatomy and Physiology II
- 3 - CHIN 4170 Chinese for Health Professionals II or
- 3 - SPAN 4190 Health and the Hispanic Community
- 3 - HLTH 2030 Overview of Health Care
- 3 - Emphasis Area Requirement
- 3 - Elective

16

*Second Semester*
- 3 - CHIN 4170 Chinese for Health Professionals II or
- 3 - Advanced Spanish Requirement
- 3 - Advanced Health Requirement
- 3 - Emphasis Area Requirement
- 3 - Social Science Requirement

12

121-122 Total Semester Hours

*Select one of the following emphasis areas:
- Health Administration—select one course from four of the following groups:
  - Accounting—ACCT 2010
  - Economics—ECON 2110, 2120
  - Finance—FIN 3060
  - Health—CRD (APEC, HLTH) 3610, HLTH 4750
  - International Trade—CHIN 3160, 4160, SPAN 3160, 4050, 4160, 4170
  - Law—LAW 3210
- Management—MGMT 2100, 2180, 3900, 4110, 4160, 4220, 4230, 1 EI 4440, 4520
- Marketing—MKT 3110

*Community Development—select one course from four of the following groups:
  - Applied Economics—APEC 2020, 3520
  - Community Development—CRD (APEC) 3570, (APEC) 4110, (APEC) 4120
  - Economics—ECON 2110, 2120
  - Health—CRD (APEC), HLTH 3610
  - International Trade—CHIN 3160, 4160, SPAN 3160, 4050, 4160, 4170
  - Rural Sociology—RS (SOC) 4010, (SOC) 4590, SOC 3710, (RS) 4710
  - Sociology—SOC 4330

*Select two courses (six hours) from two different fields: ANTH 2010, GEOG 1030, HIST 1720, 1730, 1930, POSC 1020, 1040, PSYC 2010, SOC 2100.

*See General Education Requirements. For students not taking the CH 1050/1060 sequence, three of these credit hours must also satisfy the Science and Technology in Society Requirement.

*Internship must be taken in a country where the target language is spoken. The study abroad courses and internship must be taken concurrently as listed during the second semester of the junior year or later or during the summer.

*Select from any 3000–4000-level courses in the target language: SPAN 3100.

*Select from any 3000–4000-level courses in HLTH.

**LANGUAGE AND INTERNATIONAL TRADE**

**Bachelor of Arts**

Students in the Bachelor of Arts program in Language and International Trade acquire communicative competence in the target language; a familiarity with specific peoples, cultures, literatures, and business environments; and the knowledge and skills to pursue graduate studies or careers in business within their language of specialization.

The Language and International Trade program combines foreign languages and international trade. Students choose one language concentration (Chinese, French, German, Japanese, or Spanish) and one professional concentration (Applied International Economics, International Trade, or Tourism).

The language component emphasizes speaking and writing skills, culture, civilization, and business/technical languages. The professional component introduces students to the core content of their preferred concentration, as well as to the international dimensions of that concentration.

Study abroad of at least one semester in the target language setting is mandatory. In addition, each student is required to complete an internship with an international company in the United States or a summer internship with a company abroad. Internships are subject to approval by the Language and International Trade Director. Students are strongly encouraged to participate in the Clemson Language Immersion Program (CLIP) prior to enrolling in study abroad programs.

In addition to the curriculum requirements below, students are required, as a condition of graduation, to pass a noncredit examination and submit a noncredit senior dossier to assess their language competence in various areas. Both assessments take place in the student’s last full semester at the University.
### Freshman Year

**First Semester**
- 4 - CHIN 1010 Elementary Chinese or
  - 4 - MTHS 2070 Multivariable Calculus
- 4 - GER 1010 Intermediate German or
  - 4 - JAPN 1010 Elementary Japanese or
  - 4 - FR 1020 Elementary French or
- 4 - ENGL 1030 Accelerated Composition
  - 4 - LIT 1270 Introduction to LIT
  - 4 - MTHS 1020 Intro. to Mathematical Analysis
- 4 - Natural Science Requirement
  - 15

**Second Semester**
- 3 - CHIN 2010 Intermediate Chinese or
  - 3 - APEC 2020 Agricultural Economics
- 3 - FR 2010 Intermediate French or
  - 3 - JAPN 1020 Elementary Japanese or
  - 3 - GER 1020 Elementary German or
  - 3 - SPAN 2010 Intermediate Spanish
- 3 - Social Science Requirement
  - 15

### Sophomore Year

**First Semester**
- 3 - CHIN 3160 Chinese for International Trade I or
  - 3 - FR 3160 French for International Trade I or
  - 3 - JAPN 3160 Japanese for Int’l Trade I or
  - 3 - SPAN 3160 Spanish for Int’l Trade I
- 3 - ECON 2110 Principles of Microeconomics
  - 3 - MGT 3010 Principles of Management
  - 3 - Advanced Foreign Language Requirement
  - 3 - Elective
  - 15

**Second Semester**
- 3 - CHIN 3160 Chinese for International Trade I or
  - 3 - FR 3160 French for International Trade I or
  - 3 - JAPN 3160 Japanese for Int’l Trade I or
  - 3 - SPAN 3160 Spanish for Int’l Trade I
- 3 - MGT 2010 Principles of Management
  - 3 - Advanced Agricultural Econ. Requirement
  - 3 - Advanced Foreign Language Requirement
  - 3 - Elective
  - 15

**Summer**
- 3 - LIT 4000 LIT Internship

### Junior Year

**First Semester**
- 3 - APEC 3190 Agribusiness Management
  - 3 - CHIN 3050 Chinese Conv. and Comp. I or
    - 3 - FR 3050 Intermediate French Conversation and Composition I or
  - 3 - GER 3050 German Conv. and Comp. or
  - 3 - GER 3060 German Short Story or
  - 3 - JAPN 3050 Japanese Conv. and Comp. or
  - 3 - SPAN 3050 Intermediate Spanish Conversation and Composition I
- 3 - ENGL 3040 Business Writing
  - 3 - MKT 3020 Consumer Behavior
  - 3 - Advanced Social Science Requirement
  - 15

**Second Semester**
- 3 - CHIN 3160 Chinese for International Trade I or
  - 3 - FR 3160 French for International Trade I or
  - 3 - JAPN 3160 Japanese for Int’l Trade I or
  - 3 - SPAN 3160 Spanish for Int’l Trade I
- 3 - MGT 2010 Principles of Management
  - 3 - Advanced Agricultural Econ. Requirement
  - 3 - Advanced Foreign Language Requirement
  - 3 - Elective
  - 15

**Summer**
- 3 - LIT 4000 LIT Internship

### International Trade Concentration

**Sophomore Year**

**First Semester**
- 3 - CHIN 2010 Intermediate Chinese or
  - 3 - FR 2010 Intermediate French or
  - 3 - GER 2010 Intermediate German or
  - 3 - JAPN 2010 Intermediate Japanese or
  - 3 - SPAN 2010 Intermediate Spanish
- 3 - ECON 2110 Principles of Microeconomics
  - 3 - MGT 2010 Principles of Management
  - 3 - Social Science Requirement
  - 15

**Second Semester**
- 3 - CHIN 2010 Intermediate Chinese or
  - 3 - FR 2010 Intermediate French or
  - 3 - GER 2010 Intermediate German or
  - 3 - JAPN 2010 Intermediate Japanese or
  - 3 - SPAN 2010 Intermediate Spanish
- 3 - ECON 2110 Principles of Microeconomics
  - 3 - MGT 2010 Principles of Management
  - 3 - Social Science Requirement
  - 15

### Junior Year

**First Semester**
- 3 - CHIN 3050 Chinese Conv. and Comp. I or
  - 3 - FR 3050 Intermediate French Conversation and Composition I or
  - 3 - GER 3050 German Conv. and Comp. or
  - 3 - GER 3060 German Short Story or
  - 3 - JAPN 3050 Japanese Conv. and Comp. or
  - 3 - SPAN 3050 Intermediate Spanish Conversation and Composition I
- 3 - ENGL 3040 Business Writing
  - 3 - MKT 3020 Consumer Behavior
  - 3 - Advanced Social Science Requirement
  - 15

**Second Semester**
- 3 - CHIN 3160 Chinese for International Trade I or
  - 3 - FR 3160 French for International Trade I or
  - 3 - JAPN 3160 Japanese for Int’l Trade I or
  - 3 - SPAN 3160 Spanish for Int’l Trade I
- 3 - MGT 2010 Principles of Management
  - 3 - Advanced Agricultural Econ. Requirement
  - 3 - Advanced Foreign Language Requirement
  - 3 - Elective
  - 15

**Summer**
- 3 - LIT 4000 LIT Internship

### APPLIED INTERNATIONAL ECONOMICS CONCENTRATION

**Sophomore Year**

**First Semester**
- 3 - APEC 2020 Agricultural Economics
  - 3 - CHIN 2010 Intermediate Chinese or
  - 3 - FR 2010 Intermediate French or
  - 3 - GER 2010 Intermediate German or
  - 3 - JAPN 2010 Intermediate Japanese or
  - 3 - SPAN 2010 Intermediate Spanish
- 3 - ECON 2110 Principles of Microeconomics
  - 3 - Arts and Humanities (Non-Lit.) Requirement
  - 3 - Social Science Requirement
  - 15

**Second Semester**
- 3 - APEC 3090 Econ. of Agricultural Marketing
  - 3 - CHIN 2010 Intermediate Chinese or
  - 3 - FR 2010 Intermediate French or
  - 3 - GER 2020 Intermediate German or
  - 3 - JAPN 2020 Intermediate Japanese or
  - 3 - SPAN 2020 Intermediate Spanish
- 3 - Social Science Requirement
  - 15

### International Trade Concentration

**Sophomore Year**

**First Semester**
- 3 - CHIN 2010 Intermediate Chinese or
  - 3 - FR 2010 Intermediate French or
  - 3 - GER 2010 Intermediate German or
  - 3 - JAPN 2010 Intermediate Japanese or
  - 3 - SPAN 2010 Intermediate Spanish
- 3 - ECON 2110 Principles of Microeconomics
  - 3 - MGT 2010 Principles of Management
  - 3 - Social Science Requirement
  - 15

**Second Semester**
- 3 - CHIN 2010 Intermediate Chinese or
  - 3 - FR 2010 Intermediate French or
  - 3 - GER 2020 Intermediate German or
  - 3 - JAPN 2020 Intermediate Japanese or
  - 3 - SPAN 2020 Intermediate Spanish
- 3 - ECON 3140 Intermediate Microeconomics
  - 3 - MKT 4210 International Marketing
  - 3 - Advanced Social Science Requirement
  - 3 - Elective
  - 15

**Summer**
- 3 - LIT 4000 LIT Internship
Senior Year
First Semester
3 - CHIN 4160 Chinese for Int’l Trade II or
3 - FR 4160 French for International Trade II or
3 - GER 4160 German for Int’l Trade II or
3 - JAPN 4160 Japanese for Int’l Trade II or
3 - SPAN 4160 Spanish for Int’l Trade II
3 - MKT 4270 International Marketing
3 - Advanced Business Requirement
3 - Foreign Language Civilization Requirement
3 - Elective
15
Second Semester
3 - MGT 4230 International Management
6 - Advanced Foreign Language Requirement
3 - Advanced Social Science Requirement
12

120 Total Semester Hours

*See General Education Requirements. Three of these credit hours must also satisfy the Science and Technology in Society Requirement.
*Six credit hours selected from two different areas: ANTH 2010, GEOG 1030, HIST 1720, 1730, 1930, PSOC 1020, 1040, PSYC 2010
*Select from 3000-4000 level courses in ANTH, APEC, ECON, GEOG, HIST, PSOC, PSYC, SOC
*minimum of nine hours of 3000-4000 level foreign language courses is required. At least one course must be in literature.
Advanced grammar is recommended for those graduating 1000-2000 levels. FR 4380 and 4390 and SPAN 4380 and 4390 may not be used to satisfy requirements for the French or Spanish Concentration. Students may not take more than one foreign language course taught in English.
*Any 3000- or 4000-level MKT course
*Any 3000- or 4000-level APEC, ECON, MGT or MKT course
*CHIN (ANTH) 4160, 4990, FR 3070, 3170, GER 3400, 4050, JAPN 3070, 3080, (ANTH) 4170, 4990, SPAN 3070, 3080, or 4350

TOURISM CONCENTRATION
Sophomore Year
First Semester
3 - CHIN 2010 Intermediate Chinese or
3 - FR 2010 Intermediate French or
3 - GER 2010 Intermediate German or
3 - JAPN 2010 Intermediate Japanese or
3 - SPAN 2020 Intermediate Spanish
3 - ECON 2110 Principles of Microeconomics
3 - PRTM 3420 Introduction to Tourism
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Social Science Requirement
15
Second Semester
3 - CHIN 2020 Intermediate Chinese or
3 - FR 2020 Intermediate French or
3 - GER 2020 Intermediate German or
3 - JAPN 2020 Intermediate Japanese or
3 - SPAN 3020 Intermediate Spanish Grammar and Composition or
3 - SPAN 3060 Span. Composition for Bus.
3 - MKT 3010 Principles of Marketing
3 - PRTM 3050 Safety and Risk Mgr. in PRTM or
3 - PRTM 3430 Spatial Aspects of Tourist Behavior or
3 - PRTM 3440 Tourism Markets and Supply
3 - Arts and Humanities (Literature) Requirement
3 - Social Science Requirement
15

Junior Year
First Semester
3 - CHIN 3050 Chinese Conv. and Comp. I or
3 - FR 3050 Intermediate French Conversation and Composition I or
3 - GER 3050 German Conv. and Comp. or
3 - GER 3060 German Short Story or
3 - JAPN 3050 Japanese Conv. and Comp. or
3 - SPAN 3050 Intermediate Spanish Conversation and Composition I
3 - ENGL 3040 Business Writing
3 - MKT 3020 Consumer Behavior
3 - Advanced PRTM Requirement
3 - Advanced Social Science Requirement
15
Second Semester
3 - CHIN 3160 Chinese for International Trade I or
3 - FR 3160 French for International Trade I or
3 - GER 3160 German for Int’l Trade I or
3 - JAPN 3160 Japanese for Int’l Trade I or
3 - SPAN 3160 Spanish for Int’l Trade I
3 - MGT 2010 Principles of Management
3 - Advanced Foreign Language Requirement
3 - Advanced PRTM Requirement
3 - Elective
15
Summer
3 - L&IT 4000 L&IT Internship

Senior Year
First Semester
3 - CHIN 4160 Chinese for Int’l Trade II or
3 - FR 4160 French for International Trade II or
3 - GER 4160 German for Int’l Trade II or
3 - JAPN 4160 Japanese for Int’l Trade II or
3 - SPAN 4160 Spanish for Int’l Trade II
3 - ECON 3100 International Economy or
3 - ECON 4120 International Microeconomics
3 - MKT 4270 International Marketing
3 - Advanced PRTM Requirement
3 - Foreign Language Civilization Requirement
3 - Elective
15
Second Semester
3 - MGT 4230 International Management
6 - Advanced Foreign Language Requirement
3 - Advanced Social Science Requirement
12

120 Total Semester Hours

*See General Education Requirements. Three of these credit hours must also satisfy the Science and Technology in Society Requirement.
*Six credit hours selected from two different areas: ANTH 2010, GEOG 1030, HIST 1720, 1730, 1930, PSOC 1020, 1040, PSYC 2010
*Select from 3000-4000 level courses in ANTH, APEC, ECON, GEOG, HIST, PSOC, PSYC, SOC
*minimum of nine hours of 3000-4000 level foreign language courses is required. At least one course must be in literature.
Advanced grammar is recommended for those graduating 1000-2000 levels. FR 4380 and 4390 and SPAN 4380 and 4390 may not be used to satisfy requirements for the French or Spanish Concentration. Students may not take more than one foreign language course taught in English.
*Any 3000- or 4000-level MKT course
*Any 3000- or 4000-level APEC, ECON, MGT or MKT course
*CHIN (ANTH) 4160, 4990, FR 3070, 3170, GER 3400, 4050, 4550, JAPN 3070, 3080, (ANTH) 4170, 4990, SPAN 3070, 3080, or 4350

MODERN LANGUAGES
Bachelor of Arts
The Bachelor of Arts degree in Modern Languages provides a broadly humanistic course of study in seven areas of concentration: American Sign Language, Chinese, French, German, Italian, Japanese, and Spanish. This course of study seeks to provide students with basic competence in both the relevant language and the literary and cultural heritage pertaining to that language. Moreover, students will be required to take at least two courses in cultural inquiry which are designed to sharpen their sense of cultural difference, to enhance their critical thinking skills, and to prepare them for citizenship in a global community of diverse cultural precepts and practices. In this respect, the Bachelor of Arts in Modern Languages is intended to prepare students for a wide range of careers in the international arena as well as for the kinds of graduate programs that are an appropriate starting point for such careers.

All Modern Languages students are required to study French, but may take German as well for at least one semester in the case of Japanese and Spanish students. At least two semesters in the case of French and German.

As a condition of graduation, students in the Modern Languages program will be required to pass a noncredit examination and to submit an electronic portfolio in the relevant language to assess their competence in that language. Students should see their advisor for details. Both assessments take place in the student’s last full semester of study.

AMERICAN SIGN LANGUAGE EMPHASIS AREA
Freshman Year
First Semester
4 - ASL 1010 American Sign Language
3 - ENGL 1030 Accelerated Composition
3 - Mathematics Requirement
3 - Oral Communication Requirement
3 - Social Science Requirement
16
Second Semester
4 - ASL 1020 American Sign Language
3 - Mathematics or Natural Science Requirement
4 - Natural Science Requirement
3 - Social Science Requirement
16

Sophomore Year
First Semester
3 - ASL 1030 American Sign Language
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Fine Arts Requirement
3 - Minor Requirement
4 - Elective
16
Sophomore Year
First Semester
3 - CHIN 2010 Intermediate Chinese
3 - Arts and Humanities (Literature) Requirement
3 - Fine Arts Requirement
4 - Elective
16
Second Semester
3 - CHIN 2020 Intermediate Chinese
3 - Arts and Humanities (Literature) Requirement
3 - History Requirement
3 - Minor Requirement
3 - Elective
15
Junior Year
First Semester
3 - LANG 3030 Study Abroad Transfer
3 - Advanced Language Requirement
3 - Major Requirement
3 - Minor Requirement
4 - Elective
15
Second Semester
3 - Advanced Arts and Humanities Requirement
3 - Major Requirement
3 - Methodology and Theory Requirement
3 - Minor Requirement
3 - Elective
15
Senior Year
First Semester
2 - LANG 499 Language Portfolio
3 - Major Requirement
3 - Methodology and Theory Requirement
12
120 Total Semester Hours

CHINESE EMPHASIS AREA
Freshman Year
First Semester
4 - CHIN 1010 Elementary Chinese
3 - ENGL 1030 Accelerated Composition
3 - Mathematics Requirement
3 - Oral Communication Requirement
3 - Social Science Requirement
16
Second Semester
4 - CHIN 1020 Elementary Chinese
3 - Mathematics or Natural Science Requirement
3 - Natural Science Requirement
3 - Social Science Requirement
2 - Elective
16
Sophomore Year
First Semester
3 - CHIN 2020 Intermediate Chinese
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Fine Arts Requirement
4 - Elective
16
Second Semester
3 - CHIN 2020 Intermediate Chinese
3 - Arts and Humanities (Literature) Requirement
3 - History Requirement
3 - Minor Requirement
3 - Elective
15
Junior Year
First Semester
3 - LANG 3030 Study Abroad Transfer
3 - Advanced Language Requirement
3 - Major Requirement
3 - Minor Requirement
3 - Elective
15
Second Semester
3 - Advanced Arts and Humanities Requirement
3 - Major Requirement
3 - Methodology and Theory Requirement
3 - Minor Requirement
3 - Elective
15
Senior Year
First Semester
2 - LANG 4990 Language Portfolio
3 - Major Requirement
3 - Methodology and Theory Requirement
12
120 Total Semester Hours

FRENCH EMPHASIS AREA
Freshman Year
First Semester
4 - CHIN 1010 Elementary French
3 - ENGL 1030 Accelerated Composition
3 - Mathematics Requirement
3 - Oral Communication Requirement
3 - Social Science Requirement
16
Second Semester
4 - CHIN 1020 Elementary French
3 - Mathematics or Natural Science Requirement
3 - Natural Science Requirement
3 - Social Science Requirement
2 - Elective
16
Sophomore Year
First Semester
3 - FR 2010 Intermediate French
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Fine Arts Requirement
3 - Minor Requirement
4 - Elective
16
Second Semester
3 - FR 2020 Intermediate French
3 - Arts and Humanities (Literature) Requirement
3 - History Requirement
3 - Minor Requirement
3 - Elective
15
Junior Year
First Semester
3 - FR 3050 Intermediate French Conversation and Composition
3 - LANG 3030 Study Abroad Transfer
3 - Major Requirement
3 - Minor Requirement
3 - Elective
15
Second Semester
3 - Advanced Arts and Humanities Requirement
3 - Major Requirement
3 - Methodology and Theory Requirement
3 - Minor Requirement
3 - Elective
15
Senior Year
First Semester
2 - LANG 4990 Language Portfolio
3 - Major Requirement
3 - Methodology and Theory Requirement
12
120 Total Semester Hours

1Students who have had previous instruction in French may take an accelerated one-semester course that covers the material presented in the standard first-year sequence. They must then take four additional elective credit hours.
2See advisor.
3Three credit hours from FR 3000 or 3040, three credit hours from FR 3070 or 3170, and a minimum of nine credit hours of FR 3000–4000-level courses is required, of which at least one course must be in literature. No more than two courses taught in English may be taken.
GERMAN EMPHASIS AREA

Freshman Year
First Semester
4 - GER 1010 Elementary German
3 - ENGL 1030 Accelerated Composition
3 - Mathematics Requirement
3 - Oral Communication Requirement
2 - Social Science Requirement
3 - Elective

Second Semester
4 - GER 1020 Elementary German
3 - Mathematics or Natural Science Requirement
3 - Natural Science Requirement
3 - Social Science Requirement
2 - Elective

Sophomore Year
First Semester
3 - GER 2010 Intermediate German
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Fine Arts Requirement
3 - Minor Requirement
3 - Elective

Second Semester
3 - GER 2020 Intermediate German
3 - Arts and Humanities (Literature) Requirement
3 - History Requirement
3 - Minor Requirement
3 - Elective

Junior Year
First Semester
3 - GER 3050 Ger. Conversation and Comp. or
3 - GER 3060 German Short Story
3 - LANG 3030 Study Abroad Transfer
3 - Major Requirement
3 - Minor Requirement
3 - Elective

Second Semester
3 - Advanced Arts and Humanities Requirement
3 - Major Requirement
3 - Methodology and Theory Requirement
3 - Minor Requirement
3 - Elective

Senior Year
First Semester
3 - LANG 4990 Language Portfolio
3 - Major Requirement
3 - Methodology and Theory Requirement
3 - Minor Requirement
4 - Elective
15

Second Semester
3 - Advanced Arts and Humanities Requirement
6 - Major Requirement
3 - Methodology and Theory Requirement
12

120 Total Semester Hours

ITALIAN EMPHASIS AREA

Freshman Year
First Semester
3 - ENGL 1030 Accelerated Composition
4 - ITAL 1010 Elementary Italian
3 - Mathematics Requirement
3 - Oral Communication Requirement
3 - Social Science Requirement
3 - Elective

Second Semester
4 - ITAL 1020 Elementary Italian
3 - Mathematics or Natural Science Requirement
3 - Natural Science Requirement
3 - Social Science Requirement
2 - Elective

Sophomore Year
First Semester
3 - ITAL 2010 Intermediate Italian
3 - Arts and Humanities (Literature) Requirement
3 - Fine Arts Requirement
3 - Minor Requirement
4 - Elective
16

Second Semester
3 - ITAL 2020 Intermediate Italian
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Social Science Requirement
3 - Elective
16

Junior Year
First Semester
3 - JAPN 2010 Intermediate Japanese
3 - Mathematics or Natural Science Requirement
3 - Social Science Requirement
3 - Elective

Second Semester
3 - JAPN 2020 Intermediate Japanese
3 - Social Science Requirement
3 - Oral Communication Requirement
3 - Mathematics Requirement
4 - Elective
16

Sophomore Year
First Semester
3 - JAPN 3050 Japanese Conversation and Comp.
3 - LANG 3030 Study Abroad Transfer
3 - Advanced Language Requirement
3 - Major Requirement
3 - Minor Requirement
3 - Elective
15

Second Semester
3 - Advanced Arts and Humanities Requirement
3 - Major Requirement
3 - Methodology and Theory Requirement
3 - Minor Requirement
3 - Elective
15

Junior Year
First Semester
3 - JAPN 3050 Japanese Conversation and Comp.
3 - LANG 3030 Study Abroad Transfer
3 - Major Requirement
3 - Minor Requirement
3 - Elective
15

JAPANESE EMPHASIS AREA

Freshman Year
First Semester
3 - ENGL 1030 Accelerated Composition
4 - JAPN 1010 Elementary Japanese
3 - Mathematics Requirement
3 - Oral Communication Requirement
3 - Social Science Requirement

Second Semester
4 - JAPN 1020 Elementary Japanese
3 - Mathematics or Natural Science Requirement
3 - Social Science Requirement
3 - Elective

Sophomore Year
First Semester
3 - JAPN 1010 Elementary Japanese
3 - Social Science Requirement
3 - Oral Communication Requirement
3 - Mathematics Requirement
4 - Elective
16

Second Semester
3 - JAPN 2010 Intermediate Japanese
3 - Arts and Humanities (Literature) Requirement
3 - History Requirement
3 - Social Science Requirement
2 - Elective
16

Junior Year
First Semester
3 - JAPN 2010 Intermediate Japanese
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Fine Arts Requirement
3 - Minor Requirement
4 - Elective
16

Second Semester
3 - JAPN 2020 Intermediate Japanese
3 - Arts and Humanities (Literature) Requirement
3 - History Requirement
3 - Minor Requirement
3 - Elective
15

Junior Year
First Semester
3 - JAPN 3050 Japanese Conversation and Comp.
3 - LANG 3030 Study Abroad Transfer
3 - Major Requirement
3 - Minor Requirement
3 - Elective
15
College of Architecture, Arts and Humanities

Second Semester
3 - Advanced Arts and Humanities Requirement
3 - Major Requirement
3 - Methodology and Theory Requirement
3 - Minor Requirement
3 - Elective
15

Junior Year
First Semester
3 - LANG 3030 Study Abroad Transfer
3 - SPAN 3020 Intermediate Spanish Grammar and Composition
3 - SPAN 3030 Intermediate Spanish Conversation and Composition
3 - Major Requirement
3 - Minor Requirement
3 - Elective
15

Second Semester
3 - Advanced Arts and Humanities Requirement
3 - Major Requirement
3 - Methodology and Theory Requirement
3 - Minor Requirement
3 - Elective
15

Senior Year
First Semester
2 - LANG 4990 Language Portfolio
3 - Major Requirement
3 - Methodology and Theory Requirement
3 - Minor Requirement
4 - Elective
12

Second Semester
3 - Advanced Arts and Humanities Requirement
6 - Major Requirement
3 - Methodology and Theory Requirement
3 - Minor Requirement
4 - Elective
12

120 Total Semester Hours

SPANISH EMPHASIS AREA

Freshman Year
First Semester
3 - ENGL 1030 Accelerated Composition
4 - SPAN 1010 Elementary Spanish
3 - Mathematics Requirement
3 - Oral Communication Requirement
3 - Social Science Requirement
16

Second Semester
4 - SPAN 1020 Elementary Spanish
3 - Mathematics or Natural Science Requirement
4 - Natural Science Requirement
3 - Social Science Requirement
2 - Elective
16

Sophomore Year
First Semester
3 - SPAN 2010 Intermediate Spanish
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Fine Arts Requirement
3 - Minor Requirement
4 - Elective
16

Second Semester
3 - SPAN 2020 Intermediate Spanish
3 - Arts and Humanities (Literature) Requirement
3 - History Requirement
3 - Minor Requirement
3 - Elective
15

PHILOSOPHY

Bachelor of Arts

First Semester
3 - Cross-Cultural Awareness Requirement
3 - Science and Tech. in Society Requirement
3 - Major Requirement
3 - Minor Requirement
3 - Elective
15

Second Semester
3 - Arts and Humanities (Literature) Requirement
6 - Major Requirement
3 - Minor Requirement
3 - Elective
15

Junior Year
First Semester
6 - Advanced Area Requirement
6 - Major Requirement
3 - Minor Requirement
15

Standard Philosophy Major—PHIL 3150, 3160, 4010 or 4020, and 24 additional credits in PHIL selected with the advice and consent of the advisor. Three of these credits may be at the 1000 level.

Law, Liberty and Justice Emphasis Area—PHIL 1020, 3150, 3160, 3400 or 3120, 3430, 4010 or 4020, HIST 3280, 3290, and nine additional credits in philosophy selected with the advice and consent of the pre-law advisor. Students with this emphasis area are strongly advised to include POSC 4370 and/or 4380 as an elective, minor, or advanced area requirement.

Religious Studies Emphasis Area—REL 1010 or 1020, 3010, 3020, 4010 or 4020, PHIL 3030, 3150, 3160, 4010 or 4020, and nine additional credits selected with the advice and consent of the advisor. Of these nine credits, three must be in philosophy and three must be in religion courses at the 3000 level or above. (POSC 4070 may count as a religion course.) The remaining three credits may be in philosophy or religion but must be at the 3000 level or above. Students with this emphasis area must choose a minor other than Religion.

Pre-law and Premedicine students majoring in Philosophy should consult the departmental advisor for help in tailoring the program to their needs.
Second Semester
2 - PHIL 3990 Philosophy Portfolio
9 - Major Requirement1
3 - Minor Requirement4
3 - Elective
- 17

Senior Year
First Semester
6 - Advanced Area Requirement5
3 - Major Requirement1
3 - Minor Requirement4
12
Second Semester
6 - Major Requirement1
9 - Elective
15
120 Total Semester Hours
1. The foreign language requirement is a proficiency requirement. Students must complete through 2020 in Arabic, Chinese, French, German, Italian, Japanese, Latin, Portuguese, Russian, or Spanish.
2. See General Education Requirements.
3. See major requirements in program description above.
4. See page 78 for approved minors. Students with a Religious Studies Emphasis Area may not minor in Religion.
5. Select from 3000-4000 level courses in the humanities (must be from an area other than philosophy), mathematical sciences, science, or the social sciences.

PRODUCTION STUDIES IN PERFORMING ARTS

Bachelor of Arts

The Production Studies in Performing Arts degree is a nationally distinctive Bachelor of Arts degree that prepares students for careers in many aspects of the arts, including but not limited to performance, design, arts administration, and arts technologies. The curriculum offers specialized study in music, theatre, and audio technology. In addition to discipline-specific concentrations, all performing arts students take classes in performance, production, history, theory, and arts technology. The Brooks Center for the Performing Arts is a living performing arts laboratory where visiting artists and industry professionals provide additional experiential educational opportunities for Clemson students. Students may choose from more than 70 minors and select elective courses to tailor their degrees to their individual interests.

The degree is rooted in the liberal arts tradition with specific training in the performing arts. It provides the background for a number of career options or advanced studies such as graduate school, professional internships, and specialized postgraduate training.

The curriculum features a senior capstone project in which students spend a semester of their final year working as a production team—writing, composing, designing, marketing, and performing a final project with a strong service component.

To be considered for admission to this program, students must undergo an interview/audition with the Department of Performing Arts. Please note that students will not be eligible for admission to Clemson University in Production Studies in Performing Arts until this interview/audition is completed. Contact the department for specific requirements.

As a requirement for graduation, all Music Concentration students will be required to demonstrate piano competence equivalent to the 1020 level, and all Audio Technology students will be required to demonstrate piano competence equivalent to the 1010 level.

AUDIO TECHNOLOGY CONCENTRATION

Freshman Year
First Semester
3 - AUD 1850 Introduction to Audio Technology
4 - MTHS 1030 Accelerated Composition
4 - MTHS 1040 Precalculus and Introductory Differential Calculus1
1 - MUSC 1010 Beginning Class Piano2
3 - PHYS 1220 Physics with Calculus I or PHYS 2070 General Physics I
1 - PHYS 1240 Physics Laboratory I or PHYS 2090 General Physics I Laboratory
3 - PA 1010 Introduction to Performing Arts
1 - PA 1030 Portfolio I
16
Second Semester
3 - AUD 2850 Acoustics of Music
3 - ENGL 1030 Accelerated Composition
4 - MTHS 1070 Differential and Integral Calculus1
3 - PHYS 2080 General Physics II or MUSC 1430 Music Theory I
3 - PHYS 2210 Physics with Calculus II
1 - PHYS 2100 General Physics II Laboratory or PHYS 2230 Physics Laboratory II
17

Sophomore Year
First Semester
3 - AUD 3850 Sound Reinforcement
3 - AUD 3840 Audio Engineering I
3 - MUSC 1430 Music Theory I1
1 - MUSC 1430 Aural Skills I
3 - PA 2100 Career Planning and Professional Development
3 - Foreign Language Requirement4
16
Second Semester
3 - AUD 3850 Adv. Live Sound Reinforcement or AUD 3860 Electr. Comp. and Sound Design
3 - MUSC 2100 Music Appreciation: Music in the Western World
1 - PA 2790 Performing Arts Practicum I
3 - Social Science Requirement5
3 - Foreign Language Requirement4
3 - Elective
16

Junior Year
First Semester
3 - AUD 4800 Audio Engineering II
1 - PA 2800 Performing Arts Practicum II
3 - PA 3010 Principles of Arts Administration
3 - Minor Requirement
3 - Music History Requirement4
3 - Social Science Requirement5
16
Second Semester
3 - AUD 2790 Audio Practicum
3 - COMM 2500 Public Speaking
3 - MUSC 3180 History of Audio Technology
3 - Arts and Humanities (Literature) Requirement4
3 - Minor Requirement
15

Senior Year
First Semester
4 - PA 4010 Senior Capstone Project
1 - PA 4030 Portfolio II
6 - Minor Requirement
3 - Music History Requirement4
14
Second Semester
3 - AUD 4850 Production Workshop
3 - PA 3990 Internship
3 - Minor Requirement
3 - Music Requirement4
3 - Elective
15
H2 Total Semester Hours
Students scoring a five or six on the mathematics placement exam may take MTHS 1060 as their only math requirement.
1. Audio Technology students may demonstrate piano competence at the MUSC 1010 level with a competency test and not have to take the class. Students will still be responsible for this hour of credit by substituting another class.
2. Students minoring in music must also take MUSC 1440/1450.
3. The foreign language requirement is a proficiency requirement. Students must complete through 2020 in American Sign Language, Arabic, Chinese, French, German, Italian, Japanese, Latin, Portuguese, Russian, or Spanish.
4. See General Education Requirements.
5. Must be chosen from MUSC 3080, 3090, 3120, 3130, 3140, 3170, 4150, or 4160.
6. Select any 3000-4000 level MUSC course.

MUSIC CONCENTRATION

Freshman Year
First Semester
3 - ENGL 1030 Accelerated Composition
1 - MUSC 1010 Beginning Class Piano I
3 - MUSC 1420 Music Theory I
1 - MUSC 1430 Aural Skills I1
3 - PA 2100 Career Planning and Professional Development
3 - Foreign Language Requirement4
16
Second Semester
3 - MUSC 1020 Beginning Class Piano II
3 - MUSC 1440 Music Theory II
1 - MUSC 1450 Aural Skills II1
1 - MUSC 1530 Applied Music for Majors
3 - PA 1010 Introduction to Performing Arts
1 - PA 1030 Portfolio I
3 - Foreign Language Requirement4
1 - Large Ensemble Requirement2
17
Second Semester
1 - MUSC 1020 Beginning Class Piano II
3 - MUSC 1440 Music Theory II
1 - MUSC 1450 Aural Skills II1
1 - MUSC 1540 Applied Music for Majors
3 - THEA 2100 Theatre Appreciation (Humanities Non-Lit Requirement)
3 - Foreign Language Requirement4
1 - Large Ensemble Requirement2
3 - Mathematics Requirement1
16
Sophomore Year

First Semester
3 - MUSC 2420 Music Theory III
1 - MUSC 2430 Aural Skills III
1 - MUSC 2530 Applied Music for Majors
3 - PA 2010 Career Planning and Professional Development
1 - PA 2790 Performing Arts Practicum I
1 - Large Ensemble Requirement
3 - Mathematics or Natural Science Requirement
3 - Social Science Requirement
16

Second Semester
1 - MUSC 2540 Applied Music for Majors
1 - PA 2800 Performing Arts Practicum II
3 - Arts and Humanities (Literature) Requirement
1 - Large Ensemble Requirement
3 - Music History Requirement
4 - Natural Science Requirement
3 - Social Science Requirement
16

Junior Year

First Semester
3 - COMM 2500 Public Speaking
1 - MUSC 3530 Applied Music for Majors
3 - MUSC 4150 Music History to 1750
3 - PA 3010 Principles of Arts Administration
3 - Minor Requirement
2 - Elective
15

Second Semester
3 - MUSC 1800 Introduction to Music Technology
1 - MUSC 3540 Music History Since 1750
3 - MUSC 4300 Conducting
3 - Minor Requirement
2 - Elective
15

Senior Year

First Semester
4 - PA 4010 Senior Capstone Project
1 - PA 4030 Portfolio II
3 - Minor Requirement
3 - Music History Requirement
3 - Elective
14

Second Semester
6 - Minor Requirement
6 - Elective
12
121 Total Semester Hours

Note: As a requirement for graduation, Music Concentration students will be required to demonstrate piano competence at the 1020 level.

THEATRE CONCENTRATION

Freshman Year

First Semester
3 - ENGL 1030 Accelerated Composition
3 - MUSC 2100 Music Appreciation
1 - PA 1010 Introduction to Performing Arts
1 - PA 1030 Portfolio I
1 - PA 2790 Performing Arts Practicum I
3 - THEA 2780 Acting I
3 - Foreign Language Requirement
17

Second Semester
1 - PA 2800 Performing Arts Practicum II
3 - THEA 2770 Production Studies in Theatre or
3 - THEA 3770 Stagecraft
3 - Foreign Language Requirement
3 - Mathematics Requirement
3 - Elective
14

Sophomore Year

First Semester
3 - PA 2010 Career Planning and Professional Development
3 - THEA 3150 Theatre History I
1 - THEA (ENGL) 3470 The Structure of Drama
3 - Mathematics or Natural Science Requirement
3 - Elective
15

Second Semester
1 - THEA 2790 Theatre Practicum
1 - THEA 3160 Theatre History II
3 - Social Science Requirement
3 - Elective
15

Junior Year

First Semester
3 - PA 3010 Principles of Arts Administration
3 - THEA 3170 African American Theatre I or
3 - THEA 3180 African American Theatre II
3 - THEA 3760 Stage Directing I
3 - Minor Requirement
3 - Social Science Requirement
15

Second Semester
3 - Advanced Theatre Requirement
3 - Dramatic Literature Requirement
3 - Minor Requirement
6 - Elective
15

Senior Year

First Semester
3 - COMM 2500 Public Speaking
4 - PA 4010 Senior Capstone Project
1 - PA 4030 Portfolio II
1 - THEA 2790 Theatre Practicum
3 - Minor Requirement
3 - Arts and Humanities (Literature) Requirement
15

Second Semester
1 - THEA 2790 Theatre Practicum
6 - Advanced Theatre Requirement
6 - Minor Requirement
2 - Elective
15
121 Total Semester Hours

3See General Education Requirements. Three of these credit hours must also satisfy the Science and Technology in Society Requirements.

4Students are expected to complete the first year of language in high school or in a Clemson summer session before the first semester of the freshman year, except for Chinese or Japanese.

5Select from 3000- or 4000-level courses in THEA. At least three hours must be at the 4000 level.

6Must be chosen from ENGL 4290, THEA/ENGL 4300, ENGL 4100 or 4110.

VISUAL ARTS

Bachelor of Fine Arts

The Bachelor of Fine Arts degree is the recognized professional undergraduate degree in the visual arts. The program offers students a balanced curriculum of academic coursework and studio art and art history courses in preparation for careers in studio-related areas of the visual arts. The department offers coursework in a number of studio disciplines, including ceramics, drawing, painting, printmaking, photography, sculpture and the new media arts.

First-year art students participate in a foundations program comprised of four studio classes. These classes expose first-year art students to 2-D, 3-D, and 4-D studio practices; utilize traditional and new media; and place special emphasis on drawing. Near the end of the freshmen year, students exhibit their work in a mandatory Foundations Review.

In the sophomore year, students take studio courses in six disciplines, which provides an overview of the studio arts and exposes students to a broad range of studio experiences. Upon completion of this core of courses, students identify one studio discipline as their emphasis area in the Bachelor of Fine Arts program.

In the junior year, students fulfill requirements in their emphasis area in preparation for the Senior Studio experience. Requirements include intermediate and advanced courses in their chosen studio discipline.

The Senior Studio experience is comprised of three courses and provides students an opportunity to focus and refine their personal art concepts and skills, produce a cohesive body of artworks for their BFA exhibition, and develop their portfolio for graduate study or a career in studio-related art professions.

Freshman Year

First Semester
3 - AAH 1010 Survey of Art and Arch. History I
3 - ART 1050 Foundation Drawing I
3 - ART 1510 Foundations in Visual Art I
3 - ENGL 1030 Accelerated Composition
3 - Mathematics Requirement
3 - Elective
15

Second Semester
3 - ART 1020 Foundation Drawing II
3 - ART 1510 Foundations in Visual Art II
3 - ART 2400 Aural Skills I
3 - Mathematics Requirement
3 - Elective
15

Junior Year

First Semester
3 - AAH 1010 Survey of Art and Arch. History I
3 - ART 1050 Foundation Drawing I
3 - ART 1510 Foundations in Visual Art I
3 - ENGL 1030 Accelerated Composition
3 - Mathematics Requirement
15

Second Semester
3 - ART 1020 Foundation Drawing II
3 - ART 1510 Foundations in Visual Art II
3 - Mathematics Requirement
3 - Elective
15

Senior Year

First Semester
3 - AAH 1010 Survey of Art and Arch. History I
3 - ART 1050 Foundation Drawing I
3 - ART 1510 Foundations in Visual Art I
3 - ENGL 1030 Accelerated Composition
3 - Mathematics Requirement
15

Second Semester
3 - ART 1020 Foundation Drawing II
3 - ART 1510 Foundations in Visual Art II
3 - Mathematics Requirement
3 - Elective
15

Junior Year

First Semester
3 - AAH 1010 Survey of Art and Arch. History I
3 - ART 1050 Foundation Drawing I
3 - ART 1510 Foundations in Visual Art I
3 - ENGL 1030 Accelerated Composition
3 - Mathematics Requirement
15

Second Semester
3 - ART 1020 Foundation Drawing II
3 - ART 1510 Foundations in Visual Art II
3 - Mathematics Requirement
3 - Elective
15

Senior Year

First Semester
3 - AAH 1010 Survey of Art and Arch. History I
3 - ART 1050 Foundation Drawing I
3 - ART 1510 Foundations in Visual Art I
3 - ENGL 1030 Accelerated Composition
3 - Mathematics Requirement
15
Second Semester
3 - AAH 1020 Survey of Art and Arch. History II
3 - ART 1060 Foundation Drawing II
3 - ART 1520 Foundations in Visual Art II
3 - ART 2210 Beginning New Media
4 - Natural Science Requirement¹
16

Sophomore Year
First Semester
3 - AAH 2050 History and Theory of Art I
9 - Art 2000 Requirement²
3 - Mathematics or Natural Science Requirement¹
15
Second Semester
3 - AAH 2060 History and Theory of Art II
9 - Art 2000 Requirement²
3 - Social Science Requirement¹
15

Junior Year
First Semester
3 - AAH 3050 Contemporary Art History
3 - Art 3000 Emphasis Area Requirement³
3 - Art 3000/4000 Requirement⁴
3 - Arts and Humanities (Literature) Requirement¹
3 - Oral Communication Requirement¹
15
Second Semester
3 - Art 4000 Emphasis Area Requirement³
3 - Art 3000/4000 Requirement⁴
3 - Studio Requirement⁵
3 - Social Science Requirement¹
3 - Elective
15

Senior Year
First Semester
3 - ART 4710 BFA Senior Studio I
3 - ART 4730 Sr. Sem. in Professional Career Prep.
3 - Art 3000/4000 Requirement⁴
3 - Studio Requirement⁵
3 - Elective
15
Second Semester
5 - ART 4720 BFA Senior Studio II
3 - Art 3000/4000 Requirement⁴
6 - Elective
14
120 Total Semester Hours

¹See General Education Requirements. Six of these credit hours must also satisfy the Cross-Cultural Awareness and Science and Technology in Society Requirements.
²Select from ART 2050, 2070, 2090, 2110, 2130 and 2170
³Select an emphasis area from one of the studio disciplines included in the required core courses.
⁴Any 3000-4000 level ART course
⁵Any ART course or other course approved by advisor
MINORS

Following are minors acceptable for students in the College of Architecture, Arts and Humanities. Students cannot major and minor in the same field or acquire a minor that is not allowed by the degree program.

Accounting
Adult/Extension Education
Aerospace Studies
Agricultural Business Management
Agricultural Mechanization and Business
American Sign Language Studies
Animal and Veterinary Sciences
Anthropology
Architecture
Art
Athletic Leadership—not open to Marketing majors.
Biochemistry
Biological Sciences
Business Administration
Chemistry
Cluster
Communication Studies
Computer Science
Crop and Soil Environmental Science
Digital Production Arts
East Asian Studies
Economics
Education
English
Entomology
Entrepreneurship
Environmental Engineering
Environmental Science and Policy
Equine Business
Film Studies
Financial Management
Food Science
Forest Resource Management
Genetics
Geography
Geology
Global Politics
Great Works
History
Horticulture
Legal Studies
Management
Management Information Systems
Mathematical Sciences
Microbiology
Military Leadership
Modern Languages—not open to Language and International Trade majors
Music
Natural Resource Economics
Nonprofit Leadership
Packaging Science
Pan African Studies
Park and Protected Area Management
Philosophy
Physics
Plant Pathology
Political Science
Psychology
Public Policy
Religion—not open to Philosophy—Religious Studies majors
Russian Area Studies
Science and Technology in Society
Screenwriting
Sociology
Spanish-American Area Studies
Theatre
Therapeutic Recreation
Travel and Tourism
Turfgrass
Urban Forestry
Wildlife and Fisheries Biology
Women’s Studies
Writing

See pages 39-42 for details.
COLLEGE OF BUSINESS AND BEHAVIORAL SCIENCE

Students in the College of Business and Behavioral Science seek to understand and organize human behavior in a business, economic, and social context. The College promotes scholarship with broad awareness of the individual, cultural, political, and global levels and develops distinctive leaders in industry, higher education, professional and public service. The College includes the School of Accountancy and Finance, and the Departments of Aerospace Studies, Economics, Graphic Communications, Management, Marketing, Military Leadership, Political Science, Psychology, and Sociology and Anthropology.

All College of Business and Behavioral Science majors, and other non-majors taking 3000- and 4000-level courses offered by the College, are required to pay a differential fee to fund significant infrastructure and program enhancements. Additional information about this fee and the benefits derived from it is available at www.clemson.edu/obb/academics/fee.

BUSINESS AND PROFESSIONAL PROGRAMS

Bachelor of Science degrees are offered in Accountancy, Economics, Financial Management, Graphic Communications, Management, and Marketing. With the exception of Graphic Communications, these programs share a common curriculum during the first year, allowing the student maximum flexibility in choosing an appropriate major. The Business programs in Accounting, Financial Management, Management, and Marketing are accredited by AACSB International (Association to Advance Collegiate Schools of Business). The Accounting program has earned additional accounting accreditation by AACSB International. All business and professional curricula prepare students for a variety of careers and reflect an understanding of the basic principles of science, appreciation for the nature of human interaction, and the comprehension of the economic, political, and social environment.

Pre-Business Program

The Pre-Business program provides students planning to earn Bachelor of Science degrees in Accounting, Economics, Financial Management, Management, and Marketing with a sound academic preparation for these degrees. All Pre-Business students complete a common curriculum during the freshman year. All new Business students (including transfer students) are admitted into the Pre-Business program until the following core classes are satisfactorily completed and the grade-point average requirement is met: BUS 1010, ECON 2110, 2120, MTHS 1020, 2070 or acceptable sequence, ENGL 1030, and a natural science requirement.

Change of Major into Pre-Business

Students who change majors into Pre-Business must have completed at least 12 credit hours at Clemson and must have a 2.0 minimum cumulative grade-point ratio.

Freshman Curriculum

First Semester
1 - BUS 1010 Business Foundations
2 - ECON 2110 Principles of Microeconomics
3 - MTHS 1020 Intro. to Math. Analysis or 2
4 - MTHS 1060 Calculus of One Variable I
5 - PSYC 1010 Introduction to Psychology or 3
6 - SOC 2010 Introduction to Sociology 4
7 - Natural Science Requirement 5
8 - Elective
9 - 15

Second Semester
1 - COMM 1500 Intro. to Human Comm. or
2 - COMM 2500 Public Speaking
3 - ECON 2120 Principles of Macroeconomics
4 - ENGL 1030 Accelerated Composition 1
5 - MTHS 2070 Multivariable Calculus or 2
6 - MTHS 1080 Calculus of One Variable II
7 - Science and Tech. in Society Requirement 6
8 - 3
9 - Elective
10 - 15

1Freshman core curriculum class. Students must complete two classes before submitting a change-of-major request from Pre-Business to a business major.
2The following sequences are acceptable: MTHS 1020/2070, 1060/1080, 1060/2070. For each of the four-credit-hour courses taken, one credit will be applied toward the elective credit-hour requirement.
3See General Education Requirements.
4Natural Science Requirement.
5Admission to Business Degree Programs

To be eligible for admission into the Bachelor of Science degree programs in Accounting, Economics, Financial Management, or Management, students must have completed the courses outlined in the freshman core curriculum and have a cumulative grade-point average of 2.0 or higher. Students wishing to enter the Marketing Program must have completed the freshman core curriculum and have a Clemson/Bridge cumulative grade-point average of 3.0 or higher.

Students should initiate a change-of-major request with the College of Business and Behavioral Science Academic Advising Center in G-02 SRRH after completing the freshman core curriculum. Students who fail to meet the requirements for admission to a degree-granting business program may remain in Pre-Business until those requirements are met, but only until 64 semester hours of coursework have been completed. Students who exceed 64 credit hours and still do not meet the requirements for admission into a degree program must declare another major.

Transfer Credit Policy

For upper level undergraduates business courses (3000- and 4000-level courses with the rubrics of ACCT, BUS, ELE, FIN, LAW, MGT and MKT) transfer credits will only be accepted from AACSB International and/or EQUIS accredited institutions. Transfer credits from non-US institutions that do not hold either accreditation may be evaluated on a case-by-case basis.

BEHAVIORAL AND SOCIAL SCIENCE PROGRAMS

Bachelor of Arts degrees are offered in Anthropology, Economics, Political Science, Psychology, and Sociology. Bachelor of Science degrees are also offered in Anthropology, Political Science, Psychology, and Sociology. These programs are designed to meet the needs of students seeking a broad general education as preparation for intelligent citizenship, commercial and industrial life, government service, research, and teaching. These curricula also provide an excellent background for the study of law, journalism, and medicine.

To achieve depth as well as breadth in the educational experience, students select a major consisting of courses above the sophomore level. Students also choose a minor consisting of additional credit hours. Students should contact their advisor for additional information and approval before pursuing a minor. See page 90 for a list of acceptable minors.

Students in Bachelor of Arts programs who plan to attend public schools may elect education courses required for certification by the South Carolina Department of Education. Such courses are to be approved by their own department advisors.

ROTC PROGRAMS

Aerospace Studies (AFROTC)

Air Force Reserve Officer Training Corps (AFROTC) is designed to “develop quality leaders for the Air Force.” Students can earn a minor in Aerospace Studies and a commission as Second Lieutenants while pursuing a bachelor’s degree. Clemson’s program has won numerous local and national awards for excellence. The program includes courses in foundations of the Air Force, air power history, leadership and management, and national security affairs. In addition to courses, students participate in a weekly leadership laboratory. “Lead Lab” provides students a training environment to practice leadership principles in a cadet led Air Force wing. Throughout the program, cadets hone their communication skills through various leadership positions, briefings, and papers. The first year of the program, Foundations of the United States Air Force, introduces students to the Air Force and AFROTC. It provides an overview of the basic characteristics, missions, and organization of the Air Force. The second year, The Evolution of USAF Air and Space Power, features topics on Air Force heritage and leaders; and introduces air and space power through examination of distinct capabilities and functions. The third year, Air Force Leadership Studies, teaches cadets advanced skills and knowledge in management and leadership. Special emphasis is placed on enhancing leadership skills. Cadets have an opportunity to try out these leadership and management techniques in a supervised environment as juniors and seniors. The fourth year, National Security Affairs and Preparation for Active Duty, is designed for college seniors and gives them the foundation to understand their role as military officers in American society. It is an overview of complex social and political issues facing the military profession and requires a measure of sophistication commensurate with the senior college level. Seniors are also prepared to enter active duty as they transition from student to Air Force Officer. For additional information, contact the Department of Aerospace Studies.
Military Leadership (Army ROTC)
Army Reserve Officer Training Corps (Army ROTC) is all about leadership. Students that complete the entire program may earn a commission as a Lieutenant in the Army Reserve, National Guard, or Active Army. The first two years of the program are open to all students. During the freshman year, the focus is on learning individual leadership skills such as time management, leadership character, values, setting goals, and conducting meetings. The sophomore year emphasizes teamwork, team leading, communication/briefings, decision making, team values, and organizational culture and vision. Juniors primarily learn how to plan and conduct training for large groups and are evaluated in leadership positions. Seniors focus on organizational leadership. They plan and run the 170-person organization, conduct individual counseling, and evaluate the juniors' performance in leadership positions. This prepares them for their career as an Army Officer once they graduate. A minor in Military Leadership can be earned by completing the program. Enrollment requires no military obligation until the sophomore year for those on an Army scholarship or the junior year for those without a scholarship. Additional information is available from the Military Leadership Department.

ACCOUNTING
Bachelor of Science
The program leading to the Bachelor of Science degree in Accounting prepares students for careers as professional accountants. Students completing this program are well prepared to begin professional careers in corporate accounting or internal auditing or to continue study at the graduate level.

Students planning to become Certified Public Accountants should note that the requirements for certification in South Carolina include 150 hours of collegiate education and completion of a bachelor’s degree. Other states have similar requirements. The Accounting faculty of the School of Accountancy and Finance believes these requirements are best met with a bachelor’s degree in Accounting and completion of the Master of Professional Accountancy (MPAcc) degree program. The MPAcc program also enhances the preparation of students pursuing accounting careers in areas of specialization such as assurance services and taxation.

Admission to the MPAcc program is separate from admission to the undergraduate program. It is based on the student’s undergraduate record and score on the Graduate Management Admissions Test (GMAT). For information, contact the School of Accountancy and Finance, 300 Sirrine Hall.

In addition to accounting and business courses, the Bachelor of Science curriculum is devoted to analytical, communication, and interpersonal skills. Along with the general business accreditation held by the College, the Accounting degree programs offered by the School of Accountancy and Finance are separately accredited by AACSB International, the only accrediting agency for accounting programs. Students wishing to change majors into the accounting program must have a 2.0 or higher Clemson/Bridge cumulative grade-point ratio.

Sophomore Year
First Semester
3 - ACCT 2010 Financial Accounting Concepts 15
3 - EXST 3010 Introductory Statistics or
3 - MTHS 3090 Intro. Business Statistics
3 - MGT 2010 Principles of Management
3 - Arts and Humanities (Non-Lit.) Requirement 1 or
3 - Elective
15
Second Semester
1 - ACCT 2040 Accounting Procedures
1 - MGT 2180 Management Personal Computer Applications
1 - MGT 3010 Principles of Marketing
1 - Arts and Humanities (Literature) Requirement
1 - Cross-Cultural Awareness Requirement 1 or
1 - Elective
16

Junior Year
First Semester
3 - ACCT 3110 Intermediate Financial Acct. I 15
3 - ACCT 3220 Accounting Information Systems
3 - ENGL 3040 Business Writing
3 - FIN 3110 Financial Management I
3 - Fine Arts Requirement
15
Second Semester
3 - ACCT 3120 Intermediate Financial Acct. II 15
3 - ACCT 3410 Internal Auditing or
3 - ACCT 4150 Auditing
3 - FIN 3220 Financial Management II
3 - LAW 3220 Legal Environment of Business
3 - PHIL 3440 Business Ethics
3 - Elective
16

Senior Year
First Semester
3 - ACCT 3030 Cost Accounting
3 - ACCT 3130 Intermediate Financial Acct. III
3 - ACCT 4040 Individual Taxation or
3 - ACCT 4060 Business Taxation
3 - MGT 3100 Intermediate Business Statistics or
3 - International Business Requirement 4
15
Second Semester
Option A: Internship 3
3 - ACCT 3990 Internship in Accounting
3 - ACCT 4100 Budgeting and Executive Control
3 - MGT 4150 Business Strategy 3
6 - Business Requirement 6
15
Option B: Business Management
3 - ACCT 4100 Budgeting and Executive Control
3 - MGT 4150 Business Strategy 3
9 - Business Requirement 9
15
122 Total Semester Hours

1See General Education Requirements. Note: Cross-Cultural Awareness Requirement may also be satisfied by some of these courses.
2AAH 2100, MUSC 2100, or THEA 2100
Students planning to pursue the Master of Professional Accountancy degree program should take ACCT 4040 and 4150.
Students planning to work in industry upon completion of the degree program should take ACCT 4340 and 4060.
3ECON 3020, FIN 4110, LAW 4200, MGT 4230, or MGT 4270
Internship may be completed in the summer between junior and senior years with ACCT 4100, MGT 4150, and six hours of Business Requirement completed in the second semester of the senior year; or internship may be completed in the second semester of the senior year with ACCT 4100, MGT 4150, and six hours of Business Requirement completed during the summer sessions.
4ACCT 3400, any 4000-level ACCT course, ECON 3020, (MGT) 3060, FIN 3040, 3050, 3070, 3080, 4020, 4040, MGT 3900, 4110, 4130, or 4560.
5MGT 4150 must be taken at Clemson University.
Note: At least 50 percent of the total credits taken in ACCT, ECON, FIN, LAW, MGT, and MKT must be taken at Clemson University.

ANTHROPOLOGY
Bachelor of Arts
The Anthropology B.A. major prepares students for a variety of professional careers related to human resources, international business, public relations, museum and park service interpretation, health services, and other people-oriented positions in the public and private sector. In addition, the degree provides excellent preparation for graduate training in anthropology, law, health care, and business. The degree requires a total of 124 semester hours, including 39 credit hours in anthropology and sociology, as identified below. In addition, students take a foreign language and nine additional hours of social science or humanities courses related to Anthropology (from a departmentapproved list). These additional courses provide students with a greater depth and broader diversity of interdisciplinary knowledge useful for the direct application of an anthropological perspective to potential career paths. Courses used to fulfill General Education Requirements and Departmental Social Science and Humanities courses may be used to fulfill minor requirements.

Students wishing to change majors into the Anthropology BA program must have a 2.0 or higher Clemson/Bridge cumulative grade-point average.

Bachelor of Arts
Freshman Year
First Semester
3 - ANTH 2010 Introduction to Anthropology
3 - MTHS 1010 Essential Mathematics for the Natural Sciences
3 - EXST 3010 Introductory Statistics
3 - Foreign Language Requirement 1 or
3 - Elective
9
Second Semester
3 - ANTH 2020 Introduction to Anthropology
3 - MTHS 1010 Essential Mathematics for the Natural Sciences
3 - Foreign Language Requirement 1 or
3 - Elective
9

Sophomore Year
First Semester
3 - ANTH 2010 Introduction to Anthropology
3 - MTHS 1010 Essential Mathematics for the Natural Sciences
3 - Foreign Language Requirement 1 or
3 - Elective
9
Second Semester
3 - ANTH 2020 Introduction to Anthropology
3 - MTHS 1010 Essential Mathematics for the Natural Sciences
3 - Foreign Language Requirement 1 or
3 - Elective
9

Junior Year
First Semester
3 - ANTH 2010 Introduction to Anthropology
3 - MTHS 1010 Essential Mathematics for the Natural Sciences
3 - Foreign Language Requirement 1 or
3 - Elective
9
Second Semester
3 - ANTH 2020 Introduction to Anthropology
3 - MTHS 1010 Essential Mathematics for the Natural Sciences
3 - Foreign Language Requirement 1 or
3 - Elective
9

Senior Year
First Semester
3 - ANTH 2010 Introduction to Anthropology
3 - MTHS 1010 Essential Mathematics for the Natural Sciences
3 - Foreign Language Requirement 1 or
3 - Elective
9
Second Semester
3 - ANTH 2020 Introduction to Anthropology
3 - MTHS 1010 Essential Mathematics for the Natural Sciences
3 - Foreign Language Requirement 1 or
3 - Elective
9

1See General Education Requirements. Note: Cross-Cultural Awareness Requirement may also be satisfied by some of these courses.
2AAH 2100, MUSC 2100, or THEA 2100
Students planning to pursue the Master of Professional Accountancy degree program should take ACCT 4040 and 4150.
Students planning to work in industry upon completion of the degree program should take ACCT 4340 and 4060.
3ECON 3020, FIN 4110, LAW 4200, MGT 4230, or MGT 4270
Internship may be completed in the summer between junior and senior years with ACCT 4100, MGT 4150, and six hours of Business Requirement completed in the second semester of the senior year; or internship may be completed in the second semester of the senior year with ACCT 4100, MGT 4150, and six hours of Business Requirement completed during the summer sessions.
4ACCT 3400, any 4000-level ACCT course, ECON 3020, (MGT) 3060, FIN 3040, 3050, 3070, 3080, 4020, 4040, MGT 3900, 4110, 4130, or 4560.
5MGT 4150 must be taken at Clemson University.
Note: At least 50 percent of the total credits taken in ACCT, ECON, FIN, LAW, MGT, and MKT must be taken at Clemson University.
Sophomore Year
First Semester
3 - Science and Technology in Society Requirement
3 - Arts and Humanities (Literature) Requirement
3 - Arts and Humanities (Non-Lit) Requirement
6 - Subfield Requirement
15-16
Second Semester
1 - SOC 2050 Sociology Lab
3 - Anthropology Requirement
3 - Departmental Humanities/Social Science Requirement
6 - Minor Requirement
3 - Subfield Requirement
16-17
Junior Year
First Semester
6 - Anthropology Requirement
3 - Departmental Humanities/Social Science Requirement
6 - Elective
15
Second Semester
6 - ANTH 4040 Anthropological Theories and/or Anthropology Requirement
3 - Departmental Humanities/Social Science Requirement
6 - Minor Requirement
15
Summer Semester
3 - Practicing Anthropology Requirement
3
Senior Year
First Semester
3 - Anthropology Requirement
3 - Minor Requirement
9 - Elective
15
Second Semester
3 - ANTH 4970 Senior Capstone
3 - Minor Requirement
3 - Elective
15
Sophomore Year
First Semester
3 - ANTH 2010 Introduction to Anthropology
3 - MTHS 1010 Essential Mathematics for the Informed Society
4 - Natural Science Requirement
3 - Social Science Requirement
3 - Elective
16
Second Semester
3 - COMM 1500 Intro. to Human Comm. or COMM 2500 Public Speaking
3 - ENGL 1030 Accelerated Composition
3 - MTHS 1030 Elementary Statistical Inference
3 - Departmental Math or Science Requirement
3 - Elective
15
Senior Year
First Semester
3 - Arts and Humanities (Literature) Requirement
3 - Departmental Math or Science Requirement
6 - Minor Requirement
6 - Subfield Requirement
15-16
Second Semester
1 - SOC 2050 Sociology Lab
3 - Anthropology Requirement
3 - Arts and Humanities (Non-Lit) Requirement
3 - Departmental Math or Science Requirement
3 - Science and Technology in Society Requirement
3 - Subfield Requirement
16-17
ANTHROPOLOGY Bachelor of Science
Freshman Year
First Semester
3 - ANTH 2010 Introduction to Anthropology
3 - MTHS 1010 Essential Mathematics for the Informed Society
4 - Natural Science Requirement
3 - Social Science Requirement
3 - Elective
16
Second Semester
3 - ANTH 4040 Anthropological Theories and/or Anthropology Requirement
3 - Departmental Humanities/Social Science Requirement
6 - Minor Requirement
15
Sophomore Year
First Semester
3 - Arts and Humanities (Literature) Requirement
3 - Departmental Math or Science Requirement
6 - Minor Requirement
6 - Subfield Requirement
15-16
Second Semester
1 - SOC 2050 Sociology Lab
3 - Anthropology Requirement
3 - Arts and Humanities (Non-Lit) Requirement
3 - Departmental Math or Science Requirement
3 - Science and Technology in Society Requirement
3 - Subfield Requirement
16-17
Junior Year
First Semester
6 - Anthropology Requirement
3 - Departmental Math or Science Requirement
6 - Elective
15
Second Semester
6 - ANTH 4040 Anthropological Theories and/or Anthropology Requirement
3 - Departmental Math or Science Requirement
6 - Minor Requirement
15
Summer Semester
3 - Practicing Anthropology Requirement
3
ECONOMICS
A bachelor’s degree in Economics provides a thorough understanding of business, society, and public policy and prepares students for a wide range of careers. By combining general education courses and a strong course of study in economics, students can prepare for graduate studies in business, law, or any of the social sciences, as well as for careers in business and government.

The Department of Economics offers two undergraduate degree paths. The Bachelor of Arts degree emphasizes foreign language skills and offers students maximum freedom to tailor their course of study to their specific interests and career goals. A broad choice of minors is available for this program. The Bachelor of Arts program requires 30 credit hours in economics, which should be satisfied by completing ECON 2110, 2120, and 24 credits of coursework above the sophomore level. Bachelor of Arts majors must complete ECON 3140 and 3150. ECON 4050 is strongly recommended but not required.

Bachelor of Science
First Semester
3 - ANTH 2010 Introduction to Anthropology
3 - MTHS 1010 Essential Mathematics for the Informed Society
4 - Natural Science Requirement
3 - Social Science Requirement
3 - Elective
16
Second Semester
3 - ANTH 4040 Anthropological Theories and/or Anthropology Requirement
3 - Departmental Humanities/Social Science Requirement
6 - Minor Requirement
15
Sophomore Year
First Semester
3 - Arts and Humanities (Literature) Requirement
3 - Departmental Math or Science Requirement
6 - Minor Requirement
6 - Subfield Requirement
15-16
Second Semester
1 - SOC 2050 Sociology Lab
3 - Anthropology Requirement
3 - Arts and Humanities (Non-Lit) Requirement
3 - Departmental Math or Science Requirement
3 - Science and Technology in Society Requirement
3 - Subfield Requirement
16-17
Senior Year
First Semester
3 - Anthropology Requirement
3 - Minor Requirement
9 - Elective
15
Second Semester
3 - ANTH 4970 Senior Capstone
3 - Minor Requirement
3 - Elective
15
124 Total Semester Hours

Notes:
1. Two semesters (through 2020) in the same modern foreign language are required.
2. See General Education Requirements. (Note: Social Science Requirement must be in an area other than anthropology.)
3. Select from a department-approved list.
4. See page 90 for approved minors.
5. ANTH 3010, 3310 or 3510.
6. ANTH 4950, 4980, or an approved Field School, Internship, or Study Abroad experience.
The Bachelor of Science program emphasizes business applications. It requires 31 credit hours in economics, which should be satisfied by completing ECON 2110, 2120, and 25 credits of coursework above the sophomore level. Bachelor of Science majors must complete ECON 4050 in addition to 3140 and 3150. Students wishing to change majors into the Bachelor of Science program in Economics must have a 2.0 or higher Clemson/Bridge cumulative grade-point ratio.

Minors
A minor field is required of students in both the Bachelor of Arts and the Bachelor of Science degree programs. Economics majors may choose, in consultation with their advisors, any University-approved minor (see page 90).

Students who wish to combine the curriculum in Economics with secondary-school teaching should take the degree in Education with a teaching area in Economics. The courses taken will be those required for teaching certification as specified by the South Carolina Department of Education, as well as those required for an Economics major.

Combined Bachelor’s/Master’s Plan
The Department of Economics allows students to count up to 12 hours of graduate credit (8000-level courses) toward both the bachelor’s and master’s degrees. Students participating in this program must have a minimum grade-point average of 3.4 and be admitted to the Graduate School prior to registering for graduate courses. Details of the suggested curriculum and program information are available from the Department of Economics.

Dual Degree Program with Université Catholique de Louvain in Belgium
The Economics Department has a dual degree program with the Université Catholique de Louvain in Belgium. Students spend one semester taking coursework at the University of Maastricht in The Netherlands and two semesters at UCL in Louvain la Neuve, Belgium. The instruction at Maastricht is in English, and the instruction at UCL is in French. After returning to Clemson to complete their studies, students will earn bachelor degrees from both Clemson and UCL. Students must be proficient in French to participate in the program. Interested students should contact the Department of Economics for information.

Change of Major into Bachelor of Arts in Economics
Students who change majors into Bachelor of Arts in Economics must have a 2.0 minimum Clemson/Bridge cumulative grade-point ratio.

Bachelor of Arts
Freshman Year
First Semester
3 - ECON 2110 Principles of Microeconomics
3 - MTHS 1020 Intro. to Mathematical Analysis
3 - Foreign Language Requirement
4 - Natural Science Requirement
2 - Elective
15
Second Semester
3 - ECON 2120 Principles of Macroeconomics
3 - ENGL 1030 Accelerated Composition
3 - MTHS 2070 Multivariable Calculus
3 - Foreign Language Requirement
3 - Science and Tech. in Society Requirement
15
Sophomore Year
First Semester
3 - ECON 3140 Intermediate Microeconomics
3 - MTHS 3010 Statistical Methods
3 - Arts and Humanities (Literature) Requirement
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Elective
15
Second Semester
3 - ECON 3150 Intermediate Macroeconomics
3 - HIST 1730 The West and the World
3 - Major Requirement
3 - Minor Requirement
3 - Elective
15
Junior Year
First Semester
3 - COMM 1500 Intro. to Human Comm. or
3 - COMM 2500 Public Speaking
3 - Major Requirement
3 - Minor Requirement
6 - Elective
15
Second Semester
3 - Major Requirement
3 - Minor Requirement
6 - Elective
15
Senior Year
First Semester
3 - Major Requirement
3 - Minor Requirement
9 - Elective
15
Second Semester
3 - Major Requirement
3 - Minor Requirement
9 - Elective
15
120 Total Semester Hours

1The following sequences are also acceptable: MTHS 1060/1080; and MTHS 1060/2070.
2Two semesters (through 2020) in the same modern foreign language are required.
3See General Education Requirements.
4See General Education Requirements. This requirement may be satisfied by other courses in the curriculum. In this case, elective hours must be substituted.
5EXST 3010, 4110, MTHS 3020, 3090 may be substituted.
6This course satisfies the cross-cultural requirement.
7Three credit hours must be selected from ECON 3440, 3500, 3600, 4020, 4040, 4100, 4240, 4260, 4350, 4550. Note: Only ECON courses numbered 3860 and above may be used to satisfy the Major Requirement.

ECONOMICS
Bachelor of Science
Sophomore Year
First Semester
3 - ACCT 2010 Financial Accounting Concepts
3 - ECON 3140 Intermediate Microeconomics
3 - EXST 3010 Introductory Statistics or
3 - MTHS 3010 Statistical Methods I or
3 - MTHS 3090 Intro. Business Statistics
3 - MGT 3010 Principles of Management
3 - Elective
15
Second Semester
3 - ACCT 2020 Managerial Accounting Concepts
3 - ECON 3150 Intermediate Macroeconomics
3 - Arts and Humanities (Literature) Requirement
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Cross-Cultural Awareness Requirement
15
Junior Year
First Semester
4 - ECON 4050 Introduction to Econometrics
4 - FIN 3060 Corporation Finance
3 - Major Requirement
3 - Minor Requirement
3 - Elective
16
Second Semester
3 - Major Requirement
6 - Minor Requirement
6 - Elective
15
Senior Year
First Semester
3 - Major Requirement
3 - Minor Requirement
9 - Elective
15
Second Semester
6 - Major Requirement
3 - Minor Requirement
5 - Elective
14
120 Total Semester Hours

1The following sequences are also acceptable: MTHS 1060/1080; and MTHS 1060/2070.
2Two semesters (through 2020) in the same modern foreign language are required.
3See General Education Requirements.
4See General Education Requirements. This requirement may be satisfied by other courses in the curriculum. In this case, elective hours must be substituted.
5EXST 3010, 4110, MTHS 3020, 3090 may be substituted.
6This course satisfies the cross-cultural requirement.
7Three credit hours must be selected from ECON 3440, 3500, 3600, 4020, 4040, 4100, 4240, 4260, 4350, 4550. Note: Only ECON courses numbered 3860 and above may be used to satisfy the Major Requirement.
FINANCIAL MANAGEMENT

Bachelor of Science
The Bachelor of Science in Financial Management is designed to develop an understanding of financial markets in the contemporary economy, the operation of financial institutions, and the financial management of business operations. The curriculum prepares students for careers in such areas as corporate finance, banking, investments, financial planning, insurance, and real estate. Governments of all levels also employ finance graduates in many of their divisions. The curriculum also provides excellent preparation for students interested in graduate studies in law school.

The core of the curriculum provides a broad range of subjects with an emphasis on technical and communication skills. Students then have the flexibility to tailor courses to their own needs by choosing emphasis areas that will enhance career preparation in specific areas of finance. Students who complete a specific set of courses are eligible to sit for the certified financial planner (CFP®) examination.

Students wishing to change majors into the financial management program must have at least a 2.0 or higher Clemson/Bridge cumulative grade-point ratio.

Sophomore Year
First Semester
3 - ACCT 2010 Financial Accounting Concepts
3 - EXST 3010 Introductory Statistics or MATH 1000 Intro. Business Statistics
3 - MGT 2010 Principles of Management
3 - MGT 2180 Mgr. Personal Computer Appl.
3 - Arts and Humanities (Non-Lit.) Requirement1
15

Second Semester
1 - ACCT 2040 Accounting Procedures
1 - MGT 3010 Intermediate Business Statistics
3 - MKT 3010 Principles of Marketing
3 - Arts and Humanities (Literature) Requirement1
3 - Cross-Cultural Awareness Requirement2
3 - Elective
16

Junior Year
First Semester
3 - ACCT 3110 Intermediate Financial Acct. I
3 - ENGL 3040 Business Writing
3 - FIN 3110 Financial Management I
3 - LAW 3220 Legal Environment of Business
3 - Elective
15

Second Semester
3 - ACCT 3120 Intermediate Financial Acct. II
3 - FIN 3050 Investment Analysis
3 - FIN 3070 Principles of Real Estate
3 - FIN 3120 Financial Management II
3 - Elective
15

Senior Year
First Semester
3 - ACCT 3310 Cost Accounting
3 - ACCT 3130 Intermediate Financial Acct. III
3 - FIN 3080 Financial Institutions and Markets
6 - Emphasis Area Requirement6
15

Second Semester
3 - MGT 4150 Business Strategy
9 - Emphasis Area Requirement6
3 - Elective
15

121 Total Semester Hours

Notes:
1. One General Education requirement, students will have three additional hours in ACCT, ECON, FIN, LAW, MGT, and MKT must be taken at Clemson University.
2. Students minoring in Financial Management may not use FIN 3040, 4050, 4060, or 4080. One accounting course may substitute for FIN 3040, 4050, 4060, or 4080. ECON courses numbered 3160 and above may be used to satisfy the Major Requirement.
3. At least 50 percent of the total credits taken in ACCT, ECON, FIN, LAW, MGT, and MKT must be taken at Clemson University.

GRAPHIC COMMUNICATIONS

Bachelor of Science
The Bachelor of Science degree in Graphic Communications prepares students for professional careers in printing, publishing, packaging, and related industries. The core curriculum assures graduates of having the skills and knowledge required by most entry-level jobs. The major requirements allow each student to select courses that enhance career preparation in specific segments of graphic communications. Coursework is heavily oriented around individual laboratory performance, which stresses the development of problem-solving skills in a broad cross-section of manufacturing areas. Applications include all major processes and a variety of industry segments, including commercial printing, publishing, package production, specialty printing, and industrial applications of printing technology beyond communications. The most common career opportunities are in printing management, production planning and supervision, and commercial and technical sales.

Policy on Advancement in Graphic Communications
Graphic Communications majors must earn a C or better in prerequisite GC courses before enrolling in the next level GC course. Registration priority is given to those students for whom the course is a requirement.

Change of Major into Graphic Communications
Students who change majors into Graphic Communications must have completed at least 12 credit hours at Clemson, must have a 2.0 minimum cumulative grade-point ratio, and must have earned a B or better in GC 1020.

Freshman Year
First Semester
1 - GC 1010 Orientation to Graphic Comm.
4 - GC 1020 Foundations in Graphic Comm.
3 - FYSTC 1010 Introduction to Psychology
4 - Approved Laboratory Science Requirement1
3 - Major Requirement2
15

Second Semester
3 - ENGL 1030 Accelerated Composition
3 - MATH 1010 Introductory Statistics or MATH 2050 Elementary Statistical Inf.
3 - MATH 2510 Intro. Business Statistics
4 - GC 1040 Graphic Communications I
4 - Approved Laboratory Science Requirement1
1 - Elective
15

Sophomore Year
First Semester
3 - ACCT 2010 Financial Accounting Concepts
3 - EXST 3010 Introductory Statistics or MATH 2030 Elementary Statistical Inf.
3 - MKT 3010 Principles of Marketing
3 - Arts and Humanities (Literature) Requirement1
3 - Cross-Cultural Awareness Requirement2
3 - Elective
15
MANAGEMENT

Bachelor of Science

The Bachelor of Science degree in Management prepares students for careers as professional managers in corporations, governmental organizations, and small businesses. In addition, the program provides a foundation for graduates who wish to pursue advanced degrees in business and public administration, law, and the social sciences.

The curriculum gives students a broad exposure to the functional areas of business and allows each to select an emphasis area in a subject that is germane to individual career interests. The Management curriculum provides an examination of the social, legal, political, and economic environments in which organizations must operate; an understanding of the functional areas of business and their interrelationships; and a knowledge of behavioral science, applied statistics, and mathematics as they relate to organizational problem solving. The program is accredited by AACSB International.

Students wishing to change majors into the management program must have a 2.0 or higher Clemson/Bridge cumulative grade-point ratio.

Combined Bachelor of Science/Master of Science Degree Program

Under this plan, students may reduce the time necessary to earn both degrees by applying graduate credits to both undergraduate and graduate program requirements. Students may apply up to 12 hours of graduate credits to both the BS and MS degrees. To be eligible for this program, students must have a 3.4 or higher grade-point ratio, have completed at least 50 credits of coursework and have been admitted to the Graduate School prior to registering for graduate courses. Students in this program are conditionally accepted to the graduate program until they have completed all BS degree requirements.

Sophomore Year

First Semester
- ACCT 2010 Financial Accounting Concepts
- EXST 3010 Introductory Statistics
- MGT 2010 Principles of Management
- MGT 2180 Mgt. Personal Computer Appl.1
- Arts and Humanities (Non-Lit.) Requirement2
- Elective
15

Second Semester
- ACCT 2020 Managerial Accounting Concepts
- EXST 3020 Intermediate Business Statistics3
- MGT 3100 Intermediate Business Statistics1
- Cross Cultural Awareness Requirement2
- Elective
15

Junior Year

First Semester
- MGT 3180 Management of Info. Systems1
- MGT 3900 Operations Management1
- MGT 3100 Principles of Marketing
- Emphasis Area Requirement3
- Support Area Requirement4
15

Second Semester
- LAW 3220 Legal Environment of Business
- MGT 3070 Human Resource Management or
- MGT 4000 Mgt. of Organizational Behavior
- MGT 3120 Decision Models for Management
- Emphasis Area Requirement3
- Support Area Requirement4
15

Senior Year

First Semester
- FIN 3060 Corporation Finance
- Emphasis Area Requirement3
- Elective
15

Second Semester
- MGT 4150 Business Strategy
- MGT 4230 International Business Management1
- Emphasis Area Requirement3
- Support Area Requirement4
- Elective
15

Total Semester Hours
120

Graduate Requirements

- Grade of C or better in this course is required for graduation.
- See General Education Requirements. If this requirement is met through the completion of another General Education requirement, students will have three additional elective hours. Students must complete 120 total hours. Note: Cross-Cultural Awareness Requirement may also be satisfied by some of these courses.
- Management majors must complete an emphasis area consisting of twelve hours beyond the coursework required by the management curriculum and the support area requirement. Students should choose ONE of the following ways to satisfy this requirement:
  - Entrepreneurship—ELE 310, MGT (ELE) 3150 plus two courses from ECON (ELE) 3210, ELE 4010, 4990, MGT 4970, MGT (ELE) 3140, MGT 4200, 4250, 4260, 4270, 4280, 4300, SOC (ELE, POSC, PSYC) 3560.
  - Human Resource Management—Any four of the following courses, including at least two management courses not already taken in the basic curriculum. MGT 3070, 4000, 4160, 4250, 4300, 4350, 4360, 3680, 3690, 4350, 4570, 4710.
  - International Management—Any four of the following courses: ECON 3100, FIN 4110, LAW 4200, MGT 4240, 4440, MGT 4270, POSC 5010, 3620, 3670, 4350, and any business courses approved in advance and taken as part of a study abroad experience.
- Management Information Systems—MGT 4110, 4520, and two courses from CPSC 4620, MGT 4300 (topic must be approved in advance by advisor), 4540, 4550, 4560.
- Operations Management—MGT 4020, and two courses from MGT 4080, 4110, 4270, and one course from MGT 4040, 4120, 4440.
- Supply Chain Management—MGT 4120, 4240, and two courses from MGT 3250, 3170, 4020, 4080, 4270, 4440, MGT 4520.
- General Management—Any four 3000- or 4000-level management courses.
- Management majors must complete a support area consisting of fifteen hours beyond the coursework required by the management curriculum and the management emphasis area requirement. Students should choose ONE of the following two ways to satisfy this requirement: (1) Declare and complete a minor requiring AT LEAST 15 hours of additional coursework; or (2) Complete 15 hours of coursework selected from the approved list of management support courses.
- MGT 4150 must be taken at Clemson University.
Note: At least 50 percent of the total credits taken in ACCT, ECON, ELE, FIN, LAW, MGT, and MKT must be taken at Clemson University.

1Must include four credit hours in chemistry (CH 1010 or 1050) and four credit hours in physics (PHYS 1220/1240 or 2070/2090).
2Must be approved prior to registration. See advisor.
3Students who wish to minor in Business Administration may not select MTHS 2030.
4Select any ENGL course from General Education Arts and Humanities (Literature) Requirement.
5One internship must be in a fall or spring semester (summer—at least 12 weeks; fall/spring—at least 15 weeks). GC 4550 will not substitute for 4520.
6See General Education Requirements. This course or three elective credit hours must also satisfy the Cross-Cultural Awareness Requirement.

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MARKETING

Bachelor of Science

The Bachelor of Science degree program in Marketing develops an understanding of various aspects of marketing. The curriculum prepares students for professional marketing careers in industry, government, or the nonprofit sector. Graduates are also well prepared for entrance into the Master of Business Administration, law, or other graduate programs. For students who want a general perspective of marketing, the curriculum provides a broad range of subjects with the flexibility to tailor courses by choosing areas that enhance career preparation in various areas of marketing. Subjects include promotional strategy, professional selling, sales management, public and nonprofit marketing, entrepreneurship, marketing research, product management, management marketing, and international marketing. Emphasis areas in services marketing, sport marketing, and technical marketing are available to students who seek to specialize. The Marketing curriculum, whether approached from a general or specialized perspective, provides the conceptual, quantitative, and analytical skills necessary to function in a dynamic business environment. The Marketing degree is accredited by AACSB International.

Students wishing to change majors into the Marketing program must have a Clemson/Bridge cumulative grade-point average of 3.0 or higher.

Sophomore Year

First Semester
3 - ACCT 2010 Financial Accounting Concepts
3 - EXST 3010 Introductory Statistics or
3 - MTHS 3090 Intro. Business Statistics
3 - MGT 2010 Principles of Management
3 - MGT 2180 Personal Computer Applications
3 - Arts and Humanities (Non-Lit.) Requirement6
15

Second Semester
3 - ACCT 2020 Managerial Accounting Concepts
3 - MGT 3100 Intermediate Business Statistics
3 - MGT 3010 Principles of Management
3 - Arts and Humanities (Literature) Requirement1
3 - Cross-Cultural Awareness Requirement5
15

Junior Year

First Semester
3 - ENGL 3040 Business Writing
3 - LAW 3220 Legal Environment of Business
3 - MKT 3020 Consumer Behavior
3 - MGT 4310 Marketing Research7
3 - Support Course Requirement5
15

Second Semester
3 - FIN 3060 Corporation Finance
3 - MGT 4200 Professional Selling
3 - Marketing Requirement8
3 - Support Course Requirement5
4 - Elective
16

Senior Year

First Semester
3 - MGT 4150 Business Strategy3
3 - MKT 4270 International Marketing
3 - Marketing Requirement4
3 - Support Course Requirement5
3 - Elective
15

Second Semester
3 - MKT 4500 Strategic Marketing Management1
3 - Marketing Requirement6
6 - Support Course Requirement5
3 - Elective
15

121 Total Semester Hours

Note: General Education Requirements. See Cross-Cultural Awareness Requirement may also be satisfied by some of these courses.

1Must be taken at Clemson University.
2Chosen jointly by the student and the advisor. Certain minors may be used to satisfy the Support Courses Requirement. A maximum of six hours can be from MKT 2980, 3980, 3990, and 4980. See advisor.
3Select from any MKT 3000 and 4000 level content courses. A maximum of three hours may be from MKT 2980, 3980, 3990, and 4980 to satisfy Marketing Emphasis area requirements.
Note: At least 50 percent of the total credits taken in ECON, FIN, LAW, MGT, and MKT must be taken at Clemson University.

POLITICAL SCIENCE

The Department of Political Science offers two degree programs: a Bachelor of Arts and a Bachelor of Science degree, requiring 120-121 credit hours. Both programs prepare students for a wide range of graduate programs and career opportunities. The Bachelor of Arts program provides broad coverage of the political science discipline and emphasizes communication skills and humanities. The Bachelor of Science degree program is recommended for those with an aptitude for mathematics and/or an interest in political economy, public administration, public policy, or other fields requiring advanced quantitative skills. Both programs are appropriate for pre-law students and for students interested in either American or global politics. Note that the Bachelor of Arts degree requires a minor, and the Bachelor of Science degree requires a field of concentration and, depending on the concentration, requires or allows a minor.

Bachelor of Arts

The requirements for a Bachelor of Arts degree in Political Science consist of POSC 1010; one of 1020 or 1040; 1030, 1990, 4990, and at least 24 additional credit hours in political science at the 3000-4000 level, including at least one course from each of the following fields:

American Government—POSC 4030, 4050, 4160, 4360, 4420
Comparative Politics—POSC 3710, 3720, 4660, 4710, 4760, 4770, 4780
International Relations—POSC 3610, 3620, 3630, 3750, 4290
Political Theory—POSC 4490, 4500, 4530, 4550
Public Policy and Public Administration—POSC 3020, 3210, 4210, 4230, 4240, 4270, 4300

The student’s additional coursework in political science is chosen with the consent and advice of the departmental advisor to ensure an appropriate balance of breadth and specialization within the field of political science. In addition to the courses listed above, the department offers a wide range of specialized courses in each of the subfields of the political science discipline.

The Bachelor of Arts degree in Political Science also requires additional arts and humanities courses beyond the basic General Education Requirements.

Note: No more than three hours credit from POSC 3050, 3100, 3110, 3120, 3130, 4590, and 4600 may be applied toward a Political Science major.

Freshman Year

First Semester
3 - POSC 1010 American National Government
1 - POSC 1990 Introduction to Political Science
1 - Foreign Language Requirement1
3 - History Requirement2
3 - Mathematics Requirement5
3 - Elective
15

Second Semester
3 - ENGL 1030 Accelerated Composition
3 - POSC 1020 Intro. to International Relations or
3 - POSC 1040 Intro. to Comparative Politics
3 - POSC 1030 Introduction to Political Theory
3 - Foreign Language Requirement1
4 - Natural Science Requirement6
16

Sophomore Year

First Semester
3 - Arts and Humanities (Literature) Requirement3
3 - Major Requirement4
3 - Mathematics or Natural Science Requirement4
3 - Oral Communication Requirement3
3 - Elective
15

Second Semester
3 - Arts and Humanities (Literature) Requirement3
3 - Arts and Humanities (Non-Lit.) Requirement3
3 - History Requirement2
3 - Major Requirement4
3 - Minor Requirement5
15

Junior Year

First Semester
3 - ECON 2110 Principles of Microeconomics
3 - Major Requirement4
3 - Minor Requirement5
3 - Science and Tech. in Society Requirement1
3 - Elective
15

Second Semester
3 - ECON 2120 Principles of Macroeconomics
3 - Major Requirement4
3 - Minor Requirement5
6 - Elective
15
## Senior Year

**First Semester**
- 1 - POSC 4990 Professional Dev. in Political Sci.
- 3 - Fine Arts Requirement
- 6 - Major Requirement
- 3 - Minor Requirement
- 2 - Elective

**Second Semester**
- 6 - Major Requirement
- 3 - Minor Requirement
- 6 - Elective

120 Total Semester Hours

### AMERICAN POLITICS REQUIREMENT

**Junior Year**

**First Semester**
- 3 - POSC 3410 Quantitative Methods in Pol. Sci.
- 3 - Oral Communication Requirement
- 6 - Elective

**Second Semester**
- 3 - American Politics Requirement
- 3 - Minor Requirement
- 3 - Science and Tech. in Society Requirement
- 7 - Elective

16

### GLOBAL POLITICS REQUIREMENT

**Junior Year**

**First Semester**
- 3 - POSC 3410 Quantitative Methods in Pol. Sci.
- 3 - Global Politics Requirement
- 3 - Oral Communication Requirement
- 6 - Elective

**Second Semester**
- 3 - Global Politics Requirement
- 3 - Minor Requirement
- 6 - Elective

16

### Political Economy Concentration

**Senior Year**

**First Semester**
- 3 - POSC 4490 Political Theory of Capitalism
- 1 - POSC 4990 Professional Dev. in Political Sci.
- 3 - Advanced Political Science Requirement
- 5 - Elective

**Second Semester**
- 3 - Advanced Political Science Requirement
- 3 - Minor Requirement
- 7 - Elective

16

**PUBLIC ADMINISTRATION CONCENTRATION**

**Senior Year**

**First Semester**
- 3 - POSC 4210 Public Policy
- 1 - POSC 4990 Professional Dev. in Political Sci.
- 6 - Public Administration Requirement

**Second Semester**
- 3 - Global Politics Requirement
- 6 - Elective

15

121 Total Semester Hours

### Political Science

**Bachelor of Science**

The requirements for a Bachelor of Science degree in Political Science consist of POSC 1010; one of 1020 or 1040; 1030, 1990, 4990, and at least 21 additional credit hours in political science at the 3000–4000 level, including one upper-level American politics course and one upper-level global politics course.

In consultation with the departmental advisor, students choose one of the following concentrations: American Politics, Global Politics, Political Economy, Public Administration, or Public Policy.

**Freshman Year**

**First Semester**
- 3 - POSC 1010 American National Government
- 1 - POSC 1990 Introduction to Political Science
- 3 - Foreign Language Requirement
- 3 - Mathematics Requirement
- 4 - Natural Science Requirement

14

**Second Semester**
- 3 - ENGL 1030 Accelerated Composition
- 3 - POSC 1020 Intro. to International Relations or 3 - POSC 1040 Intro. to Comparative Politics
- 3 - POSC 1030 Introduction to Political Theory
- 3 - Foreign Language Requirement
- 4 - Natural Science Requirement

16

**Sophomore Year**

**First Semester**
- 3 - ECON 2110 Principles of Microeconomics
- 3 - American Politics Requirement
- 3 - Arts and Humanities (Non-Lit.) Requirement
- 3 - Mathematics Requirement
- 3 - Philosophy of Science Requirement

15

**Second Semester**
- 3 - ECON 2120 Principles of Macroeconomics
- 3 - Advanced Political Science Requirement
- 3 - Arts and Humanities (Literature) Requirement
- 3 - Global Politics Requirement
- 3 - Mathematics Requirement

15

**Junior Year**

**First Semester**
- 3 - ECON 3500 Moral and Ethical Aspects of a Market Economy
- 3 - POSC 4480 Studies in Political Economy
- 3 - Science and Tech. in Society Requirement
- 6 - Elective

**Second Semester**
- 3 - American Politics Requirement
- 3 - Minor Requirement
- 3 - Advanced Political Science Requirement
- 7 - Elective

16

**Senior Year**

**First Semester**
- 3 - ECON 3210 Public Administration
- 3 - POSC 3410 Quantitative Methods in Pol. Sci.
- 3 - Oral Communication Requirement
- 6 - Elective

**Second Semester**
- 3 - Advanced Political Science Requirement
- 6 - Elective

15

**PUBLIC ADMINISTRATION CONCENTRATION**

**Junior Year**

**First Semester**
- 3 - POSC 3210 Public Administration
- 3 - POSC 3410 Quantitative Methods in Pol. Sci.
- 3 - Oral Communication Requirement
- 6 - Elective

**Second Semester**
- 3 - Advanced Political Science Requirement
- 6 - Elective

15

**Senior Year**

**First Semester**
- 1 - POSC 4990 Professional Dev. in Political Sci.
- 1 - POSC 4210 Public Policy
- 3 - Philosophy of Science Requirement
- 5 - Elective

15
### Second Semester
- 3 - Policy/Administration Requirement 12
- 6 - Public Administration Requirement 11
- 6 - Elective

121 Total Semester Hours

### PUBLIC POLICY CONCENTRATION

#### Junior Year

##### First Semester
- 3 - POCS 3410 Quantitative Methods in Pol. Sci.
- 3 - POCS 4210 Public Policy
- 3 - Oral Communication Requirement 5
- 6 - Elective

5

##### Second Semester
- 3 - Advanced Political Science Requirement 7
- 6 - Public Policy Requirement 11
- 3 - Science and Tech. in Society Requirement 5
- 4 - Elective

16

#### Senior Year

##### First Semester
- 3 - POCS 3210 Public Administration
- 1 - POSC 4990 Professional Dev. in Political Sci.
- 6 - Public Policy Requirement 11
- 5 - Elective

15

##### Second Semester
- 3 - Policy/Administration Requirement 12
- 6 - Public Policy Requirement 11
- 6 - Elective

15

121 Total Semester Hours

1Six hours (through 2020) in the same modern foreign language are required.
2MTHS 1020 or 1060; MTHS 1080 or 2070; MTHS 3010 or 3090 or EXST 3100
3See General Education Requirements. A two-semester sequence in the same science is required.
4POCS 3020, 3210, 3430, 3630, 4030, 4050, 4070, 4090, 4160, 4230, 4230, 4240, 4270, 4300, 4360, 4370, 4380, 4420, 4530, 4540, 4550, 4610, 4620, or 4820
5See General Education Requirements. (Note: Arts and Humanities (Non-Literature) Requirement must be satisfied by a course in PHIL or REL)
6PHIL 1020, 2250, 3230, 3250, or 3270
7Any 3000- or 4000-level POCS course
8POCS 3100, 3220, 3300, 3310, 3320, 3330, 3410, 3420, 3430, 3440, 4010, 4020, 4030, 4040, 4050, 4060, 4070, 4080, 4090, 4100, 4110, 4120, 4130, 4140, 4150, 4160, 4170, 4180, or 4190
9See list of approved minors on page 90.
10ECON 1010, 3020, 3090, 3100, 3150, 3190, 4020, 4040, 4100, 4120, 4130, 4190, 4200, 4220, 4250, 4270, 4280, 4400 or HIST 3250, 3270.
11See advisor.
12POCS 3020, 4240, 4270, or 4300

### PSYCHOLOGY

Psychology is the study of human and animal behavior and the biological, psychological, and social processes related to that behavior. The Bachelor’s degree in Psychology prepares students for a variety of professional careers related to human resources, personnel, counseling, and other people-oriented positions in human services, business, and industry. Additionally, the Bachelor’s degree provides excellent preparation for graduate training in such areas as clinical, counseling, industrial, experimental, cognitive, social, biological, health, developmental, and school psychology. The program also provides excellent preparation for students who intend to pursue professional training in medicine, physical or occupational therapy, dentistry, pharmacy, veterinary science, or law. Further information is available at www.clemson.edu/psych.

#### Change of Major into Psychology

Students who change majors into Psychology must have completed at least 12 credit hours at Clemson or in the Bridge Program and must have a 2.4 minimum Clemson/Bridge cumulative grade-point ratio.

### Bachelor of Arts

The Bachelor of Arts program requires PSYC 2010, 2020, 3090, 3100, 4290, and 19 additional credits selected from PSYC 2750 and/or 3000-4000-level psychology courses arranged as follows:

- Two courses from the Biological and Cognitive menu: PSYC 3240, 3330, 3420

One course from each of the following menus:

- Applied—PSYC 2750, 3070, 3080, 3830, 4350, 4420, 4710, 4730, 4760, 4780
- Individuals and Groups—PSYC 3400, 3520, 3700
- Laboratory/Research—PSYC 3250, 3340, 4230, 4560, 4710, 4900, 4930, 4950, 4970, 4980

At least six credits must be from 4000-level psychology courses, with at least three of those credits from psychology courses numbered between 4000 and 4890. PSYC 4700 may be taken in lieu of one elective psychology course. Students satisfying both the Applied and Laboratory requirements with PSYC 4560 must still satisfy the requirement for 19 additional credits in Psychology (see above). Students should consult their advisors for other degree requirements and course recommendations.

### Freshman Year

##### First Semester
- 3 - PSYC 2010 Introduction to Psychology
- 3 - PSYC 2020 Introductory Psychology Lab.
- 3 - Foreign Language Requirement 7
- 3 - Mathematics Requirement 2
- 3 - Social Science Requirement 3
- 1 - Elective

14

120 Total Semester Hours

1Two semesters (through 2020) in the same modern foreign language are required.
2See General Education Requirements.
3See General Education Requirements. Social Science Requirement must be in an area other than psychology.
4See major requirements in program description above.
5Three credit hours, in addition to the Mathematics and Natural Science General Education Requirements, are required. Select any mathematics course that satisfies the General Education Requirement, any EXST or MTHS course at the 3000-level or higher, any natural or physical science course on the departmental list of acceptable courses, or any relevant course with the approval of the Psychology Department Chair.
6Select any minor listed on page 90.

### Sophomore Year

#### First Semester
- 3 - PSYC 3090 Introductory Experimental Psych.
- 3 - Arts and Humanities (Literature) Requirement 5
- 3 - Cross-Cultural Awareness Requirement 6
- 3 - Mathematics or Natural Science Requirement 2
- 2 - Elective

15

#### Second Semester
- 4 - PSYC 3100 Advanced Experimental Psych.
- 3 - Departmental Math. or Science Requirement 6
- 3 - Major Requirement 4
- 5 - Elective

20

### Junior Year

#### First Semester
- 4 - Major Requirement 4
- 3 - Minor Requirement 5
- 3 - Science and Tech. in Society Requirement 7
- 5 - Elective

25

#### Second Semester
- 3 - Major Requirement 4
- 3 - Minor Requirement 5
- 3 - Oral Communication Requirement 6
- 6 - Elective

36

### Senior Year

#### First Semester
- 1 - PSYC 4920 Senior Laboratory in Psychology
- 3 - Departmental Math. or Science Requirement 6
- 3 - Major Requirement 4
- 5 - Elective

25

#### Second Semester
- 3 - Major Requirement 4
- 6 - Minor Requirement 6
- 6 - Elective

36

120 Total Semester Hours
### PSYCHOLOGY

**Bachelor of Science**

The Bachelor of Science program in Psychology requires PSYC 2010, 2020, 3090, 3100, 4920, and 19 additional credits selected from PSYC 2750 and/or 3000-4000-level psychology courses arranged as follows:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two courses from the Biological and Cognitive menu: PSYC 3240, 3330, 4220</td>
<td></td>
<td></td>
</tr>
<tr>
<td>One course from each of the following menus: Applied—PSYC 2750, 3640, 3680, 3830, 4350, 4560, 4800, 4880</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foundations of Science—GW 4020, PHIL 3260, 3270, 4250, PSYC 4150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individuals and Groups—PSYC 3400, 3520, 3700</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laboratory/Research—PSYC 3250, 3340, 4230, 4560, 4710, 4900, 4930, 4950, 4970, 4980</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

At least six credits must be from 4000-level psychology courses, with at least three of those credits from psychology courses numbered between 4000 and 4890. BIOL 4700 may be taken in lieu of one elective psychology course. Students satisfying both the Applied and Laboratory requirements with PSYC 4560 must still satisfy the requirement for 19 additional credits in Psychology (see above). Students should consult their advisors for other degree requirements and course recommendations.

### Freshman Year

**First Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHIL 1020 Introduction to Logic</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PSYC 2010 Introduction to Psychology</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PSYC 2020 Introductory Psychology Lab.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Departmental Life Science Requirement</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Mathematics Requirement</td>
<td>3</td>
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<td>Elective</td>
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**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Requirement</th>
</tr>
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<tbody>
<tr>
<td>ENGL 1030 Accelerated Composition</td>
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</tr>
<tr>
<td>Departmental Life Science Requirement</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Departmental Mathematics Requirement</td>
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</tr>
<tr>
<td>Major Requirement</td>
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</tr>
<tr>
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<td>16</td>
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### Sophomore Year

**First Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Requirement</th>
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<tbody>
<tr>
<td>PSYC 3090 Introductory Experimental Psych.</td>
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<tr>
<td>Arts and Humanities (Literature) Requirement</td>
<td>3</td>
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<tr>
<td>Natural Science with Lab Requirement</td>
<td>3</td>
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<tr>
<td>Social Science Requirement</td>
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**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 3100 Advanced Experimental Psych.</td>
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<tr>
<td>Cross-Cultural Awareness Requirement</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Mathematics or Natural Science Requirement</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Social Science Requirement</td>
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<td></td>
</tr>
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<td>Elective</td>
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### Junior Year

**First Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Requirement</th>
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</thead>
<tbody>
<tr>
<td>Departmental Math. or Science Requirement</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Major Requirement</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Minor Requirement</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Science and Tech. in Society Requirement</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Elective</td>
<td>15</td>
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</table>

**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Departmental Math. or Science Requirement</td>
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<td></td>
</tr>
<tr>
<td>Major Requirement</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Minor Requirement</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Oral Communication Requirement</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Elective</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

### Senior Year

**First Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Requirement</th>
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<tbody>
<tr>
<td>PSYC 4920 Senior Laboratory in Psychology</td>
<td>3</td>
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<tr>
<td>Major Requirement</td>
<td>3</td>
<td></td>
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<td>Minor Requirement</td>
<td>6</td>
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**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Requirement</th>
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<tr>
<td>Major Requirement</td>
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<tr>
<td>Minor Requirement</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Elective</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

### Change of Major into Sociology

Students who change majors into Sociology must have completed at least 12 credit hours at Clemson and must have a 2.0 minimum Clemson/Bridge cumulative grade-point average.

### Emphasis Areas in Sociology

**Community Studies**—RS (SOC) 4590, SOC 3310, 4950; and six credits from all courses offered in anthropology or sociology not already taken to fulfill requirements.

**Criminal Justice**—SOC 3880, 3890; and nine credits selected from SOC 3910, 3920, 3960, 3980, 4680, 4860, 4910, 4930, 4940; and ANTH 3530. No more than three hours of SOC 4860 may be taken to satisfy concentration electives.

**General Sociology**—Nine credit hours selected from any courses offered in anthropology or sociology not already taken to fulfill requirements; three credit hours selected from SOC 3110, 3300, 4320, and 4440; and three credit hours selected from SOC 3500, 3510, 3910, and 4330.

**Health Services**—SOC 3800, 4140, (RS) 4950; and six credits from all courses offered in anthropology or sociology not already taken to fulfill requirements.

At least 12 of the total credits must be from 4000-level sociology, rural sociology, and/or anthropology courses; no more than nine credit hours may be taken in courses at the 1000 or 2000 level, except with approval of the department chair. Additional electives are added to meet the minimum of 121 hours required for graduation.

### Bachelor of Arts

**Freshman Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTHS 1010 Essential Math. for Inform. Soc. or</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MTHS 1020 Intro. to Mathemat. Analysis or</td>
<td>3</td>
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<tr>
<td>MTHS 1060 Calculus of One Variable I</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>SOC 2010 Introduction to Sociology or</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>SOC 2020 Social Problems</td>
<td>3</td>
<td></td>
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<tr>
<td>Foreign Language Requirement</td>
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<td>Natural Science Requirement</td>
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**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Requirement</th>
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<tbody>
<tr>
<td>ENGL 1030 Accelerated Composition</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MTHS 2030 Elementary Statistical Inference or</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MTHS 3010 Statistical Methods or</td>
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<td></td>
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<tr>
<td>EXST 3010 Introductory Statistics</td>
<td>3</td>
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<tr>
<td>Foreign Language Requirement</td>
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<td>Social Science Requirement</td>
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</tr>
<tr>
<td>Elective</td>
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</table>

### Junior Year

**First Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 1500 Intro. to Human Comm. or</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>COMM 2500 Public Speaking</td>
<td>3</td>
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</tr>
<tr>
<td>Arts and Humanities (Literature) Requirement</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Cross-Cultural Awareness Requirement</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Elective</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

**SOCIIOLOGY**

The Sociology major offers two degree programs: a Bachelor of Arts and a Bachelor of Science. Both degrees prepare students for a variety of professional careers related to human resources, management, public relations, social services, criminal justice, health services, social research, and other people-oriented positions in the public and private sector. In addition, the Bachelor’s degree provides excellent preparation for graduate training in sociology, anthropology, social services, law, and business. Both degrees require a total of 121 semester hours, including 36 credit hours in sociology and/or anthropology, as identified below. Courses used to fulfill General Education Requirements may be used to fulfill minor requirements.
Second Semester
1 - SOC 2050 Sociology Lab.
3 - Arts and Humanities (Non-Lit.) Requirement
6 - Minor Requirement
3 - Science and Tech. in Society Requirement
3 - Elective
16

Junior Year
First Semester
3 - ENGL 3040 Business Writing or
3 - ENGL 3120 Advanced Composition or
3 - ENGL 3140 Technical Writing or
3 - ENGL 3160 Writing and International Trade
3 - SOC 3020 Social Research Methods I
3 - SOC 3600 Social Class and Poverty or
3 - SOC 4600 Race and Ethnicity or
3 - SOC 4610 Sociology of Sex and Gender
3 - Advanced Humanities Requirement
3 - Emphasis Area Requirement
3 - Elective
16

Second Semester
4 - SOC 3040 Social Research Methods II
3 - Advanced Humanities Requirement
3 - Emphasis Area Requirement
6 - Minor Requirement
16

Senior Year
First Semester
3 - SOC 3600 Social Class and Poverty or
3 - SOC 4600 Race and Ethnicity or
3 - SOC 4610 Sociology of Sex and Gender
3 - Advanced Humanities Requirement
6 - Emphasis Area Requirement
3 - Elective
15

Second Semester
3 - SOC 4040 Sociological Theory
1 - SOC 4970 Sociology Senior Lab.
6 - Emphasis Area Requirement
3 - Minor Requirement
15

SOCIOLOGY
Bachelor of Science
Freshman Year
First Semester
3 - MTHS 1030 Essential Math. for Informed Soc. or
3 - MTHS 1020 Intro. to Mathemat. Analysis or
4 - MTHS 1060 Calculus of One Variable I
3 - SOC 2010 Introduction to Sociology or
3 - SOC 2020 Social Problems
4 - Natural Science Requirement
3 - Social Science Requirement
3 - Elective
16-17

Second Semester
3 - COMM 1500 Intro. to Human Comm. or
3 - COMM 2500 Public Speaking
3 - ENGL 1030 Accelerated Composition
3 - MTHS 2030 Elementary Statistical Inference or
3 - MTHS 3010 Statistical Methods or
3 - EXST 3010 Introductory Statistics
3 - Departmental Math or Science Requirement
3 - Elective
15

Sophomore Year
First Semester
3 - Arts and Humanities (Literature) Requirement
3 - Cross-Cultural Awareness Requirement
3 - Departmental Math or Science Requirement
3 - Minor Requirement
3 - Elective
15

Second Semester
3 - SOC 2050 Sociology Lab.
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Departmental Math or Science Requirement
3 - Minor Requirement
3 - Science and Tech. in Society Requirement
16

Junior Year
First Semester
3 - SOC 3020 Social Research Methods I
3 - SOC 3600 Social Class and Poverty or
3 - SOC 4600 Race and Ethnicity or
3 - SOC 4610 Sociology of Sex and Gender
3 - Advanced Humanities Requirement
3 - Advanced Writing Requirement
3 - Elective
15

Second Semester
4 - SOC 3040 Social Research Methods II
3 - Advanced Humanities Requirement
3 - Departmental Math or Science Requirement
3 - Minor Requirement
3 - Emphasis Area Requirement
16

Senior Year
First Semester
3 - SOC 3600 Social Class and Poverty or
3 - SOC 4600 Race and Ethnicity or
3 - SOC 4610 Sociology of Sex and Gender
6 - Departmental Math or Science Requirement
3 - Emphasis Area Requirement
3 - Elective
15

Second Semester
3 - SOC 4040 Sociological Theory
1 - SOC 4970 Sociology Senior Lab.
6 - Emphasis Area Requirement
3 - Minor Requirement
15

121-122 Total Semester Hours

1 See emphasis area requirements in program description above.
2 See General Education Requirements. (Note: Social Science Requirement must be in an area other than anthropology or sociology.)
3 See page 90 for approved minors.
4 Humanities courses numbered 3000 or higher (AAH 2100, MUSC 2100, THEA 2100 are accepted). The humanities for this purpose include art and architectural history, communication studies (except 3640 and 3680), English (except 3040, 3120, 3140, 3160, 3330, 3340, 3350, 4850, 4900, 4950), music, philosophy, religion, theatre (except 3770, 4970, 4975), and women’s studies, as well as courses entitled Humanities.
5 See emphasis area requirements in program description above.
MINORS

Following are minors acceptable for students in the College of Business and Behavioral Science. Students cannot major and minor in the same field or acquire a minor that is not allowed by the degree program.

Accounting
Adult/Extension Education
Aerospace Studies
Agricultural Business Management
Agricultural Mechanization and Business
American Sign Language Studies
Animal and Veterinary Sciences
Anthropology
Architecture
Art
Athletic Leadership—not open to Marketing majors.
Biochemistry
Biological Sciences
Business Administration—not open to Accounting, BS Economics, Financial Management, Management, or Marketing majors
Chemistry
Cluster
Communication Studies
Computer Science
Crop and Soil Environmental Science
Digital Production Arts
East Asian Studies
Economics
Education—not open to Graphic Communications majors
English
Entomology
Entrepreneurship—not open to Accounting, BS Economics, Financial Management, Management, or Marketing majors
Environmental Engineering
Environmental Science and Policy
Equine Business
Film Studies
Financial Management
Food Science
Forest Resource Management
Genetics
Geography
Geology
Global Politics—not open to Political Science majors
Great Works
History
Horticulture
Human Resources Management—not open to Management majors
Legal Studies
Management
Management Information Systems—not open to Management Majors
Mathematical Sciences
Microbiology
Military Leadership
Modern Languages
Music
Natural Resource Economics
Nonprofit Leadership
Packaging Science
Pan African Studies
Park and Protected Area Management
Philosophy
Physics
Plant Pathology
Political Science
Psychology
Public Policy—not open to Political Science majors
Religion
Russian Area Studies
Science and Technology in Society
Screenwriting
Sociology
Spanish-American Area Studies
Theatre
Therapeutic Recreation
Travel and Tourism
Turfgrass
Urban Forestry
Wildlife and Fisheries Biology
Women’s Studies
Writing

See pages 39-42 for details.
COLLEGE OF ENGINEERING AND SCIENCE

The College of Engineering and Science offers a broad range of rigorous and stimulating baccalaureate programs that provide excellent educational opportunities. The innovative combination of engineering and science disciplines that comprise the College, facilitates study and research in fields transcending the traditional disciplines. Students enjoy close interaction with a distinguished faculty committed to excellence in undergraduate education, as well as in research. Additional information on the College and its programs is available at www.clemson.edu/ces.

Minors
Engineering and science students can complement their majors by selecting minor concentrations of study. Available minors include Environmental Engineering, International Engineering and Science, and one in each of the science majors (see page 110).

International Programs
The world economy has become very tightly integrated, making it highly important that engineering and science students prepare themselves for this global environment. The College offers a minor in International Engineering and Science coupled with several programs that provide opportunities for students to gain international experience. These include study abroad at many locations around the world and EPIC (an international co-op program). In addition, engineering and science students are encouraged to pursue study of a foreign language. A Certificate in International Engineering and Science, that combines language study and an international practicum, is also offered. Information is available in the Undergraduate Studies Office (107 Riggs Hall) and at www.clemson.edu/ces/students/global.

ENGINEERING PROGRAMS

The Bachelor of Science engineering degree programs in Bioengineering, Biosystems Engineering, Chemical Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, Industrial Engineering, Materials Science and Engineering (Inorganic), and Mechanical Engineering are each accredited by the Engineering Accreditation Commission (EAC) of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012; telephone: (410) 347-7700. The new BS degree programs in Environmental Engineering and Materials Science and Engineering (Organic) are designed to meet ABET requirements and will be submitted to ABET for accreditation review when eligible.

All engineering programs have the common goal of producing engineering graduates who are able to:
- apply knowledge of math, science, and engineering
- identify, formulate, and solve engineering problems
- design and conduct experiments and analyze data
- design systems or components to meet needs within realistic constraints
- function on multidisciplinary teams
- communicate effectively
- conduct themselves professionally and ethically
- understand engineering's global, economic, environmental, and societal context
- understand contemporary engineering issues
- apply modern engineering methods and tools
- appreciate the need for life-long learning

Each engineering program has objectives specific to the discipline. All prepare students for a wide range of career opportunities and provide sound preparation for graduate study. Each curriculum provides opportunities for students to pursue individual areas of interest.

Admission Requirements
The University admission requirements are given under the section entitled Admission. Engineering applicants are strongly advised to include the following in their high school programs:

Mathematics—Four units, including geometry, trigonometry, and introductory calculus
Laboratory Science—At least three units, including both chemistry and physics
Computing—At least one unit, including introduction to a programming language. Applicants should have good keyboarding skills.

General Engineering Program

All new engineering students (including transfer students who have not completed all courses in the freshman engineering curriculum) are admitted into General Engineering. The General Engineering Program provides students an opportunity to explore various engineering fields while getting a sound academic preparation for engineering study.

Freshman Curriculum

First Semester
2 - ENGR 1020 Engineering Disciplines and Skills
4 - CH 1010 General Chemistry
3 - ENGL 1030 Accelerated Composition
4 - MTHS 1060 Calculus of One Variable I
3 - General Education Requirement

Second Semester
3 - ENGR 1410 Programming and Problem Solving
4 - MTHS 1080 Calculus of One Variable II
3 - PHYS 1220 Physics with Calculus I
3 - General Education Requirement

Electives for Engineering Curricula

Advisors must approve any course taken for elective credit in the Engineering curriculum. Courses excluded for elective credit include PHYS 2000, 2070/2090, 2080/2100.

Admission into Engineering Degree Programs

To transfer into an engineering degree program, a student must have completed the following courses in the freshman engineering curriculum with a grade of C or better:

1 - CH 1010 General Chemistry
3 - ENGL 1030 Accelerated Composition
2 - ENGR 1020 Engineering Disciplines and Skills
3 - ENGR 1410 Programming and Problem Solving
4 - MTHS 1060 Calculus of One Variable I
4 - MTHS 1080 Calculus of One Variable II
3 - PHYS 1220 Physics with Calculus I

1For Chemical Engineering, CHE 1300 is required.

In addition, the student must have the minimum grade-point average specified by the engineering degree program for admission.

Students should initiate a change-of-major request prior to the registration period during the semester when they expect to complete the freshman curriculum. Students who fail to meet the requirements for admission into a degree program may remain in general Engineering until those requirements are met; however, General Engineering majors are not permitted to take 3000- or 4000-level engineering courses. Engineering departments may allow General Engineering majors to enroll in selected 2000-level engineering courses (policy varies by department). Students admitted into an engineering degree program will follow the curriculum in effect at the time of admission into General Engineering, unless otherwise approved by the specific engineering department.

General Education Requirements for Engineering Curricula

Engineers have an obligation to practice their profession in a socially responsible manner. The education of engineers must prepare them for this responsibility and make them aware of the constraints imposed by societal and cultural factors. Thus, the humanities and social sciences are an important component of the engineering curriculum. Further, the program of study must include educational experiences addressing the intersection of science and technology with society and cross-cultural awareness.

In addition to the University General Education Requirements, some engineering majors are required to complete additional credit hours from a college approved list. Individual engineering curricula may have more specific requirements. For a complete list of acceptable courses, please speak with an advisor.
Registration Requirements
A cumulative grade-point average of 2.0 or higher is required for registration in engineering courses numbered 3000 or higher. Priority for registration in engineering courses is given to those majors for whom the course is a degree requirement. Exceptions to this requirement may be granted by the department offering the course.

Graduation Requirements
In addition to other institutional requirements, candidates for a baccalaureate degree in Engineering are required to have a 2.0 or higher cumulative grade-point average in all engineering courses taken at Clemson. All courses with “Engineering” in the course designator (e.g., ENGR 1300, ME 4530, etc.) are used in this calculation.

The baccalaureate programs in Engineering are designed to be completed in four years (eight regular semesters). Taking a reduced load or participating in cooperative education will extend this time. On average, Clemson engineering students take about four and one-half years to complete the requirements for graduation.

BIOENGINEERING
Bachelor of Science
The undergraduate program in Bioengineering is built upon a rigorous engineering science foundation that is, in turn, based upon a broad curriculum of applied and life sciences, mathemastics, electives in humanities, social science, and design. Students select a formal focus that concentrates in a subfield of interest in bioengineering: Bioelectrical Concentration or Biomaterials Concentration.

The curriculum provides undergraduates with a solid background in engineering and life sciences in preparation for advanced studies. Through the Bioengineering program, graduates acquire an understanding of biology, biochemistry, and physiology and the capability to apply advanced mathematics, including differential equations and statistics, science, and engineering, to solve the problems at the interface of engineering and biology. Graduates also have an ability to make measurements on and interpret data from living systems, addressing the problems associated with the interaction between living and nonliving materials and systems.

Combined Bachelor’s/Master’s Plan
Bioengineering undergraduates may begin a Master of Science degree program while completing the Bachelor of Science degree and use a limited number of courses to satisfy the requirements of both the undergraduate and graduate degrees. Details are available from the Department of Bioengineering.

BIOELECTRICAL CONCENTRATION
Freshman Year
First Semester
1 - ENGR 1020 Engineering Disciplines and Skills
2 - ENGL 1010 General Chemistry
3 - MTHS 1060 Calculus of One Variable I
4 - Arts and Humanities Requirement or Social Science Requirement
6 - Biology Requirement
18
Second Semester
1 - CH 1010 General Chemistry
2 - ENGL 2080 Programming and Problem Solving
3 - MTHS 1080 Calculus of One Variable II
4 - PHYS 1120 Physics with Calculus I
5 - Arts and Humanities Requirement or Social Science Requirement
1 - Biology Requirement
18
Sophomore Year
First Semester
3 - BIOE 2010 Intro. to Biomedical Engineering
2 - ECE 2010 Logic and Computing Devices
3 - ECE 2020 Electric Circuits I
1 - ECE 2030 Logic and Computing Devices Lab I
1 - ECE 2110 Electrical Engineering Lab. I
1 - ECE 2060 Calculus of Several Variables
1 - PHYS 2210 Physics with Calculus II
17
Second Semester
3 - CE 2010 Sems
1 - ECE 2120 Electrical Engineering Lab. II
1 - ECE 2620 Electric Circuits II
2 - ENGR 2080 Engineering Graphics and Machining Design
3 - MSE 2100 Introduction to Materials Science
4 - MTHS 2000 Intro. to Ordinary Diff. Equations
16
Junior Year
First Semester
4 - BIOL 3150 Functional Human Anatomy
4 - CH 2010 Survey of Organic Chemistry
1 - ECE 3110 Electrical Engineering Lab. III
1 - ECE 3200 Biomaterials
3 - ECE 3300 Signals, Systems, and Transforms
15
Second Semester
3 - BCHM 3050 Essential Elements of Biochem.
3 - BIOE 3020 Biomaterials
3 - BIOE 3710 Bioinstrumentation and Bioimaging
3 - ECE 3800 Electromagnetics
3 - BIOE or ECE Technical Requirement
15
Senior Year
First Semester
3 - BIOE 3200 Biomechanics
3 - BIOE 4010 Bioengineering Design Theory
3 - BIOL 4610 Cell Biology
3 - Arts and Humanities Requirement or Social Science Requirement
3 - BIOE or ECE Technical Requirement
15
Second Semester
1 - BIOE 4000 Senior Seminar
3 - BIOE 4030 Applied Biomedical Design
3 - BIOE 4480 Tissue Engineering
3 - Arts and Humanities Requirement or Social Science Requirement
6 - BIOE or ECE Technical Requirement
16
128 Total Semester Hours
1See Policy on Humanities and Social Sciences for Engineering Curricula. Six of these credit hours must also satisfy General Education Cross-Cultural Awareness and Science and Technology in Society Requirements.
2Students planning to enter medical school should take CH 2200 instead of CH 2210.
3Selective department-approved list.
4No student may exceed a maximum of two attempts, excluding any ECE courses.
5See Policy on Humanities and Social Sciences for Engineering Curricula.
6To transfer from General Engineering into the Bioengineering degree program, students must have a minimum cumulative grade-point average of 3.0 in courses taken at Clemson and must have earned a C or better in each course in the General Engineering freshman curriculum, including the Arts and Humanities/Social Science Requirements.
7A student is allowed to enroll in ECE courses (excluding 3000- or 4000-level ECE courses).
8Students planning to enter medical school should take CH 2200 instead of CH 2210 and take CH 2240 instead of CH 2220.
9Students planning to enter medical school should take CH 2200 instead of CH 2210.
10A student is allowed to enroll in ECE courses (excluding 3000- or 4000-level ECE courses).
11To complete successfully any ECE course.

BIOMATERIALS CONCENTRATION
Freshman Year
First Semester
2 - ENGR 1020 Engineering Disciplines and Skills
4 - CH 1010 General Chemistry
3 - ENGL 1030 Accelerated Composition
4 - MTHS 1060 Calculus of One Variable I
3 - Arts and Humanities Requirement or Social Science Requirement
16
Second Semester
4 - CH 1020 General Chemistry
3 - ENGR 2080 Programming and Problem Solving
4 - MTHS 1080 Calculus of One Variable II
4 - PHYS 1120 Physics with Calculus I
3 - Arts and Humanities Requirement or Social Science Requirement
1 - Biology Requirement
18
### Sophomore Year

**First Semester**
- 3 - BIOE 2010 Intro. to Biomedical Engineering
- 4 - CH 2010 Survey of Organic Chemistry
- 2 - MTHS 2060 Calculus of Several Variables
- 3 - PHYS 2210 Physics with Calculus II

**Second Semester**
- 3 - BIOE 3020 Biomechanics
- 4 - BIOL 3150 Functional Human Anatomy
- 3 - MTHS 3190 Materials Processing I
- 3 - MTHS 3260 Thermodynamics of Materials
- 3 - MTHS 3270 Transport Phenomena

### Junior Year

**First Semester**
- 3 - BIOE 3210 Bioprocess Mechanics
- 3 - BIOE 3210 Bioprocess Mechanics
- 3 - BIOE 3700 Biostatistics and Bioimaging
- 3 - MTHS 3702 Statistics for Science and Engr.
- 3 - BIOE Technical Requirement

**Second Semester**
- 3 - BCHM 3500 Essential Elements of Biochem.
- 3 - BIOE 3210 Bioprocess Mechanics
- 3 - BIOE 3700 Biostatistics and Bioimaging
- 3 - MTHS 3702 Statistics for Science and Engr.
- 3 - BIOE Technical Requirement

### Senior Year

**First Semester**
- 3 - BIOE 4010 Bioengineering Design Theory
- 3 - BIOL 4610 Cell Biology
- 3 - MTHS 4150 Intro. to Polymer Science and Engr.
- 3 - Arts and Humanities Requirement or Social Science Requirement
- 3 - BIOE Technical Requirement

**Second Semester**
- 1 - BIOE 4000 Senior Seminar
- 3 - BIOE 4030 Applied Biomedical Design
- 3 - BIOE 4480 Tissue Engineering
- 3 - Arts and Humanities Requirement or Social Science Requirement
- 6 - Bioengineering Technical Requirement

128 Total Semester Hours

### Freshman Year

**First Semester**
- 2 - ENGR 1020 Engineering Disciplines and Skills
- 4 - CH 1010 General Chemistry
- 3 - ENGL 1030 Accelerated Composition
- 4 - MTHS 1060 Calculus of One Variable I
- 3 - Arts and Humanities Requirement or Social Science Requirement

**Second Semester**
- 3 - CH 2270 Organic Chemistry
- 3 - EGR 1410 Programming and Problem Solving II
- 3 - MTHS 1080 Calculus of One Variable II
- 3 - PHYS 1220 Physics with Calculus I
- 3 - Arts and Humanities Requirement or Social Science Requirement

### Sophomore Year

**First Semester**
- 2 - BE 2120 Fundamentals of Biosystems Engr.
- 3 - CE 2010 Statics
- 4 - MTHS 2060 Calculus of Several Variables
- 3 - PHYS 2210 Physics with Calculus II
- 4 - Biology Requirement

**Second Semester**
- 2 - BE 2100 Intro. to Biosystems Engineering
- 2 - CE 2080 Dynamics
- 2 - ENGR 2100 Computer-Aided Design and Engineering Applications
- 3 - ME 3100 Thermodynamics and Heat Transfer
- 4 - MICR 3050 General Microbiology
- 4 - MTHS 2080 Intro. to Ordinary Diff. Equations

### Junior Year

**First Semester**
- 3 - BE 3200 Principles and Practices of Geomatics
- 3 - BE 4100 Biol. Kinetics and Reactor Modeling
- 3 - CH 2230 Organic Chemistry
- 1 - CH 2270 Organic Chemistry Laboratory
- 2 - ECE 3070 Basic Electrical Engineering
- 1 - ECE 3090 Electrical Engineering Lab. I
- 3 - Mechanics of Materials Requirement

Note: To transfer from General Engineering into the Bioengineering degree program, students must have a minimum cumulative grade-point average of 3.0 in courses taken at Clemson and must have earned a C or better in each course in the General Engineering freshman curriculum including the Arts and Humanities/Social Science Requirements.

### BIOSYSTEMS ENGINEERING

**Bachelor of Science**

Biosystems engineering is the field of engineering most closely allied with advances in biology. Bioystems engineers apply engineering design and analysis to biological systems and incorporate fundamental biological principles to engineering designs to achieve ecological balance.

The Biosystems engineering program emphasizes two main areas – sustainable bioprocess engineering, with its basis in microbiology, and ecological engineering, with its basis in ecology. Bioprocess engineering focuses on the sustainable production of biorenewable compounds - biofuels, nutraceuticals, bioactive molecules, and biomaterials - using metabolic pathways found in nature and green processing technologies.

Ecological engineering focuses on the design of sustainable communities utilizing low-impact development strategies such as bioretention basins, rainwater harvesting, and bioswales for stormwater treatment, and management. Both emphasis areas interface with ecology to support food and energy-crop production systems.

Biosystems engineers lead teams to:
- Design bioprocesses and systems for biofuels (biodiesel, hydrogen, ethanol), biopharmaceutical, bioplastics, and food processing industries
- Develop ecological designs (permeable pavement, bioswales, green infrastructure) to integrate water management into the landscape
- Integrate ecological sustainability into energy, water, and food systems
- Provide engineering expertise for agriculture, food processing, and manufacturing industries.

Biosystems engineering graduates are highly qualified to pursue graduate studies in biosystems engineering, biomedical engineering or ecological engineering fields, or medical or veterinary school.

Students are urged to complete a minor and participate in the Cooperative Education, Biosystems Engineering Intern, and/or Study Abroad Programs. Those interested in medical school can fulfill requirements with the Biosystems Engineering BS degree.

Additional information is available from the departmental offices or at: http://www.clemson.edu/majors/biosystems-engineering.

### Combined Bachelor’s/Master’s Program

Under this plan, students may reduce the time necessary to earn both degrees by applying graduate credits to both undergraduate and graduate program requirements.

Undergraduate students in Biosystems Engineering may begin a Master of Science or a Master of Engineering Degree in Environmental Engineering and Science or Master of Science Degree in Bioengineering while completing the BS degree.

Students are encouraged to obtain the specific requirements for the dual degree from the academic departments involved as early as possible in their undergraduate program. See Academic Regulations in this catalog for enrollment guidelines and procedures.
College of Engineering and Science

Second Semester
3 - BE 3220 Small Watershed Hydrology and Sedimentology
3 - BE 4120 Heat and Mass Transport in BE
3 - BE 4380 Bioprocess Engineering Design
4 - CE 3410 Introduction to Fluid Mechanics
3 - Arts and Humanities Requirement3 or
3 - Social Science Requirement3

Second Semester
2 - BE 4210 Engineering Systems for Soil Water Management
3 - BE 4240 Ecological Engineering
3 - Arts and Humanities Requirement1 or
3 - Social Science Requirement1
4 - Ecological Requirement3
3 - Engineering Requirement3

128 Total Semester Hours

Students should choose courses to fulfill General Education requirements including Humanities, Social Science, Cross-Cultural Awareness and Science and Technology in society components. See Undergraduate Announcements and academic advisor for details.

BIOPROCESS ENGINEERING EMPHASIS AREA

Senior Year
First Semester
3 - BE 4280 Biochemical Engineering
2 - BE 4740 Biosystems Engr. Design/Project Mgt.
2 - BE 4750 Biosystems Engr. Capstone Design
3 - BIOL 4410 Ecology
5 - Biochemistry Requirement1

Second Semester
6 - Engineering Requirement2
3 - Life Science Requirement4
6 - Arts and Humanities Requirement1 or
6 - Social Science Requirement1

128 Total Semester Hours

Students should choose courses to fulfill General Education requirements including Humanities, Social Science, Cross-Cultural Awareness and Science and Technology in society components. See Undergraduate Announcements and academic advisor for details.

Notes for Bioprocess and Ecological Engineering emphasis areas:
1. Bioprocess Engineering students are allowed to enroll in upper level BE courses only when the following prerequisites have been completed with a C or better: CE 2010, 2060, 2080, 3410.
2. Bioprocess Engineering students are encouraged to complete a Minor, Coop Ed program, internship (BE 7700) and/or a Study Abroad Program.
3. Possible minors include Environmental Engineering, Environmental Science and Policy, Sustainability, Wildlife, Forestry and Fisheries.
4. Departmental Honors Thesis (BE 3000/3010/4000) is available for qualifying Junior/Senior students.
5. Bioprocess Engineering students are encouraged to consider possibilities of graduate study early in the undergraduate program and plan accordingly; including the possibility of participating in Clemson’s MS program in which six credits may count in both the BS and a MS degree.

ECOLOGICAL ENGINEERING EMPHASIS AREA

Senior Year
First Semester
2 - BE 4210 Engineering Systems for Soil Water Management
3 - BE 4240 Ecological Engineering
3 - Arts and Humanities Requirement1 or
3 - Social Science Requirement1

Second Semester
2 - BE 4120 Engineering Systems for Soil Water Management
3 - BE 4240 Ecological Engineering
3 - Arts and Humanities Requirement1 or
3 - Social Science Requirement1

Chemical engineers are involved in the research, manufacture, sales, and use of commodity and specialty chemicals, fuels, pharmaceuticals, electronic components, synthetic fibers and textiles, food and consumer goods, and many other products. They work on environmental pollution prevention and remediation and apply engineering science to solve medical and health-related problems.

Combined Bachelor of Science/ Master of Science

Qualified students can reduce the time to earn a Master’s Degree by applying graduate credits to both the Bachelor’s and Master’s program requirements. Undergraduate Chemical and Biomolecular Engineering students who have earned a grade-point average of 3.4 or above and completed 90 credit hours can begin work toward a Master of Science in Chemical Engineering or a Master of Science in Environmental Engineering and Science by selecting approved graduate courses for their emphasis area.

Details are available in the ChBE Undergraduate Handbook, which can be found at www.clemson.edu/che.

Freshman Year
First Semester
2 - ENGR 1020 Engineering Disciplines and Skills
4 - CH 1010 General Chemistry
3 - ENGL 1030 Accelerated Composition
4 - MTHS 1060 Calculus of One Variable I
3 - Arts and Humanities Requirement1 or
3 - Social Science Requirement1

Second Semester
4 - CH 1020 General Chemistry
2 - CHE 1300 Chemical Engineering Tools
4 - MTHS 1080 Calculus of One Variable II
3 - PHYS 2210 Physics with Calculus I
3 - Arts and Humanities Requirement1 or
3 - Social Science Requirement1

Sophomore Year
First Semester
3 - CH 2230 Organic Chemistry
4 - CHE 2110 Intro. to Chemical Engineering
4 - MTHS 2060 Calculus of Several Variables
3 - PHYS 2210 Physics with Calculus II
3 - Arts and Humanities Requirement1 or
3 - Social Science Requirement1

Second Semester
3 - CH 2240 Organic Chemistry
1 - CH 2290 Organic Chemistry Lab.
3 - CHE 2220 Chemical Engr. Thermodynamics I
4 - CHE 2300 Fluids/Heat Transfer
4 - MTHS 2080 Intro. to Ordinary Diff. Equations

Chemical engineering is based on chemistry, biology, physics, and mathematics. The curriculum at Clemson includes classroom and laboratory instruction and emphasizes broadly applicable fundamental principles and current technology to prepare graduates for professional practice and professional growth. The Educational Objective of the BS degree program is for graduates to have careers characterized by:
• success in chemical engineering practice, post-graduate education, or other areas making use of engineering skills, as defined by accomplishments and/or job satisfaction;
• demonstrated success in the design of chemical processes and/or identification, formulation, and solution of chemical engineering problems;
• ethical behavior in all endeavors;
• demonstrated effectiveness in teamwork, communication, and service to society through professional contributions;
• demonstrated technical and/or managerial leadership;
• demonstrated commitment to lifelong learning.
Junior Year

First Semester
1. CH 3390 Physical Chemistry Lab.
2. CHE 3070 Unit Operations Lab. I
3. CHE 3190 Engineering Materials
4. ECE 3070 Basic Electrical Engineering
6. Arts and Humanities Requirement

Second Semester
3. CHE 3320 Physical Chemistry
4. CHE 3400 Physical Chemistry Lab.
5. CHE 3210 Chemical Engr. Thermodynamics II
7. Arts and Humanities Requirement
8. Social Science Requirement
9. Biochemistry Option or
10. Emphasis Area
16

Senior Year

First Semester
3. CHE 4070 Unit Operations Lab. II
4. CHE 4310 Chemical Process Design I
5. CHE 4500 Chemical Reaction Engineering
6. Arts and Humanities Requirement
7. Social Science Requirement
8. Emphasis Area Requirement
16

Second Semester
3. CHE 3530 Process Dynamics and Control
4. CHE 4330 Process Design II
5. CHE 4440 Chemical Engr. Senior Seminar II
6. MICR 4130 Industrial Microbiology
7. Arts and Humanities Requirement
8. Social Science Requirement
9. Emphasis Area Requirement
16

129 Total Semester Hours

Second Semester
4. CH 1020 General Chemistry
5. CHE 1300 Chemical Engineering Tools
6. MTHS 1080 Calculus of One Variable II
7. PHYS 1220 Physics with Calculus I
8. Arts and Humanities Requirement
9. Social Science Requirement
16

Sophomore Year

First Semester
5. BIOL 1100 Principles of Biology I
6. CH 2230 Organic Chemistry
7. CHE 2110 Intro. to Chemical Engineering
8. MTHS 2060 Calculus of Several Variables
9. Arts and Humanities Requirement
10. Social Science Requirement
19

Second Semester
2. CHE 4340 Biological Chem. Lab. Techniques
3. CH 2240 Organic Chemistry
4. CHE 2290 Organic Chemistry Lab.
5. CHE 2200 Chemical Engr. Thermodynamics I
6. CHE 2300 Fluids/Heat Transfer
7. Biochemistry Option

Junior Year

First Semester
3. BIOE 3020 Biomaterials
4. BCHM 4310 Physical Approach to Biochem.
5. CHE 3070 Unit Operations Lab. I
6. CHE 3400 Engineering Materials
7. MTHS 2263 Intro. to Ordinary Diff. Equations
16

Second Semester
3. BMOL 4250 Biocatalytic Engineering
5. CHE 4500 Chemical Reaction Engineering
6. PHYS 2210 Physics with Calculus II
7. Arts and Humanities Requirement
8. Social Science Requirement
16

Senior Year

First Semester
3. CHE 4070 Unit Operations Lab. II
4. CHE 4310 Chemical Process Design I
5. CHE 4430 Chemical Engr. Senior Seminar I
6. CHE 4070 Unit Operations Lab. II
7. Arts and Humanities Requirement
8. Social Science Requirement
9. Engineering Requirement
16

Second Semester
3. CHE 3530 Process Dynamics and Control
4. CHE 4330 Process Design II
5. CHE 4440 Chemical Engr. Senior Seminar II
6. Arts and Humanities Requirement
7. Social Science Requirement
16

131 Total Semester Hours

See Policy on Humanities and Social Sciences for Engineering Curricula. Six of these credit hours must also satisfy the Cross-Cultural Awareness and Science and Technology in Society Requirements.

Select one course from BCHM 3050, BMOL 4250, or CH 3600.

See advisor for details. Nine credit hours devoted to completion of an emphasis area or approved minor are required. Emphasis areas are Applied Engineering, Mathematics and Science, Biomedical Science and Engineering; Business Management; Environmental Engineering; Polymers; Energy Studies.

Note: No student may exceed a maximum of two attempts, including a W, to complete successfully any CHE course.

BIOMOLECULAR ENGINEERING CONCENTRATION

Freshman Year

First Semester
2. ENGR 1020 Engineering Disciplines and Skills
3. CH 1010 General Chemistry
4. ENGL 1030 Accelerated Composition
5. MTHS 1060 Calculus of One Variable I
6. Arts and Humanities Requirement
7. Social Science Requirement
16

Second Semester
4. CHE 1020 General Chemistry
5. CHE 1300 Chemical Engineering Tools
6. MTHS 1080 Calculus of One Variable II
7. PHYS 1220 Physics with Calculus I
8. Arts and Humanities Requirement
9. Social Science Requirement
16

Sophomore Year

First Semester
5. BIOL 1100 Principles of Biology I
6. CH 2230 Organic Chemistry
7. CHE 2110 Intro. to Chemical Engineering
8. MTHS 2060 Calculus of Several Variables
9. Arts and Humanities Requirement
10. Social Science Requirement
19

Second Semester
2. CHE 4340 Biological Chem. Lab. Techniques
3. CH 2240 Organic Chemistry
4. CHE 2290 Organic Chemistry Lab.
5. CHE 2200 Chemical Engr. Thermodynamics I
6. CHE 2300 Fluids/Heat Transfer
7. Biochemistry Option

Senior Year

First Semester
3. BIOE 3020 Biomaterials
4. BCHM 4310 Physical Approach to Biochem.
5. CHE 3070 Unit Operations Lab. I
6. CHE 3400 Engineering Materials
7. MTHS 2263 Intro. to Ordinary Diff. Equations
16

Second Semester
3. BMOL 4250 Biocatalytic Engineering
5. CHE 4500 Chemical Reaction Engineering
6. PHYS 2210 Physics with Calculus II
7. Arts and Humanities Requirement
8. Social Science Requirement
16

131 Total Semester Hours

CIVIL ENGINEERING

Bachelor of Science

Civil Engineering involves the planning, design, construction management, operation, and maintenance of facilities and systems in the built environment, including bridges, buildings, airports, water supply systems, ports, dams, and highways.

The Bachelor of Science degree program in Civil Engineering includes the common educational goals listed on page 91 for the College of Engineering and Science. The complete objectives of the program can be found at www.clemson.edu/ce.

The first two years provide students with building blocks necessary to be successful civil engineers, including proficiency in calculus, engineering mechanics, physics, and chemistry. During the junior year, students receive a broad introduction to the fundamental areas of civil engineering (structures, hydraulics, geotechnical, transportation, environmental, construction materials, and construction engineering and management). Design experiences are integrated throughout the curriculum, culminating in the senior year with a major capstone design project. In addition, during the senior year, students can select from available emphasis areas that serve to strengthen their undergraduate background.

The Civil Engineering program prepares students to work immediately upon graduation in most areas of civil engineering or to pursue graduate degrees. Students are also exposed to issues related to professional practice, including professional registration, life-long learning, and communication and team skills. Because a concerned society demands a realistic consideration of the impacts of engineering projects, civil engineering students are also educated in the broad areas of the humanities and social sciences.

To be eligible for admission into the Bachelor of Science degree program in Civil Engineering, students must have completed the courses outlined in the freshman core curriculum and have a cumulative grade-point average of 2.6 or higher.

The Department of Civil Engineering allows eligible students to count up to six hours of graduate credit (6000- and 8000-level courses) toward both the bachelor’s and master’s degrees. Students participating in this program must have completed the junior year, must have earned a minimum 3.4 grade-point ratio, and must be approved by the department. Details of the suggested curriculum and program information are available from the department.
<table>
<thead>
<tr>
<th>Semester</th>
<th>1st Year</th>
<th>2nd Year</th>
<th>3rd Year</th>
<th>4th Year</th>
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<tr>
<td><strong>Freshman</strong></td>
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<tr>
<td><strong>First Semester</strong></td>
<td>2 - ENGR 1020 Engineering Disciplines and Skills</td>
<td>3 - MTHS 1080 Calculus of One Variable I</td>
<td>3 - Arts and Humanities Requirement or Technical Requirement</td>
<td>6 - Social Science Requirement</td>
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<td>4 - CH 1010 General Chemistry</td>
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<td>5 - ENGL 1030 Accelerated Composition</td>
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<td>6 - MTHS 1060 Calculus of One Variable I</td>
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<td>8 - Social Science Requirement</td>
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<td>129 Total Semester Hours</td>
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<td>3 - CE 4590 Capstone Design Project</td>
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<td>5 - Arts and Humanities (Literature) Requirement</td>
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<td>6 - Technical Requirement</td>
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<td><strong>Sophomore</strong></td>
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<td>6 - Social Science Requirement</td>
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<td>7 - Arts and Humanities Requirement or</td>
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<td><strong>Junior</strong></td>
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<tr>
<td><strong>First Semester</strong></td>
<td>1 - ECE 2120 Electrical Engineering Lab. I</td>
<td>2 - MTHS 2080 Intro. to Ordinary Diff. Equations</td>
<td>3 - Computer Engineering Technical Requirement</td>
<td>6 - Arts and Humanities Requirement or Technical Requirement</td>
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<tr>
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<td>2 - ECE 2110 Electrical Engineering Lab. I</td>
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<td>3 - ECE 2220 Systems Programming Concepts for Computer Engineering</td>
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<td>4 - MTHS 2210 Physics with Calculus II</td>
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<td><strong>Second Semester</strong></td>
<td>5 - ENGR 1410 Programming and Problem Solving</td>
<td>6 - MTHS 1080 Calculus of One Variable II</td>
<td>7 - Social Science Requirement</td>
<td>96 Total Semester Hours</td>
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<td>6 - Social Science Requirement</td>
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<td>8 - Social Science Requirement</td>
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<td><strong>Second Semester</strong></td>
<td>96 Total Semester Hours</td>
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**COMPUTER ENGINEERING**

**BACHELOR OF SCIENCE**

Computer engineers have excellent career opportunities in the design and application of hardware and software components for a variety of computer applications. These include mainframe, desktop, and embedded microprocessor platforms, as well as the networking of various types of computers and peripherals.

Based on a strong foundation in mathematics, computer science, and the physical sciences, the Computer Engineering program includes engineering science and design in circuits, electronics, computer organizations and design, peripheral interfacing, and software engineering. Emphasis is placed on hands-on experience with networked computer systems, micro-, mini-, and mainframe computers, and the solution of a wide range of practical problems using engineering principles. In addition to these technical skills, students learn to communicate effectively and to develop interpersonal, teamwork, and management skills, all of which contribute to success in a professional engineering career. The program is also an excellent preparation for graduate study.

Information on the program and its objectives is available at www.clemson.edu/ces/departments/ece/.

**Freshman Year**

**First Semester**

- ENGR 1020 Engineering Disciplines and Skills
- CH 1010 General Chemistry
- ENGL 1030 Accelerated Composition
- MTHS 1060 Calculus of One Variable I
- Arts and Humanities Requirement or Technical Requirement
- Social Science Requirement

**Second Semester**

- ENGR 1410 Programming and Problem Solving
- MTHS 1080 Calculus of One Variable II
- PHYS 1220 Physics with Calculus I
- Social Science Requirement
- Special Requirement

**Sophomore Year**

**First Semester**

- ECE 2120 Electrical Engineering Lab. II
- ECE 2220 Systems Programming Concepts for Computer Engineering
- MTHS 2620 Electric Circuits II
- ECE 2720 Computer Organization
- ECE 2730 Computer Organization Laboratory
- MTHS 2210 Physics with Calculus II

**Second Semester**

- ECE 2230 Computer Systems Engineering
- ECE 3110 Electrical Engineering Lab. III
- ECE 3200 Electronics I
- ECE 3300 Signals, Systems, and Transforms
- ECE 3710 Microcontroller Interfacing
- MTHS 3720 Microcontroller Interfacing Lab.
- MTHS 3110 Linear Algebra

**Junior Year**

**First Semester**

- ECE 2230 Computer Systems Engineering
- ECE 3110 Electrical Engineering Lab. III
- ECE 3200 Electronics I
- ECE 3300 Signals, Systems, and Transforms
- ECE 3710 Microcontroller Interfacing
- MTHS 3110 Linear Algebra

**Second Semester**

- ECE 3170 Random Signal Analysis
- ECE (CPSC) 3220 Intro. to Operating Systems
- ECE 3270 Digital Computer Design
- ECE 3520 Programming Systems
- MTHS 4190 Discrete Math. Structures I

**Senior Year**

**First Semester**

- COMM 1500 Intro. to Human Comm. or
- COMM 2500 Public Speaking
- ECE 4590 Continuous and Discrete Sys. Design
- ECE 4950 Integrated System Design I
- ENGL 3140 Technical Writing
- Computer Engineering Technical Requirement

**Second Semester**

- ECE 4960 Integrated System Design II
- Arts and Humanities (Literature) Requirement
- Computer Engineering Technical Requirement
- Computer Engineering Technical Depth Req.
- Special Requirement

127 Total Semester Hours
Second Semester
1 - ECE 4960 Integrated System Design II
3 - Arts and Humanities Requirement\(^1\) or Social Science Requirement\(^2\)
3 - Arts and Humanities Requirement\(^1\) or Social Science Requirement\(^2\)
3 - Electrical Engineering Technical Req.\(^3\)
3 - Special Requirement\(^4\)

Sophomore Year
First Semester
3 - CPSC 1110 Elementary Computer Programming in C/C++
2 - ECE 2010 Logic and Computing Devices
3 - ECE 2020 Electric Circuits I
1 - ECE 2090 Logic and Computing Devices Lab.
1 - ECE 2110 Electrical Engineering Lab. I
4 - MTHS 2060 Calculus of Several Variables
3 - PHYS 2210 Physics with Calculus II

Second Semester
1 - ECE 2120 Electrical Engineering Lab. II
3 - ECE 2620 Electric Circuits II
3 - ECE 2720 Computer Organization
1 - ECE 2730 Computer Organization Laboratory
4 - MTHS 2080 Intro. to Ordinary Diff. Equations
3 - Arts and Humanities Requirement\(^1\) or Social Science Requirement\(^1\) or Electrical Engineering Technical Req.\(^3, 3\)

Junior Year
First Semester
1 - ECE 3120 Electrical Engineering Lab. III
3 - ECE 3210 Electronics II
3 - ECE 3560 Signals, Systems, and Transforms
1 - ECE 3600 Electric Power Engineering
3 - ECE 3810 Electromagnetics
3 - Advanced Mathematics Requirement\(^4\)

Second Semester
1 - ECE 3120 Electrical Engineering Lab. IV
3 - ECE 3710 Random Signal Analysis
3 - ECE 3210 Electronics II
3 - ECE 3710 Microcontroller Interfacing
1 - ECE 3720 Microcontroller Interfacing Lab.
3 - ECE 3810 Fields, Waves, and Circuits
3 - ENGL 3140 Technical Writing

Senior Year
First Semester
3 - COMM 3500 Intro. to Human Comm. or
3 - COMM 2500 Public Speaking
3 - ECE 4090 Continuous and Discrete Syst. Des.
3 - ECE 4270 Communications Systems
2 - ECE 4950 Integrated Systems Design I
3 - Electrical Engineering Technical Req.\(^1\)

Second Semester
1 - CH 1010 General Chemistry
3 - ENGR 1410 Programming and Problem Solving
4 - MTHS 1080 Calculus of One Variable II
3 - PHYS 1220 Physics with Calculus I
3 - Arts and Humanities Requirement\(^1\) or Social Science Requirement\(^1\)

Notes:
1. A student needs to enroll in ECE courses (excluding ECE 3070, 3080, 3090) only when all prerequisites have been passed with a grade of C or better.
2. All Electrical Engineering students must have a cumulative average grade-point average of 2.0 to enroll in any 3000- or 4000-level ECE courses.
3. No student may exceed a maximum of two attempts, excluding one additional course selected from MTHS 4120, 4340, 4350, 4400, 4410, or 4530.

ELECTRICAL ENGINEERING
Bachelor of Science
Electrical engineers are in high demand for a wide range of influential positions. Professional duties range from analytical problem solving to the design of components and systems. The scope of employment requires a unique breadth and depth of knowledge and technical skills, which are reflected in the Electrical Engineering program. This program also offers an excellent preparation for graduate education. Detailed information can be found at www.clemson.edu/cei/.

Building on a foundation of mathematical and physical sciences, students progress into the application of these in the engineering science areas of circuits, electronics, communications, controls, power, and electromagnetics. In these subjects, students also begin to apply the concepts and techniques learned to the design of circuits and systems. Senior technical design courses offer the opportunity to further develop expertise in a selected area.

In addition to these technical skills, students learn to communicate effectively, both orally and with the written word. Because engineers work for the benefit of society, the curriculum includes a strong component of humanities and social science courses. Also, many project design assignments enable the development of interpersonal, teamwork, and management skills, which are necessary for success in a professional engineering career.

Freshman Year
First Semester
2 - ENGR 1020 Engineering Disciplines and Skills
4 - CH 1010 General Chemistry
3 - ENGL 1030 Accelerated Composition
4 - MTHS 1060 Calculus of One Variable I
3 - Arts and Humanities Requirement\(^1\) or Social Science Requirement\(^1\)

Second Semester
1 - ECE 2110 Electrical Engineering Lab. II
3 - ECE 2620 Electric Circuits II
3 - ECE 2720 Computer Organization
1 - ECE 2730 Computer Organization Laboratory
4 - MTHS 2080 Intro. to Ordinary Diff. Equations
3 - Arts and Humanities Requirement\(^1\) or Social Science Requirement\(^1\) or Electrical Engineering Technical Req.\(^3, 3\)

Junior Year
First Semester
1 - ECE 3120 Electrical Engineering Lab. III
3 - ECE 3210 Electronics II
3 - ECE 3560 Signals, Systems, and Transforms
1 - ECE 3600 Electric Power Engineering
3 - ECE 3810 Electromagnetics
3 - Advanced Mathematics Requirement\(^4\)

Second Semester
1 - ECE 3120 Electrical Engineering Lab. IV
3 - ECE 3710 Random Signal Analysis
3 - ECE 3210 Electronics II
3 - ECE 3710 Microcontroller Interfacing
1 - ECE 3720 Microcontroller Interfacing Lab.
3 - ECE 3810 Fields, Waves, and Circuits
3 - ENGL 3140 Technical Writing

Senior Year
First Semester
3 - COMM 3500 Intro. to Human Comm. or
3 - COMM 2500 Public Speaking
3 - ECE 4090 Continuous and Discrete Syst. Des.
3 - ECE 4270 Communications Systems
2 - ECE 4950 Integrated Systems Design I
3 - Electrical Engineering Technical Req.\(^1\)

Second Semester
1 - CH 1010 General Chemistry
3 - ENGR 1410 Programming and Problem Solving
4 - MTHS 1080 Calculus of One Variable II
3 - PHYS 1220 Physics with Calculus I
3 - Arts and Humanities Requirement\(^1\) or Social Science Requirement\(^1\)

Notes:
1. A student needs to enroll in ECE courses (excluding ECE 3070, 3080, 3090) only when all prerequisites have been passed with a grade of C or better.
2. All Electrical Engineering students must have a cumulative average grade-point average of 2.0 to enroll in any 3000- or 4000-level ECE courses.
3. No student may exceed a maximum of two attempts, excluding one additional course selected from MTHS 4120, 4340, 4350, 4400, 4410, or 4530.

ENVIRONMENTAL ENGINEERING
Bachelor of Science
Our complex world faces many challenges, including contaminated water supplies, hazardous wastes, an increasing population and limited resources. Environmental engineers help to solve many of the environmental problems faced by society using the principles of biology, chemistry, physics, mathematic- and earth sciences. An undergraduate degree in Environmental Engineering opens the door to a variety of rewarding career options. Environmental engineers protect water quality by designing water and wastewater treatment systems; ensure public safety by managing solid, hazardous and radioactive wastes; improve air quality by controlling emissions from mobile and stationary sources; reduce human health risks by tracking contaminants as they move through the environment; clean up toxic waste spills and restore historically contaminated sites; and design a more sustainable future by understanding our use of resources.

The curriculum for the Bachelor of Science degree in Environmental Engineering consists of 128-129 credit hours. All students participate in one professional seminar course and complete a capstone design project.
Freshman Year
First Semester
2 - ENGR 1020 Engineering Disciplines and Skills
4 - CH 1010 General Chemistry
3 - EES 4750 Capstone Design Project
5 - Engineering or Science Requirement
- 3 - Arts and Humanities Requirement or Social Science Requirement
15
Second Semester
4 - CH 1020 General Chemistry
3 - ENGR 1410 Programming and Problem Solving
3 - HIST 1240 Environmental History Survey
3 - MTHS 1080 Calculus of One Variable I
3 - PHYS 1220 Physics with Calculus I
11
Sophomore Year
First Semester
3 - BIOL 1030 General Biology
1 - BIOL 1050 General Biology Lab
3 - CE 2010 Statics
3 - EES 2010 Environmental Engineering Fund. I
4 - MTHS 2060 Calculus of Several Variables
3 - PHYS 2210 Physics with Calculus II
10
Second Semester
2 - CE 2080 Dynamics
4 - CH 2100 Survey of Organic Chemistry
2 - ENGR 2100 Computer-Aided Design and Engineering Applications
4 - EES 2020 Environmental Engineering Fund. II
4 - MTHS 2080 Intro. to Ordinary Diff. Equations
16
Junior Year
First Semester
3 - EES 4020 Water and Wastewater Treatment
1 - EES 4030 Water and Wastewater Treat. Lab
4 - MICR 3050 General Microbiology
2 - Engineering Economics Requirement
3 - Arts and Humanities Requirement or Social Science Requirement
3 - Statistics Requirement
17
Second Semester
4 - CE 3410 Introduction to Fluid Mechanics
3 - EES 4840 Municipal Solid Waste Mgt.
3 - EES 4850 Hazardous Waste Management
3 - ME 3100 Thermodynamics and Heat Transfer
4 - Earth Science Requirement
16
Senior Year
First Semester
3 - EES 4300 Air Pollution Engineering
1 - EES 4500 Environ. Engr. Senior Seminar
3 - EES 4800 Environmental Risk Assessment
3 - EES 4860 Pollution Prevention
5 - Engineering or Science Requirement
15
Second Semester
3 - EES 4750 Capstone Design Project
5 - Engineering or Science Requirement
- 3 - Arts and Humanities Requirement or Social Science Requirement
14
128 Total Semester Hours

See Policy on Humanities and Social Sciences for Engineering Curricula. Three of these credit hours must also satisfy the CrossCultural Awareness General Education requirement. Students are encouraged (but not required) to take PHIL 3450 (Environmental Ethics) to fulfill the non-literature humanities requirement.
- May substitute ENGR 1300 or CHE 1300. Students selecting this option must make up one hour in any manner they choose.
- HIST 1240 satisfies three credit hours of the social science requirement and the Science and Technology in Society General Education requirement. If a student is unable to enroll in the second semester of the freshman year, this course may be taken at another time.
- May substitute BIOL 1100 for 1030 and 1050; BIOL 1100 is five hours.
- May substitute CH 2230 and 2270.
- ENGR 2080 or ENGR 2090 may be substituted.
- BIOL 2110 may be substituted. Students selecting this option must make up one hour in any manner they choose.
- Select CE 3520 or IE 3840.
- Select from EXST 3101, GEOL 2110 or MTHS 3220.
- Select from GEOL 1010 and 1030; or CSENG 2220.
- Choose any combination of engineering and/or science courses from a department-approved list.

INDUSTRIAL ENGINEERING

Bachelor of Science
Industrial engineers design, install, and improve the complex systems that provide goods and services vital to our society and economy. These systems place unique demands for breadth of preparation on industrial engineers. The Industrial Engineering baccalaureate program prepares graduates to: (1) design, develop, implement, and improve integrated systems that include people, materials, information, equipment, and energy using appropriate analytical, computational and experimental practices; (2) apply information technologies to the practice of industrial engineering; (3) conduct themselves in a professional and ethical manner; and (4) work and communicate effectively with colleagues at every level in the organization.

The traditional arenas for the practice of industrial engineering are the manufacturing facilities of industry; however, many practicing industrial engineers are employed in non-manufacturing institutions such as hospitals, banks, and government agencies. In addition to numerous employment opportunities in professional practice, industrial engineering graduates may further their formal education. The Department of Industrial Engineering offers programs leading to the Master of Science and Doctor of Philosophy degrees.

The Department of Industrial Engineering allows students to count up to 12 hours of graduate credit (approved 6000- and 8000-level courses) toward both the bachelor’s and master’s degrees. Students participating in this program must have a minimum grade-point average of 3.4 and be admitted to the Graduate School prior to registering for graduate courses. Details of the suggested curriculum and program information are available from the Industrial Engineering Department.

Detailed curriculum and department information is available at www.ces.clemson.edu/ie.

Freshman Year
First Semester
2 - ENGR 1020 Engineering Disciplines and Skills
4 - CH 1010 General Chemistry
3 - EES 4750 Capstone Design Project
5 - Engineering or Science Requirement
- 3 - Arts and Humanities Requirement or Social Science Requirement
17
Second Semester
4 - ENGR 1410 Programming and Problem Solving
4 - MTHS 2060 Calculus of One Variable I
3 - Arts and Humanities Requirement or Social Science Requirement
16
Sophomore Year
First Semester
1 - IE 2000 Sophomore Seminar in IE
4 - IE 2100 System Design I
3 - IE 2800 Methods of Operational Research I
4 - MTHS 2060 Calculus of Several Variables
3 - PHYS 2210 Physics with Calculus II
1 - PHYS 2230 Physics Lab. II
16
Second Semester
3 - CE 2010 Statics
2 - ENGR 2080 Engineering Graphics and Machine Design or
2 - ENGR 2090 Introduction to Engineering/Computer Graphics
3 - IE 2100 Design and Analysis of Work Systems
3 - IE 3840 Engineering Economic Analysis
3 - MSE 2100 Introduction to Materials Science
3 - Arts and Humanities Requirement or Social Science Requirement
17
Junior Year
First Semester
2 - CE 2080 Dynamics
3 - IE 3600 Design and Control of Industrial Sys. I
1 - IE 3680 Professional Practice in IE
3 - IE 4400 Decision Support Systems in IE
3 - Arts and Humanities Requirement or Social Science Requirement
3 - Mathematics or Natural Science Req.
Second Semester
3 - COMM 1500 Intro. to Human Comm. or
3 - COMM 2500 Public Speaking
2 - ECE 3070 Basic Electrical Engineering
1 - ECE 3090 Electrical Engineering Lab. I
3 - IE 3610 Design and Control of Industrial Sys. II
3 - IE 3810 Methods of Operational Research II
3 - IE 3860 Production Planning and Control

Senior Year
First Semester
3 - IE 4610 Quality Engineering
3 - IE 4650 Facilities Planning and Design
4 - IE 4820 Systems Modelling
3 - Engineering Requirement1
3 - Technical Requirement2
16

Second Semester
3 - IE 4670 Systems Design II
3 - Arts and Humanities Requirement1 or 3 - Social Science Requirement1
3 - Management Requirement2
3 - Technical Requirement2
12
124 Total Semester Hours

See policy on Humanities and Social Sciences for Engineering curricula.

Select from department-approved list. See advisor.

PHYS 1240 may be substituted.

ME 2010 may be substituted for CE 2010 and 2080; EM 2020 may be substituted for CE 2080.

MATERIALS SCIENCE AND ENGINEERING

Bachelor of Science
Materials scientists and engineers design, develop, and produce traditional and new advanced materials with diverse applications intended for use in a wide variety of industries. These include traditional materials-intensive industries such as structural clay, foundry, white ware, polymers, plastics, fibers, textiles, composite materials, and automotive industries. Also included are high performance technology industries such as semiconductor, defense, biomaterials, aerospace, and communication industries. The broad career responsibilities of this discipline require competence in science, engineering, mathematics, and the social sciences. The curriculum develops skills in problem solving, engineering analysis, and design, as well as oral and written communication.

The School of Materials Science and Engineering offers two areas of concentration within the Bachelor of Science degree in Materials Science and Engineering. The Inorganic Materials Concentration provides for more in-depth study of the engineering and science of materials such as ceramics, glasses, metals, optical and electronic materials; while the Polymeric Materials Concentration provides more emphasis on plastics, elastomers, fibers and fibrous materials, films, coatings and adhesives. Students select either the Inorganic Materials Concentration or the Polymeric Materials Concentration at the beginning of their sophomore year. Both concentrations in Materials Science and Engineering integrate laboratory with classroom experiences to prepare students for life-long learning and exciting career opportunities. Courses covering thermodynamics, kinetics, mechanical behavior, processing, fabrication and characterization of materials prepare students for careers in industry and for graduate school.

In addition to the common educational objectives of all engineering programs, baccalaureate degree graduates in Materials Science and Engineering will be able to:

• demonstrate learning consistent with Accreditation Board for Engineering and Technology Engineering Criteria 2011 for materials engineering programs;
• function easily and well in the laboratory and plant environments;
• serve the local, national, and international materials communities.

Specifically, the Accreditation Board for Engineering and Technology Engineering Criteria 2011 requires that baccalaureate degree graduates in Materials Science and Engineering be able to:

• apply advanced scientific and engineering principles to materials systems;
• demonstrate an integrated understanding of the scientific and engineering principles underlying structure, properties, processing, and performance relationships;
• apply this understanding to the solution of materials engineering selection and design problems; and
• apply appropriate experimental, statistical, and computational methods to advantage in the solution of materials problems.

INORGANIC MATERIALS CONCENTRATION

Freshman Year
First Semester
2 - ENGR 1020 Engineering Disciplines and Skills
4 - CH 1010 General Chemistry
3 - ENGL 1030 Accelerated Composition
4 - MTHS 1060 Calculus of One Variable I
3 - Arts and Humanities Requirement1 or 3 - Social Science Requirement1
16

Second Semester
4 - CH 1020 General Chemistry
3 - ENGR 1410 Programming and Problem Solving
4 - MTHS 1080 Calculus of One Variable II
3 - PHYS 1220 Physics with Calculus I
3 - Arts and Humanities Requirement1 or 3 - Social Science Requirement1
17

Sophomore Year
First Semester
4 - CH 2010 Survey of Organic Chemistry
3 - MSE 2100 Introduction to Materials Science
4 - MTHS 2060 Calculus of Several Variables
4 - PHYS 2210 Physics with Calculus II
3 - Arts and Humanities Requirement1 or 3 - Social Science Requirement1
17

See policy on Humanities and Social Sciences for Engineering curricula. Six of these credits must also satisfy the Cross-Cultural Awareness and the Science and Technology in Society General Education requirements.

POLYMERIC MATERIALS CONCENTRATION

Freshman Year
First Semester
2 - ENGR 1020 Engineering Disciplines and Skills
4 - CH 1010 General Chemistry
3 - ENGL 1030 Accelerated Composition
4 - MTHS 1060 Calculus of One Variable I
3 - Arts and Humanities Requirement1 or 3 - Social Science Requirement1
16
Second Semester
4 - CH 1020 General Chemistry
3 - ENGR 1410 Programming and Problem Solving
4 - MTHS 1080 Calculus of One Variable II
3 - PHYS 122 Physics with Calculus I
3 - Arts and Humanities Requirement¹ or
3 - Social Science Requirement¹

Sophomore Year
First Semester
3 - CH 2230 Organic Chemistry
1 - CH 2270 Organic Chemistry Laboratory
3 - MSE 2100 Introduction to Materials Science
4 - MTHS 2060 Calculus of Several Variables
3 - PHYS 2210 Physics with Calculus II
3 - Arts and Humanities Requirement¹ or
3 - Social Science Requirement¹

Junior Year
First Semester
3 - CH 3310 Physical Chemistry
3 - COMM 2500 Public Speaking
3 - MSE 3270 Transport Phenomena
3 - MSE 4150 Intro. to Polymer Sci. and Engineering
1 - MSE 4550 Polymer and Fiber Lab.
3 - Arts and Humanities Requirement¹ or
3 - Social Science Requirement¹

Second Semester
3 - CH 3320 Physical Chemistry
3 - EXST 3010 Introductory Statistics or
3 - MTHS 3020 Stat. for Science and Engr.
3 - IE 3840 Engineering Economic Analysis
3 - MSE 4220 Mechanical Behavior or Materials
3 - MSE 4560 Polymer and Fiber Science II

Senior Year
First Semester
3 - MSE 4580 Surface Phenomena in Materials Science and Engineering
1 - MSE 4600 Surface Phenomena in Materials Science and Engineering Laboratory
3 - MSE 4610 Polymer and Fiber Science III
3 - MSE 4910 Undergraduate Research
3 - Technical Requirement²

Second Semester
3 - MSE 4700 Senior Capstone Design
1 - MSE 4450 Practice of Materials Engineering
3 - MSE 4570 Color Science
1 - MSE 4590 Color Science Laboratory
3 - Arts and Humanities Requirement¹ or
3 - Social Science Requirement¹

MECHANICAL ENGINEERING

Bachelor of Science

Breadth, individuality, and flexibility are inherent characteristics of the mechanical engineering profession. Mechanical engineers, in a broad sense, make major contributions to the creation of products and systems that benefit mankind. They work in a variety of areas, including bioengineering, energy systems, environmental and life-support systems, propulsion and transport systems, food production, materials processing, automated manufacturing, and construction. A wide spectrum of career opportunities is open to them. The practice of mechanical engineering includes one or more of the following activities: manufacturing, testing, research, development, design, technical management, technical sales and marketing, construction, and teaching.

Preparation for a 30-35 year professional career requires development of the whole person through a balanced program encompassing the humanities, social sciences, communication and computer skills, physical and engineering sciences, design, and laboratory experience. Students start with the physical sciences and communication skills and progress throughout the engineering sciences, ultimately applying the principles learned in such areas as energy conversion and transfer, mechanical design, and systems analysis. Throughout the curriculum, the fundamental nature of engineering as a problem-solving discipline is emphasized.

Most graduates take positions in industry, government, or business. Many, however, continue their formal education in a graduate program. The Department of Mechanical Engineering offers study leading to the Master of Science and Doctor of Philosophy degrees.

Mechanical Engineering students who have a cumulative grade-point average or cumulative engineering grade-point average (EGPA) below 2.0 are on probation and will have restricted enrollment in classes. Students whose cumulative grade-point average is below 2.0 are subject to the regulations stipulated under Academic Eligibility Policy. Students on probation for EGPR below 2.0 who fail to recover in the first regular semester (fall or spring) will not be allowed to register for mechanical engineering classes. After one year, such students may petition the Mechanical Engineering Department for continued enrollment. An advising policy for students on probation is available from the Mechanical Engineering Department.

Freshman Year
First Semester
2 - ENGR 1020 Engineering Disciplines and Skills
4 - CH 1010 General Chemistry
4 - ENGL 1030 Accelerated Composition
4 - MTHS 1060 Calculus of One Variable I
3 - Arts and Humanities (Non-Lit.) Requirement¹ or
3 - Social Science Requirement¹

Second Semester
2 - ENGR 2080 Engineering Graphics and Machine Design
3 - ENGR 1410 Programming and Problem Solving
4 - MTHS 1080 Calculus of One Variable II
3 - PHYS 1220 Physics with Calculus I
3 - PHYS 1240 Physics Lab. I
3 - Arts and Humanities Required¹ or
3 - Social Science Requirement¹

Sophomore Year
First Semester
1 - ME 2000 Sophomore Seminar
5 - ME 2010 Statics and Dynamics for Mech. Engr.
2 - ME 2220 Mechanical Engineering Lab. I² or
3 - MEE 2100 Intro. to Materials Science²
4 - MTHS 2060 Calculus of Several Variables
3 - PHYS 2210 Physics with Calculus II

Second Semester
2 - ECE 3070 Basic Electrical Engineering
1 - ECE 3090 Electrical Engineering Lab. I
3 - ME 2020 Foundations of Mechanical Systems
3 - ME 2030 Found. of Thermal and Fluid Systems
2 - ME 2220 Mechanical Engineering Lab. II² or
3 - MSE 2100 Intro. to Materials Science²
4 - MTHS 2080 Intro. to Ordinary Diff. Equations

Junior Year
First Semester
3 - ENGL 3140 Technical Writing
3 - ME 3140 Technical Writing
3 - ME 3020 Mechanics of Materials
3 - ME 3030 Thermodynamics
3 - ME 3080 Fluid Mechanics
2 - ME 3330 Mechanical Engineering Lab. II² or
3 - Statistics Requirement¹ or
3 - Social Science Requirement¹
3 - MTHS 3650 Numerical Methods for Engineers

Second Semester
3 - ME 3040 Heat Transfer
3 - ME 3050 Model, and Analysis of Dynamic Syst.
3 - ME 3060 Fundamentals of Machine Design
3 - ME 3120 Manufacturing Processes and Their Application
2 - ME 3330 Mechanical Engineering Lab. II or
3 - Statistics Requirement¹

Additional information can be found at www.clemson.edu/me.
Bachelor of Science Curricula
The Bachelor of Science degree prepares graduates for professional employment or graduate study in the chosen science discipline. BS curricula are more highly structured than BA curricula but nonetheless offer opportunity for students to pursue a minor or secondary area of interest.

Bachelor of Arts Curricula
The curricula leading to the Bachelor of Arts degree are designed to meet the needs of students who desire a broad general education. They require a minor (or a second major) as well as the major concentration. A major requires a minimum of 24 credits from courses above the sophomore level, including or in addition to courses specified by the major department. In some major disciplines, certain prescribed courses at the sophomore level are counted toward the 24-credit requirement.

Students have a large degree of flexibility and responsibility in selecting a minor from those listed on page 110. Courses for these minors are to be selected in consultation with the appropriate department.

CHEMISTRY
Bachelor of Science
Chemistry, an experimental discipline based on observation guided by molecular theories of fundamental importance in much of modern science and technology. Its molecular concepts form the basis for ideas about complex material behavior. Due to the fundamental nature and extensive application of chemistry, an unusually large variety of challenging opportunities to contribute in the science-oriented community are open to students whose education is built around the principles of this discipline.

The Chemistry curriculum, through the career requirement options and the number of elective choices, provides students the opportunity to select a coherent program of study beyond the basic courses. Career requirement options are provided for students anticipating graduate study in chemistry or related fields; employment following the BS degree in laboratory, production, technical sales, or management positions; professional studies (e.g., medicine); chemical physics; geochemistry; and employment in fields requiring extensive preparation in courses other than sciences (e.g., patent law and technical writing). Significant features of the curriculum are the student’s extensive participation in experimental work and the opportunity to take part in a research investigation during the junior and senior years.

Freshman Year
First Semester
1 - CH 1010 General Chemistry
4 - CH 1020 General Chemistry
2 - CH 1520 Chemistry Communication I
3 - CH 4500 Chemical Capstone
4 - MTHS 1080 Calculus of One Variable II
3 - PHYS 1220 Physics with Calculus I
122 Total Semester Hours
1 - CH 1410 Chemistry Orientation
3 - CH 4430 Research Problems
2 - CH 3150 Quantitative Analysis Lab.
2 - CH 3160 Organic Chemistry Lab.
5 - ENGL 3140 Technical Writing
3 - CH 3310 Physical Chemistry
3 - Elective
15
15
3 - CH 3320 Physical Chemistry Lab.
3 - CH 3330 Physical Chemistry Lab.
3 - ENGL 3140 Technical Writing
3 - Elective
15
Second Semester
3 - CH 3340 Physical Chemistry
2 - CH 3400 Physical Chemistry Lab.
3 - CH 3600 Chemical Biology
1 - CH 4110 Instrumental Analysis
4 - CH 4120 Instrumental Analysis Lab.
3 - Arts and Humanities (Literature) Requirement
15

Junior Year
First Semester
3 - CH 3130 Quantitative Analysis
2 - CH 3150 Quantitative Analysis Lab.
3 - CH 3310 Physical Chemistry
1 - CH 3390 Physical Chemistry Lab.
3 - ENGL 3140 Technical Writing
3 - Elective
15
Second Semester
3 - CH 3320 Physical Chemistry
1 - CH 3400 Physical Chemistry Lab.
3 - CH 3600 Chemical Biology
3 - CH 4110 Instrumental Analysis
2 - CH 4120 Instrumental Analysis Lab.
3 - Arts and Humanities (Literature) Requirement
15

Senior Year
First Semester
3 - CH 4020 Inorganic Chemistry
3 - CH 4430 Research Problems
3 - Arts and Humanities Requirement
3 - Social Science Requirement
3 - Chemistry Requirement
3 - Elective
15
Second Semester
2 - CH 4030 Advanced Synthetic Techniques
3 - CH 4440 Research Problems
3 - CH 4500 Chemistry Capstone
1 - CH 4520 Chemistry Communication II
3 - Arts and Humanities Requirement
3 - Social Science Requirement
3 - Chemistry Requirement
15
122 Total Semester Hours

Notes:
1. Enrollment Policy (see Web Site for Complete Statement of Department Policy). A student is allowed to enroll in any ME course only when all prerequisites, as defined by current official listings for that course, have been passed with a grade of C or higher.
2. No student may exceed three attempts to complete successfully ME 2190, 2191, 2020, or 2030. Registration for a third attempt to complete one of these ME courses requires the approval of the undergraduate coordinator in the Department of Mechanical Engineering. A grade of C counts as an unsuccessful attempt at completing the course.
3. For students repeating an ME course, registration preference will be given to students in a degree-granting engineering major whose curriculum requires the course in question.
4. To change majors into the Mechanical Engineering degree program, students must have a minimum cumulative grade-point average of 2.60 or higher at Clemson and earned a grade of C or better in each course in the General Engineering freshman curriculum. EXCLUDING the Arts and Humanities/Social Science requirements.

SCIENCE PROGRAMS
The College of Engineering and Science offers curricula leading to the Bachelor of Science in Chemistry, Computer Information Systems, Computer Science, Geology, Mathematical Sciences, and Physics. The Bachelor of Arts is offered in Chemistry, Computer Science, Geology, Mathematical Sciences, and Physics.

The science departments in the College work closely with the other academic departments in the University, including such disciplines as economics and management as well as engineering. This allows students in the sciences great flexibility and responsibility in designing their own programs.
CHEMISTRY

Bachelor of Arts

Freshman Year
First Semester
4 - CH 1010 General Chemistry
1 - CH 1410 Chemistry Orientation
3 - ENGL 1030 Accelerated Composition
4 - MTHS 1060 Calculus of One Variable I
3 - Arts and Humanities Requirement¹ or
3 - Social Science Requirement¹
15

Second Semester
4 - CH 1020 General Chemistry
2 - CH 1520 Chemistry Communication I
4 - MTHS 1080 Calculus of One Variable II
3 - PHYS 1220 Physics with Calculus I
3 - Arts and Humanities Requirement¹ or
3 - Social Science Requirement¹
16

Sophomore Year
First Semester
3 - CH 2230 Organic Chemistry
1 - CH 2270 Organic Chemistry Lab.
4 - MTHS 2060 Calculus of Several Variables
3 - PHYS 2210 Physics with Calculus II
4 - Foreign Language Requirement²
15

Second Semester
3 - CH 2050 Introduction to Inorganic Chemistry
3 - CH 2240 Organic Chemistry
1 - CH 2280 Organic Chemistry Lab.
6 - Arts and Humanities Requirement¹ or
6 - Social Science Requirement¹
4 - Foreign Language Requirement²
17

Junior Year
First Semester
3 - CH 3130 Quantitative Analysis
1 - CH 3170 Quantitative Analysis Lab.
3 - CH 3310 Physical Chemistry
3 - Arts and Humanities Requirement¹ or
3 - Social Science Requirement¹
3 - Foreign Language Requirement²
3 - Minor Requirement
16

Second Semester
3 - CH 3320 Physical Chemistry
3 - ENGL 3140 Technical Writing
3 - Arts and Humanities (Literature) Requirement¹
3 - Foreign Language Requirement²
3 - Minor Requirement
15

Senior Year
First Semester
3 - Arts and Humanities Requirement¹ or
3 - Social Science Requirement¹
3 - Chemistry Requirement¹
3 - Minor Requirement
6 - Elective
15

Second Semester
3 - CH 4500 Chemistry Capstone
1 - CH 4520 Chemistry Communication II
3 - Chemistry Requirement¹
6 - Minor Requirement
13
122 Total Semester Hours

¹See General Education Requirements. Six of these credit hours must also satisfy the Cross-Cultural Awareness and Science and Technology in Society Requirements.
²One semester (through 1020) in any modern foreign language is required.
³See advisor.
⁴BCHM 3050 can substitute for CH 3600.

COMPUTER INFORMATION SYSTEMS

Bachelor of Science

The Computer Information Systems degree program is oriented toward computer applications in management-related problems. The program emphasizes functional areas of management, including accounting, production, marketing, and finance and the applications of computers in these areas. The curriculum is designed to prepare students for careers in areas such as systems design and analysis, applications programming, database administration, and information retrieval, as well as for continued study toward an advanced degree.

Students who change majors into Computer Information Systems must have a cumulative grade-point average of 2.0 or higher.

Additional information can be found at www.cs.monroe.edu.

Freshman Year
First Semester
4 - CPSC 1010 Computer Science I
3 - ENGL 1030 Accelerated Composition
3 - MTHS 1020 Intro. to Mathemat. Analysis¹ and
1 - Elective¹ or
4 - MTHS 1060 Calculus of One Variable I¹
4 - Natural Science Requirement²
15

Second Semester
4 - CPSC 1020 Computer Science II
3 - MTHS 2070 Multivariable Calculus³ and
1 - Elective¹ or
4 - MTHS 1080 Calculus of One Variable II¹
3 - Arts and Humanities (Non-Lit.) Requirement²
3 - Natural Science Requirement²
3 - Social Science Requirement¹
17

Sophomore Year
First Semester
3 - CPSC 2070 Discrete Structures for Computing
4 - CPSC 2120 Algorithms and Data Structures
3 - Arts and Humanities (Literature) Requirement¹
3 - Oral Communication Requirement¹
3 - Social Science Requirement¹
16

Second Semester
3 - CPSC 2150 Software Development Foundations
4 - CPSC 2310 Intro. to Computer Organization
1 - CPSC 2910 Seminar in Professional Issues I
3 - MGT 2100 Principles of Management
3 - Probability and Statistics Requirement⁴
14

Junior Year
First Semester
3 - ACCT 2010 Financial Accounting Concepts
3 - CPSC 2200 Microcomputer Applications
3 - CPSC 3220 Introduction to Operating Systems
3 - CPSC 3720 Intro. to Software Engineering
2 - Writing Requirement¹
15

Second Semester
3 - ACCT 2020 Managerial Accounting Concepts
3 - CPSC 3600 Networks and Network Program.
3 - CPSC 3710 Systems Analysis or
3 - MGT 4520 Systems Analysis and Design
3 - ECON 2110 Principles of Microeconomics
3 - Computer Science Requirement⁶
15

Senior Year
First Semester
3 - CPSC 4200 Computer Security Principles or
3 - CPSC 4240 System Admin. and Security
3 - CPSC 4620 Database Management Systems
3 - CPSC 4910 Seminar in Professional Issues II
3 - Business Requirement⁷
3 - Computer Science Requirement⁶
15

Second Semester
3 - MGT 3120 Decision Models for Management
3 - MKT 3010 Principles of Marketing
3 - Business Requirement⁷
3 - Computer Science Requirement⁶
3 - Information Systems Requirement⁶
15
122 Total Semester Hours

¹Select either the MTHS 1020/2070, 1060/2070 or 1060/1080 sequences. Students who select the 1060/1080 sequence will have satisfied the two elective credits in the freshman year.
²Select from courses in BIOL, BCHM, CH, GEOL, MICR, PHYS, or ENSP 2000. At least one course must include a laboratory and satisfy the Natural Science General Education Requirement.
³See General Education Requirements.
⁴MTHS 3010, 3020, or 3090.
⁵Select from School-approved list.
⁶Select from 3000 level or higher CPSC courses. No more than six credits of CPSC 4810 may be used.
⁷Select from MGT 3900, 4000 and FIN 3060.
⁸Select from BCHM 4520, 4540, 4550, or 4560 level CPSC courses. CPSC 4810 may not be used.
### Combined Bachelor's/Master's Plan

The School of Computing allows students to count up to nine hours of graduate credit (600- and 800-level courses) toward both the bachelor's and master's degrees. Students participating in this program must have a minimum grade-point average of 3.4 and be admitted to the Graduate School prior to registering for graduate courses. Details of the suggested curriculum and program information are available from the Department.

### Freshman Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
</tr>
</thead>
</table>
| First Semester | 4 - CPSC 1010 Computer Science I  
3 - ENGL 1030 Accelerated Composition  
4 - MTHS 1060 Calculus of One Variable I  
4 - Natural Science Requirement1 |
| Second Semester | 4 - CPSC 1020 Computer Science II  
4 - MTHS 2070 Multivariable Calculus1 and 2  
4 - Elective |

122 Total Semester Hours

Notes:
1. For graduation, a candidate for the BS degree in Computer Science must have earned a grade of C or better in each CPSC course applied to the degree.
2. A grade of C or better must be earned in all prerequisite courses (including CPSC and MTHS courses) before enrolling in the next CPSC course.

### Sophomore Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
</tr>
</thead>
</table>
| First Semester | 3 - CPSC 2120 Algorithms and Data Structures  
3 - Arts and Humanities (Literature) Requirement2  
3 - Natural Science Requirement1  
3 - Oral Communication Requirement2 |
| Second Semester | 3 - CPSC 2150 Software Development Foundations  
4 - CPSC 2310 Intro. to Computer Organization  
1 - CPSC 2910 Seminar in Professional Issues I  
3 - Natural Science Requirement1  
3 - Probability and Statistics Requirement3  
2 - Elective  |

### Junior Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
</tr>
</thead>
</table>
| First Semester | 3 - CPSC 3300 Computer Systems Organization  
3 - CPSC 3600 Networks and Network Program.  
3 - CPSC 3720 Intro. to Software Engineering  
3 - MTHS 3110 Linear Algebra  
3 - Social Science Requirement2  |
| Second Semester | 3 - CPSC 3220 Introduction to Operating Systems  
3 - CPSC 3500 Foundations of Computer Science  
3 - CPSC 3620 Distributed and Cluster Computing  
3 - Arts and Humanities Requirement4 or  
3 - Social Science Requirement4  
3 - Social Science Requirement2  |

### Senior Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
</tr>
</thead>
</table>
| First Semester | 3 - CPSC 3520 Programming Languages  
6 - Computer Science Requirement5  
3 - Writing Requirement  
3 - Elective  |
| Second Semester | 3 - CPSC 4910 Seminar in Professional Issues II  
3 - Arts and Humanities Requirement4 or  
3 - Social Science Requirement4  
6 - Computer Science Requirement5  
3 - Elective  |

### Fall Semester Hours

2 Two-semester sequence in the same physical or biological science, each including a laboratory, is required. Select from BIOL 1030/1050, 1040/1060; 1100; 1110; CH 1010, 1020; GEOL 1010/1030 and 1020 or 1120/1140; PHYS 1220/1240, 2210/2230. The six remaining hours may be selected from BIOL, BCHM, CH, GEOL, MICR, PHYS, or ENSP 2000.

3 See General Education Requirements.

4 MTHS 3010, 3020 or 3090.

5 Select from courses in AAH, ANTH, ART, CHIN, COMM, DANC, EAS, ECON, ENGL, FR, GEOG, GER, HIST, HUM, ITAL, JAPN, MUSC, PA, PAS, PHIL, POSC, PSYC, REL, RUSS, SOC, SPAN, THEA, WS.

6 Select from 3000-level or higher CPSC courses. No more than six credits of CPSC 4810 may be applied to this requirement. Up to three credits of approved 3000-level or higher MTHS or ECE courses may be substituted.

7 Select from School-approved list.

### Notes:
1. For graduation, a candidate for the BS degree in Computer Science must have earned a grade of C or better in each CPSC course applied to the degree.
2. A grade of C or better must be earned in all prerequisite courses (including CPSC and MTHS courses) before enrolling in the next CPSC course.

### Bachelor of Arts

The Bachelor of Arts in Computer Science is ideal for students interested in acquiring a broad-based liberal arts education that includes a strong and solid understanding of computer science. The curriculum is oriented toward design, implementation, and application of computer software systems to solve information processing problems. The program prepares students for employment in the computer software field or for continued study toward an advanced degree in computer science. Additional information can be found at www.cs.clemson.edu.

Students who change majors into Computer Science must have a cumulative grade-point average of 2.0 or higher.

### Freshman Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
</tr>
</thead>
</table>
| First Semester | 4 - CPSC 1010 Computer Science I  
3 - ENGL 1030 Accelerated Composition  
3 - MTHS 1060 Calculus of One Variable I  
4 - CPSC 1020 Computer Science II  
4 - MTHS 2070 Multivariable Calculus1 and 2  
3 - Arts and Humanities (Literature) Requirement1  
4 - Foreign Language Requirement6  |
| Second Semester | 4 - CPSC 1020 Computer Science II  
3 - MTHS 2070 Multivariable Calculus1 and 2  
1 - Elective or  
4 - MTHS 1060 Calculus of One Variable I1  
4 - Foreign Language Requirement6  |

### Sophomore Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
</tr>
</thead>
</table>
| First Semester | 3 - CPSC 2070 Discrete Structures for Computing  
4 - CPSC 2120 Algorithms and Data Structures  
3 - Arts and Humanities (Literature) Requirement2  
3 - Natural Science Requirement1  
3 - Oral Communication Requirement2 |
| Second Semester | 3 - CPSC 2150 Software Development Foundations  
4 - CPSC 2310 Intro. to Computer Organization  
1 - CPSC 2910 Seminar in Professional Issues I  
3 - Natural Science Requirement1  
3 - Probability and Statistics Requirement3  
2 - Elective  |

### Junior Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
</tr>
</thead>
</table>
| First Semester | 6 - Computer Science Requirement6  
6 - Mathematical Sciences Requirement6  
3 - Minor Requirement  
3 - Natural Science Requirement4  
15 |
| Second Semester | 3 - Computer Science Requirement6  
6 - Minor Requirement  
3 - Social Science Requirement3  
3 - Writing Requirement1  
15 |

### Senior Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
</tr>
</thead>
</table>
| First Semester | 3 - Elective  
3 - Oral Communication Requirement4  |
| Second Semester | 3 - Elective  
3 - Oral Communication Requirement4  |

### Notes:  
1. For graduation, a candidate for the BS degree in Computer Science must have earned a grade of C or better in each CPSC course applied to the degree.
2. A grade of C or better must be earned in all prerequisite courses (including CPSC and MTHS courses) before enrolling in the next CPSC course.

### Computer Science

The Bachelor of Arts in Computer Science is ideal for students interested in acquiring a broad-based liberal arts education that includes a strong and solid understanding of computer science. The curriculum is oriented toward design, implementation, and application of computer software systems to solve information processing problems. The program prepares students for employment in the computer software field or for continued study toward an advanced degree in computer science. Additional information can be found at www.cs.clemson.edu.

Students who change majors into Computer Science must have a cumulative grade-point average of 2.0 or higher.

### Freshman Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
</tr>
</thead>
</table>
| First Semester | 4 - CPSC 1010 Computer Science I  
3 - ENGL 1030 Accelerated Composition  
3 - MTHS 1060 Calculus of One Variable I  
4 - CPSC 1020 Computer Science II  
4 - MTHS 2070 Multivariable Calculus1 and 2  
3 - Arts and Humanities (Literature) Requirement1  
4 - Foreign Language Requirement6  |
| Second Semester | 4 - CPSC 1020 Computer Science II  
3 - MTHS 2070 Multivariable Calculus1 and 2  
1 - Elective or  
4 - MTHS 1060 Calculus of One Variable I1  
4 - Foreign Language Requirement6  |

### Sophomore Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
</tr>
</thead>
</table>
| First Semester | 3 - CPSC 2070 Discrete Structures for Computing  
4 - CPSC 2120 Algorithms and Data Structures  
3 - Arts and Humanities (Literature) Requirement2  
3 - Natural Science Requirement1  
3 - Oral Communication Requirement2 |
| Second Semester | 3 - CPSC 2150 Software Development Foundations  
4 - CPSC 2310 Intro. to Computer Organization  
1 - CPSC 2910 Seminar in Professional Issues I  
3 - Natural Science Requirement4  
15 |

### Junior Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
</tr>
</thead>
</table>
| First Semester | 6 - Computer Science Requirement6  
6 - Mathematical Sciences Requirement6  
3 - Minor Requirement  
3 - Natural Science Requirement4  
15 |
| Second Semester | 3 - Computer Science Requirement6  
6 - Minor Requirement  
3 - Social Science Requirement3  
3 - Writing Requirement1  
15 |
Senior Year

First Semester
6 - Computer Science Requirement4
3 - Departmental Humanities Requirement4
3 - Minor Requirement
3 - Social Science Requirement4
15

Second Semester
3 - CPSC 4910 Seminar in Professional Issues II
3 - Computer Science Requirement4
3 - Fine Arts Requirement4
3 - Minor Requirement
3 - Elective
15

121 Total Semester Hours

Notes:
1. For graduation, a candidate for the BA degree in Computer Science must have earned a grade of C or better in each CPSC course applied to the degree.
2. A grade of C or better must be earned in all prerequisite courses (including CPSC and MATH courses) before enrolling in the next CPSC course.

GEOLGY

Bachelor of Science

Geology and biogeochemical environmental science involve the physics and chemistry of materials that comprise the earth, as well as the development and influence of life on earth and the environmental systems and processes involved. The chemical, physical, and biological responses to environments on and in the earth must be thoroughly understood at a fundamental level so that the history of the earth can be deduced, future changes and natural disasters might be predicted, and sustainable approaches to natural resources developed. We depend on many geological resources, such as coal, petroleum, and radioactive minerals. Geology integrates the science and engineering principles used for understanding and managing these geological and environmental systems. The geology curriculum is built around three themes in geology and environmental science: appreciation for spatial and temporal scales, knowledge of earth materials and compositions of environmental systems, and understanding geological and environmental processes. The Bachelor of Science degree can be earned in traditional geology or with a concentration in Hydrogeology or Environmental Science. All majors participate in an interdisciplinary problem-oriented group research sequence and capstone course.

Employment opportunities for geologists and environmental scientists are numerous and varied. Included are such far-reaching fields as environmental and engineering consulting firms, mineral-producing industries, railroads, municipalities, natural resource conservation organizations, and water authorities.

The "traditional" curriculum provides the fundamentals of geology and excellent support in basic sciences. Graduates are prepared for employment or for graduate study in any field of geology. The Environmental Science Concentration provides an appropriate quantitative science base for students interested in environmental science and an introduction to environmental systems. It prepares students for careers in natural resources, the environmental consulting industry, government agencies or graduate school in environmental fields. The Hydrogeology Concentration may be taken by students interested in surface and groundwater systems or applied engineering principles to geology problems. Graduates from the Hydrogeology Concentration work for consulting companies, government agencies and in the natural resources area or go on to graduate study.

Second Semester
4 - GEOL 2120 Geoanalysis II
1 - GEOL 2920 Introduction to Research I
3 - PHYS 1220 Physics with Calculus I
3 - Social Science Requirement4
15

Junior Year

First Semester
3 - ENSP 2000 Intro. to Environmental Science
4 - GEOL 3020 Structural Geology
3 - GEOL 3160 Igneous and Metamorphic Petrology
2 - GEOL 3910 Research Methods I
3 - Arts and Humanities (Literature) Requirement4
2 - Elective
17

Second Semester
3 - GEOL 3000 Environmental Geology
4 - GEOL 3130 Sedimentology and Stratigraphy
2 - GEOL 3920 Research Methods II
3 - Geology Requirement4
3 - Social Science Requirement4
12

Summer
6 - Summer Geology Field Course4

Senior Year

First Semester
4 - GEOL 4050 Surficial Geology
3 - GEOL 4080 Geohydrology
3 - GEOL 4910 Research Synthesis I
2 - Elective
12

Second Semester
4 - GEOL 4090 Subsurface Methods
3 - GEOL 4920 Research Synthesis II
3 - Geology Requirement4
2 - Elective
12

122 Total Semester Hours

Notes:
1. See General Education Requirements. Three of these credit hours must also satisfy the Cross-Cultural Awareness Requirement.
2. MATH 1060 and 1080 or 3010 or EXST 3010 may be substituted.
3. Select from department-approved list.

ENVIRONMENTAL SCIENCE CONCENTRATION

Freshman Year

First Semester
4 - CH 1010 General Chemistry
3 - ENGL 1010 Accelerated Composition
3 - GEOL 1010 Physical Geology
1 - GEOL 1020 Earth History
4 - MATH 1060 Calculus of One Variable I
15

Second Semester
4 - CH 1020 General Chemistry
4 - GEOL 1020 Earth History
4 - MATH 1080 Calculus of One Variable II
3 - Arts and Humanities (Non-Lit.) Requirement4
15

Sophomore Year

First Semester
3 - BIOL 1030 General Biology I
1 - BIOL 1050 General Biology Lab. I
3 - GEOL 2050 Mineralogy and Intro. Petrology
2 - GEOL 2080 Min. and Intro. Petrography Lab.
4 - GEOL 2110 Geoaayysis II
1 - GEOL 2910 Introduction to Research I
1 - Elective
15

Second Semester
4 - CH 1020 General Chemistry
4 - GEOL 2120 Geoanalysis II
1 - GEOL 2920 Introduction to Research II
3 - PHYS 1220 Physics with Calculus I
3 - Social Science Requirement4
15
Second Semester
4 - CH 1020 General Chemistry
4 - GEOL 1020 Earth History
4 - MTHS 1080 Calculus of One Variable II
3 - Arts and Humanities (Non-Lit.) Requirement
105
College of Engineering and Science

HYDROGEOLOGY
CONCENTRATION

Freshman Year
First Semester
4 - CH 1010 General Chemistry
3 - ENGL 1030 Accelerated Composition
3 - GEOL 1010 Physical Geology
1 - GEOL 1030 Physical Geology Lab.
1 - MTHS 1060 Calculus of One Variable I
15
Second Semester
3 - Field Experience
3 - ENSP 4000 Studies in Environmental Science
3 - GEOL 4920 Research Synthesis II

Sophomore Year
First Semester
3 - BIOL 1030 General Biology I
1 - BIOL 1050 General Biology Lab. I
3 - GEOL 2050 Mineralogy and Intro. Petrology
1 - GEOL 2070 Mineral. and Intro. Petrology Lab.
4 - GEOL 2110 Geoanalysis II
1 - GEOL 2910 Introduction to Research I
3 - Arts and Humanities (Non-Lit.) Requirement
16
Second Semester
3 - BIOL 1040 General Biology II
1 - BIOL 1060 General Biology Lab. II
4 - GEOL 2120 Geoanalysis II
1 - GEOL 2920 Introduction to Research II
3 - GEOL 3000 Environmental Geology
3 - PHYS 1220 Physics with Calculus I
10
Junior Year
First Semester
3 - EN SP 200 Intro. to Environmental Science
2 - GEOL 391 Research Methods I
9 - Environmental Science Requirement
3 - Social Science Requirement
17
Second Semester
3 - GEOL 3180 Introduction to Geochemistry
2 - GEOL 392 Research Methods II
9 - Environmental Science Requirement
3 - Social Science Requirement
17
Summer
3 - Field Experience
Senior Year
First Semester
3 - ENSP 4000 Studies in Environmental Science
3 - GEOL 4920 Research Synthesis II
3 - Environmental Science Requirement
12
Second Semester
3 - CH 2230 Organic Chemistry or
3 - CH 4130 Chemistry of Aqueous Systems
3 - GEOL 4930 Research Synthesis II
6 - Environmental Science Requirement
12
122 Total Semester Hours

See General Education Requirements. Three of these credit hours must also satisfy the Cross-Cultural Awareness Requirement.

MTHS 2060 and 2080 or 3010 or EXST 3010 may be substituted.

Select from department-approved list. At least three credit hours must be from geology courses.

Field course in geology, ecology, or related area. Must be at least three credits. Students desiring to become registered professional geologists should take a six-credit summer geology field course.

Second Semester
3 - EES 4010 Environmental Engineering
4 - GEOL 4090 Subsurface Methods
3 - GEOL 4920 Research Synthesis II
3 - Technical Requirement
13
121 Total Semester Hours

See General Education Requirements. Three of these credit hours must also satisfy the Cross-Cultural Awareness Requirement.

MTHS 2060 and 2080 or 3010 or EXST 3010 may be substituted.

Select from department-approved list.

Any 3000- or 4000-level geology course

GEOLOGY

Bachelor of Arts

Freshman Year
First Semester
4 - CH 1010 General Chemistry
3 - ENGL 1030 Accelerated Composition
3 - GEOL 1010 Physical Geology
1 - GEOL 1030 Physical Geology Lab.
3 - Technical Requirement
13
Second Semester
4 - CH 1020 General Chemistry
4 - GEOL 1020 Earth History
4 - MTHS 1080 Calculus of One Variable II
3 - Arts and Humanities (Non-Lit.) Requirement
15
Sophomore Year
First Semester
3 - GEOL 2050 Mineralogy and Intro. Petrology
1 - GEOL 2070 Mineral. and Intro. Petrology Lab.
4 - GEOL 2110 Geoanalysis II
1 - GEOL 2910 Introduction to Research I
3 - Arts and Humanities (Literature) Requirement
3 - Technical Requirement
15
Second Semester
3 - GEOL 2120 Geoanalysis II
1 - GEOL 2920 Introduction to Research II
3 - GEOL 3000 Environmental Geology
3 - PHYS 1220 Physics with Calculus I
1 - GEOL 2070 Mineral. and Intro. Petrology Lab.
3 - Social Science Requirement
17
Junior Year
First Semester
4 - GEOL 3180 Introduction to Geochemistry
2 - GEOL 392 Research Methods II
9 - Environmental Science Requirement
3 - Social Science Requirement
17
Second Semester
4 - GEOL 3190 Introduction to Research II
3 - GEOL 3000 Environmental Geology
3 - PHYS 1220 Physics with Calculus I
1 - GEOL 2070 Mineral. and Intro. Petrology Lab.
3 - Social Science Requirement
17
Summer
3 - Field Experience
Senior Year
First Semester
4 - GEOL 3120 Structural Geology
2 - GEOL 391 Research Methods I
3 - GEOL 4080 Geochemistry
3 - PHYS 2210 Physics with Calculus II
3 - Geology Requirement
15
Second Semester
4 - GEOL 3130 Sedimentology and Stratigraphy
3 - GEOL 3180 Introduction to Geochemistry
2 - GEOL 392 Research Methods II
3 - Social Science Requirement
3 - Technical Requirement
15
Summer
6 - GEOL 4750 Summer Geology Field Camp

See General Education Requirements. Three of these credit hours must also satisfy the Cross-Cultural Awareness Requirement.

MTHS 2060 and 2080 or 3010 or EXST 3010 may be substituted.

Select from department-approved list. At least three credit hours must be from geology courses.

Field course in geology, ecology, or related area. Must be at least three credits. Students desiring to become registered professional geologists should take a six-credit summer geology field course.

Second Semester
3 - BIOL 1030 General Biology I
1 - BIOL 1050 General Biology Lab. I
3 - GEOL 2050 Mineralogy and Intro. Petrology
1 - GEOL 2070 Mineral. and Intro. Petrology Lab.
1 - GEOL 2910 Introduction to Research I
3 - Arts and Humanities (Non-Lit.) Requirement
16
Second Semester
4 - CH 1020 General Chemistry
3 - GEOG 1030 World Regional Geography
4 - GEOL 1020 Earth History
3 - Mathematics Requirement
2 - Elective
16
Sophomore Year
First Semester
3 - BIOL 1030 General Biology
1 - BIOL 1050 General Biology Lab. II
3 - GEOL 2050 Mineralogy and Intro. Petrology
1 - GEOL 2070 Mineral. and Intro. Petrology Lab.
1 - GEOL 2910 Introduction to Research I
3 - Arts and Humanities (Non-Lit.) Requirement
16
Second Semester
3 - BIOL 1040 General Biology II
1 - BIOL 1060 General Biology Lab. II
4 - GEOL 2120 Geoanalysis II
1 - GEOL 2920 Introduction to Research II
3 - GEOL 3000 Environmental Geology
3 - PHYS 1220 Physics with Calculus I
1 - GEOL 2070 Mineral. and Intro. Petrology Lab.
3 - Social Science Requirement
17
Summer
3 - Field Experience
Senior Year
First Semester
4 - GEOL 4210 GIS Applications in Geology
3 - GEOL 4910 Research Synthesis I
3 - Geology Requirement
3 - Technical Requirement
12
Second Semester
3 - GEOL 4210 GIS Applications in Geology
3 - GEOL 4910 Research Synthesis I
3 - Geology Requirement
3 - Technical Requirement
12
College of Engineering and Science
MATHEMATICAL SCIENCES

The Mathematical Sciences curriculum is designed to be versatile. Students gain a broad knowledge of mathematical concepts and methods that are applicable in sciences, engineering, business, industry, and other professions requiring a strong mathematical background. In addition to the basic courses that provide necessary mathematical skills, the curriculum allows students to select an emphasis area of concentration, providing an introduction to the specific area where mathematics is used. These are Abstract Mathematics, Actuarial Science/Financial Mathematics, Applied and Computational Mathematics, Biology, Computer Science, Operations Research/Management Science, and Statistics.

In addition to the overall goal of preparing students to cope with a variety of mathematical problems, the curriculum seeks to provide an adequate background for students who plan to pursue graduate study or positions in business, industry, or government. Students electing the Biology Concentration will have the necessary preparation for entering medical school. More information about the degree program can be found at www.math.clemson.edu.

All mathematical sciences majors are required to complete a capstone experience that provides an opportunity to pursue research, independent study, or an approved internship under the direction of a faculty member, or the opportunity to study mathematical models in some area of the mathematical sciences. The capstone experience requires a written report (thesis, computer code, project description, intern experience, etc.) and an oral or poster presentation by each student.

Combined Bachelor’s/Master’s Plan

Under this plan, students may reduce the time necessary to earn both degrees by applying graduate credits to both undergraduate and graduate program requirements. Students are encouraged to obtain the specific requirements for pursuing the dual degree from the Department of Mathematical Sciences (www.math.clemson.edu) as early as possible in their undergraduate program. Enrollment guidelines and procedures can be found under Academic Regulations in this catalog.

Bachelor of Science

Freshman Year

First Semester
3 - ECON 2000 Economic Concepts1 or 3 - ECON 2110 Principles of Microeconomics1
3 - ENGL 1030 Accelerated Composition
4 - MTHS 1080 Calculus of One Variable I
3 - Arts and Humanities (Non-Lit.) Requirement1
3 - Foreign Language Requirement1
6 - Elective
12

Second Semester
3 - MTHS 1080 Calculus of One Variable II
3 - MTHS 1190 Intro. to Discrete Math or 3 - MTHS 1290 Prob. Solving in Discrete Math.
3 - MTHS 1220 Physics with Calculus I
3 - Computer Science Requirement6
3 - Social Science Requirement2
16

Sophomore Year

First Semester
4 - MTHS 2060 Calculus of Several Variables
1 - MTHS 2500 Intro. to Mathematical Sciences
1 - MTHS 3110 Linear Algebra
3 - MTHS 3600 Intermediate Math. Computing
4 - Natural Science Requirement6
15

Second Semester
4 - MTHS 2080 Intro. to Ordinary Diff. Equations
3 - MTHS 3020 Statistics for Science and Engr.
3 - Arts and Humanities (Literature) Requirement2
4 - Natural Science Requirement6
3 - Cross-Cultural Awareness Requirement2
17

Junior Year

First Semester
3 - ENGL 3140 Technical Writing
3 - MTHS 4030 Intro. to Statistical Theory
3 - Science Requirement6
15

Second Semester
3 - MTHS 4120 Introduction to Modern Algebra
3 - MTHS 4540 Advanced Calculus II
3 - Emphasis Area Requirement7
3 - Science Requirement6
3 - Elective
15

Senior Year

First Semester
3 - COMM 2500 Public Speaking
3 - Capstone Experience8
6 - Emphasis Area Requirement7
3 - Science and Tech. in Society Requirement2
15

Second Semester
1 - MTHS 4920 Professional Development
3 - Capstone Experience8
3 - Emphasis Area Requirement7
3 - Mathematical Sciences Requirement9
3 - Elective
13

122 Total Semester Hours

1MTHS 1060 and 1080 are recommended; however, MTHS 1010 and 1020 or MTHS 1020 and 2030 may be substituted.

2See General Education Requirements.

3Spanish is recommended. Two years (through 2020) in the same foreign language are required.

4See advisor.

5Any 3000- or 4000-level geology course

6Select from department-approved list.

EMPHASIS AREAS

Abstract Mathematics

6 - Abstract Mathematics Requirement2
6 - Mathematical Sciences Requirement3
12

Actuarial Science/Financial Mathematics

3 - ACCT 2010 Financial Accounting Concepts
1 - ACCT 2040 Accounting Procedures
3 - FIN 3120 Financial Management II
3 - MTHS 4030 Intro. to Statistical Theory
3 - MTHS 4310 Theory of Interest
Applied and Computational Mathematics
3 - MTHS 4340 Advanced Engineering Math.
3 - MTHS 4600 Intro. to Numerical Analysis I
6 - Applications Area
12

Computer Science
3 - CPSC 2150 Software Development Foundations
9 - Computer Science 3000-Level Requirement
12

Operations Research/Management Science
3 - IE 3840 Engineering Economic Analysis or
4 - IE 4820 Systems Modeling
3 - MGT 4020 Operations Planning and Control
3 - MTHS 4070 Regress. and Time-Ser. Analysis
3 - MTHS 4410 Intro. to Stochastic Models
12-T3

Statistics
3 - MTHS 4030 Intro. to Statistical Theory
3 - MTHS 4050 Statistical Theory and Meth. II
3 - MTHS 4060 Sampling Theory and Methods
3 - MTHS 4070 Regress. and Time-Ser. Analysis
12

BIOLOGY CONCENTRATION
Freshman Year
First Semester
5 - BIOL 1100 Principles of Biology I
3 - ENGL 1030 Accelerated Composition
4 - MTHS 1060 Calculus of One Variable I
3 - Foreign Language Requirement
15

Second Semester
5 - BIOL 1100 Principles of Biology II
4 - MTHS 1080 Calculus of One Variable II
3 - MTHS 1130 Intro. to Discrete Methods or
3 - Computer Science Requirement
15

Sophomore Year
First Semester
4 - CH 1010 General Chemistry
3 - ECON 2000 Economic Concepts or
3 - ECON 2110 Principles of Microeconomics
4 - MTHS 2060 Calculus of Several Variables
1 - MTHS 2500 Intro. to Mathematical Sciences
3 - PHYS 2070 General Physics I
1 - PHYS 2090 General Physics II Lab.
16

Second Semester
4 - CH 1020 General Chemistry
4 - MTHS 2080 Intro. to Ordinary Diff. Equations
3 - MTHS 3110 Linear Algebra
3 - PHYS 2080 General Physics II
1 - PHYS 2100 General Physics II Lab.
15

Junior Year
First Semester
3 - CH 2230 Organic Chemistry
1 - CH 2270 Organic Chemistry Lab.
3 - ENGL 3140 Technical Writing
3 - MTHS 3600 Intermediate Math. Computing
3 - MTHS 4400 Linear Programming
3 - Arts and Humanities (Literature) Requirement
16

Second Semester
3 - CH 2240 Organic Chemistry
1 - CH 2280 Organic Chemistry Lab.
3 - COMM 2500 Public Speaking
3 - MTHS 3020 Statistics for Science and Engr.
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Math Science Requirement
16

Senior Year
First Semester
3 - MTHS 4000 Theory of Probability
3 - MTHS 4530 Advanced Calculus I or
3 - MTHS 4630 Mathematical Analysis I
3 - Animal or Plant Diversity Requirement
3 - Capstone Experience
3 - Social Science Requirement
15

Second Semester
3 - MTHS 4120 Introduction to Modern Algebra
3 - MTHS 4540 Advanced Calculus II
1 - MTHS 4920 Professional Development
3 - Biological Sciences Requirement
3 - Capstone Experience
13

Total Semester Hours
121

Notes:
3 - Second Major Requirement
3 - Math Science Requirement
3 - Elective
3 - Social Science Requirement
16

MATH SCIENCE CONCENTRATION
Bachelor of Arts
Freshman Year
First Semester
3 - ECON 2000 Economic Concepts or
3 - ECON 2110 Principles of Microeconomics
3 - ENGL 1030 Accelerated Composition
4 - MTHS 1060 Calculus of One Variable I
3 - Foreign Language Requirement
1
4 - Elective
1

Second Semester
4 - MTHS 1080 Calculus of One Variable II
3 - MTHS 1910 Intro. to Discrete Methods or
3 - Computer Science Requirement
3 - Foreign Language Requirement
3 - Social Science Requirement
16

Sophomore Year
First Semester
3 - MTHS 2060 Calculus of Several Variables
1 - MTHS 2500 Intro. to Mathematical Sciences
3 - MTHS 3600 Intro. to Discrete Math. Computing or
3 - EDSC 4370 Technology in Sec. Math.
3 - Arts and Humanities (Literature) Requirement
3 - Cross-Cultural Awareness Requirement
14

Second Semester
4 - MTHS 2080 Intro. to Ordinary Diff. Equations
3 - MTHS 3020 Statistics for Science and Engr.
3 - MTHS 3110 Linear Algebra
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Minor Requirement or
3 - Second Major Requirement
16

Junior Year
First Semester
3 - ENGL 3140 Technical Writing
3 - MTHS 4120 Introduction to Modern Algebra
3 - Math Science Requirement
4 - Natural Science Requirement
3 - Elective
16

Second Semester
4 - MTHS 4400 Linear Programming
3 - Math Science Requirement
3 - Minor Requirement or
3 - Second Major Requirement
3 - Natural Science Requirement
3 - Elective
16

Notes:
1. For graduation, a candidate for the BS degree in Mathematical Sciences will be required to have a 2.0 or higher cumulative grade-point average in all required MTHS courses.
2. A grade of C or better must be earned in all prerequisite courses before enrolling in the next MTHS course.
3. Students who change majors to Mathematical Sciences must have achieved the Minimum Cumulative Grade-Point Average (MCGPA) by Total Credit Hour Level as defined in the Academic Regulations section of the Undergraduate Announcements and must have received a grade of C or better in all MTHS courses taken.
Senior Year
First Semester
3 - MTHS 4530 Advanced Calculus I
3 - Arts and Humanities Requirement
3 - Education Requirement
3 - Capstone Experience
3 - Minor Requirement
3 - Second Major Requirement
3 - Science and Tech. in Society Requirement
122 Total Semester Hours

Second Semester
1 - MTHS 4920 Professional Development
2 - Elective
1 - MTHS 4920 Professional Development
2 - Elective

First Semester
3 - PHYS 1240 Physics Lab. I
3 - Phys 1220 Physics with Calculus I
4 - PHYS 1220 Physics with Calculus I
5 - PHYS 1240 Physics Lab. I
15

Second Semester
4 - CH 1020 General Chemistry
4 - MTHS 1060 Calculus of One Variable I
3 - PHYS 1220 Physics with Calculus I
3 - PHYS 1240 Physics Lab. I
15

Freshman Year
First Semester
4 - CH 1010 General Chemistry
3 - ENGL 1030 Accelerated Composition
4 - MTHS 1060 Calculus of One Variable I
1 - PHYS 1240 Physics Lab. I
15

Second Semester
4 - CH 1020 General Chemistry
4 - MTHS 1080 Calculus of One Variable II
3 - PHYS 2220 Physics with Calculus II
1 - PHYS 2230 Physics Lab. II
3 - Arts and Humanities (Non-Lit.) Requirement
15

Sophomore Year
First Semester
4 - MTHS 2060 Calculus of Several Variables
3 - PHYS 2220 Physics with Calculus III
1 - PHYS 3000 Introduction to Research
1 - Elective
15

Second Semester
4 - MTHS 2080 Intro. to Ordinary Diff. Equations
3 - PHYS 3120 Methods to Theoretical Physics II
3 - Foreign Language Requirement
15

Junior Year
First Semester
3 - PHYS 3120 Methods to Theoretical Physics II
3 - PHYS 3150 Intro. to Computational Physics
3 - PHYS 3210 Mechanics I
3 - Emphasis Area Requirement
3 - Oral Communications Requirement
15

Second Semester
3 - PHYS 3220 Mechanics II
3 - PHYS 4650 Thermodynamics and Statistical Mechanics
3 - Emphasis Area Requirement
3 - Physics Writing Requirement
3 - Science Requirement
15

The undergraduate Physics curricula provide students with a strong background in the classical areas of physics, as well as an introduction to the more important aspects of modern physics. The BS curriculum is directed toward preparing students for graduate study ultimately leading to the PhD degree or toward research and development work in industrial or governmental laboratories. It also provides a good background for graduate study in many areas or engineering physics and applied science.

PHYSICS
Bachelor of Science

Physics, the most fundamental of the natural sciences, forms the basis of study upon which the other branches of science are founded. Physics is concerned with the fundamental behavior of matter and energy. Classical physics encompasses the fields of mechanics, heat and thermodynamics, electricity and magnetism, acoustics and optics. Modern physics is concerned with the study of atoms and molecules, atomic nuclei, elementary particles and the properties of liquids, crystalline solids, and other materials, as well as the areas of relativity, cosmology, and the large-scale structure of the universe.

Senior Year
First Semester
3 - PHYS 4010 Senior Thesis
3 - PHYS 4410 Electromagnetics I
3 - PHYS 4550 Quantum Physics I
3 - Arts and Humanities (Literature) Requirement
3 - Emphasis Area Requirement
15

Second Semester
3 - HIST 1720 The West and the World I or
3 - HIST 1730 The West and the World II
3 - PHYS 4420 Electromagnetics II
3 - PHYS 4560 Quantum Physics II
3 - Emphasis Area Requirement
3 - Social Science Requirement
15

120 Total Semester Hours

BIOPHYSICS CONCENTRATION
The Biophysics Concentration offers an excellent preparation for medical school or graduate work in biological sciences. It includes the flexibility of selecting courses in chemistry, biological sciences, physics, and mathematics. This concentration also provides the necessary background for employment in industry, manufacturing, and instrumentation for clinical or molecular biology applications.

Freshman Year
First Semester
4 - CH 1010 General Chemistry
3 - ENGL 1030 Accelerated Composition
4 - MTHS 1060 Calculus of One Variable I
3 - PHYS 1220 Physics with Calculus I
1 - PHYS 1240 Physics Lab. I
15

Second Semester
4 - CH 1020 General Chemistry
4 - MTHS 1080 Calculus of One Variable II
3 - PHYS 2220 Physics with Calculus II
3 - PHYS 2230 Physics Lab. II
3 - Arts and Humanities (Non-Lit.) Requirement
15

Sophomore Year
First Semester
4 - MTHS 2060 Calculus of Several Variables
3 - PHYS 2220 Physics with Calculus III
1 - PHYS 3000 Introduction to Research
1 - Elective
15

Second Semester
4 - MTHS 2080 Intro. to Ordinary Diff. Equations
3 - PHYS 3120 Methods to Theoretical Physics II
3 - Foreign Language Requirement
15

Junior Year
First Semester
3 - PHYS 3120 Methods to Theoretical Physics II
3 - PHYS 3150 Intro. to Computational Physics
3 - PHYS 3210 Mechanics I
3 - Emphasis Area Requirement
3 - Oral Communications Requirement
15

Second Semester
3 - PHYS 3220 Mechanics II
3 - PHYS 4650 Thermodynamics and Statistical Mechanics
3 - Emphasis Area Requirement
3 - Physics Writing Requirement
3 - Science Requirement
15

Senior Year
First Semester
3 - PHYS 4010 Senior Thesis
3 - PHYS 4410 Electromagnetics I
3 - PHYS 4550 Quantum Physics I
3 - Arts and Humanities (Literature) Requirement
3 - Emphasis Area Requirement
15

Second Semester
3 - HIST 1720 The West and the World I or
3 - HIST 1730 The West and the World II
3 - PHYS 4420 Electromagnetics II
3 - PHYS 4560 Quantum Physics II
3 - Emphasis Area Requirement
3 - Social Science Requirement
15

120 Total Semester Hours

1See General Education Requirements. Three of these credit hours must also satisfy the Science and Technology in Society Requirement.

2Two semesters (through 1020) in the same modern foreign language are required.

3Students who change majors to Mathematical Sciences must have achieved the Minimum Cumulative Grade-Point Average (MCGPA) by Total Credit Hour Level as defined in the Academic Regulations section of the Undergraduate Announcements and must have received a grade of C or better in all MTHS courses taken.

4Any 2000–4000 level science course

5Any 2000–4000 level science course

6Any 2000–4000 level science course
Second Semester
4 - MTHS 2080 Intro. to Ordinary Diff. Equations
3 - PHYS 3110 Intro. to Meth. of Theoretical Phys.
3 - PHYS 3260 Experimental Physics II or
   3 - Science Requirement
4 - Biophysics Requirement
14

Junior Year
First Semester
3 - PHYS 3120 Methods of Theoretical Physics II
3 - PHYS 4650 Thermodynamics and Statistical Mechanics
3 - Biophysics Requirement
4 - Foreign Language Requirement
3 - Oral Communication Requirement
16

Second Semester
3 - PHYS 3220 Mechanics II
3 - PHYS 4650 Thermodynamics and Statistical Mechanics
3 - Biophysics Requirement
4 - Foreign Language Requirement
3 - Social Science Requirement
15

Senior Year
First Semester
3 - PHYS 4410 Electromagnetics I
3 - PHYS 4550 Quantum Physics I
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Minor Requirement
3 - Physics Writing Requirement
15

Second Semester
3 - PHYS 4420 Electromagnetics II
3 - PHYS 4560 Quantum Physics II
3 - Minor Requirement
3 - Social Science Requirement
15

Sophomore Year
First Semester
4 - MTHS 2060 Calculus of Several Variables
3 - PHYS 2220 Physics with Calculus III
1 - PHYS 3000 Introduction to Research
3 - Foreign Language Requirement
15

Second Semester
4 - MTHS 2080 Intro. to Ordinary Diff. Equations
3 - PHYS 3150 Intro. to Computational Physics
3 - PHYS 3220 Mechanics II
3 - Foreign Language Requirement
3 - Minor Requirement
3 - Physics Requirement
3 - Elective
15

Senior Year
First Semester
3 - PHYS 3120 Methods of Theoretical Physics II
3 - PHYS 3210 Mechanics I
3 - Minor Requirement
3 - Physics Requirement
3 - Elective
15

Second Semester
3 - HIST 1720 The West and the World I or
   3 - HIST 1730 The West and the World II
3 - PHYS 4410 Electromagnetics I
3 - Arts and Humanities (Literature) Requirement
3 - Minor Requirement
3 - Physics Requirement
3 - Elective
15

120 Total Semester Hours

Double Major in Physics/Science Teaching—Physics
The Bachelor of Arts Degree in Physics and Science Teaching—Physics prepares students for teaching physics on the secondary school level and for graduate studies in physics. See pages 115-116 for the curriculum.

Freshman Year
First Semester
4 - CH 1010 General Chemistry
3 - ENGL 1030 Accelerated Composition
4 - MTHS 1060 Calculus of One Variable I
1 - PHYS 1240 Physics Lab. I
15

Second Semester
4 - CH 1020 General Chemistry
4 - MTHS 1080 Calculus of One Variable II
3 - PHYS 2210 Physics with Calculus II
1 - PHYS 2230 Physics Lab. II
3 - Arts and Humanities (Non-Lit.) Requirement
15

Sophomore Year
First Semester
4 - MTHS 2060 Calculus of Several Variables
3 - PHYS 2220 Physics with Calculus III
1 - PHYS 3000 Introduction to Research
3 - Foreign Language Requirement
15

Second Semester
4 - MTHS 2080 Intro. to Ordinary Diff. Equations
3 - PHYS 3110 Intro. to Meth. of Theoretical Phys.
4 - Foreign Language Requirement
3 - Minor Requirement
3 - Physics Writing Requirement
3 - Elective
15

Junior Year
First Semester
3 - PHYS 3150 Intro. to Computational Physics
3 - PHYS 3210 Mechanics I
3 - Foreign Language Requirement
3 - Minor Requirement
3 - Physics Requirement
3 - Elective
15

Second Semester
3 - PHYS 4410 Electromagnetics I
3 - PHYS 4550 Quantum Physics I
6 - Minor Requirement
3 - Physics Requirement
3 - Elective
15

Senior Year
First Semester
3 - PHYS 4410 Electromagnetics I
3 - PHYS 4550 Quantum Physics I
3 - Minor Requirement
3 - Physics Requirement
3 - Elective
15

PHYSICS
Bachelor of Arts
The Bachelor of Arts in Physics program is ideal for students interested in acquiring a broad-based liberal education that includes a strong and solid understanding of either science or a broad exposure to engineering with a strong physics foundation.
MINORS

Following are minors acceptable for students in the College of Engineering and Science. Students cannot major and minor in the same field or acquire a minor that is not allowed by the degree program.

Accounting
Adult/Extension Education
Aerospace Studies
Agricultural Business Management
Agricultural Mechanization and Business
American Sign Language Studies
Animal and Veterinary Sciences
Anthropology
Architecture
Art
Athletic Leadership—*not open to Marketing majors.*
Biochemistry
Biological Sciences
Business Administration
Chemistry
Cluster
Communication Studies
Computer Science—*not open to Computer Information Systems majors.*
Crop and Soil Environmental Science
Digital Production Arts
East Asian Studies
Economics
Education
English
Entomology
Entrepreneurship
Environmental Engineering
Environmental Science and Policy
Equine Business
Film Studies
Financial Management
Food Science
Forest Resource Management
Genetics
Geography
Geology
Global Politics
Great Works
History
Horticulture
International Engineering and Science
Legal Studies
Management
Management Information Systems
Mathematical Sciences
Microbiology
Military Leadership
Modern Languages
Music
Natural Resource Economics
Nonprofit Leadership
Packaging Science
Pan African Studies
Park and Protected Area Management
Philosophy
Physics
Plant Pathology
Political Science
Psychology
Public Policy
Religion
Russian Area Studies
Science and Technology in Society
Screenwriting
Sociology
Spanish-American Area Studies
Theatre
Therapeutic Recreation
Travel and Tourism
Turfgrass
Urban Forestry
Wildlife and Fisheries Biology
Women’s Studies
Writing

See pages 39-42 for details.
The College of Health, Education and Human Development provides students the means by which to pursue careers in the fields of nursing, education, health, and recreation management. The “Engaged College with a Personal Touch” is home to the academic programs offered by the School of Nursing; the Eugene T. Moore School of Education; the Department of Public Health Sciences; and the Department of Parks, Recreation and Tourism Management. The College also offers outreach services available through the Joseph F. Sullivan Center; the National Dropout Prevention Center; and the Outdoor Laboratory. Collaboration within the college between academics and community outreach services prepares students to be professional leaders in health, education, and recreation management. As with all programs at the University, students take course offerings from all colleges on campus to achieve the most complete education possible.

ATHLETIC LEADERSHIP CERTIFICATE

Students acquiring the nationally recognized American Sport Education Program (ASEP) Certification through the Athletic Leadership Program at Clemson are eligible to complete the requirements for Athletic Leadership Certification in any of the following areas related to their ASEP Certification: (1) Sport Coaching and Character Development; (2) Sport First Aid and Conditioning; and (3) Sport Psychology and Motivation. For more information, contact the Coordinator of Athletic Leadership at (864) 656-0343.

EUGENE T. MOORE SCHOOL OF EDUCATION

The mission of the Eugene T. Moore School of Education is to prepare caring and capable professionals through intellectually engaging experiences in theory, method, and research that connect them to the communities in which they live and serve. The Eugene T. Moore School of Education trains teachers, counselors, university administrators, and leaders for the P-12 schools and training and development specialists for business and industry.

TEACHER EDUCATION PROGRAMS

The Eugene T. Moore School of Education Conceptual Framework guides the School’s work as a unit. It is consensus-based and provides the foundation for all that is done. It addresses the fundamental issues of what students need to know (knowledge), what they need to be able to do (skills), what they value (dispositions), and how they interface with their communities, large and small (connections). The Conceptual Framework, simply stated, is to prepare caring, capable, and connected professionals for the twenty-first century.

The Teacher Education Programs prepare teachers, provide professional services to education in South Carolina, and carry out basic and applied research in education. Curricula provide a broad general education through liberal arts and science courses, develop depth of knowledge in the teaching area, gain an understanding of the historical, philosophical, and psychological backgrounds of American education, and acquire knowledge of and skill and experience in effective teaching techniques.

The Teacher Education Programs are accredited by the National Council for the Accreditation of Teacher Education (NCATE) for the preparation of educational personnel in South Carolina in the following undergraduate programs: Early Childhood, Elementary, Special Education, and secondary school programs in Agriculture, English, Mathematics, Science, and Social Studies.

Criminal Records Check

A criminal record could prevent a person enrolled in a teacher education program from being certified as a teacher in this state in accordance with State Board of Education guidelines.

Section 59-25-115 of the South Carolina Code of Laws specifies that before beginning the full-time clinical teaching experience in South Carolina, a teacher education candidate shall undergo a state criminal records check by the South Carolina Law Enforcement Division (SLED) and additional criminal records check supported by fingerprints by the Federal Bureau of Investigation (FBI). The applicant is responsible for the cost associated with the FBI background checks. Information reported relative to prior arrests or convictions will be reviewed by the State Department of Education and the State Board of Education when warranted, according to board guidelines. A teacher education candidate with prior arrests or convictions of a serious nature that could affect his/her fitness to teach in the public schools of South Carolina may be denied the opportunity to complete the clinical teaching experience, and thus affect eligibility for initial teacher certification. An individual who is denied this opportunity as a result of prior arrests or convictions, after one year, may request reconsideration under guidelines established by the State Board of Education.

The criminal records check will be handled through the Office of Teacher Certification at the South Carolina State Department of Education and will be considered phase one of a person’s application for a teaching credential. Provided the criminal records check is conducted within 18 months of the time the teacher candidate formally applies for a teaching certificate, the fingerprinting will not have to be repeated at the time of application. A graduate of a teacher education program applying for initial teacher certification must have completed the FBI fingerprint process within 18 months of formally applying for initial teacher certification or the fingerprint process must be repeated. The background check normally requires six (6) to eight (8) weeks to process. If the fingerprint card cannot be processed, the South Carolina State Department will inform the individual that it will be necessary to complete another fingerprint card and submit it to their office as soon as possible.

Admission

Professional—Application to the professional level of a program will be processed during the term in which a student is to complete 60 semester hours of work. At that time, the student will be notified of his/her status by the College’s Academic Advising Center. Prior to admission, the student must have passed all areas of the Praxis I Pre-Professional Skills Test (PPST) and have a minimum cumulative grade-point average of 2.5. A student may exempt the PPST by meeting minimum ACT or SAT requirements as determined each year by the South Carolina Department of Education.

Directed Teaching/Teaching Internship (Secondary)—A student shall apply to the field experience director prior to the semester in which block methods courses are to be scheduled. The following conditions must be met prior to registration for directed teaching: (1) admission to the professional level of a program; (2) completion of at least 95 semester hours; (3) a minimum cumulative grade-point average of 2.5. Students with a grade-point average of 2.25 to 2.5 may appeal to the Chair of Teacher Education, but exceptions are not common.

Enrollment in Professional Courses

Enrollment in 4000 level professional education courses is contingent upon admission to the professional level as described above. Any student who desires to enroll in education courses must meet the cumulative grade-point requirements established for education majors. Appeals to continue taking classes may be made to the Chair of Teacher Education, but exceptions are not common.

Change of Major

Changing majors into Education is highly competitive and limited in Early Childhood Education, Elementary Education, Special Education, Secondary Education—Social Studies, and Secondary Education—English. The process involves a formal application and an essay. Requests for a change of major application can be made at the Health, Education and Human Development Academic Advising Center in 309 Edwards Hall and should be accompanied by an appointment with an advisor. Students wishing to change into any education major must have a minimum grade-point average of 2.5.

Graduation

To graduate, a student must have scores for all state-mandated certification exams on file with the Academic Advising Center in the College of Health, Education and Human Development. As of July 2006, students must pass all required Praxis II tests, including PLT (Principles of Learning and Teaching), before receiving recommendation for certification.

Graduate Study

Clemson University offers programs leading to the Master of Arts in Teaching, Master of Education, Master of Human Resource Development, Specialist in Education, and Doctor of Philosophy degrees.
# AGRICULTURAL EDUCATION

**Bachelor of Science**

The College of Health, Education and Human Development and the College of Agriculture, Forestry and Life Sciences conduct a cooperative program to produce agricultural teachers (grades 9–12) for South Carolina. See page 43 for the curriculum.

# EARLY CHILDHOOD EDUCATION

**Bachelor of Arts**

The Early Childhood Education curriculum prepares students for teaching positions on the pre-kindergarten and primary levels (Pre-K–3).

## Freshman Year

**First Semester**
- ED 1050 Orientation to Education
- HIST 1730 The West and the World II
- MTHS 1150 Contemporary Mathematics for Elementary School Teachers I
- Foreign Language Requirement
- Natural Science Requirement
  
**Second Semester**
- COMM 1500 Intro. to Human Comm. or
- COMM 2500 Public Speaking
- ENGL 1030 Accelerated Composition
- MTHS 1160 Contemporary Mathematics for Elementary School Teachers II
- Foreign Language Requirement
- Elective

## Sophomore Year

**First Semester**
- GEOG 1030 World Regional Geography
- MTHS 2160 Geometry for Elementary School Teachers
- PSYC 2010 Introduction to Psychology
- Arts and Humanities (Literature) Requirement
- Natural Science Requirement
  
**Second Semester**
- EDEC 2200 Family, School, and Community Relationships
- EDF 3200 Educational Psychology
- EDF (CTE) 3150 Technology Skills for Learning
- EDF 3340 Child Growth and Development
- Arts and Humanities (Non-Lit) Requirement
- Science and Tech. in Society Requirement
  
## Junior Year

**First Semester**
- EDEC 3360 Social Development of Infants and Young Children
- EDEL 3100 Arts in the Elementary School
- EDEL 3210 Physical Education Methods and Content for Classroom Teachers
- EDSP 3700 Introduction to Special Education
- Elective

**Second Semester**
- EDEC 3000 Found. of Early Childhood Educ.
- MTHS 4160 Contemporary Mathematics for Elementary School Teachers
- Foreign Language Requirement

## Senior Year

**First Semester**
- EDEC 4000 Observation and Assessment in Clinical Settings
- EDEC 4300 Early Childhood Mathematics
- EDEC 4400 Integrated Language Arts and Social Studies in Primary Schools
- EDEC 4600 Critical Issues in Early Childhood Education
- EDF 4250 Instructional Technology Strategies
- EDLT 4590 Teaching Reading in the Early Grades: K–3

**Second Semester**
- EDEC 4840 Directed Teaching in Early Childhood Education
- EDEC 4850 Early Childhood Capstone

123 Total Semester Hours

Two semesters (through 2020) in a modern foreign language are required. Spanish is recommended.

One biological science and one physical science course, each with laboratory, must be selected from General Education Requirements by advisor.

ENGL 2120, 2130, 2140, or 2150

5 Must be taken the fall semester of the junior year. Must be taken in the spring semester of the senior year.

6 Must be taken the fall semester of the senior year. Must be taken the spring semester of the senior year.

## ELEMENTARY EDUCATION

**Bachelor of Arts**

The Elementary Education curriculum prepares students for teaching on the elementary school level (grades 2–6). Students select one of two Emphasis Areas: Literacy, Culture and Diversity; or Mathematics and Science.

### LITERATURE, CULTURE AND DIVERSITY EMPHASIS AREA

## Freshman Year

**First Semester**
- BIOL 1090 Introduction to Life Science
- ED 1050 Orientation to Education
- GEOG 1030 World Regional Geography
- MTHS 1150 Contemporary Mathematics for Elementary School Teachers I
- Foreign Language Requirement
  
**Second Semester**
- ENGL 1030 Accelerated Composition
- HIST 1010 History of the United States or
- HIST 1020 History of the United States
- MTHS 1160 Contemporary Mathematics for Elementary School Teachers II
- PHSC 1170 Intro. to Chemistry and Earth Science for Elementary Education Majors
- Foreign Language Requirement

## Sophomore Year

**First Semester**
- COMM 1500 Intro. to Human Comm. or
- COMM 2500 Public Speaking
- EDEC 3340 Child Growth and Development
- EDSP 3700 Introduction to Special Education
- ENGL 3850 Children’s Literature
- STS 1010 Survey of Sci. and Tech. in Society or
- STS 1020 Ideas, Machinery and Society

**Second Semester**
- EDEL 3100 Arts in the Elementary School
- EDLT 4020 Educational Psychology
- EDF 3340 Child Growth and Development
- EDSP 3700 Introduction to Special Education
- ENGL 3850 Children’s Literature
- STS 1010 Survey of Sci. and Tech. in Society or
- STS 1020 Ideas, Machinery and Society

## Junior Year

**First Semester**
- EDEL 3210 Physical Education Methods and Content for Classroom Teachers
- EDF 3340 Child Growth and Development
- EDEL 4050 Social Justice and 21st Century Classroom
- EDEL 4510 Elem. Methods in Science Teaching
- EDEL 4870 Prin. and Strat. for Teaching Eng.
- EDF 4800 Digital Technology in the 21st Century Classroom
- EDLT 4600 Teaching Reading in the Elementary Grades: 2–6
- MTHS 3160 Problem Solving for Math. Teachers

**Second Semester**
- EDF 4050 Social Justice and 21st Cen. Learners
- EDEL 4520 Elem. Methods in Math. Teaching
- EDEL 4670 Prin. and Strat. for Teaching Eng.
- EDEL 4870 Prin. and Strat. for Teaching Eng.
- SPEAKERS OF OTHER LANG. IN Elem. Classrooms
- EDLT 4620 Reading and Responding to Literature in the Elementary School
- EDLT 4630 Teaching Reading and Writing to English Language Learners

## Senior Year

(Courses must be taken as listed in both semesters.)

**First Semester**
- EDEL 4010 Elementary Field Experience
- EDEL 4510 Elem. Methods in Science Teaching
- EDEL 4870 Elementary Methods in Social Studies Teaching
- EDEL 4880 Elementary Methods in Language Arts Teaching
- EDLT 4610 Content Area Reading: Grades 2–6

123 Total Semester Hours

9 Must be taken the fall semester of the senior year.

10 Must be taken the spring semester of the senior year.

11 Must be taken in the fall semester of the junior year.

12 Must be taken in the spring semester of the junior year.
Second Semester
3 - EDEL 4820 Capstone Sem. in Elem. Teaching
9 - EDEL 4830 Directed Teaching in the Elementary School

12

122 Total Semester Hours

Two semesters (through 2020) in the same modern foreign language (including American Sign Language) are required.

Select from ENGL 2120, 2130, 2140 or 2150

MATHMATICS AND SCIENCE EMPHASIS AREA

Freshman Year

First Semester
4 - BIOL 1090 Introduction to Life Science
2 - ED 1050 Orientation to Education
3 - GEOG 1030 World Regional Geography
3 - MTHS 1150 Contemporary Mathematics for Elementary School Teachers I
3 - Foreign Language Requirement

Second Semester
3 - ENGL 1030 Accelerated Composition
3 - HIST 1010 History of the United States or
3 - HIST 1020 History of the United States
3 - MTHS 1160 Contemporary Mathematics for Elementary School Teachers II
4 - PHSC 1170 Intro. to Chemistry and Earth Science for Elementary Education Majors
3 - Foreign Language Requirement

Sophomore Year

First Semester
3 - COMM 1500 Intro. to Human Comm. or
3 - COMM 2500 Public Speaking
3 - EDF 3010 Principles of American Education
3 - MTHS 2160 Geometry for Elementary School Teachers
4 - PHSC 1180 Intro. to Physics, Astronomy and Earth Science for Elementary Education Majors
3 - Arts and Humanities (Literature) Requirement

Second Semester
3 - EDEL 3100 Arts in the Elementary School
3 - EDF 3020 Educational Psychology
3 - EDSP 3700 Child Growth and Development
3 - EDSP 3700 Introduction to Special Education
3 - ENGL 3850 Accelerated Composition
3 - MTHS 3160 Problem Solving for Math. Teachers
3 - MTHS 3190 Intro to Discrete Methods or
3 - MTHS 3190 Intro to Discrete Methods

Junior Year

First Semester
3 - EDEL 3210 Physical Education Methods and Content for Classroom Teachers
3 - EDF 3080 Classroom Assessment
3 - EDF 4800 Digital Technology in the 21st Century Classroom
3 - EDLT 4600 Teaching Reading in the Elementary Grades: 2–6
3 - MTHS 3160 Problem Solving for Math. Teachers
3 - MTHS 4120 Introduction to Modern Algebra
3 - MTHS 4530 Advanced Calculus I

Second Semester
3 - EDEL 4520 Elem. Methods in Math. Teaching
3 - ENSP 2000 Introduction to Environmental Science
3 - EDLT 4620 Reading and Responding to Literature in the Elementary School
3 - MTHS 3150 Advance Topic in Mathematics for Elementary Teachers
3 - Science Content Requirement

Senior Year

(Courses must be taken as listed in both semesters.)

First Semester
3 - EDEL 4610 Content Area Reading: Grades 2–6
3 - EDSC 4260 Teaching Secondary Mathematics
3 - EDSC 4370 Technology in Secondary Math.
3 - EDSC 4460 Teaching Internship in Secondary Mathematics
3 - EDF 4250 Instructional Technology Strategies
3 - EDF 4320 Teaching Secondary Mathematics
3 - EDLT 4980 Secondary Content Area Reading
3 - MTHS 4000 Theory of Probability
3 - MTHS 4050 Stat. Theory and Methods II
3 - MTHS 4080 Topics in Geometry
3 - Arts and Humanities (Literature) Requirement

Mathematics Teaching

Bachelor of Science

The program leading to a Bachelor of Science degree in Mathematics Teaching is designed for students planning to teach mathematics on the secondary school level (grades 9–12). (Note: The program leading to a Bachelor of Arts degree in Mathematics is also designed for students planning to teach mathematics on the secondary school level.) To be recommended for certification, students must earn a grade of C or higher in all mathematics content courses.

Freshman Year

First Semester
4 - CH 1050 Chemistry in Context I
2 - ED 1050 Orientation to Education
4 - MTHS 1060 Calculus of One Variable I
3 - PHIL 1020 Introduction to Logic
3 - Cross-Cultural Awareness Requirement

Second Semester
4 - CH 1060 Chemistry in Context II
3 - ENGL 1030 Accelerated Composition
4 - MTHS 1080 Calculus of One Variable II
3 - MTHS 1190 Intro to Discrete Methods or
3 - MTHS 1190 Intro to Discrete Methods

Sophomore Year

First Semester
3 - COMM 1500 Intro. to Human Comm. or
3 - COMM 2500 Public Speaking
3 - EDF 2260 A Prof. Approach to Sec. Algebra
4 - MTHS 2060 Calculus of Several Variables
3 - PHYS 1220 Physics with Calculus I
1 - PHYS 1240 Physics Lab. I
3 - Arts and Humanities (Literature) Requirement

Second Semester
3 - ECON 2110 Principles of Microeconomics
3 - EDF 3020 Educational Psychology
1 - EDF (CTE) 3150 Technology Skills for Learning
4 - MTHS 2080 Intro. to Ordinary Diff. Equations
3 - MTHS 3110 Linear Algebra
3 - PHYS 2210 Physics with Calculus II
1 - PHYS 2230 Physics Lab. II

Junior Year

First Semester
3 - EDF 4250 Instructional Technology Strategies
3 - EDF 4320 Teaching Secondary Mathematics
3 - EDLC 4610 Content Area Reading
3 - EDSC 4460 Teaching Internship in Secondary Mathematics

Second Semester
3 - MTHS 3160 Problem Solving for Math. Teachers
3 - MTHS 4000 Theory of Probability
3 - MTHS 4050 Stat. Theory and Methods II
3 - MTHS 4080 Topics in Geometry
3 - Arts and Humanities (Literature) Requirement

Senior Year

First Semester
1 - EDF 4250 Instructional Technology Strategies
3 - EDSC 4260 Teaching Secondary Mathematics
3 - EDLT 4980 Secondary Content Area Reading
3 - MTHS 4000 Theory of Probability
3 - MTHS 4050 Stat. Theory and Methods II
3 - MTHS 4080 Topics in Geometry
3 - MTHS 4530 Advanced Calculus I

Second Semester
9 - EDSC 4460 Teaching Internship in Secondary Mathematics

12

126 Total Semester Hours

Select from courses in ASTR, BIOL, CH, GEOL, PHYS.
3 - ENGL 2120, 2130, 2140, or 2150
4 - EDF 4250, EDSC 4260, and EDLT 4980 must be taken concurrently. Offered fall semester only.
4 - EDSC 4460 and 4560 must be taken concurrently. Offered spring semester only.
Double Majors in Science Teaching and Content Area

The Bachelor of Arts Degree in Science Teaching will result in a double major in Science Teaching and the select content area (Biological Science, Chemistry, or Physics). To achieve the double major, the plan of study listed under Science Teaching must be followed. The double major prepares students for teaching science on the secondary level and graduate work in the respective content field.

TEACHING AREA:

BIOLOGICAL SCIENCES

Bachelor of Arts

Freshman Year

First Semester
3 - BIOL 1030 General Biology I and
1 - BIOL 1050 General Biology Lab. I or
5 - BIOL 1100 Principles of Biology
4 - CH 1010 General Chemistry
2 - ED 1050 Orientation to Education
4 - MTHS 1060 Calculus of One Variable I
3 - Foreign Language Requirement1

Second Semester
3 - BIOL 1040 General Biology II and
1 - BIOL 1060 General Biology Lab. II or
5 - BIOL 1110 Principles of Biology II
4 - CH 1020 General Chemistry
2 - ED 1050 Orientation to Education
4 - MTHS 1060 Calculus of One Variable I
3 - Foreign Language Requirement1

Sophomore Year

First Semester
4 - CH 2010 Survey of Organic Chemistry
3 - BIOL 4820 Lab. Techniques for Teaching Sci.
3 - EDF 3550 Adolescent Growth and Development
3 - ENGL 3150 Scientific Writing and Comm.
4 - Animal or Plant Diversity Requirement4
3 - Ecology Requirement4
16

Second Semester
3 - BIOL 3350 Evolutionary Biology
3 - BIOL 4820 Lab. Techniques for Teaching Sci.
3 - EDF 3550 Adolescent Growth and Development
3 - ENGL 3150 Scientific Writing and Comm.
4 - Animal or Plant Diversity Requirement4
3 - Ecology Requirement4
16

Junior Year

First Semester
3 - BIOL 4610 Cell Biology
2 - BIOL 4620 Cell Biology Laboratory
3 - EDSC 4720 Teaching Secondary Science1
3 - EDLT 4980 Secondary Content Area Reading7
3 - EDSC 4270 Teaching Secondary Science7
3 - EDSP 3700 Introduction to Special Education
2 - BIOL 4620 Cell Biology Laboratory
3 - EDSC 4720 Teaching Secondary Science1
3 - EDLT 4980 Secondary Content Area Reading7
3 - EDSC 4270 Teaching Secondary Science7
3 - EDSP 3700 Introduction to Special Education
18

Second Semester
3 - BIOL 4700 Teaching Internship in Sec. Sci.9
3 - EDSC 4570 Sec. Science Capstone Seminar9
18

Senior Year

First Semester
1 - BIOL 1050 General Biology Lab. I
3 - BIOL 1110 Principles of Biology II
4 - Animal or Plant Diversity Requirement4
3 - Ecology Requirement4
15

Second Semester
3 - BIOL 1110 Principles of Biology II
4 - Animal or Plant Diversity Requirement4
3 - Ecology Requirement4
15

Third Semester
3 - Arts and Humanities (Non-Lit.) Requirement8
3 - EDLT 4980 Secondary Content Area Reading7
3 - EDSC 4270 Teaching Secondary Science6
3 - EDSP 3700 Introduction to Special Education
3 - COMM 1500 Intro. to Human Comm. or
3 - COMM 2500 Public Speaking
3 - EDSC 3270 Practicum in Secondary Science
3 - Arts and Humanities (Non-Lit.) Requirement8
15

Fourth Semester
3 - Arts and Humanities (Non-Lit.) Requirement8
3 - EDLT 4980 Secondary Content Area Reading6
3 - EDSC 4270 Teaching Secondary Science6
3 - EDSP 3700 Introduction to Special Education
3 - COMM 1500 Intro. to Human Comm. or
3 - COMM 2500 Public Speaking
3 - EDSC 3270 Practicum in Secondary Science
3 - Arts and Humanities (Non-Lit.) Requirement8
15

Bachelor of Science

Freshman Year

First Semester
3 - BIOL 1030 General Biology I and
1 - BIOL 1050 General Biology Lab. I or
5 - BIOL 1100 Principles of Biology
4 - CH 1010 General Chemistry
2 - ED 1050 Orientation to Education
4 - MTHS 1060 Calculus of One Variable I
15

Second Semester
3 - BIOL 1040 General Biology II and
1 - BIOL 1060 General Biology Lab. II or
5 - BIOL 1110 Principles of Biology II
4 - CH 1020 General Chemistry
2 - ED 1050 Orientation to Education
4 - MTHS 1060 Calculus of One Variable I
15

Sophomore Year

First Semester
4 - CH 2010 Survey of Organic Chemistry
3 - EDSC 4720 Teaching Secondary Science6
3 - EDLT 4980 Secondary Content Area Reading6
3 - GEOG 1030 World Regional Geography
3 - Arts and Humanities (Literature) Requirement5
4 - Plant or Animal Diversity Requirement4
15

Second Semester
3 - BIOL 3350 Evolutionary Biology
3 - BIOL 4820 Lab. Techniques for Teaching Sci.
3 - EDF 3550 Adolescent Growth and Development
3 - Arts and Humanities (Literature) Requirement5
4 - Plant or Animal Diversity Requirement4
16

Third Semester
3 - BIOL 4470 Teaching Internship in Sec. Sci.3
3 - EDSC 4570 Sec. Science Capstone Seminar2
12

Fourth Semester
130-132 Total Semester Hours

1Two semesters through 2020 in any modern foreign language (including American Sign Language) are required.
2MTHS 2030, 3010, or 3090
3ENGL 2120, 2130, 2140, or 2150
4One lecture course must be completed for both biochemistry (BCHM 3010 or BCHM 3050) and for genetics (GEN 3000 or GEN 3020).
5One lecture and associated laboratory must be completed for both animal diversity (BIOL 3020/3060 or BIOL 3030/3070) and/or plant diversity (BIOL 3040/3080, BIOL 3200, or BIOL 4060/4070).
6To be taken the semester prior to EDSC 4470 and 4570. EDSC 4270 and EDLT 4980 must be taken concurrently.
7See General Education Requirements.
8EDSC 4470 and 4570 must be taken concurrently. Offered spring semester only.
9TEACHING AREA:

BIOLOGICAL SCIENCES

Bachelor of Science

Freshman Year

First Semester
3 - BIOL 1030 General Biology I and
1 - BIOL 1050 General Biology Lab. I or
5 - BIOL 1100 Principles of Biology
4 - CH 1010 General Chemistry
2 - ED 1050 Orientation to Education
4 - MTHS 1060 Calculus of One Variable I
15

Second Semester
3 - BIOL 1040 General Biology II and
1 - BIOL 1060 General Biology Lab. II or
5 - BIOL 1110 Principles of Biology II
4 - CH 1020 General Chemistry
2 - ED 1050 Orientation to Education
3 - ENGL 1030 Accelerated Composition
3 - Statistics Requirement1
16

Sophomore Year

First Semester
4 - CH 2010 Survey of Organic Chemistry
3 - HIST 1220 History, Technology and Society or
3 - HIST 1240 Environmental History Survey
3 - PHYS 2070 General Physics I
1 - PHYS 2090 General Physics Lab. I
3 - Arts and Humanities (Literature) Requirement5
3 - Biochemistry or Genetics Requirement4
17

Second Semester
4 - BIOL 3160 Human Physiology
3 - EDF 3350 Adolescent Growth and Development
3 - Arts and Humanities (Non-Lit.) Requirement5
4 - Plant or Animal Diversity Requirement4
16

Third Semester
3 - BIOL 4470 Teaching Internship in Sec. Sci.3
3 - EDSC 4570 Sec. Science Capstone Seminar2
12

Fourth Semester
121-123 Total Semester Hours

1EXST 3010, MTHS 2030, 3010, or 3090
2One lecture course must be completed for both biochemistry (BCHM 3010 or BCHM 3050) and for genetics (GEN 3000 or 3020).
3BIOL 4410, 4430, 4460, or 4700
4One lecture and associated laboratory must be completed for both animal diversity (BIOL 3020/3060 or BIOL 3030/3070) and/or plant diversity (BIOL 3040/3080, BIOL 3200, or BIOL 4060/4070).
5One semester through 2020 in any modern foreign language (including American Sign Language) are required.
6MTHS 2030, 3010, or 3090
7ENGL 2120, 2130, 2140, or 2150
8Two semesters through 2020 in any modern foreign language (including American Sign Language) are required.
9EDSC 4470 and 4570 must be taken concurrently. Offered spring semester only.
College of Health, Education and Human Development

TEACHING AREA: CHEMISTRY

Bachelor of Arts

Freshman Year

First Semester
1 - BIOL 1060 General Biology Laboratory II
3 - BIOL 1040 General Biology II

Second Semester
3 - PHYS 2220 Physics with Calculus III
1 - EDF 3150 Technology Skills for Learning
3 - CH 3300 Introduction to Physical Chemistry
1 - CH 3170 Quantitative Analysis Laboratory
3 - EDF 3020 Educational Psychology
3 - Arts and Humanities (Literature) Requirement

Sophomore Year

First Semester
3 - CH 1100 Principles of Biology I
1 - BIOL 1050 General Biology Laboratory I
3 - MTHS 1080 Calculus of One Variable I
3 - PHYS 1220 Physics with Calculus I
1 - PHYS 1240 Physics Laboratory I
3 - Foreign Language Requirement

Second Semester
3 - PHYS 1240 Physics Laboratory I
3 - PHYS 1220 Physics with Calculus I
4 - MTHS 1080 Calculus of One Variable II
2 - CH 1520 Chemistry Communication I
4 - CH 1020 General Chemistry

Junior Year

First Semester
3 - PHYS 2230 Physics Lab. II
3 - PHYS 2210 Physics with Calculus II
3 - EDF 3350 Adolescent Growth and Development
3 - EDF 3020 Educational Psychology
3 - BIOL 1100 Principles of Biology II
4 - CH 2270 Organic Chemistry
2 - ED 1050 Orientation to Education
3 - COMM 1500 Introduction Human Comm.
4 - CH 1010 General Chemistry

Second Semester
3 - PHYS 2240 Physics Lab. III
1 - EDF (CTE) 3150 Technology Skills for Learning
3 - EDF 3010 Principles of American Education
3 - CH 2050 Intro. to Inorganic Chemistry
3 - MTHS 2030, 3010, 3020, or 3090

Senior Year

First Semester
3 - EDSP 3700 Introduction to Special Education
3 - EDSC 4270 Teaching Secondary Science
3 - EDLT 4980 Secondary Content Area Reading
3 - GEOG 1030 World Regional Geography
3 - Arts and Humanities (Literature) Requirement

Second Semester
3 - CH 4500 Chemistry Capstone
1 - CH 4520 Chemistry Communication II
9 - EDSC 4470 Teaching Internship in Sec. Sci.
3 - EDSC 4570 Sec. Science Capstone Seminar

123–125 Total Semester Hours

Bachelor of Science

Freshman Year

First Semester
4 - CH 1010 General Chemistry
1 - BIOL 1410 Chemistry Orientation
1 - MTHS 1030 Accelerated Composition
4 - MTHS 1060 Calculus of One Variable I
3 - Foreign Language Requirement

Second Semester
4 - CH 1020 General Chemistry
2 - CH 1320 Chemistry Communication I
4 - MTHS 1080 Calculus of One Variable II
3 - PHYS 2210 Physics with Calculus II
1 - PHYS 2230 Physics Laboratory II
3 - Arts and Humanities (Non-Lit.) Requirement

Sophomore Year

First Semester
3 - CH 2230 Organic Chemistry
1 - CH 2270 Organic Chemistry Laboratory
2 - ED 1050 Orientation to Education
3 - HIST 1220 History, Technology, and Society or HIST 1240 Environmental History Survey
3 - PHYS 2210 Physics with Calculus II
1 - PHYS 2230 Physics Laboratory II
3 - Arts and Humanities (Non-Lit.) Requirement

Second Semester
3 - CH 2050 Intro. to Inorganic Chemistry
3 - CH 2240 Organic Chemistry
1 - CH 2280 Organic Chemistry Laboratory
3 - EDF 3010 Principles of American Education
1 - EDF 3150 Technology Skills for Learning
3 - PHYS 2220 Physics with Calculus III

Junior Year

First Semester
3 - BIOL 1030 General Biology I and BIOL 1050 General Biology Laboratory I or BIOL 1100 Principles of Biology I
3 - CH 3130 Quantitative Analysis
1 - CH 3170 Quantitative Analysis Laboratory
3 - CH 3300 Introduction to Physical Chemistry
3 - EDSC 3270 Practicum in Secondary Science

Second Semester
3 - BIOL 1040 General Biology II and BIOL 1060 General Biology Laboratory II or BIOL 1110 Principles of Biology II
3 - BIOL 4820 Laboratory Techniques for Teaching Science
3 - EDF 3020 Educational Psychology
3 - EDF 3350 Adolescent Growth and Develop.
3 - Social Science Requirement

Senior Year

First Semester
3 - EDSP 3700 Introduction to Special Education
3 - EDSC 4270 Teaching Secondary Science
3 - EDLT 4980 Secondary Content Area Reading
3 - COMM 2500 Public Speaking
3 - ENGL 2120, 2130, 2140, or 2150

Second Semester
3 - PHYS 3110 Intro. to Meth. of Theoretical Phys.
3 - PHIL 3240 Philosophy of Technology
3 - ASTR 1020 Stellar Astronomy
3 - EDSC 4570 Sec. Science Capstone Seminar

120–123 Total Semester Hours

College of Health, Education and Human Development

TEACHING AREA: PHYSICS

Bachelor of Arts

Freshman Year

First Semester
4 - CH 1010 General Chemistry
2 - ED 105 Orientation to Education
3 - MTHS 1030 Accelerated Composition
3 - PHYS 1220 Physics with Calculus I
2 - CH 1410 Chemistry Orientation
3 - ENGL 1030 Accelerated Composition
2 - ED 105 Orientation to Education
4 - CH 1010 General Chemistry

Second Semester
9 - EDSC 4470 Teaching Internship in Sec. Sci.
3 - EDSC 4570 Sec. Science Capstone Seminar

12–13 Total Semester Hours

First Semester
4 - CH 1010 General Chemistry
3 - COMM 1500 Introduction Human Comm.
3 - COMM 2500 Public Speaking
2 - ED 1050 Orientation to Education
3 - HIST 1220 History, Technology, and Society or HIST 1240 Environmental History Survey
3 - MTHS 1060 Calculus of One Variable I

Second Semester
4 - CH 1020 General Chemistry
3 - MTHS 1030 Quantitative Analysis
3 - MTHS 1080 Calculus of One Variable II
3 - PHYS 1220 Physics with Calculus I
1 - PHYS 1240 Physics Lab. I

Junior Year

First Semester
3 - ASTR 1050 Physics of the Universe or ASTR 1020 Stellar Astronomy and ASTR 1040 Stellar Astronomy Lab.
3 - CH 3130 Quantitative Analysis
1 - CH 3170 Quantitative Analysis Lab.
3 - CH 3300 Introduction to Physical Chemistry
3 - EDSC 3270 Practicum in Secondary Science
3 - Arts and Humanities (Literature) Requirement

Second Semester
3 - BIOL 1040 General Biology II
1 - BIOL 1060 General Biology Lab. II or 5 - BIOL 1110 Principles of Biology II
3 - CH 2050 Intro. to Inorganic Chemistry
3 - EDF 3010 Principles of American Education
1 - EDF (CTE) 3150 Technology Skills for Learning
3 - PHYS 2220 Physics with Calculus III
1 - PHYS 2240 Physics Lab. III

Senior Year

First Semester
3 - EDSP 3700 Introduction to Special Education
3 - EDSC 4270 Teaching Secondary Science
3 - EDLT 4980 Secondary Content Area Reading
3 - COMM 2500 Public Speaking
3 - ENGL 2120, 2130, 2140, or 2150

Second Semester
9 - EDSC 4470 Teaching Internship in Sec. Sci.
3 - EDSC 4570 Sec. Science Capstone Seminar

12–13 Total Semester Hours

1 - PHYS 2240 Physics Lab. III
3 - BIOL 1100 Principles of Biology II
4 - CH 2270 Organic Chemistry
3 - MTHS 2030, 3010, 3020, or 3090

To be taken the semester prior to EDSC 4470 and 4570. EDSC 4270 and EDLT 4980 must be taken concurrently. Offered spring semester only.

EDSC 4470 and 4570 must be taken concurrently. Offered spring semester only.

To be taken the semester prior to EDSC 4470 and 4570. EDF 4270 and EDLT 4980 must be taken concurrently. Offered fall semester only.

EDSC 4470 and 4570 must be taken concurrently. Offered spring semester only.

To be taken the semester prior to EDSC 4470 and 4570. EDSC 4270 and EDLT 4980 must be taken concurrently. Offered fall semester only.

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To be taken the semester prior to EDSC 4470 and 4570. EDF 4270 and EDLT 4980 must be taken concurrently. Offered fall semester only.

To be taken the semester prior to EDSC 4470 and 4570. EDF 4270 and EDLT 4980 must be taken concurrently. Offered fall semester only.
Second Semester
4 - CH 1020 General Chemistry
4 - MTHS 1080 Calculus of One Variable II
3 - PHYS 2210 Physics with Calculus II
1 - PHYS 2230 Physics Laboratory II
3 - Arts and Humanities (Non-Lit.) Requirement¹
3 - Oral Communication Requirement¹
18

Sophomore Year
First Semester
5 - BIOL 1100 Principles of Biology I or
3 - BIOL 1030 General Biology I and
1 - BIOL 1050 General Biology I Lab.
3 - EDF 3010 Principles of American Education
1 - EDF 3150 Tech. Skills for Learning
4 - MTHS 2080 Intro. to Ordinary Diff. Equations
3 - Social Science Requirement¹
15-16

Second Semester
5 - BIOL 1110 Principles of Biology II or
3 - BIOL 1040 General Biology II and
1 - BIOL 1060 General Biology II Lab.
3 - EDF 3010 Principles of American Education
1 - EDF 3150 Tech. Skills for Learning
4 - MTHS 2080 Intro. to Ordinary Diff. Equations
3 - Foreign Language Requirement²
15

Junior Year
First Semester
3 - ASTR 101 Solar System Astronomy
3 - CH 3300 Intro. to Physical Chemistry or
3 - CH 3310 Physical Chemistry
3 - EDSC 3270 Practicum in Secondary Science
3 - PHYS 3210 Mechanics I
3 - Foreign Language Requirement²
15

Second Semester
3 - BIOL 4820 Lab. Techniques for Teaching Sci.
3 - EDF 3020 Educational Psychology
3 - EDF 3010 Principles of American Education
3 - ENGL 3310 Intro. to the Methods of Theoretical Physics
3 - Foreign Language Requirement²
3 - Social Science Requirement¹
18

Senior Year
First Semester
3 - EDSC 4270 Teaching Secondary Science¹
3 - EDLT 4980 Secondary Content Area Reading¹
3 - PHYS 4110 Electromagnetics I
3 - PHYS 4550 Quantum Physics I
3 - Arts and Humanities (Literature) Requirement¹
15

Second Semester
3 - EDSP 3700 Introduction to Special Education
9 - EDSC 4470 Teaching Internship in Secondary Science⁸
3 - EDSC 4570 Sec. Science Capstone Seminar⁸
127-129 Total Semester Hours¹

SECONDARY EDUCATION
The Bachelor of Arts degree in Secondary Education is available to students preparing to teach English and mathematics on the secondary school level (grades 9–12). The teaching field should be selected as early as possible so appropriate freshman and sophomore courses may be taken.

Each curriculum is a double major composed of the major concentration in the teaching field and the corresponding content major. Specific courses and sequences have been designated to meet requirements for those planning to teach. The professional education courses should be completed in sequence.

TEACHING AREA: ENGLISH
The Bachelor of Arts Degree in Secondary Education—English offers a double major in Secondary Education—English and English.

Freshman Year
First Semester
3 - COMM 1500 Intro. to Human Comm. or
3 - COMM 2500 Public Speaking
2 - ED 1050 Orientation to Education
3 - ENGL 1030 Accelerated Composition
3 - Mathematics Requirement²
14

Second Semester
3 - BIOL 2000 Biology in the News³
3 - ENGL 1100 World Literature
3 - HIST 1730 The West and the World II
4 - Natural Science Requirement²
16

Sophomore Year
First Semester
3 - EDSC 3010 Principles of American Education
3 - EDSC 3020 Educational Psychology
3 - ENGL 3100 Critical Writing About Literature
3 - Arts and Humanities (Non-Lit.) Req.⁴
3 - English Literature Survey Requirement⁵
15

Second Semester
1 - EDSC (CITE) 3150 Technology Skills for Learning
3 - EDSC 3350 Adolescent Growth and Development
3 - ENGL 3860 Adolescent Literature⁶
3 - English Literature Survey Requirement⁵
3 - HIST 3600 American Social History or
3 - HIST 3610 History of England to 1688 or
3 - HIST 3630 Britain Since 1688 or
3 - HIST 3650 British Cultural History
3 - Fine Arts Requirement⁷
16

Junior Year
First Semester
3 - EDSC 3240 Prac. in Teaching Secondary Eng.⁸
2 - ENGL 3000 Professional Development
3 - ENGL 4110 Shakespeare
3 - English Literature Survey Requirement⁵
3 - Literature Emphasis Area Requirement⁹
3 - Literature Emphasis Area Diversity Req.¹⁰
17

Second Semester
3 - English Literature Survey Requirement⁵
3 - Literary Theory Requirement¹¹
3 - Literature Emphasis Area Requirement II¹²
3 - Literature Emphasis Area Requirement III¹³
3 - Social Science Requirement³
15

Senior Year
First Semester
3 - EDSP 3700 Introduction to Special Education¹⁴
3 - EDSC 4240 Teaching Secondary English¹⁴
3 - ENGL 4850 Composition for Teachers¹⁴
1 - ENGL (EDSEC) 4850 English Senior Seminar
1 - EDLT 4980 Secondary Content Area Reading¹⁴
15

Second Semester
1 - ED 4250 Instructional Technology Strategies¹⁵
9 - EDSC 4440 Teaching Intern. in Secondary Eng.¹¹
3 - EDSC 4540 Secondary English Capstone Sem.¹⁵
13

121 Total Semester Hours
¹Two semesters (through 2020) in any modern foreign language are required.
²See General Education Requirements.
³Any other course related to science or mathematics that satisfies the General Education STS requirement may be substituted.
⁴Select from PHIL 1010, 1020, or 1030.
⁵Select from ENGL 3960, 3970, 3980, or 3990.
⁶This course qualifies as a Literature Emphasis Area Requirement for a BA in English.
⁷ENGL 3570 is required.
⁸Students must complete 45 hours of field experience in a public school.
⁹Select from ENGL 4030, 4070, 4080, 4100, 4120, 4290, 4440, or 4630.
¹⁰Select from ENGL 3530, 3800, 4900, (HUM) 4560, 4820, or 4830.
¹¹Select from ENGL 4350, 4360, 4400, or 4420, or other course approved by the department.
¹²Select from ENGL 4150, 4160, 4180, 4210, 4250, 4260, or 4640.
¹³Select from ENGL 4280, (THEA) 4300, 4310, 4320, 4330, 4340, 4550, or 465.
¹⁴EDSP 3700, EDSC 4240, ENGL (EDSEC) 4850, and EDLT 4980 must be taken concurrently during fall semester of senior year. Students must also enroll in the laboratory sections of EDSC 4240 and EDLT 4980.
¹⁵EDF 4250, EDSC 4440, and 4540 must be taken concurrently during spring semester of senior year.
TEACHING AREA: MATHEMATICS
The Bachelor of Arts degree in Secondary Education—Mathematics offers a double major in Secondary Education—Mathematics and Mathematical Sciences. To be recommended for certification, students must earn a C or higher in all mathematics content courses.

Bachelor of Arts
Freshman Year
First Semester
2 - ED 1050 Orientation to Education
3 - ENGL 1030 Accelerated Composition
4 - MTHS 1060 Calculus of One Variable I
3 - Foreign Language Requirement
4 - Natural Science Requirement

Second Semester
4 - MTHS 1080 Calculus of One Variable II
3 - MTHS 1190 Intro to Discrete Methods or
3 - MTHS 1290 Problem Solving in Discrete Math.
3 - PHIL 1020 Introduction to Logic
3 - PHYS 1220 Physics with Calculus I
1 - PHYS 1240 Physics Laboratory I
3 - Foreign Language Requirement

Sophomore Year
First Semester
3 - ECON 2000 Economic Concepts or
3 - ECON 2110 Principles of Microeconomics
3 - EDSC 2260 A Prof. Approach to Sec. Algebra
3 - HIST 1020 History of the United States
4 - MTHS 2060 Calculus of Several Variables
1 - MTHS 2500 Intro to Mathematical Sciences
3 - Computer Science Requirement

Second Semester
3 - EDF 3020 Educational Psychology
1 - MTHS 1290 Problem Solving in Discrete Math.
3 - PHIL 1020 Introduction to Logic
3 - PHYS 1220 Physics with Calculus I
1 - PHYS 1240 Physics Laboratory I
3 - Foreign Language Requirement

Junior Year
First Semester
3 - PO SC 1010 American National Government
3 - HIST 1720 The West and the World I
3 - EDF 3020 Educational Psychology
3 - HIST 1010 History of the United States
3 - HIST 1720 The West and the World I
3 - PO SC 1010 American National Government

Second Semester
1 - EDF (CTE) 3150 Technology Skills for Learning
1 - EDF 3350 Adolescent Growth and Development
3 - EDSC 3280 Practicum in Secondary Social Studies

Senior Year
First Semester
3 - COMM 2500 Public Speaking
1 - EDF 4250 Instructional Technology Strategies
3 - EDLT 4980 Secondary Content Area Reading
3 - EDSC 4260 Teaching Secondary Mathematics
3 - MTHS 4080 Topics in Geometry
3 - MTHS 4530 Advanced Calculus I

Second Semester
9 - EDSC 4460 Teaching Internship in Secondary Mathematics
125 Total Semester Hours
*Two semesters (through 2020) in any modern foreign language (including American Sign Language) are required.
*See General Education Requirements.
*CPSC 1010, 1110, or 1200
*ENGL 2120, 2130, 2140, or 2150
*EDF 4250, EDSC 4260, and EDLT 4980 must be taken concurrently prior to the teaching internship. Offered fall semester only.
*EDSC 4460 and 4560 must be taken concurrently. Offered spring semester only.

TEACHING AREA: SOCIAL STUDIES (HISTORY)
The Bachelor of Arts Degree in Secondary Education—Social Studies (History) offers a double major in Secondary Education—Social Studies (History) and History.

Freshman Year
First Semester
3 - EDF 1050 Orientation to Education
3 - ENGL 1030 Accelerated Composition
3 - MTHS 100 Essential Math. for Informed Soc.
3 - Foreign Language Requirement
4 - Natural Science Requirement

Second Semester
3 - ANTH 1010 Introduction to Anthropology
3 - BIOL 2000 Biology in the News
3 - ENGL 2140 American Literature
3 - GEOG 1010 Introduction to Geography
3 - PSYC 2010 Introduction to Psychology
3 - Foreign Language Requirement

Junior Year
First Semester
3 - EDF 3010 Principles of American Education
3 - EDSC 3260 Practicum in Secondary Math.
3 - MTHS 3020 Statistics for Science and Engr.
3 - MTHS 4000 Theory of Probability
3 - Cross-Cultural Awareness Requirement

Second Semester
3 - EDF 3350 Adolescent Growth and Development
3 - EDSP 3700 Introduction to Special Education
3 - EDSC 4370 Technology in Secondary Math.
3 - MTHS 4080 Topics in Geometry
3 - MTHS 4120 Introduction to Modern Algebra

Second Semester
1 - EDF (HIST) 3200 History of U.S. Public Educ.
3 - EDF 3350 Adolescent Growth and Development
3 - EDSC 3280 Practicum in Secondary Social Studies
9 - Teaching Major
18

Senior Year
First Semester
3 - EDF 4250 Instructional Technology Strategies
3 - EDSP 3700 Introduction to Special Education
3 - EDSC 4580 Secondary Social Studies
3 - EDSC 4280 Teaching Secondary Social Studies
3 - EDLT 4980 Secondary Content Area Reading
3 - HIST 4900 Senior Seminar
3 - Advanced Humanities Requirement

Second Semester
9 - EDSC 4480 Teaching Internship in Secondary Social Studies
3 - EDSC 4580 Secondary Social Studies
Capstone Seminar

12
129 Total Semester Hours
*Two semesters (through 2020) in any modern foreign language, including American Sign Language, are required.
*See General Education Requirements.
*Any other course related to science or mathematics that satisfies the General Education STS requirement may be substituted.
*Select from AAH 2120, MUSC 2120, THEA 2120, or any AAH, COMM (except 3640, 3680), ENGL (except 3040, 3120, 3140, 3160, 3310, 3350, 4850, 4900, 4950), HUM, MUSC, PHIL, REL, THEA (except 3770, 4670, 4970), WS, or foreign language course numbered 3000 or higher.
*See advisor. Students must complete a minimum of three hours each of United States history and European history, and six hours of non-Western history selected from 3000- or 4000-level HIST courses. At least one course must be at the 4000 level.
*EDF 4250, EDSC 4260, HIST 4900, and EDLT 4980 must be taken concurrently in the fall semester of the senior year.
*EDSC 4480 and 4580 must be taken concurrently. Offered spring semester only.
SPECIAL EDUCATION

Bachelor of Arts

The Bachelor of Arts degree in Special Education prepares students to teach individuals with mild disabilities in grades P–12. The curriculum is designed to meet the competencies outlined by the Council for Exceptional Children for beginning special education teachers. Students completing the program receive instruction and practical experiences that lead to Multi-Categorical Special Education Certification in South Carolina.

Freshman Year
First Semester
2 - ED 1050 Orientation to Education
3 - ENGL 1300 Environmental History Survey or
3 - HIST 1220 History, Technology, and Society
3 - MATH 1150 Contemporary Mathematics for Elementary School Teachers I
3 - Foreign Language Requirement1
4 - Natural Science Requirement2

Second Semester
3 - ENGL 1030 Accelerated Composition
3 - GEOG 1030 World Regional Geography
3 - MATHS 1160 Contemporary Mathematics for Elementary School Teachers II
3 - Foreign Language Requirement1
4 - Natural Science Requirement2

Sophomore Year
First Semester
3 - EDF 3010 Principles of American Education
3 - EDSP 3700 Introduction to Special Education
3 - MATH 2160 Geometry for Elementary School Teachers
3 - Arts and Humanities (Literature) Requirement1
4 - Natural Science Requirement2

Second Semester
3 - COMM 1500 Intro. to Human Comm. or
3 - COMM 2500 Public Speaking
3 - EDF 3020 Educational Psychology
3 - EDF 3340 Child Growth and Development or
3 - EDF 3350 Adolescent Growth and Dev.
3 - Arts and Humanities (Non-Lit.) Requirement1
3 - History Requirement1

Junior Year
First Semester
3 - EDEL 3100 Arts in the Elementary School
3 - EDPT 4600 Teaching Reading in the Elementary Grades: 2–6
3 - EDPT 4800 Foundations of Digital Media and Learning
3 - EDSP 3720 Char. and Instruction of Individuals with Learning Disabilities6
3 - EDSP 3740 Char. and Strat. for Individuals with Emotional/Behavioral Disabilities6

Second Semester
3 - EDEL 4510 Elem. Meth. in Science Teaching’
3 - EDEL 4870 Elementary Methods in Social Studies Teaching’
3 - EDSP 3730 Characteristics and Instruction of Individuals with Intellectual Disabilities and Autism1
3 - EDSP 3750 Early Intervention Strategies for Young Children with Special Needs7
3 - EDSP 4910 Educational Assessment of Individuals with Disabilities7
— 15

Senior Year
First Semester
3 - EDSP 4920 Mathematics Instruction for Individuals with Mild Disabilities6
3 - EDSP 4930 Classroom and Behavior Management for Special Educators6
3 - EDSP 4940 Teaching Reading to Students with Mild Disabilities6
3 - EDSP 4960 Special Education Field Experiences12
3 - EDSP 4970 Secondary Methods for Individuals with Disabilities6
— 15

Second Semester
3 - EDSP 4950 Communication and Collaboration in Special Education6
12 - EDSP 4980 Directed Teaching in Special Ed.9

122 Total Semester Hours

*Two semesters (through 2020) in the same modern foreign language (including American Sign Language) are required.

**See General Education Requirements. Eight credit hours must be in a sequence. Biological and physical sciences must be represented. PHSC 1070, 1080, and BIOL 1090 are recommended.

†ENGL 2120, 2130, 2140, or 2150.

‡See General Education Requirements.

§HIST 1010, 1020, 1720, or 1730, or 1930.

¶EDPT 4600 and EDSP 3720 and 3740 must be taken concurrently during the fall semester of junior year.

‖EDPT 3750 and 3780, EDSP 3730, 3750, and 3790, and EDTP 4600 must be taken concurrently during the spring semester of the junior year.

¶¶EDSP 4970, 4980, and 4980 must be taken concurrently during the spring semester of the senior year.

HEALTH SCIENCE

Bachelor of Science

The Department of Public Health Sciences prepares students for careers in the health field, one of the largest industries in the United States. It includes hospitals and other medical service providers, public health organizations, health insurance companies, health/medical related sales, health fitness organizations, and community and nonprofit health agencies.

Plans of study can be arranged in health promotion and education, health services administration, leadership for cardiovascular technology, and preprofessional health studies. Students in the Health Promotion and Education Concentration have the skills to assess, plan, communicate, implement, manage, and evaluate public health promotion programs. Students in the Preprofessional Health Studies Concentration obtain the coursework and experience necessary for acceptance into various graduate programs in clinical health professions. The Cardiovascular Imaging Leadership Concentration provides a core of health science classes, training in diagnostic cardiovascular sonography, and a leadership certificate. The Health Services Administration Concentration allows students to develop skills and competencies in health administration/management for entry-level careers or graduate study in this area. A minor in Business Administration is integral to the concentration.

The department, in cooperation with the College of Architecture, Arts and Humanities, also offers a joint Bachelor of Science degree in Language and International Health (see pages 68-69).

When space is available, students with fewer than 50 credit hours earned may apply to change majors into Health Science with a minimum cumulative grade-point average of 2.25. Students with 50 or more credit hours may apply for a change-of-major into Health Science when space is available based on the following restrictions:

- completion of the Health Science Mathematics and Statistics Requirements and the General Education Natural Science Requirement
- minimum cumulative grade-point average of 2.5
- submission of a 1–3-page document detailing why the applicant desires to major in Health Science and how this major would support his/her career goals

Additional information is available at www.ched.clemson.edu/PublicHealth/index.htm.

HEALTH PROMOTION AND EDUCATION CONCENTRATION

Freshman Year
First Semester
3 - BIOL 1030 General Biology I and
1 - BIOL 1050 General Biology Lab, I or
5 - BIOL 1100 Principles of Biology I
3 - HLTH 2020 Introduction to Public Health
3 - PSYC 2010 Introduction to Psychology
3 - SOC 2010 Introduction to Sociology
1 - Elective
14-15

Second Semester
3 - ENGL 1030 Accelerated Composition
3 - HLTH 2030 Overview of Health Care Systems
3 - PSYC 2030 Principles of Human Nutrition
3 - Guided Requirement3
4 - Elective
16-17

Sophomore Year
First Semester
4 - CH 1010 General Chemistry or
4 - CH 1050 Chemistry in Context I
3 - HLTH 2980 Human Health and Disease
3 - NUTR 2030 Principles of Human Nutrition
3 - Statistics Requirement4
— 15
### Second Semester
1. CH 1020 General Chemistry or CH 1060 Chemistry in Context II
2. COMM 1500 Intro. to Human Comm. or COMM 2500 Public Speaking
3. HLTH 2400 Determinants of Health Behavior
4. HLTH 3980 Health Appraisal Skills
5. HLTH 3400 Lifespan Developmental Psych.

### Junior Year
#### First Semester
1. BIOL 2220 Human Anatomy and Phys. I
2. HLTH 4190 Health Science Internship Preparation Seminar
3. HLTH 4800 Community Health Promotion
4. HLTH 4900 Research and Evaluation Strategies for Public Health
5. Arts and Humanities (Non-Lit.) Requirement
6. Elective

#### Second Semester
1. BIOL 2230 Human Anatomy and Phys. II
2. HLTH 4190 Health Science Internship
3. Arts and Humanities (Non-Lit.) Requirement
4. Elective

### Senior Year
#### First Semester
1. HLTH 4200 Health Science Internship
2. Health Requirement
3. Elective

#### Second Semester
1. Arts and Humanities (Literature) Requirement
2. Guided Requirement
3. Health Requirement
4. Elective

### Notes:
- A minimum grade-point average of 2.0 is required for registration in each HLTH course.
- Students who wish to pursue preprofessional options should take CH 1010 and 1020.
- Internship may be done fall, spring, or summer after completing HLTH 4190.

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### HEALTH SERVICES ADMINISTRATION CONCENTRATION

#### Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 - ECON 2110 Principles of Microeconomics</td>
</tr>
<tr>
<td>3 - HLTH 2020 Introduction to Public Health</td>
</tr>
<tr>
<td>4 - Natural Science Requirement</td>
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<tr>
<td>3 - Social Science Requirement</td>
</tr>
<tr>
<td>2 - Elective</td>
</tr>
</tbody>
</table>

#### Second Semester

| 3 - ECON 2120 Principles of Macroeconomics |
| 3 - ENGL 1030 Accelerated Composition |
| 3 - HLTH 2030 Overview of Health Care Systems |
| 3 - Guided Requirement |
| 3 - Mathematics Requirement |

#### Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
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<tbody>
<tr>
<td>3 - ACCT 2010 Financial Accounting Concepts</td>
</tr>
<tr>
<td>3 - CRD (APEC, HLTH) 3610 Introduction to Health Care Economics</td>
</tr>
<tr>
<td>3 - HLTH 2980 Human Health and Disease</td>
</tr>
<tr>
<td>3 - Health Requirement</td>
</tr>
<tr>
<td>3 - Statistics Requirement</td>
</tr>
</tbody>
</table>

#### Second Semester

| 3 - COMM 1500 Intro. to Human Comm. or COMM 2500 Public Speaking |
| 3 - HLTH 2400 Determinants of Health Behavior |
| 3 - MGT 2010 Principles of Management |
| 3 - Guided Requirement |
| 3 - Social Science Requirement |

#### Junior Year

<table>
<thead>
<tr>
<th>First Semester</th>
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</thead>
<tbody>
<tr>
<td>3 - HLTH 3800 Epidemiology</td>
</tr>
<tr>
<td>3 - HLTH 3400 Health Promotion Program Planning</td>
</tr>
<tr>
<td>3 - HLTH 3030 Public Health Communication</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 - BIOL 2220 Human Anatomy and Physiology II</td>
</tr>
<tr>
<td>3 - CH 1010 and 1020.</td>
</tr>
</tbody>
</table>

### Notes:
- A minimum grade-point average of 2.0 is required for registration in each HLTH course.
Junior Year
First Semester
4 - CVT 3250 Echocardiography Principles
4 - CVT 3350 Vascular Sonography Principles
3 - HLTH 3800 Epidemiology
3 - Arts and Humanities (Literature) Requirement¹
14
Second Semester
4 - CVT 3260 Echocardiography Methods
4 - CVT 3360 Vascular Sonography Methods
3 - HEHD 4100 Leadership Behavior and Civil Engagement
3 - HLTH 4900 Research and Evaluation Strategies for Public Health
3 - Arts and Humanities (Non-Lit.) Requirement¹
17
Summer
6 - CVT 4240 CVS Field Experience I

Senior Year
First Semester
6 - CVT 4230 CVS Field Experience II
3 - HEHD 4200 Leadership Appl. and Experience
3 - Social Sciences Requirement¹
12
Second Semester
6 - CVT 4260 CVS Field Experience III
3 - Health Requirement⁴
3 - Elective⁶
12
125–128 Total Semester Hours
¹See General Education Requirements. Six of these credits must also satisfy the Cross-Cultural Awareness and Science and Technology in Society Requirements.
²MTHS 1010, 1020, or 1060
³EXST 3010, MTHS 2030, 3010, or 3090
⁴Any HLTH course not otherwise required.
⁵Note: A minimum grade-point average of 2.0 is required for registration in each HLTH course.

PREPROFESSIONAL HEALTH STUDIES CONCENTRATION

Freshman Year
First Semester
3 - BIOL 1030 General Biology I and
1 - BIOL 1050 General Biology Lab. I or
5 - BIOL 1100 Principles of Biology I
4 - CH 1010 General Chemistry
3 - HLTH 2020 Introduction to Public Health
3 - Social Science Requirement¹
14-15
Second Semester
3 - BIOL 1040 General Biology II and
1 - BIOL 1060 General Biology Lab. II or
5 - BIOL 1110 Principles of Biology II
4 - CH 1020 General Chemistry
3 - ENGL 1030 Accelerated Composition
3 - HLTH 2030 Overview of Health Care Systems
3 - Mathematics Requirement¹
17-19

Sophomore Year
First Semester
4 - BIOL 2220 Human Anatomy and Phys. I
3 - HLTH 2980 Human Health and Disease
3 - Guided Requirement¹
3 - Health Requirement⁴
3 - Statistics Requirement⁵
16
Second Semester
4 - BIOL 2230 Human Anatomy and Phys. II
3 - COMM 1500 Intro. to Human Comm. or
3 - COMM 2500 Public Speaking
3 - HLTH 2400 Determinants of Health Behavior
3 - Social Science Requirement¹
3 - Elective⁶
16
Junior Year
First Semester
3 - HLTH 3800 Epidemiology
3 - PHYS 2070 General Physics I
1 - PHYS 2000 General Physics I Lab.
4 - Guided Requirement¹
3 - Health Requirement⁴
1 - Elective⁶
15
Second Semester
1 - HLTH 4190 Health Science Internship
3 - HLTH 4910 Health Science Internship Preparation Seminar
3 - HLTH 4900 Research and Evaluation Strategies for Public Health
3 - PHYS 2980 General Physics II
1 - PHYS 2090 General Physics II Lab.
3 - Arts and Humanities (Non-Lit.) Requirement¹
4 - Guided Requirement¹
15
Senior Year
First Semester
5 - HLTH 4400 Health Science Internship²
3 - Arts and Humanities (Literature) Requirement¹
3 - Health Requirement⁴
3 - Elective⁶
15
Second Semester
3 - Guided Requirement¹
3 - Health Requirement⁴
7 - Elective⁶
13
120–123 Total Semester Hours
¹See General Education Requirements. Six of these credit hours must also satisfy the Cross-Cultural Awareness and Science and Technology in Society Requirements.
²MTHS 1010, 1020, or 1060
³Any HLTH course not otherwise required.
⁴Note: A minimum grade-point average of 2.0 is required for registration in each HLTH course.

LANGUAGE AND INTERNATIONAL HEALTH

Bachelor of Science
The Language and International Health program is administered by the College of Architecture, Arts and Humanities and the College of Health, Education and Human Development. See page 68 for the curriculum.

NURSING

Bachelor of Science
The Bachelor of Science degree program in Nursing prepares students for professional nursing practice in a variety of settings, such as hospitals, industry, clinics, and public health agencies. During the first two years, emphasis is on liberal arts and basic science courses arranged to provide a foundation for the nursing major. Junior and senior courses emphasize the study of nursing. Clinical nursing experiences, guided by the Nursing faculty, involve acute and community-based settings. Students are responsible for their own transportation to clinical laboratory experiences, which may extend throughout the Upstate.

Throughout the clinical laboratory period, Nursing majors are required to carry current, valid student nurses' professional liability insurance with minimum limits of liability of $1,000,000 per occurrence and $6,000,000 in aggregate. Documentation of such coverage must be provided to the Director of the School of Nursing. No student may participate in clinical learning activities without this insurance coverage.

To comply with clinical agency contract requirements and South Carolina law, students enrolled in nursing courses with a clinical laboratory must meet specific requirements listed in the School of Nursing Student Handbook at www.clemson.edu/health/nursing.

The School of Nursing programs are accredited by the CCNE (Commission on Collegiate Nursing Education), One Dupont Circle NW, Suite 530, Washington, DC 20036-1120.

Entrance Requirements
To facilitate admission of students who can achieve at an appropriate level in the program, admission is selective. Consideration is given to performance in secondary school and on the College Board Examination (SAT). Those seeking admission are advised to apply to the University early in the fall of the senior year in high school.

Transfer admission is competitive. Students are encouraged to apply early to the Office of Admissions. The University admits ten new transfer students to the Nursing major during the fall semester only. Potential students should have a minimum grade point average of 3.0 and completion of 30 semester hours of transferable courses. Placement in the Nursing curriculum will be determined after credit evaluation is completed.

Students may change majors into Nursing based on approval of an Admissions Committee in the School of Nursing. Applications are accepted each year during January with a deadline of January 31.
Decisions are made by February 28. Change-of-major students will have a start date of the following January into upper division (junior-level) nursing courses. Applicants should meet the following requirements prior to the semester of application: a minimum cumulative grade-point average of 2.75, completion of a minimum of two required sciences in the Nursing curriculum with a C or better. Selection priority is based on grade-point average and number of completed nursing prerequisites. Students are allowed to apply only twice. Information regarding the admission process to the Accelerated Second Degree nursing program can be found on the School of Nursing website.

Detailed information is available from the Academic Advising Center in 309 Edwards Hall or at www.clemson.edu/hehd/nursing.

### Freshman Year

#### First Semester
- BIOL 1030 General Biology I (3)
- BIOL 1050 General Biology Lab. I (1)
- COMM 1500 Intro. to Human Comm. or COMM 2500 Public Speaking (3)
- NURS 1020 Nursing Success Skills (2)
- NURS 1400 Computer Appl. in Health Care (3)
- SOCI 1010 Introduction to Sociology (3)

#### Second Semester
- CH 1010 General Chemistry I (4)
- ENGL 1030 Accelerated Composition (3)
- MTHS 2030 Elementary Statistical Inference (3)
- PSYC 1010 Introduction to Psychology (3)
- Arts and Humanities (Non-Lit.) Requirement (3)

### Sophomore Year

#### First Semester
- BIOL 2220 Human Anatomy and Phys. I (4)
- MICRO 2050 Introductory Microbiology (4)
- NURS (HCG) 3330 Health Care Genetics (3)
- Arts and Humanities (Literature) Requirement (3)

#### Second Semester
- BIOL 2230 Human Anatomy and Phys. II (4)
- NURS 3200 Professionalism in Nursing (3)
- NURS (HCG) 3330 Health Care Genetics (3)
- Cross-Cultural Awareness Requirement (3)

### Junior Year

#### First Semester
- ENGL 3040 Business Writing or ENGL 3140 Technical Writing (3)
- ENGL 3150 Scientific Writing and Comm. (3)
- NURS 3040 Pathophysiology for Health Care Professionals (3)
- NURS 3100 Health Assessment (4)
- NURS 3120 Medical-Surgical I: Foundations of Nursing (3)
- NURS 3400 Pharmacotherapeutic Nursing Interventions (3)

#### Second Semester
- NURS 3300 Research in Nursing (3)
- NURS 3110 Health Promo. Across the Lifespan (3)
- NURS 3230 Gerontology Nursing (3)
- NURS 3300 Research in Nursing (3)

### Senior Year

#### First Semester
- NURS 4010 Mental Health Nursing (5)
- NURS 4110 Nursing Care of Children (5)
- NURS 4120 Nursing Care of Women and Their Families (5)

#### Second Semester
- NURS 4030 Medical-Surgical III: Complex Nursing of Adults (5)
- NURS 4100 Leadership Management and Nursing Care Practicum (5)
- NURS 4140 Community Health Nursing and Health Promotion or NURS 4150 Community Health Nursing (5)

#### Total Semester Hours
- 123 or 125

### Sophomore Year

#### First Semester
- BIOL 2220 Human Anatomy and Phys. I (4)
- MICRO 2050 Introductory Microbiology (4)
- NURS (HCG) 3330 Health Care Genetics (3)
- Arts and Humanities (Literature) Requirement (3)

#### Second Semester
- BIOL 2230 Human Anatomy and Phys. II (4)
- Nutrition Requirement (3)
- Oral Communication Requirement (3)
- Elective (3)

### Junior Year

#### First Semester
- NURS 3030 Medical-Surgical II: Nursing of Adults (5)
- NURS 3190 Health Assessment for RNs (2)
- Elective (2)

#### Second Semester
- NURS 3300 Research in Nursing (3)
- NURS 3050 Psychosocial Nursing (3)
- NURS 3110 Health Promo. Across the Lifespan (3)
- NURS 3230 Gerontology Nursing (3)
- NURS 3300 Research in Nursing (3)

#### Total Semester Hours
- 15 or 17

### Registered Nurse BS Completion Program

The RN/BS curriculum offers an individualized study option for the registered nurse to obtain a baccalaureate degree in Nursing. Credits may be earned through an accelerated program of study, combining transfer credits for selected courses from accredited institutions of higher learning, credit by examination for previously completed nursing courses, and enrollment in courses at Clemson University. Qualified students may take up to six hours of graduate courses towards the master’s degree in Nursing. Registered nurses interested in pursuing a baccalaureate degree should contact the School of Nursing for curriculum requirements. This program is offered at the University Center of Greenville.

### Freshman Year

#### First Semester
- BIOL 1030 General Biology I (3)
- BIOL 1050 General Biology Lab. I (1)
- COMM 1500 Intro. to Human Comm. or COMM 2500 Public Speaking (3)
- NURS 1020 Nursing Success Skills (2)
- NURS 1400 Computer Appl. in Health Care (3)
- SOCI 1010 Introduction to Sociology (3)

#### Second Semester
- CH 1010 General Chemistry I (4)
- ENGL 1030 Accelerated Composition (3)
- MTHS 2030 Elementary Statistical Inference (3)
- PSYC 1010 Introduction to Psychology (3)
- Arts and Humanities (Non-Lit.) Requirement (3)

### Sophomore Year

#### First Semester
- BIOL 2220 Human Anatomy and Phys. I (4)
- MICRO 2050 Introductory Microbiology (4)
- NURS (HCG) 3330 Health Care Genetics (3)
- Arts and Humanities (Literature) Requirement (3)

#### Second Semester
- BIOL 2230 Human Anatomy and Phys. II (4)
- Nutrition Requirement (3)
- Oral Communication Requirement (3)
- Elective (3)

### Junior Year

#### First Semester
- NURS 3030 Medical-Surgical II: Nursing of Adults (5)
- NURS 3190 Health Assessment for RNs (2)
- Elective (2)

#### Second Semester
- NURS 3300 Research in Nursing (3)
- NURS 3050 Psychosocial Nursing (3)
- NURS 3110 Health Promo. Across the Lifespan (3)
- NURS 3230 Gerontology Nursing (3)
- NURS 3300 Research in Nursing (3)

#### Total Semester Hours
- 15 or 17

### Registered Nurse BS Completion Program

The RN/BS curriculum offers an individualized study option for the registered nurse to obtain a baccalaureate degree in Nursing. Credits may be earned through an accelerated program of study, combining transfer credits for selected courses from accredited institutions of higher learning, credit by examination for previously completed nursing courses, and enrollment in courses at Clemson University. Qualified students may take up to six hours of graduate courses towards the master’s degree in Nursing. Registered nurses interested in pursuing a baccalaureate degree should contact the School of Nursing for curriculum requirements. This program is offered at the University Center of Greenville.

### Freshman Year

#### First Semester
- BIOL 1030 General Biology I (3)
- BIOL 1050 General Biology Lab. I (1)
- COMM 1500 Intro. to Human Comm. or COMM 2500 Public Speaking (3)
- NURS 1020 Nursing Success Skills (2)
- NURS 1400 Computer Appl. in Health Care (3)
- SOCI 1010 Introduction to Sociology (3)

#### Second Semester
- CH 1010 General Chemistry I (4)
- ENGL 1030 Accelerated Composition (3)
- MTHS 2030 Elementary Statistical Inference (3)
- PSYC 1010 Introduction to Psychology (3)
- Arts and Humanities (Non-Lit.) Requirement (3)

### Sophomore Year

#### First Semester
- BIOL 2220 Human Anatomy and Phys. I (4)
- MICRO 2050 Introductory Microbiology (4)
- NURS (HCG) 3330 Health Care Genetics (3)
- Arts and Humanities (Literature) Requirement (3)

#### Second Semester
- BIOL 2230 Human Anatomy and Phys. II (4)
- Nutrition Requirement (3)
- Oral Communication Requirement (3)
- Elective (3)

### Junior Year

#### First Semester
- NURS 3030 Medical-Surgical II: Nursing of Adults (5)
- NURS 3190 Health Assessment for RNs (2)
- Elective (2)

#### Second Semester
- NURS 3300 Research in Nursing (3)
- NURS 3050 Psychosocial Nursing (3)
- NURS 3110 Health Promo. Across the Lifespan (3)
- NURS 3230 Gerontology Nursing (3)
- NURS 3300 Research in Nursing (3)
PARKS, RECREATION AND TOURISM MANAGEMENT

Bachelor of Science

The Department of Parks, Recreation and Tourism Management prepares students for a variety of careers in public and private leisure services. The curriculum provides a broad exposure to the management of leisure service programs and resources, such as those for municipalities, institutions, voluntary and youth-serving agencies, management positions within the travel and tourism industry and as resource managers of local, state, and federal parks and related lands and waters.

The curriculum allows students to select from five concentrations. This latitude permits accommodation of each student's career objectives in positions in community recreation, sport management, recreation programming, cultural arts management, commercial recreation, wilderness management, nature interpretation, park management, historic site management, rehabilitation services, leisure counseling, camp administration, recreation therapy, programs for people with disabilities or senior citizens, travel industry, resort management, convention and visitor bureaus, theme parks, community tourism, and special event/festival planning, to name a few.

The Parks, Recreation and Tourism Management program is accredited by the National Council on Accreditation (National Recreation and Park Association/Council on Postsecondary Accreditation). Graduates are immediately eligible to apply to become "Certified Park and Recreation Professionals," a valuable credential for professional advancement.

When space is available, a student may change majors to one of the degree concentrations in the Department of Parks, Recreation and Tourism Management with a 2.0 cumulative grade-point average and approval of the department chair or his/her designee. Students are encouraged to speak with the PRTM advisor about changing their major prior to the start of their sophomore year to avoid a delay in graduation due to course sequencing and course prerequisite requirements.

Graduate degrees offered are Master of Parks, Recreation and Tourism Management; Master of Science; and Doctor of Philosophy.

COMMUNITY RECREATION, SPORT AND CAMP MANAGEMENT CONCENTRATION

The Community Recreation, Sport and Camp Management (CRSCM) Concentration prepares students for careers in community recreation, amateur athletics, and camp management by developing theoretical, conceptual, and applied knowledge bases necessary for success in its diverse field. The focus of this program is on community, family, and individual development. Career opportunities include, but are not limited to, community recreation programming, community athletic programming, camp administration, facility operation and management, special events, campus recreation, and fitness and wellness programming.

Freshman Year

First Semester
1 - PRTM 1980 Creative Inquiry—PRTM I
2 - CU 1010 University Success Skills
3 - Mathematics or Natural Science Requirement
15

Second Semester
1 - PRTM 2000 Profession and Practice in PRTM
2 - PRTM 2290 Distributed Competency
3 - ENGL 1030 Accelerated Composition
12

Sophomore Year

First Semester
1 - PRTM 2070 Practicum II
2 - Elective
15

Second Semester
1 - PRTM 2200 Conceptual Foundations of PRTM
2 - PRTM 2270 Provision of Leisure Service Exp.
3 - PRTM 2260 Found. of Mgt., Administration
15

Junior Year

First Semester
2 - PRTM 3980 Creative Inquiry—PRTM III
1 - PRTM 4040 Field Training I
12 - Concentration Requirement
15

Second Semester
1 - PRTM 4980 Creative Inquiry—PRTM IV
12 - Concentration Requirement
15

Summer
6 - PRTM 4050 Field Training II

Senior Year

First Semester
12 - Concentration Requirement
15

Second Semester
6 - Elective

122 Total Semester Hours

Notes:
1See advisor.
2MTHS 2030 or other course approved by department.
3See General Education Requirements. Three of these credit hours must also satisfy the Cross-Cultural Awareness Requirement.
4This course is exempt if the student achieves a B or better in NURS 4060.
5ENGL 3040, 3140, or 3150

Notes:
1. Students must achieve a C or better in all required science and nursing courses.
2. A minimum grade-point average of 2.5 is required in all nursing courses for progression to the next level. Students may repeat a nursing course one time only. A student who does not maintain a 2.5 or better GPR in the curriculum will not be permitted to continue in the Nursing major.
3. Students must pass didactic and clinical components to pass all clinical courses.

PARKS, RECREATION AND TOURISM MANAGEMENT

Bachelor of Science

The Department of Parks, Recreation and Tourism Management prepares students for a variety of careers in public and private leisure services. The curriculum provides a broad exposure to the management of leisure service programs and resources, such as those for municipalities, institutions, voluntary and youth-serving agencies, management positions within the travel and tourism industry and as resource managers of local, state, and federal parks and related lands and waters.

The curriculum allows students to select from five concentrations. This latitude permits accommodation of each student’s career objectives in positions in community recreation, sport management, recreation programming, cultural arts management, commercial recreation, wilderness management, nature interpretation, park management, historic site management, rehabilitation services, leisure counseling, camp administration, recreation therapy, programs for people with disabilities or senior citizens, travel industry, resort management, convention and visitor bureaus, theme parks, community tourism, and special event/festival planning, to name a few.

The Parks, Recreation and Tourism Management program is accredited by the National Council on Accreditation (National Recreation and Park Association/Council on Postsecondary Accreditation). Graduates are immediately eligible to apply to become “Certified Park and Recreation Professionals,” a valuable credential for professional advancement.

When space is available, a student may change majors to one of the degree concentrations in the Department of Parks, Recreation and Tourism Management with a 2.0 cumulative grade-point average and approval of the department chair or his/her designee. Students are encouraged to speak with the PRTM advisor about changing their major prior to the start of their sophomore year to avoid a delay in graduation due to course sequencing and course prerequisite requirements.

Graduate degrees offered are Master of Parks, Recreation and Tourism Management; Master of Science; and Doctor of Philosophy.

COMMUNITY RECREATION, SPORT AND CAMP MANAGEMENT CONCENTRATION

The Community Recreation, Sport and Camp Management (CRSCM) Concentration prepares students for careers in community recreation, amateur athletics, and camp management by developing theoretical, conceptual, and applied knowledge bases necessary for success in its diverse field. The focus of this program is on community, family, and individual development. Career opportunities include, but are not limited to, community recreation programming, community athletic programming, camp administration, facility operation and management, special events, campus recreation, and fitness and wellness programming.

Freshman Year

First Semester
1 - PRTM 1980 Creative Inquiry—PRTM I
2 - CU 1010 University Success Skills
3 - Mathematics or Natural Science Requirement
15

Second Semester
1 - PRTM 2000 Profession and Practice in PRTM
2 - PRTM 2290 Distributed Competency
3 - ENGL 1030 Accelerated Composition
12

Sophomore Year

First Semester
1 - PRTM 2070 Practicum II
2 - Elective
15

Second Semester
1 - PRTM 2200 Conceptual Foundations of PRTM
2 - PRTM 2270 Provision of Leisure Service Exp.
3 - PRTM 2260 Found. of Mgt., Administration
15

Junior Year

First Semester
2 - PRTM 3980 Creative Inquiry—PRTM III
1 - PRTM 4040 Field Training I
12 - Concentration Requirement
15

Second Semester
1 - PRTM 4980 Creative Inquiry—PRTM IV
12 - Concentration Requirement
15

Summer
6 - PRTM 4050 Field Training II

Senior Year

First Semester
12 - Concentration Requirement
15

Second Semester
6 - Elective

122 Total Semester Hours

Notes:
1See advisor for new General Education Requirement to replace CU 1010.
2See General Education Requirements. Six of these credit hours must also satisfy the Cross-Cultural Awareness and Science and Technology in Society requirements. See advisor.
3See advisor.

PARKS AND CONSERVATION AREA MANAGEMENT CONCENTRATION

Students in Park Conservation Area Management (PCAM) prepare for work as park rangers, planners, educators, law enforcement officers, and administrators of our nation’s federal, state, and county public lands that hold unique natural, cultural, and historic resources. PCAM focuses on helping visitors enjoy and appreciate parklands while protecting those resources for future generations. Besides taking coursework in PRTM, many students choose to complete a minor field of study in forest resource management, wildlife and fisheries biology, history, or anthropology.

Freshman Year

First Semester
2 - CU 1010 University Success Skills
3 - Mathematics Requirement
4 - Natural Science Requirement
15

Second Semester
1 - PRTM 1980 Creative Inquiry—PRTM I
6 - PRTM 2260 Found. of Mgt., Administration
and Programming in Leisure Services
5 - PRTM 2270 Provision of Leisure Service Exp.
3 - PRTM 2290 Distributed Competency
15

Integration in PRTM
15

Second Semester
2 - PRTM 2980 Creative Inquiry—PRTM II
3 - Arts and Humanities (Literature) Requirement
9 - Concentration Requirement
1 - Elective
15

Summer
1 - PRTM 2060 Practicum I
1 - PRTM 2070 Practicum II
2
Sophomore Year
First Semester
1 - PRTM 1980 Creative Inquiry—PRTM I
6 - PRTM 2260 Foundations of Management, Admin. and Programming in Leisure Skills
1 - PRTM 2270 Provision of Leisure Service Exp.
3 - PRTM 2290 Competency Integration in PRTM
15
Second Semester
2 - PRTM 2980 Creative Inquiry—PRTM II
3 - Arts and Humanities (Literature) Requirement
9 - Concentration Requirement
1 - Elective
15

Summer
1 - PRTM 2060 Practicum I
1 - PRTM 2070 Practicum II
2

Junior Year
First Semester
2 - PRTM 3980 Creative Inquiry—PRTM III
1 - PRTM 4040 Field Training I
12 - Concentration Requirement
15
Second Semester
1 - PRTM 4980 Creative Inquiry—PRTM IV
12 - Concentration Requirement
1 - Elective
15

Summer
6 - PRTM 4050 Field Training II

Senior Year
First Semester
12 - Concentration Requirement
12
Second Semester
6 - Concentration Requirement
6 - Elective
12
122 Total Semester Hours

PROFESSIONAL GOLF MANAGEMENT CONCENTRATION
The Professional Golf Management (PGM) Concentration provides a unique educational background for students who desire to become PGA professionals. Students obtain specialized knowledge and skills which prepare them to become leaders in the golf industry. The PGM Concentration combines academics, career training, and extensive internship experience to develop well-rounded, service-oriented professionals who can meet and respond to the personal as well as business management requirements of golf programs and facilities. See advisor for new/ additional General Education Requirements.

Freshman Year
First Semester
3 - PRTM 2810 Introduction to Golf Management
6 - Social Science Requirement
3 - Mathematics Requirement
4 - Natural Science Requirement
16
Second Semester
3 - ENGL 1030 Accelerated Composition
1 - PRTM 1950 PGM Seminar I
1 - PRTM 2000 Profession and Practice in PRTM
2 - PRTM 2200 Conceptual Foundations of PRTM
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Mathematics or Natural Science Requirement
3 - Oral Communication Requirement
16

Summer
0 - CO-OP 2010 Cooperative Education
1 - PRTM 2060 Practicum I
1

Sophomore Year
First Semester
1 - PRTM 1980 Creative Inquiry—PRTM I
6 - PRTM 2260 Foundations of Management and Administration in PRTM
5 - PRTM 2270 Provision of Leisure Service Exp.
3 - PRTM 2950 PGM Seminar II
16
Second Semester
3 - Arts and Humanities (Literature) Requirement
9 - Concentration Requirement
4 - Elective
15

Summer
0 - CO-OP 2020 Cooperative Education
1 - PRTM 2060 Practicum I
1

Junior Year
First Semester
0 - CO-OP 2030 Cooperative Education
1 - PRTM 2070 Practicum II

Second Semester
12 - Concentration Requirement
3 - Elective
15

Senior Year
First Semester
1 - PRTM 1980 Creative Inquiry—PRTM I
6 - PRTM 2260 Foundations of Management and Administration in PRTM
5 - PRTM 2270 Provision of Leisure Service Exp.
3 - PRTM 2990 Distributed Competency in PRTM
17
Second Semester
3 - Elective
15

Summer
0 - CO-OP 2040 Cooperative Education
0

Fifth Year
First Semester
1 - PRTM 4950 PGM Seminar IV
15 - Concentration Requirement
16
120 Total Semester Hours

THERAPEUTIC RECREATION CONCENTRATION
The Therapeutic Recreation (TR) Concentration prepares students for exciting careers working with people with disabilities in a variety of settings, including community-based recreation agencies, camps, children’s hospitals, psychiatric and physical rehabilitation hospitals, and assisted-living facilities, to name a few. Therapeutic Recreation consists of the delivery of recreation services designed to enhance participants’ leisure experiences, quality of life, and functional capabilities. Students who complete these requirements will be eligible to sit for an examination to become a Certified Therapeutic Recreation Specialist (CTRS). Students take courses and preceptorships at the University Center and agencies in Greenville, SC and the surrounding area, during their junior year.

Freshman Year
First Semester
2 - CU 1010 University Success Skills
3 - Mathematics Requirement
4 - Natural Science Requirement
6 - Social Science Requirement
15
Second Semester
3 - ENGL 1030 Accelerated Composition
1 - PRTM 2000 Profession and Practice in PRTM
2 - PRTM 2200 Conceptual Foundations of PRTM
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Mathematics or Natural Science Requirement
3 - Oral Communication Requirement
16

Summer
0 - COOP 2010 Cooperative Education
0

Junior Year
First Semester
0 - CO-OP 2020 Cooperative Education
1 - PRTM 2070 Practicum II

Second Semester
12 - Concentration Requirement
3 - Elective
15

Senior Year
First Semester
1 - PRTM 1980 Creative Inquiry—PRTM I
6 - PRTM 2260 Foundations of Management and Administration in PRTM
5 - PRTM 2270 Provision of Leisure Service Exp.
3 - PRTM 2990 Distributed Competency in PRTM
15

Sophomore Year
First Semester
1 - PRTM 1980 Creative Inquiry—PRTM I
6 - PRTM 2260 Foundations of Management and Administration in PRTM
5 - PRTM 2270 Provision of Leisure Service Exp.
3 - PRTM 2990 Distributed Competency in PRTM
15
## Freshman Year

**First Semester**
- 2 - CU 1010 University Success Skills
- 3 - Mathematics or Natural Science Requirement
- 3 - Oral Communication Requirement

**Second Semester**
- 2 - PRTM 2980 Creative Inquiry—PRTM II
- 3 - Arts and Humanities (Literature) Requirement
- 9 - Concentration Requirement
- 1 - Elective

**Summer**
- 1 - PRTM 2060 Practicum I
- 1 - PRTM 2070 Practicum II

## Second Semester

**First Semester**
- 2 - PRTM 3980 Creative Inquiry—PRTM III
- 1 - PRTM 4040 Field Training I
- 12 - Concentration Requirement

**Second Semester**
- 1 - PRTM 4980 Creative Inquiry—PRTM IV
- 12 - Concentration Requirement
- 2 - Elective

**Summer**
- 6 - PRTM 4050 Field Training II

## Senior Year

**First Semester**
- 12 - Concentration Requirement

**Second Semester**
- 6 - Concentration Requirement
- 6 - Electives

## TRAVEL AND TOURISM CONCENTRATION

The Travel and Tourism (T&T) Concentration prepares students for interesting and challenging careers working in one of the world’s most diverse and dynamic industries. Students in this concentration are introduced to issues pertaining to the management, planning, and promotion of places and events such as tourist attractions. The program is designed to provide an understanding of the linkages that exist between local communities, their populations, and various public, private, and special interest groups. Students in Travel and Tourism can pursue careers in private sector enterprises, government agencies, convention and visitor bureaus, as well as other tourism-affiliated organizations.

1. See advisor for new General Education Requirement to replace CU 1010.
2. See General Education Requirements. Six of these credit hours must also satisfy the Cross-Cultural Awareness and Science and Technology in Society requirements. See advisor.
3. See advisor.

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2013-14
MINORS

Following are minors acceptable for students in the College of Health, Education and Human Development. Students cannot major and minor in the same field or acquire a minor that is not allowed by the degree program.

Accounting
Adult/Extension Education
Aerospace Studies
Agricultural Business Management
Agricultural Mechanization and Business
American Sign Language Studies
Animal and Veterinary Sciences
Anthropology
Architecture
Art
Athletic Leadership—not open to Marketing majors.
Biochemistry
Biological Sciences—not open to Science Teaching–Biological Sciences
Business Administration
Chemistry
Cluster
Communication Studies
Computer Science
Crop and Soil Environmental Science
Digital Production Arts
East Asian Studies
Economics—not open to Secondary Education: Social Studies (Economics) majors
Education
English
Entomology
Entrepreneurship
Environmental Engineering
Environmental Science and Policy
Equine Business
Film Studies
Financial Management
Food Science
Forest Resource Management
Genetics
Geography
Geology
Global Politics
Great Works
History—not open to Secondary Education: Social Studies (History) majors
Horticulture
Legal Studies
Management
Management Information Systems
Mathematical Sciences—not open to Mathematics Teaching or Secondary Education–Mathematics majors
Microbiology
Military Leadership
Modern Languages—not open to Secondary Education–Modern Languages majors
Music
Natural Resource Economics
Nonprofit Leadership
Packaging Science
Pan African Studies
Park and Protected Area Management
Philosophy
Physics—not open to Science Teaching–Physical Sciences majors
Plant Pathology
Political Science—not open to Secondary Education: Social Studies (Political Science) majors
Psychology—not open to Secondary Education: Social Studies (Psychology) majors
Public Policy
Religion
Russian Area Studies
Science and Technology in Society
Screenwriting
Sociology—not open to Secondary Education: Social Studies (Sociology) majors
Spanish-American Area Studies
Theatre
Therapeutic Recreation
Travel and Tourism
Turfgrass
Urban Forestry
Wildlife and Fisheries Biology
Women’s Studies
Writing

See pages 39-42 for details.
COURSES OF INSTRUCTION

This list includes for each course the catalog number, title, credit hours, class and laboratory hours per week, description, and prerequisites. Courses numbered 6000 and above are graduate courses.

Cross-Referenced Courses

A cross-referenced course is one that can be taken for credit under different departmental titles. For example, students can take Herpetology as either BIOL 4680 or WFB 4680. The student should select the desired departmental title in conference with an advisor. The departmental title may be changed only during the period allowed by the University calendar for adding a course.

COURSE ABBREVIATIONS

AAH ..........Art and Architectural History
ACCT ..........Accounting
AGED ..........Agricultural Education
AGM ..........Agricultural Mechanization
AGR ..........Agriculture
AI ..........Athletic Leadership
ANTH ..........Anthropology
APEC ..........Applied Economics
ARAB ..........Arabic
ARCH ..........Architecture
ART ..........Art
AS ..........Aerospace Studies
ASL ..........American Sign Language
ASTR ..........Astronomy
AUD ..........Audio Technology
AVS ..........Animal and Veterinary Sciences
BCHM ..........Biochemistry
BE ..........Biosystems Engineering
BIOE ..........Bioengineering
BIOL ..........Biology
BMOL ..........Biomolecular Engineering
BT ..........Biotechnology
BUS ..........Business
CAAH ..........College of Architecture, Arts and Humanities
CE ..........Civil Engineering
CES ..........College of Engineering and Science
CH ..........Chemistry
CHE ..........Chemical Engineering
CHIN ..........Chinese
COMM ..........Communication Studies
CPSC ..........Computer Science
CRD ..........Community and Rural Development
CRP ..........City and Regional Planning
CSEN ..........Crop and Soil Environmental Science
CSM ..........Construction Science and Management
CTE ..........Career and Technology Education
CU ..........Clemson University
CVT ..........Cardiovascular Technology
DANC ..........Dance
DPA ..........Digital Production Arts
DSGN ..........Design Studies
EAS ..........East Asian Studies
ECE ..........Electrical and Computer Engineering
ECON ..........Economics
ED ..........Education
ECC ..........Educational Counseling
EDE ..........Early Childhood Education
EDEL ..........Elementary Education
EDF ..........Educational Foundations
EDLT ..........Literacy
EDSC ..........Secondary Education
EDSP ..........Special Education
EES ..........Environmental Engineering and Science
ELE ..........Executive Leadership and Environmental Stewardship
EM ..........Engineering Mechanics
ENG ..........Engineering
ENGR ..........Engineering
ENR ..........Environmental and Natural Resources
ENSP ..........Environmental Science and Policy
ENT ..........Entomology
ETOX ..........Environmental Toxicology
EXST ..........Experimental Statistics
FDSC ..........Food Science
FIN ..........Finance
FNR ..........Forestry and Natural Resources
FOR ..........Forestry
FR ..........French
GC ..........Graphic Communications
GEN ..........Genetics
GEOG ..........Geography
GEOI ..........Geology
GER ..........German
GW ..........Great Works
HCG ..........Health Care Genetics
HEHD ..........Health, Education and Human Development
HIST ..........History
HLTH ..........Health
HON ..........Honors
HORT ..........Horticulture
HUM ..........Humanities
IE ..........Industrial Engineering
IPM ..........Integrated Pest Management
IS ..........International Studies
ITAL ..........Italian
JPN ..........Japanese
LAW ..........Law
LARC ..........Landscape Architecture
LATN ..........Latin
LATW ..........Law
LIB ..........Library
LING ..........Language and International Trade
IS ..........International Studies
MGT ..........Management
MCR ..........Microbiology
MKT ..........Marketing
ML ..........Military Leadership
MSE ..........Materials Science and Engineering
MTHS ..........Mathematical Sciences
MUSC ..........Music
NPL ..........Nonprofit Leadership
NURS ..........Nursing
NUTR ..........Nutrition
PA ..........Performing Arts
PAS ..........Pan African Studies
PCPC ..........Pearce Center for Professional Communication
PHIL ..........Philosophy
PHSC ..........Physical Science
PHYS ..........Physics
PKSC ..........Packaging Science
PLPA ..........Plant Pathology
PLPH ..........Plant Physiology
PORT ..........Portuguese
POSC ..........Political Science
PRTM ..........Parks, Recreation and Tourism Management
PSYC ..........Psychology
RELI ..........Religion
RS ..........Rural Sociology
RUSS ..........Russian
SOC ..........Sociology
SPAN ..........Spanish
SSCS ..........Soils and Sustainable Crop Systems
STS ..........Science and Technology in Society
THEA ..........Theatre
WFB ..........Wildlife and Fisheries Biology
WS ..........Women’s Studies

ART AND ARCHITECTURAL HISTORY

Professor: W.W. Lew; Associate Professors: A.V. Feerer, J.B. LeBlanc; Assistant Professors: K. Kourelis

AAH 1010 Survey of Art and Architectural History I 3 (3) Comprehensive survey of art and architectural history of Western heritage as well as significant coverage of Asian, African, Native American, and South American art. The arts are studied within the contexts of history, geography, politics, religion, and culture. Survey includes Ancient through Gothic. Includes Honors sections.


AAH 2040 History and Theory of Architecture II 3 (3) Second in a two-semester sequence on special topics and issues in the history of architecture. Emphasizes typologies of the house, governmental buildings, and sacred architecture. Includes study of new directions in architectural historiography. Includes Honors sections.

AAH 2050 History and Theory of Art I 3 (3) First of a two-semester sequence on special topics and issues in the history of art. Emphasizes stylistic developments and specific art movements. Analyzes art within the larger context of social, political, and religious history. Examines art techniques and theory as they have developed. Includes Honors sections. Prep: AAH 1020.

AAH 2060 History and Theory of Art II 3 (3) Second of a two-semester sequence on special topics and issues in the history of art. Continued emphasis on stylistic developments and art movements, with specific attention directed toward post-Renaissance art. Analyzes the influence of past history on modern. Includes Honors sections. Prep: AAH 2050.

AAH 2100 Introduction to Art and Architecture 3 (3) One-semester lecture survey that introduces the nonmajor to an overview of art and architecture from different time periods and cultures. Students are encouraged to appreciate the contribution to art made by the great masters and to discern different styles, art techniques, and creative traditions. Includes Honors sections.
AAH 3050 Contemporary Art History 3 (3) Study of contemporary art from World War II to the present, exploring forces that have shaped various movements and directions. Preq: AAH 2060.
AAH 3300 Honors Colloquium 3 (0) Undergraduate honors colloquium emphasizing interdisciplinary interpretations. Focuses on an integration of art, architecture, landscape, and city planning. Preq: AAH 2040 or AAH 2060.
AAH 3950 Special Topics in Visual Studies Abroad I 3 (3) Onsite exposure to art and architecture in foreign countries, coupled with lectures and study problems. Different countries may be selected for study at faculty discretion. May be taught as a compact course during the academic year with a short stay in a foreign country or during summer with extended foreign experience. May not be taken Pass/No Pass. Preq: AAH 2040 or AAH 2060.
AAH 4110, 6110 Directed Research in Art History II 3 (3) Comprehensive studies and research of special topics not covered in other courses. Emphasis is on field studies, research activities, and current developments in art history.
AAH 4120, 6120 Directed Research in Art History II 3 (3) Continuation of AAH 4110.
AAH 4230, 6230 Studies in the Art and Architecture of the Renaissance I 3 (3) Consideration of the visual arts and architectural monuments of the Renaissance (Western Europe from the 15th–18th centuries), with a study in depth of selected examples from the period. Preq for 4230: AAH 2040 or AAH 2060. Preq for 6230: AAH 2040 or AAH 2060 or consent of instructor.
AAH 4240, 6240 Studies in the Art and Architecture of the Renaissance II 3 (3) Consideration of the visual arts and architectural monuments of the Renaissance (Western Europe from the 15th–18th centuries), with a study in depth of selected examples from the period. Preq: AAH 4230.
AAH 4300, 6300 Twentieth Century Art I 3 (3) Acquaints students with the major artists, movements, and issues of the modern period in art. Through lecture/discussions and the reading of primary sources, course places the major modern movements in the context of the period (1860–1945). Preq: Consent of instructor.
AAH 4320, 6320 Twentieth Century Art II 3 (3) Overview of trends in art and architecture since World War II. Specific artists, artworks, and movements are presented in a socio/historic context with specific emphasis on the transition from the late-modernist to a post-modernist perspective. Preq: Consent of instructor.

ACCOUNTING

ACCT 2010 Financial Accounting Concepts 3 (3) Introduction to accounting principles with emphasis on the use of financial data and analysis of financial statements. Includes Honors sections.
ACCT 2020 Managerial Accounting Concepts 3 (3) Introduction to managerial accounting with emphasis on using accounting information to make decisions. Includes Honors sections.
ACCT 2040 Accounting Procedures I 1 (1) Lectures, demonstrations, and hands-on experience with accounting systems and analysis required to complete the accounting cycle and prepare financial statements. Intended for students who plan to enroll in ACCT 3030 or 3110. Coreq: ACCT 2041.
ACCT 2041 Accounting Procedures Laboratory 0 (2) Non-credit laboratory to accompany ACCT 2040. Coreq: ACCT 2040.
ACCT 2990 Creative Inquiry Accounting 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of six credits. To be taken Pass/No Pass only.
ACCT 3030 Cost Accounting 3 (3) Application of cost analysis to manufacturing and distributing problems; analysis of behavior characteristics of business costs and a study of principles involved in standard cost systems; lectures and problems. Includes Honors sections. Preq: ACCT 2040 and 2040 with a C or better.
ACCT 3110 Intermediate Financial Accounting I 3 (3) In-depth treatment of traditional financial accounting topics in standards setting, financial statement format and content, and accounting and reporting of current assets. Emphasizes basic theory, valuation, and measurement, as well as presentation and analysis of accounting information. Includes Honors sections. Preq: ACCT 2010 and 2040 with a C or better.
ACCT 3130 Intermediate Financial Accounting III 3 (3) Continuation of ACCT 3120. In-depth treatment of selected accounting topics, such as investments, cash flows, tax allocation, post-retirement benefits, leases, and error corrections. Emphasizes basic theory, valuation, and measurement, as well as presentation and analysis of accounting information. Includes Honors sections. Preq: ACCT 3110 with a C or better.
ACCT 3220 Accounting Information Systems 3 (3) Study of computer-based accounting systems with attention to systems design, application, internal control, auditing the system, and system security. Preq: MGT 2180.
ACCT 3400 Internal Auditing Theory 3 (3) Introduces students to internal auditing and covers internal auditing standards, ethics, concepts, audit techniques, and reporting practices. Enrollment priority will be given to students who have completed 60, but not more than 100, credits. Preq: ACCT 3110 with a C or better.
ACCT 3990 Internship in Accounting 1-3 (1-3) Faculty-supervised accounting internship designed to give students learning opportunities that support their classroom experiences. Requires a minimum of six full-time weeks. Course enrollment and internship must occur in the same semester. Simultaneous credit cannot be received for another internship offering. May be repeated for a maximum of three credits. To be taken Pass/No Pass only. Preq: Junior standing and consent of instructor.
ACCT 4040, 6040 Individual Taxation 3 (3) Interpretation of Federal income tax laws, regulations, and court decisions with practice in application of these laws to the returns of individuals, partnerships, and corporations. Includes Honors sections. Preq: ACCT 3110 with a C or better.
ACCT 4060 Business Taxation 3 (3) Introduction to the importance of taxation in business decision making. Emphasizes the interrelationship of taxes, the choice of business form, and various business transactions; exposes students to the breadth of business decisions which are affected by the Federal Income Tax. Preq: ACCT 3110 with a C or better.
ACCT 4080 Retirement and Estate Planning 3 (3) Provides students with an understanding of the tax consequences of personal financial, retirement, and estate planning. Subjects include the basic concepts of retirement, gift, income shifting, and estate planning. Preq: ACCT 4040 with a C or better.
ACCT 4100, 6100 Budgeting and Executive Control 3 (3) Study and application of selected techniques used in the planning and control functions of business organizations. Preq: ACCT 3030 with a C or better.
ACCT 4150 Auditing 3 (3) Study of professional and practical auditing theory. Includes a review of internal controls, audit procedures, and development of audit programs for various types of businesses. Considers auditors professional and ethical standards. Preq: ACCT 3110 and ACCT 3220, each with a C or better.

AGRICULTURAL EDUCATION

Professor: T.R. Dobbins; Associate Professors: P.M. Favel, K.D. Layfield; Lecturer: S. Lawrence
AGED 1000 Orientation and Field Experience I (2) Supervised observations and explanations of vocational agriculture teaching while serving as teacher aides. One full week of field experience in representative high schools is required.
AGED 1020 Agricultural Education Freshman Seminar I (2) Introduces students to the South Carolina agriculture education structure and provides opportunities to prepare oral presentations on selected agricultural education organizations. Assists students in understanding the value of professional organizations to agriculture education in the state and nation. Preq: Agricultural Education major.
AGED 1030 Multiculturalism in Agricultural Education 3 (3) Studies the influence of various groups and their contributions to agriculture. Includes the roles of women, African-, Hispanic-, Asian-, Native, and European-Americans.

AGED 2001 Agricultural Applications of Educational Technology Laboratory 0 (2) Non-credit laboratory to accompany AGED 2000. Coreq: AGED 2000.

AGED 2010 Introduction to Agricultural Education 3 (2) Principles of education, development of agricultural education, and an introduction to the formulation of instructional programs for the teaching of agricultural courses. Coreq: AGED 2011.

AGED 2020 Agricultural Education Sophomore Seminar 1 (2) Instruction on how to establish a comprehensive student record-keeping system. Includes integration of that data into the FFA Awards program. Allows students hands-on experience with the total FFA Awards program on the state and national level. Preq: AGED 1020.

AGED 2030 Teaching Agriscience 3 (2) Integrates biological and technological concepts appropriate for teaching introductory middle or secondary school-level courses in agricultural science. Topics emphasize disciplines, theories, and applications in modern agricultural production. Experiences include teaching techniques, materials, resources, and the design and implementation of new activities to facilitate teaching agriscience. Preq: BIOL 1040 and BIOL 1060. Coreq: AGED 2031.

AGED 2031 Teaching Agriscience Laboratory 0 (3) Non-credit laboratory to accompany AGED 2030. Coreq: AGED 2030.

AGED 2040 Applied Agriculture Calculations 3 (2) Demonstrates basic mathematical applications in crop and livestock production and agricultural and financial management. These applications aid students in understanding the mathematical applications needed in the agriculture field.

AGED 3020 Agricultural Education Junior Seminar 1 (2) Allows students the opportunity to prepare and deliver information on Career Development Events (CDE) and to understand fully the CDE concepts. Students receive much needed hands-on experience at the state and national levels. Preq: AGED 2020.

AGED 3030 Mechanical Technology for Agriculture Education 3 (2) Study of technical content and new technology utilized in agriculture mechanics. Integrates agriculture mechanics topics such as electrical wiring and controls, green industry maintenance, irrigation systems, and agriculture construction. Offers a delivery of mechanics instruction in the classroom and laboratory setting. Coreq: AGED 3031.

AGED 3031 Mechanical Technology for Agriculture Education Laboratory 0 (3) Non-credit laboratory to accompany AGED 3030. Coreq: AGED 3030.

AGED 3550 Team and Organizational Leadership in the Food and Fiber System 3 (3) Principles and practices in planning, developing, conducting, and evaluating leadership programs for agricultural groups. Focuses on helping students better understand themselves and others; improving group communications; becoming effective leaders and members of groups; improving leadership and personal development skills; assessing leadership situations, determining and administering appropriate leadership strategies.

AGED 4000 Supervised Field Experience II 1 (3) Special emphasis is placed on enhancing existing knowledge and experiences of the students. Primary focus is on becoming acquainted with the student teaching center well in advance of the customary twelve-week directed teaching experience.

AGED 4010, 6010 Instructional Methods in Agricultural Education 3 (2) Appropriate methods of teaching vocational agriculture in high schools. Includes procedures for organizing teaching programs, teaching high school students, and directing FFA activities. Coreq: AGED 4011, 6011.

AGED 4011, 6011 Instructional Methods in Agricultural Education Laboratory 0 (3) Non-credit laboratory to accompany AGED 4010, 6011. Coreq: AGED 4010, 6011.

AGED 4020 Agricultural Education Senior Seminar 1 (2) Provides an opportunity to prepare and deliver information on continuing adult education. Assists students in fully understanding the adult education component of the Secondary Agriculture Education Program. Preq: AGED 3520.

AGED 4030, 6030 Principles of Adult/Extension Education 3 (3) Overview of adult/extension education and adult learning. Selection of adult education providers is reviewed with emphasis on extension. Preq: Junior standing.

AGED 4040 Directed Teaching 12 (36) Guided participation in the professional responsibilities of agricultural education, including intensive study of the problems encountered and competencies developed. Twelve weeks of directed teaching in selected schools are required. Preq: AGED 4000 and AGED 4010.

AGED 4070 Internship in Extension and Leadership Education 6-12 (6-12) Internship placements may include county extension offices and other appropriate extension units. Six weeks of supervised experience must be completed for six hours of credit. Twelve weeks of supervised experience must be completed for 12 hours of credit. May be repeated for a maximum of 12 credits. Preq: AGED 4000 and AGED 4010 and Senior standing.

AGED 4120 Senior Agriculture Leadership Seminar 1 (2) Emphasizes leadership techniques and policies that affect agriculture. Students conduct research and make presentations on issues which influence agriculture policy. Preq: APEC 3020; and one of APEC 2020 or ECON 2000 or ECON 2110.

AGED 4150, 6150 Leadership of Volunteers 3 (3) Provides an overview of volunteer management. Examines the knowledge, skills, and abilities required of professional managers to involve volunteers effectively in the work of organizations.

AGED 4160, 6160 Ethics and Issues in Agriculture and the Food and Fiber System 3 (3) Explores ethical theories, concepts of critical thinking, and major ethical issues in American agriculture. The major social, political, economic, and ethical issues that arise in connection to the food and fiber system are examined and potential solutions considered.

AGED 4230, 6230 Curriculum 3 (3) Curriculum goals and related planning for career and continuing education programs.

AGED 4250, 6250 Teaching Agricultural Mechanics 2 (1) Instruction in organizing course content, conducting and managing an agricultural mechanics laboratory, shop safety, microteaching demonstrations of psychomotor skills, and methods of teaching manipulative abilities. Coreq: AGED 4251, 6251.

AGED 4251, 6251 Teaching Agricultural Mechanics Laboratory 0 (3) Non-credit laboratory to accompany AGED 4250, 6250. Coreq: AGED 4250, 6250.

AGED 4280, 6280 Special Studies in Agricultural Education 1-3 (1-3) Students study, individually or collectively, selected topics and/or problems in agricultural education to meet the particular needs of the clientele enrolled. May be repeated for a maximum of six credits.

AGED 4400, 6400 Program Development in Adult/Extension Education 3 (3) Principles, theory, and practice in planning and conducting educational programs in adult/extension settings. Preq: Junior standing.

AGED 4500 Modern Topics and Issues 3 (3,0) Students select a major area of concern to teachers of agriculture and county agents for intensive study at least one semester prior to offering the course. Team teaching with faculty from other departments in the College of Agriculture, Forestry and Life Sciences is utilized when feasible. Preq: Senior standing or relevant experience.

AGED 4800, 6800 Foundations of Digital Media and Learning 3 (2) Critical use of digital media for leadership and learning within societal and educational contexts. Course focuses on learner impact while exploring, developing, and evaluating technology-enhanced applications. Further develops competencies with new media literacies and addresses societal, cultural, ethical, and participatory issues and uses of digital media. Coreq: 4801, 6801.

AGED 4801, 6801 Foundations of Digital Media and Learning Laboratory 0 (2) Non-credit laboratory to accompany AGED 4800, 6800. Coreq: AGED 4800, 6800.

AGED 4820, 6820 Advanced Educational Applications of Microcomputers 3 (2) Provides students with the knowledge and skills needed to apply microcomputer technology to the utilization and generation of educational software in accordance with sound educational principles. Preq: AGED 4800 or EDF 4800. Coreq: AGED 4821, 6821.

AGED 4821 Advanced Educational Applications of Microcomputers Laboratory 0 (2) Non-credit laboratory to accompany AGED 4820, 6820. Coreq: AGED 4820, 6820.
AGRICULTURAL MECHANIZATION

Professors: J.P. Chastain, Y.J. Han, A. Khalilian; Associate Professor: C.V. Privette, III; Assistant Professor: D.R. Hitchcock, A. Jayakaran, K.R. Kirk, C.B. Sawyer; Lecturer: H. Massey; Extension Economist: W.N. Ferreira

AGM 1010 Introduction to Agricultural Mechanization and Business 1 (3) Introduces the Agricultural Mechanization and Business program. Gives an overview of the curriculum, introduces students to relevant extracurricular activities, exposes students to employment opportunities through alumni and interns, and helps students to prepare for careers relevant to the major.

AGM 2050 Principles of Fabrication 3 (2) Principles, techniques, and methods in the selection, proper use, and maintenance of hand and power tools. Principal topics include welding, tool fitting, metal working, woodworking, finishing and preserving, and heat treatment. Coreq: AGM 2051.

AGM 2051 Principles of Fabrication Laboratory 0 (3) Non-credit laboratory to accompany AGM 2050. Coreq: AGM 2050.

AGM 2060 Machinery Management 3 (2) Teaches agriculture students to apply physical principles and sound reasoning to the mechanization of modern agricultural production and processing enterprises. Stresses planning efficient operational systems and wise selection of equipment, based on function and economic suitability. Preq or concurrent enrollment: MTHS 1020 or MTHS 1060, and PHYS 2000 or PHYS 2070. Coreq: AGM 2061.

AGM 2061 Machinery Management Laboratory 0 (3) Non-credit laboratory to accompany AGM 2060. Coreq: AGM 2060.

AGM 2190 Agribusiness and Food Systems 3 (3) Provides a general introduction to the major activities associated with the movement of agricultural and food products from producers to processors, to consumers and the essential supply chain functions of buying, selling, transportation, storage, financing, standardization, pricing and risk bearing. Coreq: AGM 2191.

AGM 2210 Surveying: Earthwork and Area Measurements 3 (2) Fundamentals of surveying relative to earthwork and land area measurements, including linear measurements, leveling, angular measurements, and computations. Levels and total stations are used with an introduction to GPS. Preq or concurrent enrollment: MTHS 1020 or 1060. Coreq: AGM 2211.

AGM 2211 Surveying: Earthwork and Area Measurements Laboratory 0 (3) Non-credit laboratory to accompany AGM 2210. Coreq: AGM 2210.

AGM 3010 Soil and Water Conservation 3 (3) Soil and water management is studied by applying principles of mathematics, fluid flow, hydrology, and soil characteristics as related to soil-water-vegetation complexes in runoff, erosion control, channel design, water conservation, drainage, irrigation, stormwater best management practices and stream restoration. Preq or concurrent enrollment: MTHS 1020 or MTHS 1060.

AGM 3030 Calculations for Mechanized Agriculture 3 (2) Enhances students’ ability to analyze and solve a wide range of problems requiring engineering technology. Laboratory periods introduce students to microcomputer hardware. Basic programming and typical applications to agricultural mechanization problems are included. Preq or concurrent enrollment: PHYS 2000 or PHYS 2070. Coreq: AGM 3031.

AGM 3031 Calculations for Mechanized Agriculture Laboratory 0 (3) Non-credit laboratory to accompany AGM 3030. Coreq: AGM 3030.

AGM 3190 Agribusiness Decision Analysis 3 (3) Improvement of the decision-making process in agricultural businesses through the use of decision-analysis software. Students build their own decision-making models using spreadsheets. Preq: AGM 2190, or APEC 3020, or APEC 3190, or MGT 2010.

AGM 3710 Agricultural Mechanization Practicum 1-3 (1-3) Preplanned internship with an approved employer in agricultural technical or business endeavors. 130 hours of supervised responsibility are required per credit hour. A work journal, written/oral reports, company consent and evaluation must be on file. May be repeated for a maximum of twelve credits. To be taken Pass/No Pass only.

AGM 4000 Senior Seminar in Agricultural Mechanization and Business 1 (1) Seminar and project-based course providing information on a variety of topics of value to those seeking employment in agricultural mechanization and business and in agricultural education. Topics include development of a professional resume, professional ethics, and current topics related to agricultural technology and systems management. Preq: Junior or senior standing in Agricultural Mechanization and Business or MGT 2010.

AGM 4020, 6020 Landscape Drainage and Irrigation 3 (3) Uses basic soil-water-plant relationships to determine the need for and methods of irrigation and drainage. Topics include irrigation methods, drainage needs and drainage methods. Preq or concurrent enrollment: AGM 3010. Coreq: AGM 4021, 6021.

AGM 4021, 6021 Landscape Drainage and Irrigation Laboratory 0 (3) Non-credit laboratory to accompany AGM 4020, 6020. Coreq: AGM 4020, 6020.

AGM 4050, 6050 Environmental Control in Animal Structures 3 (2) Design of environmental control systems for animal production facilities. Topics include effects of the thermal and chemical environment on animals, ventilation system design, thermal design of structural envelopes, design of heating, cooling, and lighting systems. Emphasis is on practical, energy-efficient applications to modern animal production facilities. Preq: AGM 3030 or AWS 3010. Coreq: AGM 4051, 6051.

AGM 4051, 6051 Environmental Control in Animal Structures Laboratory 0 (3) Non-credit laboratory to accompany AGM 4050, 6050. Coreq: AGM 4050, 6050.

AGM 4060, 6060 Mechanical and Hydraulic Systems 3 (2) Study of power transmission systems for agricultural production emphasizing mobile equipment. Characteristics, requirements, and design of both V-belt drive and roller-chain drives are presented. Emphasizes hydraulic power transmission systems, including pumps, actuators, control devices, and hydraulic circuitry. Preq: AGM 2060, and PHYS 2000 or PHYS 2070. Coreq: 4061, 6061.

AGM 4061, 6061 Mechanical and Hydraulic Systems Laboratory 0 (3) Non-credit laboratory to accompany AGM 4060, 6060. Coreq: AGM 4060, 6060.

AGM 4100, 6100 Precision Agriculture Technology 3 (2) Includes principles and hands-on application of technologies supporting precision agriculture. Topics include global positioning system (GPS), geographic information system software, variable rate technologies, collection of spatial data, automated guidance of equipment, spatial data mapping and analysis, remote sensing, and economic considerations. Preq: Junior standing. Coreq: AGM 4101, 6101.

AGM 4101, 6101 Precision Agriculture Technology Laboratory 0 (3) Non-credit laboratory to accompany AGM 4100, 6100. Coreq: AGM 4100, 6100.

AGM 4190 Agribusiness Innovation and Entrepreneurship 3 (3) Emphasis on assessing students’ abilities as agribusiness entrepreneurs, evaluating the feasibility of a business idea, creating strategies for organizing and marketing the agricultural business, exploring pricing for products or services, developing capital needs and sound financial statements, and researching, developing, and writing a comprehensive plan for the business. Preq: AGM 2190, or AGM 3190, or APEC 3020 or APEC 3190. Coreq: AGM 4191, 6191.

AGM 4520, 6520 Mobile Power 3 (2) Study of tractors, emphasizing internal combustion engines and support systems necessary for their proper functioning. Also considers application of power, maintenance, adjustment, and general repair. Preq: PHYS 2000 or PHYS 2070. Coreq: AGM 4521, 6521.

AGM 4521, 6521 Mobile Power Laboratory 0 (3) Non-credit laboratory to accompany AGM 4520, 6520. Coreq: AGM 4520, 6520.

AGM 4600, 6600 Electrical Systems 3 (2) Students in agriculture and related curricula study electric and other utilities on the farm and in the home. Emphasizes selection, installation, and maintenance of wiring systems, lighting systems, motors, controls, water systems, and waste disposal systems. Preq: Junior standing. Coreq: AGM 4601, 6601.

AGM 4601, 6601 Electrical Systems Laboratory 0 (3) Non-credit laboratory to accompany AGM 4600, 6600. Coreq: AGM 4600, 6600.

AGM 4720 Capstone 3 (2) Covers professional conduct, ethics, oral and written communication, and financial matters. Each student completes a comprehensive project on a technical subject. The results are given in a written report and oral presentation. Students use digital portfolio technology to assess their education. Coreq: AGM 4721.

AGM 4721 Capstone Laboratory 0 (3) Non-credit laboratory to accompany AGM 4720. Coreq: AGM 4720.
AGM 4730 Special Topics in Agricultural Mechanization 1-3 (1-3) Comprehensive study and application of new technologies and methods not covered in existing courses. Emphasizes independent study using innovative approaches to problem solving. May be repeated for a maximum of six credits.

AGRICULTURE

AGR 1040 Introduction to Plant Sciences 3 (3) Fundamental course in plant sciences, including agronomic and horticultural crops of the major agricultural areas of the world and emphasizing the crops of South Carolina. Includes Honors sections.

AGR 3150 Environment and Agriculture 3 (3) Survey of the interrelationships of the environment and current agriculture and agricultural practices to include both the environmental impacts of agriculture and the role of agriculture in conservation and improving the environment. Includes Honors sections. Preq: Sophomore standing and one of the following combinations: BIOL 1040 and BIOL 1060; or BIO 1100 and BIOL 1110; or CH 1010 and CH 1020; or CH 1050 and CH 1060.

AGR 3550 Team and Organizational Leadership in Food and Fiber System 3 (3) Principles and practices in planning, developing, conducting, and evaluating leadership programs for agricultural groups. Focuses on helping students better understand themselves and others, improving group communications; becoming effective leaders and members of groups; improving leadership and personal development skills, assessing leadership situations, determining and administering appropriate leadership strategies.

AGR 4120 Senior Agriculture Leadership Seminar 1 (2) Emphasizes leadership techniques and policies that affect agriculture. Students conduct research and make presentations on issues which influence agriculture policy. Preq: APEC 3020; and one of APEC 2020 or ECON 2000 or ECON 2120.

AGR 4910 Senior Honors Research 3 (1) Senior division honors research in an agricultural sciences curriculum. In consultation with and under the direction of a professor, students select a research topic, conduct experiments, record data, and make oral presentations of results to the College Honors Program Committee. Open to approved Honors Program students only. Coreq: AGR 4911.

AGR 4911 Senior Honors Research Laboratory 0 (6) Non-credit laboratory to accompany AGR 4910. Coreq: AGR 4910.

AGR 4920 Senior Honors Research 3 (1) Continuation of AGR 4910. Senior division honors research in an agricultural sciences curriculum. Upon termination of the research project, students submit formal written reports and make final oral presentations of results to the College Honors Program Committee. Professor-student discussions of additional topics are arranged. Coreq: AGR 4921.

AGR 4921 Senior Honors Research Laboratory 0 (6) Non-credit laboratory to accompany AGR 4920. Coreq: AGR 4920.

ATHLETIC LEADERSHIP

Lecturer: D. J. Cadorette

AL 3490 Principles of Coaching 3 (3) Investigation into the scientific basis of the coaching profession, middle and high school levels. Topics include developing a coaching philosophy, sport psychology, sport pedagogy, sport physiology, athletic administration, and risk management. Current issues regarding sportsmanship, gender equity compliance, and cultural diversity are researched and synthesized. Preq: Athletic Leadership minor.

AL 3500 Scientific Basis of Coaching I: Exercise Physiology 3 (3) Increases understanding of basic scientific information concerning athletic performance by using the conceptual approach. Focuses primarily on an in-depth investigation into the physiological principles that can enhance athletic performance. Includes phases of physical training as well as comprehensive evaluative techniques. Preq: AL 3490.

AL 3520 Scientific Basis of Coaching II: Kinesiology 3 (3) Increases understanding of basic scientific information concerning athletic movement by utilizing the conceptual approach. Deals with the basic laws of human motion necessary in evaluation of athletic movement, utilizing joint structure and anatomic landmarks as a basis for motion. Preq: AL 3490.


AL 3531 Theory of Prevention and Treatment of Athletic Injuries Laboratory 0 (3) Non-credit laboratory to accompany AL 3530. Coreq: AL 3530.

AL 3600 High School Athletics Ethical and Legal Issues 3 (3) Investigates ethical and legal issues specific to high school athletic program administration as identified by the National Interscholastic Athletic Administrators Association (NIAAA) Leadership Program and addressed by the National Association for Sport and P.E. (NASPE) National Standards for Sport Coaches. Preq: AL 3490.

AL 3610 Administration and Organization of Athletic Programs 3 (3) Study of modern techniques and practices used in administering athletic programs. Emphasizes areas such as practice and game organization, purchase and care of equipment, budget and finances, public relations, and legal liability in athletic programs. Preq: AL 3490.


AL 3710 Coaching Baseball 1 (3) Increases understanding of basic technical and practical information concerning the coaching of baseball by utilizing the conceptual approach. Students study basic principles of coaching, competitive organization, and proper technical skills needed to improve athletic performances. Also covers total program development as it pertains to specific levels of competition. Preq: AL 3490.

AL 3720 Coaching Basketball 1 (3) Increases understanding of basic technical and practical information concerning the coaching of basketball by utilizing the conceptual approach. Students study basic principles of coaching, competitive organization, and proper technical skills needed to improve athletic performances. Also covers total program development as it pertains to specific levels of competition. Preq: AL 3490.

AL 3730 Coaching Cross Country 1 (3) Increases understanding of technical and practical information concerning the coaching of cross country by utilizing the conceptual approach. Students study basic principles of coaching, competitive organization, and proper technical skills needed to improve athletic performances. Also covers total program development as it pertains to specific levels of competition. Preq: AL 3490.

AL 3740 Coaching Football 1 (3) Increases understanding of basic technical and practical information concerning the coaching of football by utilizing the conceptual approach. Students study basic principles of coaching, competitive organization, and proper technical skills needed to improve athletic performances. Also covers total program development as it pertains to specific levels of competition. Preq: AL 3490.

AL 3750 Coaching Soccer 1 (3) Increases understanding of basic technical and practical information concerning the coaching of soccer by utilizing the conceptual approach. Students study basic principles of coaching, competitive organization, and proper technical skills needed to improve athletic performances. Also covers total program development as it pertains to specific levels of competition. Preq: AL 3490.

AL 3760 Coaching Strength and Conditioning 1 (3) Increases understanding of basic technical and practical information concerning the coaching of strength and conditioning by utilizing the conceptual approach. Students study basic principles of coaching, training programs, and equipment appraisal as a means to improve athletic performance. Also covers total program development as it pertains to specific levels of competition. Preq: AL 3490.

AL 3770 Coaching Track and Field 1 (3) Increases understanding of basic technical and practical information concerning the coaching of track and field by utilizing the conceptual approach. Students study basic principles of coaching, competitive organization, and proper technical skills needed to improve athletic performances. Also covers total program development as it pertains to specific levels of competition. Preq: AL 3490.

AL 4000 Athletic Leadership Internship 0 (3) Athletic coaching and administration internship for a minimum of 60 hours. To be taken concurrently with any other Clemson University course. To be taken Pass/No Pass only. Students must have current CPR certification. Preq: Consent of Athletic Leadership coordinator.

AL 4380 Selected Topics in Athletic Leadership 1-3 (1-3) Specfic athletic leadership topics not found in other courses are selected for in-depth study. May be repeated for a maximum of nine credits, but only if different topics are covered.
ANTH 3530 Forensic Anthropology 3 (3) Introduction to forensic anthropology, the science that utilizes methods from skeletal biology and archaeology as tools in human identification in a medicolegal context. Preq: Junior standing.

ANTH 3710 Language and Culture 3 (3) See LANG 3710.

ANTH 4030, 6030 Qualitative Methods 3 (3) Methods and techniques of qualitative field research, including participant observation, ethnographic interviewing, data analysis, and report writing. Preq: ANTH 2010.

ANTH 4040 Anthropological Theories 3 (3) Examines various anthropological theories and their utility in explaining contemporary global issues. Students read, discuss and compare original theoretical works, and synthesize ideas through class writings and debates. Course is offered every other year.

ANTH 4170 Japanese Culture and Society 3 (3) See JAPN 4170.

ANTH 4180 Chinese Culture and Society 3 (3) See CHIN 4180.

ANTH 4230, 6230 Women in the Developing World 3 (3) Comparative anthropological study of women and their status in developing countries around the world. A survey of women’s daily lives in a global context, emphasizing education, economics, and the environment. Case studies include micronutrient, literacy, reproductive rights and practices, and the impact of religious fundamentalism on women. Preq: Sociomembership standing.

ANTH 4510 Biological Variation in Human Populations 3 (3) Provides an in-depth discussion of the most influential topics in human skeletal biology. Course explores the history and ethical dilemmas of the field, and examines how biological anthropologists use skeletons to reconstruct patterns of diet, disease, demography and physical activity in human populations. May be offered as BIOL 4510. Preq: ANTH 2010.

ANTH 4740, 4741, 6740-6741 Evolution of Human Behavior 3 (3) Familiarizes students with the evolutionary basis of human behavior. Examines topics such as altruism, cooperation, mating systems, parental investment, and social systems through diverse examples, from hunter-gatherers to technological societies. Preq: ANTH 3510 or BIOL 3350 or BIOL 4700 or BIOL 6700 or PSYC 2010.

ANTH 4740, 4741 Primate Laboratory 0 (3) Non-credit laboratory to accompany ANTH 4740. Coreq: ANTH 4740, 6741.

ANTH 4950 Field Studies 1-6 (1-6) Group field project in settings selected by the instructor to provide students with a variety of exposures to various cultural contexts. Archaeological digs are included. Project progress and student interpretations of findings are monitored by periodic group meetings and shared experiences. May be repeated for a maximum of six credits. Preq: Consent of instructor.

ANTH 4960 Creative Inquiry Cultural Anthropology 1-3 (1-3) Investigates topics in cultural anthropology selected by faculty and students. Goals, research, and outcomes vary from semester to semester and project to project. May be repeated for a maximum of 12 credits. Preq: ANTH 2010 and consent of instructor.

ANTH 4970 Senior Capstone 1 (1) Culmination of student intellectual and professional accomplishments within the anthropology major. Students are presented with learning assessments, professional development, and reflections on their undergraduate experiences.

ANTH 4980 Independent Study 1-3 (1-3) Individual readings or projects in anthropological areas not covered in other courses. May be repeated for a total maximum of six credits with advisor’s approval. Preq: ANTH 2010 and consent of instructor.

APPLIED ECONOMICS

Professors: D.W. Hughes, W.M. Smathers Jr.; Associate Professors: R.D. Lamine, D.B. Willis; Assistant Professors: O. Isengildina-Massa

APEC 2020 Agricultural Economics 3 (3) Analytical survey of the various subdivisions of agricultural economics, including farm organization, enterprise, land economics, marketing, farm prices, governmental farm policies, and the relation of agriculture to the national and international economy.

APEC 2050 Agriculture and Society 3 (3) Introduction to the development of world society focusing on food production, from early hunting and gathering to modern biotechnology. Covers factors driving societal growth with a global perspective. Explores systematic impacts of growth in technical capacity to produce agricultural products on farm and community organization, industrialization, and the global economy.

APEC 2570 Natural Resources, Environment, and Economics 3 (3) Economic principles applied to resource allocation problems related to environmental and natural resource issues.

APEC 3020 Economics of Farm Management 3 (3) Economic principles underlying the organization and operation of agricultural firms and related business enterprises. Particular emphasis is placed on management aspects of the farm as a production unit. Preq: APEC 2020 or ECON 2110.

APEC 3080 Quantitative Applied Economics 3 (3) Basic quantitative relationships in applied economics are examined and interpreted. Emphasizes the mathematical aspects of applied economics. Microcomputer software is utilized for problem solving.

APEC 3090 Economics of Agricultural Marketing 3 (3) General course in marketing agricultural commodities with particular emphasis upon food products. Analyzes efficiency criteria, consumer behavior, market organizations and institutions, and marketing functions. Includes Honors sections. Preq: APEC 2020 or ECON 2000 or ECON 2110.
Courses of Instruction

APEC 3130 Principles of Real Estate Appraisal 3 (3) Introduction to basic principles and procedures of real estate appraisal. Topics include the real estate market, principles of valuation, legal concepts, and the application of the comparable sales, cost, and income approaches to real estate valuation. Preq: FIN 3070.

APEC 3190 Agribusiness Management 3 (3) Study of the principles used in making management decisions and the application of these principles in agribusiness. Emphasizes the application of economics to the solution of problems facing managers of agricultural supply and marketing firms. Preq: APEC 3020.

APEC 3510 Principles of Advertising 3 (3) Introduction to the various functions of advertising; research and audience analysis; various media formats; planning, research, and production necessary to create an advertising campaign; social effects, economic effects, and ethical considerations of advertising.

APEC 3520 Public Finance 3 (3) Principles of financing government, sources of public revenue, objects of public expenditures, problems of fiscal administration, and the application of fiscal policies in stabilizing the national economy. Preq: Junior standing.

APEC 3570 Natural Resources Economics 3 (3) Principles and problems involved in the use of soil, water, forest, and mineral resources, with special emphasis on economic aspects of alternative methods of resource utilization. Preq: APEC 2020 or ECON 2000 or ECON 2110.

APEC 3610 Introduction to Health Care Economics 3 (3) Introductory course in which students learn the basic economics of the institutions comprising the healthcare industry. Topics include the underlying supply, demand, and institutional factors impacting health-care availability and cost of health care.

APEC 4020, 6020 Production Economics 3 (3) Economic analysis of agricultural production involves the concept of the farm as a firm; principles for decision making the quantitative nature and use of production and cost functions and the interaction and relations and applications of these principles to resource allocation in farms and among areas. Preq: APEC 3080; and ECON 3060 or ECON 3140.

APEC 4090, 6090 Commodity Futures Markets 3 (3) Introduction to the economic theory, organization, and operating principles of agricultural commodity futures markets in the United States. Emphasizes speculation, hedging, and investing in agricultural commodity futures contracts from the standpoint of the agribusiness entrepreneur. Preq: APEC 2020 or ECON 2110.

APEC 4110, 6110 Regional Impact Analysis 3 (3) Techniques for analysis of the growth and decline of regions, including economic-base theory, shift share, regional input-output, regional econometric models, and fixed impact models. Preq: APEC 2020; or both ECON 2110 and ECON 2120.


APEC 4130, 6130 Advanced Real Estate Appraisal 3 (3) Topics include highest and best use analysis, data collection, and analyses. Stresses advanced appraisal procedures for income, cost, and comparable sales approach to real estate valuation. Covers eminent domain, the appraisal of property in transition, and specialized property. Preq: APEC 3130 or FIN 3070.

APEC 4210, 6210 Globalization 3 (3) Utilizes basic principles of international economics (comparative advantage, free trade versus protectionism, exchange rate determination, etc.) to analyze the contemporary problems and issues of the world economy. Emphasizes application of economic principles to current globalization trends. Preq: APEC 2020 or ECON 2000 or ECON 2110.

APEC 4260, 6260 Cropping Systems Analysis 3 (2) Application of agronomic and economic principles in solving problems related to the production and marketing of agronomic crops. Major part of the course is a case study in which detailed analysis of a farm, agribusiness, or environmental situation is made with students forming written and oral presentations of results. Preq: AGR 1010; and Junior standing; and APEC 2020 or ECON 2000 or ECON 2110. Coreq: APEC 4261, 6261.

APEC 4261, 6261 Cropping Systems Analysis Laboratory 0 (2) Non-credit laboratory to accompany APEC 4260, 6260. Coreq: APEC 4260, 6260.

APEC 4520, 6520 Agricultural Policy 3 (3) Review of public agricultural policy programs in the United States and a critical examination of current and proposed government policies and programs affecting the agricultural sector of the economy. Includes economic considerations as related to past and current farm price and income problems. Includes Honors sections. Preq: APEC 2020 or ECON 2000 or ECON 2110.

APEC 4550, 6550 Prices 3 (3) Review of the basic theory of price under competitive conditions and various modifications: nature, measurement, and causes of daily, seasonal, and cyclical price fluctuations; geographical price relationships; nature, function, and behavior of futures markets; government price programs. Includes Honors sections. Preq: APEC 3080 or ECON 4050; and ECON 3060 or ECON 3140.

APEC 4570, 6570 Natural Resource Use, Technology, and Policy 3 (3) Focuses on economic analyses of actual, efficient, and sustainable uses of natural resources, impacts of technologies that affect these uses, and policies that affect development and use of such technologies. Resource-technology-policy combinations may vary, but an example is crude oil, hybrid automotive engines, and fuel economy standards. May also be offered as ECON 4570. Preq: MTHS 1020 or MTHS 1060; and APEC 3570 or ECON 3570 or ECON 3140.

APEC 4600, 6600 Agricultural Finance 3 (3) Study of the principles and techniques of financing in the agricultural sector. Topics include the capital situation in agriculture, concepts of farm financial management, use of credit, capital markets, lending agencies, and estate planning. Preq: ACCT 2010; and APEC 2020 or ECON 2000 or ECON 2110.

APEC 4750, 6750 Economics of Wildlife Management and Policy 3 (3) Integrated approach to the study of the economics of wildlife. Topics include determination of market and nonmarket value, single and multiple species management, enterprise cost and returns, marketing wildlife, leasing methods, complementarity and competitiveness with agricultural and forestry enterprises, and timber and crop damage cost estimates and control. Preq: APEC 2020 or ECON 2000 or ECON 2110 or FOR 3040 or WFB 3060.

APEC 4900 Selected Topics 1-15 (1-15) Study of topics in applied economics. Topics may include classroom and/ or field experience not normally covered in other classes. May be repeated for credit, but only if different topics are covered. Preq: Junior standing.

APEC 4910 Internship, Agribusiness, and Community and Rural Development 1-6 (1-6) Internship under faculty supervision in an approved agency or firm. Internships provide students with work experience in agribusiness or community and rural development. Students submit a comprehensive report within one week of the end of the internship. A maximum of six internship credits may be earned. Preq: Junior standing and consent of instructor.

APEC 4940 Creative Inquiry Community and Rural Development 1-3 (1-3) Multi-semester commitment to participate in agricultural and applied economics and community and economic development related research experience for students working in teams, mentored and directed by a faculty member. Students learn to collect, analyze, evaluate, and present information. Suitable for inclusion in the students e-portfolio. May be repeated for a maximum of 12 credits. Preq: Consent of instructor.

ARABIC

ARAB 1010 Elementary Arabic I 4 (3) Introductory course for beginners emphasizing acquisition of the Arabic alphabet and writing, basic grammar, vocabulary, speaking and listening skills, and developing strategies for the successful long-term acquisition of Arabic. Coreq: ARAB 1011.

ARAB 1011 Elementary Arabic I Laboratory 0 (1) Non-credit laboratory to accompany ARAB 1010. Coreq: ARAB 1010.

ARAB 1020 Elementary Arabic II 4 (3) Continuation of ARAB 1010 consisting of three hours a week of classroom instruction and one hour a week in the language laboratory. Preq: ARAB 1010. Coreq: ARAB 1021.

ARAB 1021 Elementary Arabic II Laboratory 0 (1) Non-credit laboratory to accompany ARAB 1020. Coreq: ARAB 1020.


ARAB 2011 Intermediate Arabic I Laboratory 0 (1) Non-credit laboratory to accompany ARAB 2010. Coreq: ARAB 2010.

ARCH 4210 Architectural Seminar 3 (3) Lectures and seminars dealing with pertinent topics related to environmental and technological considerations in architecture and the building industry. Preq: Senior standing.

ARCH 4240, 6240 Product Design 3 (9) Furniture and product system design with emphasis on ergonomics and the relationship of form and materials. Preq: Senior standing and consent of instructor.

ARCH 4250, 6250 Energy in Architecture 3 (3) Climate design methodology and its influence on building energy patterns and architectural form. Preq: Senior standing and consent of instructor.

ARCH 4260, 6260 Architectural Color Graphics 3 (3) Architectural color graphics by computer. Theories of color classification and interaction; application of color theories to art and architecture. Preq: Consent of instructor.

ARCH 4270, 6270 Advanced Color Graphics 3 (3) Theories of color classification and interaction; three-dimensional color modeling by computer; advanced application of color theories to art and architecture. Preq for 4270: ARCH 4260. Preq for 6270: ARCH 4260 or consent of instructor.

ARCH 4280, 6280 Computer-Aided Design 3 (2) Introduction to the concepts, skills, and applications of computer-aided design as they relate to the practice of architecture. Preq for 4280: Senior standing. Preq for 6280: Senior standing or consent of instructor. Coreq: ARCH 4281, 6281.

ARCH 4281, 6281 Computer-Aided Design Laboratory 0 (3) Non-credit laboratory to accompany ARCH 4280, 6280. Coreq: ARCH 4280, 6280.

ARCH 4290, 6290 Architectural Graphics 3 (3) Provides students with an understanding of the concepts, skills, techniques, and strategies of visual presentation/graphics as they relate to the design professions - architects/landscape architects. Preq for 4290: Junior standing. Preq for 6290: Junior standing or consent of instructor.

ARCH 4300, 6300 Theories and Philosophies of Technology and Architecture 3 (3) Theoretical and practical examination of technology and architecture from pre-modern and modern viewpoints to study its nonneutral role in shaping and reflecting knowledge, beliefs, and actions within a cultural context.

ARCH 4400, 6400 New York Field Study 3 (3) Study of architecture, art, planning, and urban design of New York. Two weeks of residence are required with scheduled field trips to relevant sites in all five boroughs, with counseling to determine research interests. Guidance is provided to resources in the city. A final report is required. Offered in the summer only.


ARCH 4520 Synthesis Studio 6 (11) Integrates acquired skills, abilities, and interests from previous architecture studios. Projects emphasize the accumulation of architectural experiences and knowledge. Preq: Graduating senior status. Coreq: ARCH 4010 and ARCH 4521.

ARCH 4521 Synthesis Studio Laboratory 0 (11) Non-credit laboratory to accompany ARCH 4520. Coreq: ARCH 4520.

ARCH 4710 Architectural History of Place 3 (3) Survey of urban design and architectural history using examples viewed in a particular locale. Emphasizes an overview survey of design movements identifying specific design elements and understanding how they are used in shaping place. Course is only offered during the summer at study abroad locations. Preq: ARCH 1010. Coreq: ARCH 4720 and DSGN 3700.

ARCH 4720 Architectural Field Studies 3 (1) Students develop diagramming and writing skills and use them to document and analyze existing works of urban design and architecture observed during field trips. Course is only offered during the summer at study abroad locations. Preq: ARCH 1010. Coreq: ARCH 4721 and ARCH 4710 and DSGN 3700.

ARCH 4721 Architectural Field Studies Laboratory 0 (3) Non-credit laboratory to accompany ARCH 4720. Coreq: ARCH 4720.

ARCH 4770, 6770 Introduction of Craft 1-3 (1-3) Architectural craft lab offered under different material specializations, all of which introduce students to design as informed by craft through a hands-on lab. Basic craft operations and material properties are introduced for the subject material (wood, steel, etc.) May be repeated for a maximum of six credits. Preq: Consent of instructor.

ARCH 4850, 6850 History and Theory of Architecture + Health 3 (3) Introduces relationships between health and architectural settings for health. Examines connections between cultural context, medical thought, healthcare delivery, and health facility design within different time periods. Introduces contemporary theories on the relationships between human beings, their health and wellbeing, and the design of the physical environment. Preq: Consent of instructor.

ARCH 4850, 6850 Architectural Programming and Prediction 3 (3) Introduces the theory, mechanics, and practice of architectural programming and post-occupancy evaluation. Presents programming as a means to create architectural settings sensitive to the needs of their inhabitants. Emphasizes collaborative methodologies that involve identifying relevant goals, facts, issues, needs, and concepts. Students develop an architectural program. Preq: Consent of instructor.

ARCH 4890 Internship 1-6 (16) Practicum in professional practice. Paid work/study in a variety of related disciplines provides students with hands-on experience in design and fabrication skills relevant to the environmental design professions. Consists of two parts: a professional component, managed by an approved sponsor, and an academic component, taught by the instructor. May be repeated for a maximum of 18 credits. Preq: Consent of instructor and acceptance by sponsor.

ARCH 4900 Directed Studies 1-5 (1-5) Comprehensive studies and research of special topics not covered in other courses. Emphasis is on field studies, research activities, and current developments in architecture. May be repeated for a maximum of ten credits. Includes Honors sections. Preq: Consent of instructor.

ARCH 4990, 6990 Selected Topics in Architecture 1-3 (1-3) Study of selected topics in architecture. May be repeated for a maximum of nine credits, but only if different topics are covered. Includes Honors sections. Preq for 4990: Junior standing. Preq for 6990: Junior standing or consent of instructor.


ART 1030 Visual Arts Studio 3 (6) Studio projects in basic visual elements and principles. The development of creative design process, visual organization, and design skills are introduced as a foundation for further study in visual arts.

ART 1050 Foundation Drawing 3 (3) Introduction to drawing. Presents exploration of observational drawing practices with an emphasis on structural observations of form and application of spatial organization. Basic materials and approaches associated with drawing are studied and applied. Preq: Visual Arts major.

ART 1060 Foundation Drawing II 3 (3) Further exploration of introductory drawing. Emphasizes use of tone and color. Students work primarily with representational categories, developing comprehension of complex forms and spaces in relation to the 2-D planes. Includes use of rigorous observational drawing practices in conjunction with thematic efforts. Preq: ART 1050 or ART 1510.

ART 1510 Foundations in Visual Art I 3 (6) Intensive introduction to the fundamentals of visual art. Studio projects, lectures, and discussions introduce topics and projects relative to foundation-level art students. Explores historical and contemporary applications of the elements and principles of design. Preq: Visual Arts Major

ART 1520 Foundations in Visual Art II 3 (6) Intensive introduction to the fundamentals of visual art. Studio projects, lectures, and discussions introduce topics and projects relative to foundation-level art students. Explores historical and contemporary applications of the elements and principles of design. Preq: Visual Arts major.

ART 1530 Orientation to Visual Arts I 1 (1) Introduction to the visual arts profession focusing on issues related to various career opportunities, creativity, problem-solving methodologies, and current thinking in contemporary art. Preq: Visual Arts major.

ART 2050 Beginning Life Drawing 3 (6) Primary emphasis is on drawing from the live model. Students drawing skills and fundamental understanding of the structure and form of the human figure are reviewed through studio practice, augmented by lectures, discussions, demonstrations, and critiques. Addresses historical and contemporary use of the human figure in visual arts. Preq: ART 1060 or ART 1510 or ART 1520.
ART 2070 Beginning Painting 3 (6) Introduction to basic materials, methods, and techniques of painting. Primary medium used is acrylic, and other painting media may also be introduced. Emphasizes basic skills in painting plus individual creative development. Preq: ART 1510 and ART 1530 and ART 2050 (Visual Arts majors); ART 1050 (non-Art Majors); ARCH 1520 (Architecture majors); LARC 1520 (Landscape Architecture majors).

ART 2090 Beginning Sculpture 3 (6) Studio course investigating the meaning of sculpture through traditional and nontraditional approaches. Establishes a working knowledge of material and process in several media. Personal expression is encouraged and enhanced by employment of problem-solving techniques. Static, temporal, installation, and site specific sculpture is explored. Preq: ART 1510 and ART 1520 and ART 1530 and ART 1540 and ART 2050 (Visual Arts majors); ART 1030 (non-Art majors); ARCH 1520 (Architecture majors); LARC 1520 (Landscape Architecture majors).

ART 2110 Beginning Printmaking 3 (6) Studio course introducing basic techniques of relief printing, intaglio, lithography, silkscreen, and papermaking. Each semester concentrates on two or three of these techniques. Coursework integrates print-making processes and creativity. Preq: ART 1510 and ART 1520 and ART 1530 and ART 1540 and ART 2050 (Visual Arts majors); ART 1030 (non-Art majors); ARCH 1520 (Architecture majors); LARC 1520 (Landscape Architecture majors).

ART 2130 Beginning Photography 3 (6) Introduction to the use of photography as an art medium. Lectures and studio work cover the utilization of the camera, processing, and printing in black and white, with emphasis on perception and creative expression. Preq: ART 1510 and ART 1520 and ART 1530 and ART 1540 and ART 2050 (Visual Arts majors); ART 1030 (non-Art majors); ARCH 1520 (Architecture majors); LARC 1520 (Landscape Architecture majors).

ART 2150 Beginning Graphic Design 3 (6) Introduction to fundamental techniques, concepts, and principles of visual communication. Through a series of projects and studio work, students explore techniques of communication through the use of type design, typography, photography, illustration, symbolism, and product design. Individual creative development is stressed. Preq: ART 1510 and ART 1520 and ART 1530 and ART 1540 and ART 2050 (Visual Arts majors); ART 1030 (non-Art majors); ARCH 1520 (Architecture majors); LARC 1520 (Landscape Architecture majors).

ART 2170 Beginning Ceramics 3 (6) Basic studio course introducing ceramic arts through its various processes and techniques. Hand building methods as well as throwing on the potter's wheel are developed. Weekly projects emphasize imagination, self-expression, and skill development. Ceramic history is introduced through slide lectures. Preq: ART 1510 and ART 1520 and ART 1530 and ART 1540 and ART 2050 (Visual Arts majors); ART 1030 (non-Art majors); ARCH 1520 (Architecture majors); LARC 1520 (Landscape Architecture majors).

ART 2210 Beginning New Media 3 (6) Explores new media art practices and ideas. Digital tools and processes are explored relative to drawing, painting, printing, bookmaking, and photography. Introduces new media as a context of new collective, interactive, and social modes of art production. Preq: ART 1060 and ART 1510 and ART 1520.

ART 2230 Woodworking Studio 3 (6) Introduces woodworking explorations in sculpture and furniture design emphasizing technical understanding and creative application of woodworking processes and methodologies. Students experiment with wood as a vehicle for personal expression and thematic development and conduct research on the historical impact of woodworking in the visual arts. Preq: ART 1510; and one of ART 1520 or ARCH 1520.


ART 3070 Painting 3 (6) Continuation of ART 2070 with increased emphasis on personal expression and growth in technical competence. Some study of painting history is included in studio activity. Preq: ART 2070.

ART 3090 Sculpture 3 (6) Continuation of ART 2090 with increased emphasis on personal expression and content of work. Further exploration of materials and processes, including an introduction to sand casting and advanced welding techniques. Individual investigation into current and historical aspects of sculpture is required. Preq: ART 2090.

ART 3110 Printmaking 3 (6) Continuation of processes in beginning printmaking emphasizing expanding the range and depth of technique. The relationship of technique and process to creative idea development is emphasized. Preq: ART 2110.

ART 3120 Printmaking Research I 1-3 (1-3) Continuation of ART 3110. Technical and conceptual research in printmaking to develop self-expression. Special projects are constructed in consultation with instructor. May be repeated for a maximum of five credits. Preq: ART 3110.

ART 3130 Photography 3 (6) Continuation of ART 2130. Advanced techniques and more diverse types of film and paper are used in making images of personal and expressive nature. The design and construction of a view camera, printing in color, and multiple imagery may also be included. Preq: ART 2130.

ART 3150 Graphic Design 3 (6) Continuation of concepts and techniques introduced in ART 2150 with emphasis on more applied projects. Individual creative solutions are emphasized. Preq: ART 2150.

ART 3170 Ceramic Arts 3 (6) Continuation of skill development leading to more challenging projects and independent efforts. Further exposure to ceramic history and ceramic technology is presented. Preq: ART 2170.
ART 4710 Bachelor of Fine Arts Senior Studio I 3 (6) Individual studio project directed by an instructor and determined by the student in consultation with the instructor. Focuses on a particular studio area, concept, or theme. May be repeated for a maximum of six credits. Preq: Senior standing and completion of 3000/4000 sequence in the chosen studio area, minimum grade-point average of 3.0 in focus studio area, participation in senior studio interview. Coreq: ART 4730.

ART 4720 Bachelor of Fine Arts Senior Studio II 5 (15) Individual studio project directed by an instructor and determined by the student in consultation with the instructor. Usually focuses upon a particular studio area, concept, or theme. May be repeated with a B or better. Preq: ART 4710.

ART 4730 Senior Seminar in Professional Career Preparation 3 (3) Seminar and practical guide to prepare students for entry into the professional art world. Focuses on issues concerning visual artists in the early years of their professional activities. Presents career options and practical information for the graduating senior, including portfolio development. Coreq: ART 4710.

ART 4740 Travel Seminar I (1) Students travel with faculty to museums, galleries and festivals that directly affect studio practice, art history knowledge and engagement in historical and contemporary art practice. Students plan trips, conduct research, keep a journal and make presentations on works and sites visited and matters pertaining to professional practice. To be taken Pass/No Pass only. May be repeated for a maximum of three credits. Preq: Junior standing.

ART 4890 Art and Art History Internship I 3 (1-3) Internship with an approved sponsoring art institution in support of professional development and best art practices. May be repeated for a maximum of six credits. Preq: Junior standing in Visual Arts and consent of instructor and acceptence by sponsor.

ART 4900, 6900 Directed Studies 1-5 (1-5) Study of areas in the visual arts not included in other courses or additional advanced work. Must be arranged with a specific instructor prior to registration. May be repeated for a maximum of 18 credits. Includes Honors sections. Preq: Consent of instructor.

AEROSPACE STUDIES
Professor: J.G. Riems-Van Laare, Chair; Assistant Professors: S.P. Jordan, S.D. Wiggins

AS 1090 Air Force Today I 2 (1) Deals with Air Force in the contemporary world through a study of the total force structure: strategic offensive and defensive, general purpose, and aerospace support. Leadership laboratory activities include drill fundamentals, customs, and courtesies of the service. Coreq: AS 1091.

AS 1091 Air Force Today I Laboratory 0 (2) Non-credit laboratory to accompany AS 1090. Coreq: AS 1090.

AS 1100 Air Force Today II 2 (1) Continuation of AS 1090. Leadership laboratory includes drill, ceremonies, and an introduction to Air Force career opportunities. Coreq: AS 1101.

AS 1101 Air Force Today II Laboratory 0 (2) Non-credit laboratory to accompany AS 1100. Coreq: AS 1100.

AS 2090 Development of Air Power I 2 (1) Study of the development of air power from balloons and dirigibles through the peaceful employment of U.S. air power in relief missions and civic action programs in the late 1960s and also the war in Southeast Asia. Leadership laboratory provides experience in guiding, directing, and controlling an Air Force unit. Coreq: AS 2091.

AS 2091 Development of Air Power Laboratory 0 (2) Non-credit laboratory to accompany AS 2090. Coreq: AS 2090.


AS 2101 Development of Air Power II Laboratory 0 (2) Non-credit laboratory to accompany AS 2100. Coreq: AS 2101.

AS 3090 Air Force Leadership and Management I 4 (3) Emphasizes the individual as a manager. Includes motivational and behavioral processes, leadership communication, and group dynamics. Experiences are provided to provide a foundation for the development of the Air Force officers professional skills. Students prepare individual and group presentations, write reports, participate in group discussions, seminars, and conferences. Coreq: AS 3091.

AS 3091 Air Force Leadership and Management I Laboratory 0 (2) Non-credit laboratory to accompany AS 3090. Coreq: AS 3090.

AS 3100 Air Force Leadership and Management II 4 (3) Continuation of AS 3090. Uses the basic managerial processes involving decision making, utilization of analytical aids in planning, organizing, and controlling environment. Actual case studies are used to enhance learning and communication processes. Coreq: AS 3101.

AS 3101 Air Force Leadership and Management II Laboratory 0 (2) Non-credit laboratory to accompany AS 3100. Coreq: AS 3100.

AS 4090 National Security Policy I 4 (3) Analysis of the role and function of the military officer in a democratic society and the relationships involved in the military-institutional context. Students prepare individual and group presentations, write reports, and participate in group discussions. Coreq: AS 4091.

AS 4091 National Security Policy I Laboratory 0 (2) Non-credit laboratory to accompany AS 4090. Coreq: AS 4090.

AS 4100 National Security Policy II 4 (3) Continuation of AS 4090. Examines the environmental context in which U.S. defense policy is formulated and implemented. Emphasizes initial commissioned service and military justice. Students prepare individual and group presentations for the class, write reports, and participate in group discussions, seminars, and conferences. Coreq: AS 4101.

AS 4101 National Security Policy II Laboratory 0 (2) Non-credit laboratory to accompany AS 4100. Coreq: AS 4100.

AMERICAN SIGN LANGUAGE
Associate Professor: W.A. Brant; Lecturer: T. Bateson


ASL 1011 American Sign Language I Laboratory 0 (1) Non-credit laboratory to accompany ASL 1010. Coreq: ASL 1010.

ASL 1020 American Sign Language II 4 (3) Continuation of ASL 1010 and culture to develop further communicative competencies. Proficiency oriented with the use of visual-gestural communication skills. Preq: ASL 1010. Coreq: ASL 1021.

ASL 1021 American Sign Language I Laboratory 0 (1) Non-credit laboratory to accompany ASL 1020. Coreq: ASL 1020.

ASL 2010 American Sign Language II 3 (3) Continuation of ASL 1020. Covers additional vocabulary, sentences, and grammar structures. Main focus is on conversational and receptive skills as well as a better understanding of Deaf culture. Preq: ASL 1020.

ASL 2020 American Sign Language II 3 (3) Continuation of ASL 2010, concentrating on intermediate conversational and discourse skills using American Sign Language, more complex American Sign Language grammar, reading comprehension, and composition of short stories, narratives, and dialogues with an emphasis on topics related to the Deaf community. Class is conducted totally in American Sign Language using visual-gestural communicative techniques. Preq: ASL 2010.

ASL 2970 Creative Inquiry American Sign Language I-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Preq: Consent of faculty member because arrangements with faculty member must be established prior to registration.

ASL 3000 Fingerspelling and Numbers in American Sign Language I 1 (1) Advanced study of the manual alphabet (fingerspelling) and the numerical system in American Sign Language, with extensive practice in both expressive and receptive skills. Preq: ASL 2010.

ASL 3020 Advanced American Sign Language II 3 (3) Continuation of ASL 3010. Focuses on American Sign Language fluency, vocabulary development, grammatical structures of American Sign Language, use of classifiers, conversational skills, translating written texts into American Sign Language, and vice versa. Emphasis is on making formal presentations in American Sign Language. Preq: ASL 3010.

ASL 3040 Internship in American Sign Language 3 (4) Minimum 60 contact hours in an environment exclusively using American Sign Language. Frequent opportunities to converse with native signers in classroom settings, dormitory settings, meals, excursions, sporting events, cultural events, and meetings. Preq: ASL 3020.

ASL 3050 Deaf Studies in the United States 3 (3) In-depth look into language, culture, and daily lives of approximately one million people who use American Sign Language as their primary language. Traces the roots of American Sign Language from pre-revolutionary times to current science and knowledge and how it applies to professional fields. Preq: ASL 3020.

ASL 3150 Survey of Interpreting in Public Schools 3 (3) Overview of the ASL/English interpreting profession in public schools. Includes discussions about the role, function, and aptitudes of educational interpreters, the bilingual and bicultural context, history of interpreting, principles of professional practice, laws that affect educational interpreting, and analysis of the impact of classroom variables on accessibility and interpretability. Preq: ASL 2010.

ASL 3200 American Sign Language English Interpreting in Elementary Schools I 3 (3) ASL English interpreting in the elementary classroom. Includes analysis of the discursive features of elementary classrooms; translation of materials encountered in elementary classrooms; rendering of interpretations of elementary classroom discourse, both consecutively and simultaneously; and assessment of the effectiveness of interpreted products. Preq: ASL 3250.

ASL 3250 American Sign Language English Interpreting in Secondary Schools I 3 (3) ASL English interpreting in the high school classroom. Includes analysis of the discursive features of several high school courses; translation of materials encountered in high school classrooms; rendering interpretations, both consecutively and simultaneously; and assessment of the effectiveness of interpreted products. Preq: ASL 3150.

ASL 3450 American Sign Language for Health Care Practitioners I 3 (3) Intermediate instruction of specific health care and medical terminology in American Sign Language. Topics relate to specific body systems, medical terminology, and cultural aspects that have a direct bearing on medical treatment and understanding the deaf patient. Preq: ASL 3200.

ASL 3490 Advanced Applications in American Sign Language 3 (3) Study of select signs in American Sign Language emphasizing culturally appropriate signs in education, psychology/mental health, legal/legislation, health/medicine, religion, drugs/alcohol, and technology. May be repeated for a maximum of six credits. Preq: ASL 3200.

ASL 3970 Creative Inquiry American Sign Language I 4 (1-4) Students focus on a special research area under the guidance of a faculty member. After acquiring the requisite background, students formulate hypotheses for a group project, develop a critical framework, and initiate research on a specific topic.

ASL 4010 Discourse in American Sign Language I 3 (3) Designed for advanced-level students in American Sign Language. Primary goal is to further develop students understanding and knowledge of American Sign Language by incorporating in-depth analysis of American Sign Languages historical development, linguistic structures, syntax, grammar, and pragmatics. Preq: ASL 3020.

ASL 4020 Discourse in American Sign Language II 3 (3) Continuation of American Sign Language 4010. Primary goal is to further develop students understanding and knowledge of American Sign Language by incorporating analysis of time concepts, variations due to region and ethnicity, pluralization, classifiers, locatives, temporal aspects, and pronoun usage in American Sign Language. Preq: ASL 4010.

ASL 4200 American Sign Language English Interpreting in Elementary Schools II 3 (3) Continuation of ASL 3200. Further analyses of elementary school curricular discourse; rendering interpretations of elementary school classroom discourse simultaneously; preparation and interpretation or presentations from ASL and English into first language; and assessment of the effectiveness of interpreted products. Preq: ASL 3200.

ASL 4250 American Sign Language English Interpreting in Secondary Schools II 3 (3) Continuation of ASL 3250. Further analyses of high school curricular discourse; rendering interpretations of high school classroom discourse simultaneously; preparing and interpreting presentations from second language to first language; and assessment of the effectiveness of interpreted products. Preq: ASL 3250.

ASL 4450 American Sign Language for Health Care Practitioners II 3 (3) Continuation of ASL 3450. Expands health care and medical terminology in American Sign Language. Topics relate to specific body systems, ASL medical terminology, insurance, and medications. Preq: ASL 3450.

ASL 4600 Deaf Literature and Folklore 3 (3) Designed for advanced-level students in American Sign Language. Primary goal is to further develop students knowledge and understanding of Deaf literature, folklore, and the community at large. Includes introductions to deaf authors, literary works, plays, poetry, painting, and sculpture. Preq: ASL 3200.

ASL 4970 Creative Inquiry American Sign Language II 4 (1-4) Continuation of research initiated in ASL 3970. Students complete their projects and disseminate their research results. Preq: ASL 3970.

ASL 4980 Independent Study 1-3 (1-3) Supervised research and study on topics related to the origins and growth of American Sign Language and the Deaf Community in the United States (1800-present). May be repeated for a maximum of six credits. Preq: ASL 2020.

ASTRONOMY

Professors: D.H. Hartmann, M.D. Leising, B.S. Meyer; Associate Professors: P.J. Flower, J.R. King; Assistant Professor: S. Brittain

ASTR 1010 Solar System Astronomy 3 (3) Descriptive survey of the universe, with emphasis on basic physical concepts and the objects in our solar system. Related topics of current interest are included. For nonscience majors.

ASTR 1020 Stellar Astronomy 3 (3) Descriptive survey of the universe, with emphasis on basic physical concepts and galactic and extragalactic objects. Related topics of current interest are included. For nonscience majors. May not be taken by students who have completed ASTR 3020.

ASTR 1030 Solar System Astronomy Laboratory 1 (2) Optional laboratory to accompany ASTR 1010. Demonstrations, laboratory exercises, and planetarium visits supplement the lecture course. Preq or concurrent enrollment: ASTR 1010.

ASTR 1040 Stellar Astronomy Laboratory 1 (2) Optional laboratory to accompany ASTR 1020. Demonstrations, laboratory exercises, and planetarium visits supplement the lecture course. Preq or concurrent enrollment: ASTR 1020.

ASTR 1050 Physics of the Universe 3 (3) Basic physics principles of Newtonian mechanics, special and general relativity, quantum mechanics, atomic structure, thermal physics, optics, and radiation physics are qualitatively and quantitatively presented. These principles are then applied to demonstrate their usefulness in understanding fundamental astrophysical objects and processes in the cosmos.

ASTR 2200 Planetary Science 3 (3) Survey of the formation and evolution of planetary bodies. Emphasizes the origin of planetary material and comparative study of the primary processes operative on planetary surfaces. Describes major features of the planets and moons in our solar system, as revealed by recent space missions.

ASTR 3020 Stellar Astrophysics 3 (3) Study of the basic physical concepts necessary for understanding the sun, other stars, and their evolution. Topics include star formation, stellar structure and evolution, binary stars, and observational techniques. Preq: PHYS 2210.

ASTR 3030 Galactic Astrophysics 3 (3) Study of basic physical concepts necessary for understanding the structure of the galaxy, the motions of the stars within it, the nature of the interstellar matter, other galaxies, the large-scale structure of the universe, and the origin of the solar system. Preq: PHYS 2210.

ASTR 4750 Selected Topics in Astrophysics 1-3 (1-3) Comprehensive study of an area of astrophysics. Topics may include nucleosynthesis and stellar evolution, extragalactic distance scale, structure and evolution of galaxies, and large-scale structure of the universe. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: ASTR 3020.
AUDIO TECHNOLOGY

Associate Professor: B.A. Whisler; Assistant Professor: H. Altstatt; Lecturer: K.W. Moore

AUD 1850 Introduction to Audio Technology 3 (2) Introduction to MIDI sequencing, analog and digital recording, digital processing and related audio production technologies. Not open to students who have taken MUSC 1800. Preq: Production Studies in Performing Arts major. Coreq: AUD 1851.

AUD 1851 Introduction to Audio Technology Laboratory 0 (2) Non-credit laboratory to accompany AUD 1850. Coreq: AUD 1850.

AUD 1950 Creative Inquiry I 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits.

AUD 2790 Audio Practicum 3 (1) Practical work in audio providing technical services to the broader university and surrounding community. Projects include recording live performances, sound support for public events, and audio support for film and animation projects. May be repeated for a maximum of six credits. Preq: AUD 3800 with a C or better. Coreq: AUD 2791.

AUD 2791 Audio Practicum Laboratory 0 (5) Non-credit laboratory to accompany AUD 2790. Coreq: AUD 2790.

AUD 2800 Sound Reinforcement 3 (2) Theory and practice of using audio equipment for amplifying sound in venues ranging from conference rooms to concert halls and sports arenas. Preq: Production Studies in Performing Arts major. Coreq: AUD 2801.

AUD 2801 Sound Reinforcement Laboratory 0 (2) Non-credit laboratory to accompany AUD 2800. Coreq: AUD 2800.

AUD 2850 Acoustics of Music 3 (3) Studies the relationship between the laws of physics and the production of music from an audio engineering perspective. Topics include mechanical and acoustical laws, harmonic analysis, musical scales, sound production in instruments, and the physiology of hearing. Preq: Production Studies in Performing Arts major.

AUD 2950 Creative Inquiry II 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits.

AUD 3800 Audio Engineering I 3 (2) Intermediate-level course in music technology focusing on digital hard-disk recording and acoustical considerations in audio engineering. Preq: PHYS 1220 with a C or better or PHYS 2070 with a C or better; and MUSC 1800 with a C or better or AUD 1850 with a C or better. Coreq: AUD 3801.

AUD 3801 Audio Engineering I Laboratory 0 (2) Non-credit laboratory to accompany AUD 3800. Coreq: AUD 3800.

AUD 3850 Advanced Live Sound Reinforcement 3 (2) Advanced course in live sound reinforcement focused on digital consoles and sound system design. Preq: AUD 2800 with a C or better. Coreq: AUD 3851.

AUD 3851 Advanced Live Sound Reinforcement Laboratory 0 (2) Non-credit laboratory to accompany AUD 3850. Coreq: AUD 3850.

AUD 3860 Electronic Composition and Sound Design 3 (2) Intermediate- to advanced-level course covering techniques, methods and issues associated with electronic music composition and production. Topics include advanced MIDI/sequencing techniques, electronic orchestral arrangements, scoring/sound design, and picture and audio processing. Preq: AUD 1850 or MUSC 1800. Coreq: AUD 3861.

AUD 3861 Electronic Composition and Sound Design Laboratory 0 (2) Non-credit laboratory to accompany AUD 3860. Coreq: AUD 3860.

AUD 3950 Creative Inquiry III 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits.

AUD 4800, 6800 Audio Engineering II 3 (2) Advanced course in music technology focused on production integrating digital audio and virtual instruments. Preq: AUD 2800; and AUD 3800; and PHYS 2070 or PHYS 2210; each with a C or better. Coreq: AUD 4800, 6800.

AUD 4801, 6801 Audio Engineering II Laboratory 0 (2) Non-credit laboratory to accompany AUD 4800, 6800. Coreq: AUD 4800, 6800.

AUD 4850 Production Workshop 3 (2) Project-based course focused on music production. Students produce an audio CD that includes recorded audio tracks and/or newly-created sequenced material with creative and appropriate packaging. Preq: Production Studies in Performing Arts major. Coreq: AUD 4850.

AUD 4851 Production Workshop Laboratory 0 (2) Non-credit laboratory to accompany AUD 4850. Coreq: AUD 4850.

AUD 4950 Creative Inquiry IV 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits.

AUD 4990, 6990 Independent Study in Audio Technology 1-3 (1-3) Tutorial work for students with special interests in audio study outside the scope of existing courses. May be repeated for a maximum of six credits. Preq: Consent of department chair.

ANIMAL AND VETERINARY SCIENCES


AVS 1000 Orientation to Animal and Veterinary Sciences 1 (2) Study of the role of animal agriculture in the world today emphasizing supply and demand of end products and careers available in the animal industry.

AVS 1500 Introduction to Animal Science 3 (3) Survey of animal industries and their role in society. Examines the relationship between man and animals in both a current and historical context. Coreq: AVS 1510.

AVS 1510 Introduction to Animal Science Laboratory 1 (2) Examines the basic principles in the handling of livestock and techniques of farm animal production as well as orientation to animal production units. Coreq: AVS 1500.

AVS 2000 Beef Cattle Techniques 2 (1) Examines basic principles in the techniques and management associated with production of both beef cattle and sheep. Students may take only one techniques course per semester. Preq or concurrent enrollment: AVS 1500 and AVS 1510. Coreq: AVS 2001.


AVS 2010 Poultry Techniques 2 (1) Basic principles of the production of poultry are discussed and demonstrated. Students receive hands-on experience in the production and processing of poultry. Students may take only one techniques course per semester. Preq: AVS 1510. Coreq: AVS 2011.

AVS 2011 Poultry Techniques Laboratory 0 (2) Non-credit laboratory to accompany AVS 2010. Coreq: AVS 2010.

AVS 2030 Dairy Science Techniques 2 (1) Introduction to dairy production and processing. Laboratories include hands-on opportunities for management of dairy cattle, quality control of milk, and processing of milk and dairy products. Students may take only one techniques course per semester. Preq: AVS 1510. Coreq: AVS 2030.

AVS 2031 Dairy Science Techniques Laboratory 0 (2) Non-credit laboratory to accompany AVS 2030. Coreq: AVS 2030.

AVS 2040 Horse Care Techniques 2 (1) Basic principles of equine behavior, handling, and management are discussed and demonstrated. Students receive hands-on experience with various management techniques, including handling and all aspects of health care. Students may take only one techniques course per semester. Preq: AVS 1510. Coreq: AVS 2041.

AVS 2041 Horse Care Techniques Laboratory 0 (2) Non-credit laboratory to accompany AVS 2040. Coreq: AVS 2040.

AVS 2050 Horsemanship Techniques 2 (4) Develops basic to advanced skills based on rider aptitude. Students learn the mechanics of safety, lunging, basic position, cues, and rider’s aids, as well as individual work and building subtlety and finesse with aids. Preq: AVS 1510.

AVS 2060 Swine Techniques 2 (1) Examines the basic principles in the techniques and management associated with production of swine. Students may take only one techniques course per semester. Preq: AVS 1500 and AVS 1510. Coreq: AVS 2061.
AVS 2061 Swine Techniques Laboratory 0 (2) Non-credit laboratory to accompany AVS 2060. Coreq: AVS 2060.

AVS 2080 Techniques of Teaching Horsemanship 3 (2) Discusses teaching techniques and theory and handling of large mounted groups. Trains beginner through advanced levels. Preq: AVS 2050. Coreq: AVS 2081.

AVS 2081 Techniques of Teaching Horsemanship Laboratory 0 (2) Non-credit laboratory to accompany AVS 2080. Coreq: AVS 2080.


AVS 2091 Livestock Exhibition Techniques Laboratory 0 (2) Non-credit laboratory to accompany AVS 2090. Coreq: AVS 2090.

AVS 2110 Meat Processing Techniques 2 (1) Examines the basic principles of food animal processing. Laboratories include hands-on opportunities harvesting a variety of livestock, carcass evaluation, carcass fabrication and value-added meat products. Students also gain understanding in Hazard Analysis and Critical Control (HACCP) certification and meat inspection. Preq: AVS 1500. Coreq: AVS 2111.

AVS 2111 Meat Processing Techniques Laboratory 0 (2) Non-credit laboratory to accompany AVS 2110. Coreq: AVS 2110.

AVS 3010 Anatomy and Physiology of Domestic Animals 4 (3) Study of physiology and associated anatomy of the body systems, including nervous, skeletal, muscular, respiratory, digestive, circulatory, urinary, reproductive, and endocrine systems. Designed primarily for students in Animal and Veterinary Sciences. Preq: BIOL 1040 and BIOL 1060; or BIOL 1110. Coreq: AVS 3011.

AVS 3011 Anatomy and Physiology of Domestic Animals Laboratory 0 (3) Non-credit laboratory to accompany AVS 3010. Coreq: AVS 3010.

AVS 3020 Livestock Selection and Evaluation 1-2 (1) Selection and evaluation of the meat species of livestock with application of theory applied in multiple field exercises. Coreq: AVS 3021.

AVS 3021 Livestock Selection and Evaluation Laboratory 0 (2) Non-credit laboratory to accompany AVS 3020. Coreq: AVS 3020.

AVS 3090 Principles of Equine Evaluation 2 (4) Discusses the selection and evaluation of equines for various disciplines. Emphasizes current industry standards with regard to form to function. Students place classes of four horses and develop oral reasons to defend their placing. Opportunities for competitive horse judging teams are available.

AVS 3100 Animal Health 3 (3) Discusses basic principles of animal health. Emphasizes disease prevention in beef cattle, dairy cattle, goats, horses, poultry, and swine. The most common and important diseases and zoonosis of farm animals are explained. Preq: AVS 1500.

AVS 3110 Dairy Cattle Selection Laboratory 0 (2) Non-credit laboratory to accompany AVS 3110. Coreq: AVS 3110.

AVS 3110 Dairy Cattle Selection Laboratory 0 (2) Non-credit laboratory to accompany AVS 3110. Coreq: AVS 3110.

AVS 3150 Animal Welfare 3 (3) Discussion of past, present, and future human/animal interaction. Topics include wild animals, domestication, animal welfare organizations, animal rights organizations, welfare assessment, animal agriculture, animal research, and other current topics. Preq: Junior standing.

AVS 3230 Poultry and Poultry Products Evaluation 2 (4) Selection of layers, broilers, and turkeys. Grading of poultry products according to USDA grade standards is also studied. Students are eligible to compete in intercollegiate poultry judging contests. May be repeated for a maximum of four credits.

AVS 3600 Internship 1-12 (1-12) Off-campus, preplanned, reviewed, approved, and supervised educational experience in an area related to animal and veterinary sciences. Based on a multifaceted work experience in a highly structured professional environment. Students submit periodic written reports and a final written and oral report. To be taken Pass/No Pass only. Preq: Junior standing in Animal and Veterinary Sciences and consent of instructor.

AVS 3700 Principles of Animal Nutrition 3 (3) Familiarizes students with nutrients and feeds used in livestock and specialty animal production. Methods of evaluating common feedstuffs are covered along with chemistry of the functioning of the various digestive systems. Practical aspect to feeding each species is covered. Includes Honors sections. Preq: AVS 1500 and CH 1020.


AVS 3751 Applied Animal Nutrition Laboratory 0 (2) Non-credit laboratory to accompany AVS 3750. Coreq: AVS 3750.

AVS 3850 Equine Behavior and Training 2 (6) Introduces students to the initial processes in gentling and riding young horses. Students work with two- and three-year-old horses to desensitize them to stimuli in preparation for riding. Students do groundwork and put the initial rides on the horses. Preq: AVS 2050.

AVS 3860 Advanced Equine Behavior and Training 2 (6) Students train young horses advanced skills in western or English disciplines. Students actively prepare horses for show or sale and participate in a show or marketing/sale of their assigned horse. Develops students' negotiation and communication skills, industry insight, and industry-specific jargon. May be repeated for a maximum of four credits. Preq: AVS 3850.

AVS 3900 Practicum I-3 (1-3) On-campus, preplanned, supervised learning experience in an area related to animal and veterinary sciences. May be repeated for a maximum of four credits. To be taken Pass/No Pass only. Preq: Consent of instructor supervising practicum.

AVS 4000 Animal and Veterinary Sciences Professional Development 1 (1) Career development in the animal and veterinary sciences field by resume and interview preparation, learning about career opportunities, and interaction with industry professionals. Preq: Senior standing.


AVS 4011 Beef Production Laboratory 0 (2) Non-credit laboratory to accompany AVS 4010. Coreq: AVS 4010.

AVS 4050 Advanced Selection and Evaluation 2 (4) Special and advanced training in selection and evaluation of breeding, performance, and market animals or their products. Species used are beef and dairy cattle, sheep, swine, and horses. Preq: One of AVS 3020 or AVS 3030 or AVS 3050 or FDSC 3040; and either AVS 3090 or AVS 3110; consent of instructor.

AVS 4060 Seminars and Related Topics 2 (3) Students conduct in-depth library research on current topics related to animal science and give formal presentations using multimedia technology. Students also prepare scientific posters, learn interviewing skills, prepare résumés, and observe professional speakers. Preq: Senior standing.

AVS 4090 Selected Topics 1-3 (1-3) Topics of interest to students at the undergraduate, graduate, and professional levels. Provides experience with problems not covered in other courses or on thesis research. May be repeated for a maximum of six credits, but only if different topics are covered.

AVS 4100, 6100 Domestic Animal Behavior 3 (3) Provides knowledge and understanding of behavior related to perception, learning, sociality, reproduction, feeding, and health for application in production, training, and design of environments for optimum health and welfare of domestic animals. Preq: AVS 1500 and AVS 1510; and Junior standing.

AVS 4110, 6110 Animal Growth and Development 3 (3) Integration of the nutritional, physiological, and genetic basis for animal growth and development with application to livestock and poultry production. Includes the cellular and molecular mechanisms controlling these processes and emphasizes the genes that regulate animal products (meat, eggs, wool, and milk). Preq: AVS 3010.


AVS 4121, 6121 Advanced Equine Management Laboratory 0 (2) Non-credit laboratory to accompany AVS 4120, 6120. Coreq: AVS 4120, 6120.
AVS 4130, 6130 Animal Products 3 (2) Introduction to the safe and humane production of red meat, poultry, and dairy products. Includes HACCP principles and production of value-added animal products. Coreq: AVS 4131, 6131.

AVS 4131, 6131 Animal Products Laboratory 0 (3) Non-credit laboratory to accompany AVS 4130, 6130. Coreq: AVS 4130, 6130.

AVS 4140, 6140 Basic Immunology 3 (3) Introduction to the immune system of vertebrate animals, with an emphasis on structure, function, regulation, and cellular and molecular mechanisms of immune responses. Preq: BIOL 4100 and MICR 3050.

AVS 4150, 6150 Contemporary Issues in Animal Science 3 (3) Provides knowledge, understanding, and critical analytical skills on current issues in animal agriculture in diverse regional, national, and global social-cultural and political environments as they impact animals and man. Preq: Junior standing in Animal and Veterinary Sciences.

AVS 4160, 6160 Equine Exercise Physiology 4 (3) Integration of muscle, bone, cartilage, cardiovascular, and respiratory systems as related to the equine athlete. Encompasses biomechanics, kinetics, and kinesiology related concepts specific to the horse. Further discussion of diseases related to specific systems is covered. Preq: AVS 3100. Coreq: AVS 4161, 6161.

AVS 4161, 6161 Equine Exercise Physiology Laboratory 0 (2) Non-credit laboratory to accompany AVS 4160, 6160. Coreq: AVS 4160, 6160.

AVS 4170, 6170 Animal Agribusiness Development 2 (1) Team-based development of a business relating to the animal industries. Students develop the business from the initial idea through operations. Focuses on the development of the business plan, including financials, personnel management, and resources needed. Preq: ACCT 2010 and ECON 2110 or ECON 2120. Coreq: AVS 4171, 6171.

AVS 4171, 6171 Animal Agribusiness Development Laboratory 0 (2) Non-credit laboratory to accompany AVS 4170, 6170. Coreq: AVS 4170, 6170.

AVS 4200, 6200 Poultry Science On-line 3 (3) On-line course covering the physiology, nutrition, health, reproduction, genetics, breeding, housing, and management of commercial poultry species, including the processing of meat and egg products.

AVS 4220 Special Problems 1-3 (1-3) Laboratory, library, or field study of problems related to animal and veterinary sciences, emphasizing development and testing of hypothesis and reporting of results. May be repeated for a maximum of four credits. Preq: Junior standing and consent of instructor supervising study.

AVS 4240 Immunology Laboratory 1 (3) This course is designed to apply the knowledge gained in MICR 4140, Immunology lecture, in an applied setting. The experiments in this beginning immunology laboratory are designed to study both the innate and acquired immune systems. Experimentation into the formation, function and detection of antibodies provides students with skills in basic immunologic techniques. Preq: MICR 3050. Preq or concurrent enrollment: MICR 4140.

AVS 4410 Animal and Veterinary Sciences Teaching Experience 1-3 (1-3) Formal teaching experience related to animal and veterinary sciences supervised by a faculty member. May involve classroom instruction, educational material development, and/or student evaluation and assessment. Students submit periodic written reports and a final written and oral report. May be repeated for a maximum of four credits. To be taken Pass/No Pass only. Preq: Consent of instructor.

AVS 4420 Animal and Veterinary Sciences Extension Experience 1-3 (1-3) Formal experience in extension education. Students are involved in development, implementation, and assessment of youth educational programs related to animal and veterinary sciences, under supervision of extension professionals. Students submit periodic written reports and a final written and oral report. May be repeated for a maximum of four credits. To be taken Pass/No Pass only. Preq: Consent of instructor.

AVS 4430, 6430 AVS International Experience 1-3 (1-3) Preplanned and approved international education/cultural experience supervised by an Animal and Veterinary Sciences faculty member. Periodic reports or record keeping are required. Final report and oral presentation are required at the end of the experience. May be repeated for a maximum of four credits. To be taken Pass/No Pass only. Preq: Consent of instructor.

AVS 4440 AVS Animal Agribusiness Travel Experience 2 (1) Classroom and travel course to expose students to animal production operations, agribusiness, and industry leaders across various geographical areas. Travel is conducted during summer. Preq: BIOL 3050. Coreq: AVS 4441.

AVS 4441 AVS Animal Agribusiness Travel Experience Laboratory 0 (2) Non-credit laboratory to accompany AVS 4440. Coreq: AVS 4440.


AVS 4501 Sustainable Livestock Production Systems Laboratory 0 (2) Non-credit laboratory to accompany AVS 4500. Coreq: AVS 4500.

AVS 4530, 6530 Animal Reproduction 3 (2) Reproductive physiology and endocrinology of mammals with emphasis on farm animals and frequent reference to reproduction in laboratory animals and humans. Includes Honors sections. Preq: AVS 1500 and AVS 3010. Coreq: AVS 4531, 6531.

AVS 4531, 6531 Animal Reproduction Laboratory 0 (2) Non-credit laboratory to accompany AVS 4530, 6530. Coreq: AVS 4530, 6530.

AVS 4550, 6550 Animal Reproductive Management 2 (1) Physiology and endocrinology of pregnant and nonpregnant cows are discussed. Emphasizes methods of artificial insemination, pregnancy detection, and computer record keeping to achieve a high level of reproductive efficiency in cattle. Preq: AVS 1500 and AVS 3010. Preq or concurrent enrollment: AVS 4530. Coreq: AVS 4551, 6551.

AVS 4551, 6551 Animal Reproductive Management Laboratory 0 (3) Non-credit laboratory to accompany AVS 4550, 6550. Coreq: AVS 4550, 6550.

AVS 4650, 6650 Animal Physiology I 3 (3) Advanced study of the physiological systems of domestic animals as these systems relate to the integrated functions of the body. Exposes students to advanced physiological concepts and current literature perspectives on a variety of body systems and processes. Students are expected to have completed introductory coursework in physiology and biochemistry. Preq: BIOL 4100 and CH 2230, each with C or better.

AVS 4670, 6670 Animal Physiology II 3 (3) Advanced course extending coverage of major and current topics in animal physiology across species coursework covered in AVS 4650. Major topics include digestive physiology in nonruminant and ruminant species, reproductive physiology, muscle physiology, and general aspects of avian physiology. Students are expected to have completed introductory coursework in physiology and biochemistry.

AVS 4700, 6700 Animal Genetics 3 (3) Fundamental principles relating to the breeding and improvement of livestock, including variation, heredity, selection, linebreeding, inbreeding, crossbreeding, and other related subjects. Includes Honors sections. Preq: AVS 1500.

AVS 4800, 6800 Vertebrate Endocrinology 3 (3) Introduction to the basic principles of neuroendocrine integration and homeostatic maintenance in vertebrates. Comparative morphology and physiology of various endocrine tissues and hormone chemistry and modes of action are considered. Preq: BIOL 3030. Students who have not completed BIOL 3030, but who have completed coursework in organic chemistry, may request an override from the instructor.

AVS 4910 Animal and Veterinary Sciences Undergraduate Research Experience 1-3 (1-3) Formal laboratory, library, or field study of problems related to animal and veterinary sciences, emphasizing hypothesis development, testing, and reporting results. Projects are preplanned, reviewed, and approved. Students submit periodic written reports and final written and oral reports. May be repeated for a maximum of four credits. Preq: Consent of instructor.

**BIOCHEMISTRY**


BCHM 1030 Careers in Biochemistry and Genetics 1 (1) Introduces students to biochemistry and genetics career pathways, professional organizations, ethical issues, and requirements for advanced study. Also gives students training in design of a professional portfolio. Credit toward a degree will be given for only one of BCHM 1030, GEN 1030. Preq: Biochemistry or Genetics major.

BCHM 3010 Molecular Biochemistry 3 (3) Introduces the nature, production, and replication of biological structure at the molecular level and its relation to function. Includes Honors sections. Preq: BIOL 1100 and CH 2230, each with C or better.
BCHM 3020 Molecular Biochemistry Laboratory 2 (4) Laboratory to accompany BCHM 3010. Introduction to fundamental laboratory techniques in biochemistry and molecular biology and a demonstration of some of the fundamental principles of molecular biology discussed in BCHM 3010. Preq: BIOL 1100 and CH 2230, each with C or better. Preq or concurrent enrollment: BCHM 3010.

BCHM 3050 Essential Elements of Biochemistry 3 (3) Introduction to structure, synthesis, metabolism and function of biomolecules in living organisms. Preq: CH 2140 or CH 2230; and BIOL 1030 or BIOL 1100.

BCHM 3060 Essential Elements of Biochemistry Laboratory 1 (3) Introduces students to fundamental techniques associated with tissue extraction and analysis of biomolecules. Students learn both principles and practical applications. Preq: CH 2140 or CH 2230; and BIOL 1030 or BIOL 1100. Preq or concurrent enrollment: BCHM 3050.

BCHM 4060, 6060 Physiological Chemistry 3 (3) Studies chemical basis of the mammalian physiological processes of muscle contraction, nerve function, respiration, kidney function, and blood homeostasis. Discusses composition of specialized tissue such as muscle, nerve, blood, and bone and regulation of water, electrolytes, and acid-base balance. Preq for BCHM 4060: BCHM 3050 or CH 2230 or CH 2140. Preq for BCHM 6060: Consent of instructor.

BCHM 4230, 6230 Principles of Biochemistry 3 (3) Study of the chemistry of amino acids, monosaccharides, fatty acids, purines, pyrimidines, and associated compounds leads to an understanding of their properties and the relationship between structure and function that makes them important in biological processes. The use of modern techniques is stressed. Preq for BCHM 4230: CH 2240. Preq for BCHM 6230: Consent of instructor.

BCHM 4310, 6310 Physical Approach to Biochemistry 3 (3) Study of chemical and physical properties of amino acids, lipids, nucleic acids, sugars, and their biopolymers. Physical and mathematical analyses are correlated with biological structure and function. Includes Honors sections. Preq for BCHM 4310: BCHM 3010 with a C or better. Preq for concurrent enrollment: CH 3300 or CH 3310. Preq for BCHM 6310: Consent of instructor.

BCHM 4320, 6320 Biochemistry of Metabolism 3 (3) Study of the central pathway of carbohydrate, lipid, and nucleotide metabolism. Emphasizes bioenergetics, limiting reactions, and the regulation and integration of the metabolic pathways. Includes Honors sections. Preq for BCHM 4320: BCHM 3010 and BCHM 4310, each with a C or better. Preq for BCHM 6320: Consent of instructor.

BCHM 4330, 6330 General Biochemistry Laboratory I 2 (4) Experiments to illustrate current methods used in biochemical research. Preq or concurrent enrollment for BCHM 4330: BCHM 4310. Preq for BCHM 6330 consent of instructor.

BCHM 4340, 6340 General Biochemistry Laboratory II 2 (4) Continuation of BCHM 4330. Preq for BCHM 4340: Concurrent enrollment in BCHM 4320. Preq for BCHM 6340: Consent of instructor.

BCHM 4360, 6360 Molecular Biology: Genes to Proteins 3 (3) Examines how nucleic acids and proteins are synthesized in prokaryotic and eukaryotic cells. Designed for students interested in biochemistry, cell biology, molecular biology, and cell physiology. Includes Honors sections. Preq for BCHM 4360: BCHM 3010 and GEN 3020, each with C or better. Preq for 6360: Consent of instructor.

BCHM 4400, 6400 Bioinformatics 3 (3) Theory and application of computational technology to analysis of the genome, transcriptome, and proteome. Includes Honors sections. Preq for BCHM 4400: BCHM 3010 and GEN 3020, each with a C or better. Preq for 6400: Consent of instructor.

BCHM 4430, 6430 Molecular Basis of Disease 3 (3) Topics in heritable human metabolic disorders, including clinical features and newborn screening, genetic testing, the biochemical basis, and treatment. Preq for BCHM 4430: BCHM 3010 or BCHM 3050; and GEN 3000 or GEN 3020; each course with a C or better. Preq for BCHM 6430: Consent of instructor.

BCHM 4900 Selected Topics in Biochemistry 1-4 (1-4) Comprehensive study of selected topics not covered in other courses. May be repeated for a maximum of eight credits, but only if different topics are covered. Preq: Consent of instructor.

BCHM 4910 Directed Research in Biochemistry 1-8 (3-24) Orientation in biochemical research (i.e., experimental planning, execution, and reporting). May be repeated for a maximum of eight credits. Includes Honors sections. Preq: Consent of instructor.

BCHM 4930 Senior Seminar 2-2 (2-2) Analysis and discussion of papers from the primary literature in the life sciences, particularly in biochemistry. Students find pertinent articles in the primary literature and present and analyze the selected reading. Includes Honors sections. Preq: Consent of instructor.

BIOSYSTEMS ENGINEERING

Professor: T.H. Walker; Associate Professors: C.M. Drapcho, T.O. Owino; Assistant Professors: C. Darnault, Y. Zheng.

BE 1900 Creative Inquiry Biosystems Engineering I 1-3 (1-3) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be taken twice for a maximum of six credits. To be taken Pass/No Pass only. Preq: Junior standing in departmental honors program.

BE 3010 Biosystems Engineering Honors Thesis Research 3 (6) Honors thesis project proposal, initial research, report, and presentation of biosystems engineering project for completion of junior requirements of the Biosystems Engineering Honors program. Preq: BCHM 4230.

BE 3140 Biosystems Engineering Mechanical Design 3 (3) Study of basic mechanical design of biosystems. Includes an introduction to biomechanics and biomaterial properties. Studies applications of machine components and their selection related to specific types of biosystems. Team design project is required. Preq: CE 2060 or ME 3020.


BE 3201 Principles and Practices of Geomatics Laboratory 0 (Non-credit laboratory to accompany BE 3200. Coreq: BE 3200.

BE 3220 Small Watershed Hydrology and Sedimentology 3 (3) Fundamental relationships governing rainfall disposition are used as bases for defining the hydrology of watersheds. Emphasizes application of modeling techniques appropriate for runoff and sediment control. Preq or concurrent enrollment: CE 3410.
BE 3700 Practicum 1-3 (1-3) Preplanned internship with an approved employer involved with biosystems engineering endeavors. A minimum of 1300 hours of supervised responsibility is required per credit hour. Evaluation is based on activity journal, written/oral report, and an evaluation from the supervisor. May be repeated for a maximum of three credits. To be taken Pass/No Pass only. Prereq: Junior standing and consent of department.

BE 3990 Creative Inquiry Biosystems Engineering III 1-3 (1-3) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be taken twice for a maximum of six credits. To be taken Pass/No Pass only.

BE 4000 Biosystems Engineering Honors Thesis 3 (6) Individual research projects are conducted under the supervision and guidance of a faculty member. Senior honors thesis is required. Prereq or concurrent enrollment: BE 3700. Coreq: BE 3990.

BE 4080, 6080 Land Treatment of Wastewater and Sludges 3 (3) Principles for designing environmentally acceptable land application systems using municipal and industrial wastewater and sludges are presented. Topics include land-limiting constituent analysis; soil-plant interactions; system equipment and design; system operation and management; public acceptance, social, and regulatory issues. Case studies and field trips are planned. Prereq: Senior standing.

BE 4100, 6100 Biological Kinetics and Reactor Modeling 3 (2) Fundamentals of microbial and biochemical kinetics used in analysis and design of biological systems. Topics include mathematical and computer modeling of biological kinetics and systems, estimating model coefficients, and development of microbial kinetic models as basis for batch and continuous reactor design. Prereq: BE 2120. Prereq or concurrent enrollment: MATH 2080. Coreq: BE 4150, 6150.

BE 4101, 6101 Biological Kinetics and Reactor Modeling Laboratory 0 (3) Non-credit laboratory to accompany BE 4100, 6100. Coreq: BE 4100, 6100.

BE 4120, 6120 Heat and Mass Transport in Biosystems Engineering 3 (2) Fundamentals of heat and mass transport used in engineering design and analysis of biological systems; principles of steady state and transient energy and mass balances, including chemical and biological generation terms. Prereq for BE 4120: BE 4100.

BE 4140, 6140 Biosystems Engineering Unit Operations 3 (2) Applies the basic principles of statics, dynamics, and thermodynamics to design of mechanical and electrical systems supporting biological operations and processes. Prereq for BE 4140: BE 3140 and ME 3100. Coreq: BE 4141, 6141.

BE 4141, 6141 Biosystems Engineering Unit Operations Laboratory 0 (3) Non-credit laboratory to accompany BE 4140, 6140. Coreq: BE 4140, 6140.

BE 4150, 6150 Instrumentation and Control for Biosystems Engineers 4 (3) Overview of modern instrumentation techniques and digital electronic components and subsystems to integrate them into digital data acquisition and control systems for biosystems. Laboratory use of equipment is emphasized. Topics include characteristics of instruments, signal conditioning, transducer theory and applications, programmable logic controllers, and digital data acquisition and control. Prereq or concurrent enrollment for BE 4150: ECE 3070. Coreq: BE 4151, 6151.

BE 4151, 6151 Instrumentation and Control for Biosystems Engineers Laboratory 0 (3) Noncredit laboratory to accompany BE 4150, 6150. Coreq: BE 4150, 6150.

BE 4170, 6170 Applied Instrumentation and Control for Biosystems 2 (1) Hardware and software implementation of digital data acquisition and control systems for application to agriculture, aquaculture, biotechnology, and other biosystems. Topics include digital electronic circuits and components, microcomputer architecture, interfacing, and programming. Prereq for BE 4170: BE 4150. Prereq for BE 6170: BE 4150 or consent of instructor. Coreq: BE 4151, 6151.

BE 4171, 6171 Applied Instrumentation and Control for Biosystems Laboratory 0 (3) Noncredit laboratory to accompany BE 4170, 6170. Coreq: BE 4170, 6170.

BE 4210 Engineering Systems for Solid Water Management 2 (1) Presents fundamentals of design related to drainage of lands, infiltration, and modification of the microenvironment for optimum productivity. Prereq or concurrent enrollment: CE 3410 and MATH 2080. Coreq: BE 4211.

BE 4211 Engineering Systems for Water Management Laboratory 0 (3) Noncredit laboratory to accompany BE 4210, 6210. Coreq: BE 4210.

BE 4220, 6220 Hydrologic Modeling of Small Watersheds 3 (3) Design of structures and development of management practices for runoff, flood, and sediment control from rural and urban areas, including natural and disturbed watersheds. Topics include modeling of prismatic and non-prismatic channels, culverts, and detention/retention ponds. Prereq for BE 4220: BE 3220.

BE 4240 Ecological Engineering 3 (3) Focuses on engineering solutions to environmental and socioeconomic problems using ecological design principles. Explores ecosystem processes as they pertain to sustainable development, natural resource protection, food and energy production, waste management, and environmental restoration. Engineering fundamentals and ecological modeling are integral components of this course.

BE 4280, 6280 Biochemical Engineering 3 (3) Use of microorganisms and enzymes for the production of chemical feedstocks, single-cell protein, antibiotics, and other fermentation products. Topics include kinetics and energetics of microbial metabolism, design and analysis of reactors for microbial growth and enzymecatalyzed reactions, and considerations of scale-up, mass transfer, and sterilization during reactor design. Prereq or concurrent enrollment for BE 4280: BE 4100 or CHE 3300.

BE 4350, 6350 Applications in Biotechnology Engineering 3 (2) Bioengineering principles applied to the expanding fields of agricultural biotechnology, ecotechnology, and biomedical technology. Specific applications include waste treatment and ecological engineering, bioreactor propagation of plant and animal cells and tissues, applied genomics and synthetic seed production, biosensors and biomonitoring, biological implants and materials biocompatibility. Prereq for BE 4350: BE 4280 or CHE 4280. Coreq: BE 4351, 6351.

BE 4351, 6351 Applications in Biotechnology Engineering Laboratory 0 (3) Noncredit laboratory to accompany BE 4350, 6350. Coreq: BE 4350, 6350.

BE 4380, 6380 Bioprocess Engineering Design 3 (2) Design and analysis of systems for processing biological materials. Topics include biotechnology, thermodynamics, transport processes, and biological properties related to bioprocess design and computational simulation. Unit operations include basic bioreactor operation, bioseparations, and preservation techniques. Prereq or concurrent enrollment for BE 4380: BE 4100 or CHE 3300 and ECE 4020. Coreq: BE 4381, 6381.

BE 4381, 6381 Bioprocess Engineering Design Laboratory 0 (2) Non-credit laboratory to accompany BE 4380, 6380. Coreq: BE 4380, 6380.

BE 4400, 6400 Sustainable Energy Engineering 3 (2) Investigation into merging renewable energy resources, including detailed study of solar, wind, and bioenergy alternatives. Also includes principles, technologies, and performance evaluation of components for these technologies and an introduction to tidal, hydro, geothermal, and other energy; energy conservation; cogeneration; financial, economical, and other issues related to alternative energy sources. Prereq for BE 4400: Junior standing in an engineering major. Coreq: 4401, 6401.

BE 4401, 6601 Sustainable Energy Engineering Laboratory 0 (2) Non-credit laboratory to accompany BE 4400, 6600. Coreq: BE 4400, 6600.

BE 4510, 6510 Newman Seminar and Lecture Series in Natural Resources Engineering 1 (2) Topics dealing with development and protection of land, air, water, and related resources are covered by seminar with instructor and invited lecturers. Current environmental and/or resource conservation issues are addressed. Includes Honors sections. Prereq for BE 4510: Senior standing.

BE 4640, 6640 Non-Point Source Management in Engineered Ecosystems 3 (2) Fundamentals of non-point source pollution, including quantification of environmental impact and ecosystem management related to contaminants and nutrients and to planning and design of ecological systems. Prereq for BE 4640: MICR 3050 and Senior standing in engineering. Coreq: BE 4641, 6641.

BE 4641, 6641 Non-Point Source Management in Engineered Ecosystems Laboratory 0 (3) Non-credit laboratory to accompany BE 4640, 6640. Coreq: BE 4640, 6640.

BE 4730 Special Topics in Biosystems Engineering 1-3 (1-3) Comprehensive study of special topics not covered in other courses. Emphasizes independent pursuit of detailed investigations. May be repeated for a maximum of six credits, but only if different topics are covered. Prereq: Consent of instructor.
BE 4740 Biosystems Engineering Design/Project Management 2 (1) Study of biological systems design using hydrology principles, fluid mechanics, bioprocessing, heat/mass transfer, instrumentation, mechanical unit operations, and structural principles for project design, scheduling, and cost estimation. Topics also include engineering ethics, professional development, written and oral communication, and job skills. Senior portfolios are also developed. Prereq: Senior standing in Biosystems Engineering. Coreq: BE 4741.

BE 4741 Biosystems Engineering Design/Project Management Laboratory 0 (3) Non-credit laboratory to accompany BE 4740. Coreq: BE 4740.

BE 4750 Biosystems Engineering Capstone Design 2 (4) Applications of hydrology, fluid mechanics, bioprocessing, heat/mass transfer, instrumentation, mechanical unit operations, and structural principles in design; project scheduling; cost estimation; ethics; environmental and social impacts; design drawings; and report documentation. Prereq: Senior standing in Biosystems Engineering.

BE 4840, 6840 Municipal Solid Waste Management 3 (3) Introduction to the problems, regulations, collection, handling, recycling, and disposal of municipal solid wastes in the urban and rural sectors. Emphasizes an integrated waste-management system with resource recovery, composting, incineration, landfill disposals, and their costs. Prereq for BE 4840: EES 2020 or EES 4010.

BE 4990 Creative Inquiry Biosystems Engineering IV 1-3 (1-3) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be taken twice for a maximum of six credits. To be taken Pass/No Pass only.

BIOENGINEERING


BIOE 1010 Biology for Bioengineers 1 (1) Provides basic introduction to fundamental principles of molecular and cellular biology. Prereq: CH 1010.

BIOE 2010 Introduction to Biomedical Engineering 3 (3) Provides engineering, biological, and physical science students with an overview of the replacement of human body parts and the problems related to artificial devices. Prereq: CH 1020; and one of BIOE 1010 or BIOE 1030 or BIOL 1100.

BIOE 3020 Biomaterials 3 (2) Study of metallic, ceramic, and polymer materials used for surgical and dental implants; materials selection, implant design, physical and mechanical testing; corrosion and wear in the body. In addition, physical and mechanical properties of tissue as related to microstructure are studied. Prereq: BIOE 2010 or CH 2010 or MSE 2100. Coreq: BIOE 3021.

BIOE 3021 Biomaterials Laboratory 0 (3) Non-credit laboratory to accompany BIOE 3020. Coreq: BIOE 3020.

BIOE 3200 Biomechanics 3 (3) Study of relation between biological and mechanical functions of musculoskeletal tissues such as bone, ligaments, muscles, cartilage, etc.; mechanics of human joints; analysis of implants and implant failure. Prereq: CE 2010 and MTHS 2080.

BIOE 3210 Biofluid Mechanics 3 (3) Introduces mechanics of biological fluids (e.g., blood, synovial fluid and physiological solutions) with an emphasis on the formation of biological problems within the context of (1) kinematics, (2) the concept of stress, (3) linear momentum balance, (4) constitutive relations and (5) boundary conditions. Prereq: CE 2010 and MTHS MTHS 2080.

BIOE 3700 Bioinstrumentation and Bioimaging 3 (2) Introduction of fundamental topics in bioinstrumentation and bioimaging focused on the acquisition and monitoring of vital signals. Basic principles for the selection and appropriate use of instruments for solving bioengineering and medical problems such as microscopy, magnetic resonance imaging, and ultrasounds, among others, are addressed. Prereq: MTHS 2080; and ECE 2020 or ECE 3070. Coreq: BIOE 3701.

BIOE 3701 Bioinstrumentation and Bioimaging Laboratory 0 (3) Non-credit laboratory to accompany BIOE 3700. Coreq: BIOE 3700.

BIOE 4000 Senior Seminar 1 (1) Addresses problems to be encountered by bioengineering graduates in professional practice. Invited lecturers and faculty provide lectures and demonstrations. Pertinent information on job interview skills, career placement and guidance, professional registration, professional ethics in bioengineering, entrepreneurship and patents, and business management are provided. To be taken Pass/No Pass only. Prereq: Senior standing in Bioengineering.

BIOE 4010 Bioengineering Design Theory 3 (3) Introduces principles of engineering design and applies them to the design of medical devices. Covers materials selection, fabrication processes, performance standards, cost analysis, and design optimization. Students defend a design project proposal in written and oral form before a faculty jury. Prereq: BIOE 3020.

BIOE 4020 Biocompatibility 3 (3) Guides students through the theory and practice of determining compatibility of biomaterials and medical devices as required by the FDA. Hands-on experiments emphasize host-implant interactions such as toxicity towards tissues using specific techniques, including cell culture, implantation of biomaterials in experimental animals and histopathology. Prereq: BIOE 3020 and BIOL 4610. Coreq: BIOE 4021.

BIOE 4021 Biocompatibility Laboratory 0 (3) Non-credit laboratory to accompany BIOE 4020. Coreq: BIOE 4020.

BIOE 4030 Applied Biomedical Design 3 (3) Creative application of bioengineering and design principles to solving clinically relevant design problems. Team-based development, construction and evaluation of design prototypes, concordance with design theory. Students present results to faculty jury and external collaborators through written reports and oral presentations. Prereq: BIOE 4010. Coreq: BIOE 4031.

BIOE 4031 Applied Biomedical Design Laboratory 0 (6) Non-credit laboratory to accompany BIOE 4030. Coreq: BIOE 4030.

BIOE 4120, 6120 Orthopaedic Engineering and Pathology 3 (3) Interdisciplinary study of clinical orthopaedic cases (bone growth, bone remodeling, osteoarthritis, implant fixation and joint replacements); biomechanical, biomaterials, tribology and clinical diagnosis of failed implants (total joint replacements, fracture fixation and spinal instrumentation); basic concepts of orthopaedic pathology for engineers. Prereq for BIOE 4120: BIOE 3020 and BIOE 3200 and BIOE 3701. Prereq for BIOE 6120: BIOE 3020 and BIOE 3200 and BIOE 3150; or consent of instructor.

BIOE 4150, 6150 Research Principles and Concepts 1 (1) Introduces seniors and graduate students to principles and practices of scientific research. Topics include developing scientific concepts, developing projects, pursuing research, collaborating in multidisciplinary teams, patenting and publishing technical and scientific information, and reviewing professional and ethical standards of performance. Includes Honors sections.


BIOE 4230, 6230 Cardiovascular Engineering and Pathology 3 (3) Medical and bioengineering aspects of artificial cardiovascular and vascular devices; physiology and pathological aspects of patients with need for such devices; diagnostic techniques and surgical management of diseases and pathology; design aspects of current devices and selection; state of the art in experiments and human clinical trials. Prereq for BIOE 4230: BIOE 3020 and BIOE 3210 and BIOE 3150. Prereq for BIOE 6230: BIOE 3020 and BIOE 3200 and BIOE 3150; or consent of instructor.

BIOE 4301, 6301 Medical Imaging 3 (2) Introduction to the history, physics, and basis of medical imaging devices; including X-ray, Computed Tomography, Magnetic Resonance Imaging, and Ultrasound. Students will understand imaging from both an engineering and clinical perspective. Students will have the opportunity to work with real medical-images, to understand the trade-offs between modalities. Prereq for BIOE 4301: BIOE 3020. Prereq for BIOE 6301 or consent of instructor: BIOE 3700. Coreq: BIOE 4301, 6301.

BIOE 4311, 6311 Medical Imaging Laboratory 0 (2) Non-credit laboratory to accompany BIOE 4310, 6310. Coreq: BIOE 4310, 6310.

BIOE 4350, 6350 Computer Modeling of Multiphysics Problems 3 (3) This course will introduce students to a holistic way to deal with complicated engineering problems using a computer modeling approach. For example, a real-world problem governed by combined mechanical, electrical, thermal, electrochemical and mass-transport phenomena will be dealt with in an integrated and multidisciplinary way rather than the conventional piece-wise single-discipline way. Prereq: MTHS 2080.
BIOE 4400, 6400 Biotechnology for Bioengineers 3 (3) Explores the principles necessary to use microorganisms, tissue culture, and enzymes in bioengineering applications, including molecular techniques, fermentation, process scale-up, purification processes, and FDA regulations. Emphasizes production of biopharmaceuticals derived from recombinant systems, including uses in medical systems. Preq for BIOE 4400: BCHM 3050. Preq for BIOE 6400: BCHM 3050 or consent of instructor.

BIOE 4480 Tissue Engineering 3 (2) Explores the application of engineering principles toward the development of biologically based substances that restore, maintain, or improve tissue function. Topics include biodegradable scaffolds, wound healing and tissue repair, cell-matrix interactions, immunology and compatibility, stem cells. Preq: BIOE 3020 and BIOL 3150. Preq or concurrent enrollment: BIOL 4610. Coreq: BIOE 4481.

BIOE 4481 Tissue Engineering Laboratory 0 (3) Non-credit laboratory to accompany BIOE 4480. Coreq: BIOE 4480.

BIOE 4490 Drug Delivery 3 (3) Fundamental principles of controlled drug delivery including drug release mechanisms, physiological barriers, and various types of delivery routes. Specific emphasis is placed on understanding drug delivery technologies and processes to scale up the fabrication of drug delivery systems. Preq: BIOE 3020.

BIOE 4500 Special Topics in Bioengineering 1-4 (1-4) Comprehensive study of a topic of current interest in the field of biomedical engineering under the direct supervision and guidance of a faculty member. May be repeated for a maximum of six credits, but only if different topics are covered. Includes Honors sections. Preq: Consent of instructor.

BIOE 4510 Creative Inquiry Bioengineering 1-3 (1-3) Disciplinary and multidisciplinary team research projects with the goal of developing the students skills in literature research, engineering design, and data analysis. May be repeated for a maximum of six credits. Preq: Consent of instructor.

BIOE 4600 International Bioengineering Research Topics 1-6 (1-6) Comprehensive study and research exposure relating to bioengineering research topics at an international institution through the Bioengineering study abroad program. Students are exposed to laboratory and research methods while under the direct supervision and guidance of approved international mentors. May be repeated for a maximum of six credits. Includes Honors sections. Preq: Consent of instructor.

BIOE 4610 International Study in Bioengineering 3 (3) Introduction to selected bioengineering topics through participation in international study abroad summer programs. Offers an international study experience to undergraduates through lectures, guest speakers, tours, and/or laboratory exposure on a selected bioengineering topic chosen annually by the department. Preq: Consent of instructor.

BIOE 4690 International Bioengineering Internship 1-3 (1-3) Observation and assignment in an international medical school, dental school, hospital, regulatory agency, or professional body. Course is affiliated with the bioengineering study abroad program and students are under the direct supervision and guidance of approved international mentors. May be repeated for a maximum of six credits. Preq: Consent of instructor.

BIOL 4710, 6710 Biophotonics 3 (3) Biophotonics is an interdisciplinary subject of applying photonics to study biological samples from individual cells to the entire body. Introduces fundamental and frontier topics in optical imaging aspects of biophotonics for senior-level undergraduates and graduate students to gain the ability to solve bioimaging-related biomedical problems. Preq for BIOE 4710: MTHS 2080; and PHYS 2210; and either ECE 3070 or ECE 3200; Preq for BIOE 6710: MTHS 2080; and PHYS 2210; and either ECE 3070 or ECE 3200; or consent of instructor.

BIOE 4760 Biosurface Engineering 3 (2) Study of how surface design influences the interactions of biomolecules with biomaterials and how this in turn influences implant biocompatibility. Laboratory addresses both the theory and application of various analytical instruments commonly used in bioengineering to characterize biomaterial surfaces and investigate biomolecule-surface interactions. Preq: Senior standing in Bioengineering and BCHM 3050. Coreq: BIOE 4761.

BIOE 4761 Biosurface Engineering Laboratory 0 (3) Non-credit laboratory to accompany BIOE 4760. Coreq: BIOE 4760.

BIOE 4820, 6820 Biomaterial Implantation 3 (2) Provides training in the planning and conduct of experimental surgery, including laws and regulations; institutional requirements; selection of animal models; ethical considerations of animal research; preparation of animals for surgery; and special surgical techniques, including surgical techniques and instrumentation. Coreq: Junior standing in Bioengineering. Coreq: BIOE 4821.

BIOE 4821, 6821 Biomaterial Implantation Laboratory 0 (3) Non-credit laboratory to accompany BIOE 4820, 6820. Coreq: BIOE 4820, 6820.

BIOE 4920 Internship 3 (3) Observation and assignment in a medical school, dental school, hospital, regulatory agency, or industrial department. May be repeated for a maximum of two credits. To be taken Pass/No Pass only. Preq: Senior standing in Bioengineering and consent of department chair.

BIOE 4910 Mentored Research in Bioengineering 1-6 (1-6) Mentored research training for undergraduate students working with a faculty advisor, including literature review, experimental design, research documentation, and presentation of results. May be repeated for a maximum of six credits. Honors students must take six credits under a single advisor and write an honors thesis. Includes Honors sections. Preq: Consent of instructor.

BIOLOGY


BIOL 1010 Frontiers in Biology I 1 (1) Introduces Biological Sciences majors to University career and library services, evaluation of computer program proficiency, Web page development, Biological Sciences emphasis areas, and Biological Sciences faculty. Students initiate their own Web-based student portfolios, which showcase their skills and experiences (e.g., résumés, accomplishments, and work samples) during their undergraduate programs. Preq or concurrent enrollment: BIOL 1030 and BIOL 1050; or BIOL 1100.

BIOL 1020 Frontiers in Biology II 1 (1) Introduces Biological Sciences majors to recent advances in organismal and evolutionary biology. Topics include ecology, evolution, behavior, and organismal biology. Preq: BIOL 1030/105 or 1100 or consent of course coordinator.

BIOL 1030 General Biology I 3 (3) First in a two-semester sequence. Includes an evolutionary approach to cells, cellular activities, genetics, and animal diversity emphasizing the processes of science. Credit toward a degree will be given for BIOL 1030 or 1100 only. Includes Honors sections.

BIOL 1040 General Biology II 3 (3) Continuation of BIOL 1030. Includes an evolutionary approach to human anatomy and physiology, plant diversity, morphology, and physiology and principles of ecology. Credit toward a degree will be given for BIOL 1040 or 1110 only. Includes Honors sections. Preq: BIOL 1030 and BIOL 1050; or BIOL 1100.

BIOL 1050 General Biology Laboratory I 1 (3) Laboratory to accompany BIOL 1030. Emphasizes developing laboratory techniques, becoming familiar with biological instrumentation, and performing investigations and interpreting results in the areas of biochemistry, cell biology, and molecular biology. Preq or concurrent enrollment: BIOL 1030.

BIOL 1060 General Biology Laboratory II 1 (3) Laboratory to accompany BIOL 1040. Emphasizes developing laboratory techniques, becoming familiar with biological instrumentation, and performing investigations and interpreting results in the areas of organismal structure, physiology, and ecology. Preq or concurrent enrollment: BIOL 1040.

BIOL 1090 Introduction to Life Science 4 (3) Survey of topics in botany, zoology, microbiology, and ecology emphasizing comprehension and practical application of life science concepts to experiments and activities for the elementary school classroom. Enrollment priority will be given to Early Childhood and Elementary Education majors. Coreq: BIOL 1091.

BIOL 1091 Introduction to Life Science Laboratory 0 (3) Non-credit laboratory to accompany BIOL 1090. Coreq: BIOL 1090.

BIOL 1100 Principles of Biology I 5 (4) Introductory course designed for students majoring in biological disciplines. Integrates lecture and laboratory and emphasizes a modern, quantitative, and experimental approach to explanations of structure, composition, dynamics, interactions, and evolution of cells and organisms. High school chemistry is recommended. Credit toward a degree will be given for BIOL 1100 or 1030 only. Includes Honors sections. Preq or concurrent enrollment: CH 1010. Coreq: BIOL 1101.
BIOL 1101 Principles of Biology I Laboratory 0 (3)
Non-credit laboratory to accompany BIOL 1100.
Coreq: BIOL 1100.

BIOL 1110 Principles of Biology II Laboratory 0 (3)
Non-credit laboratory to accompany BIOL 1110.
Coreq: BIOL 1110.

BIOL 1200 Biological Inquiry Laboratory 1 (3)
Required laboratory experience to accompany BIOL 1210, 1220, 1230, or 1240. Focuses on the process and outcomes of scientific inquiry. Students employ scientific methodology in a laboratory environment as well as critical analysis of biological problems in a small group context. Prereq or concurrent enrollment: BIOL 1210 or BIOL 1220 or BIOL 1230 or BIOL 1240.

BIOL 1210 Key to Human Identity 3 (3)
Introduction to scientific inquiry that emphasizes the biological aspects of human identity, including genetics, development, and the brain. Applications in biotechnology and ethical issues associated with these topics are discussed. Credit toward a degree will be given for only one of BIOL 1210, 1220, 1230, or 1240.

BIOL 1220 Key to Biodiversity 3 (3)
Introduction to scientific inquiry through analysis of biodiversity. Biological foundations for life are studied, including evolution, ecology, genetics, cells, and molecules. Also includes discussion of ethical issues related to biodiversity. Credit toward a degree will be given for only one of BIOL 1210, 1220, 1230, or 1240.

BIOL 1230 Key to Human Biology 3 (3)
Introduction to scientific inquiry through analysis of human biology. Considers biological processes occurring within humans and human impact on global bio-social processes. Interrelationships ultimately affecting evolution and diversity are explored. Credit toward a degree will be given for only one of BIOL 1210, 1220, 1230, or 1240.

BIOL 1240 Key to Reproduction: Cells, Organisms, Populations, Ecosystems 3 (3)
Introduction to scientific inquiry through analysis of the process of reproduction. The ethics of human reproduction and the evolution and ecological impact of population growth and extinction are emphasized. Credit toward a degree will be given for only one of BIOL 1210, 1220, 1230, or 1240.

BIOL 1910 Directed Research 1-3 (3-9)
Research projects, supervised by faculty in the College of Agriculture, Forestry and Life Sciences introducing research methods. Restricted to outstanding high school students, selected using Governor’s School for Science and Mathematics ranking criteria. May be repeated for a maximum of six credits. Prereq: Entering high school junior or senior status and consent of faculty research supervisor and department in which research is conducted.

BIOL 2000 Biology in the News 3 (3)
For non-science majors. Students examine current topics of biology appearing in newspapers and other current media. Uses a problem-based learning approach, with students working as teams and individually on areas of interest identified by the class. Students are expected to have completed the General Education Natural Science Requirement prior to enrolling in this course. Prereq: ENGL 1030.

BIOL 2010 Biotechnology and Society 3 (3)
Introduction to the theories, fields, and applications of biotechnology, including the structure and function of genes and their manipulation to improve plant and animal productivity and human health. Individual case studies are examined, including social and ethical issues surrounding biotechnology-based research and development. Not open to Genetics majors. Prereq: BIOL 1200; and one of BIOL 1210 or BIOL 1220 or BIOL 1230 or BIOL 1240; and General Education Natural Science requirement.

BIOL 2030 Human Disease and Society 3 (3)
Focuses on the basic biology underlying human disease, how disease is understood, and current methods of prevention and treatment of disease. The economics as well as the social and ethical issues surrounding human disease are a common thread throughout the course. Prereq: BIOL 1240 and BIOL 1060 and BIOL 1110; and one of BIOL 1210 or BIOL 1220 or BIOL 1230 or BIOL 1240.

BIOL 2040 Environment, Energy, and Society 3 (3)
Examines power and energy production, the resultant environmental impacts, and the relationship between this technology and society. Introduces historical and contemporary sources of energy and power; the economic, social, and political forces important for types and patterns of development; and the resultant impacts to ecosystems and the environment. Students are expected to have completed the General Education Natural Science Requirement prior to enrolling in this course.

BIOL 2050 Plant Form and Function 3 (3)
Introductory course for students majoring in plant sciences. Integrates lecture and laboratory and emphasizes fundamental structures and functions of higher plants. Prereq: BIOL 1030 and BIOL 1050.

BIOL 2060 Plant Form and Function Laboratory 1 (1)
Laboratory for BIOL 2050. Prereq or concurrent enrollment: BIOL 2050.

BIOL 2100 Evolution and Creationism 3 (3)
Critical review of the scientific and technological basis for evolutionary theory compared to creationist explanations for the origin and diversity of life. Includes a historical survey of the impact that the evolution/creation debate has had on law, politics, education, and other important aspects of society. Credit toward a degree will be given for only one of BIOL 2100 or PHIL 2100. Prereq: BIOL 1040 or BIOL 1110; and one of BIOL 1210 or BIOL 1220 or BIOL 1230 or BIOL 1240; and General Education Natural Science requirement.

BIOL 2110 Introduction to Toxicology 3 (3)
Acquaints students with the field of toxicology, integrates the science of toxicology with regulatory policy, and demonstrates its impact on our daily lives. Prereq: BIOL 1040 and BIOL 1060; or BIOL 1110.

BIOL 2200 Biology Concepts, Issues, and Values 3 (3)
Develops a thorough knowledge of basic biological concepts and issues and explores how these can be incorporated into a system of human values affecting technology, society, and life.

BIOL 2220 Human Anatomy and Physiology I 4 (3)
Basic introductory course in integrated human anatomy and physiology covering cells and tissues; integumentary, skeletal, muscular, and nervous systems; sensory organs. Physiology is stressed. Structured primarily for Nursing and other health-related curricula. Prereq: BIOL 1030 and BIOL 1050; or BIOL 1100; and CH 1010 or CH 1050. Coreq: BIOL 2221.

BIOL 2221 Human Anatomy and Physiology I Laboratory 0 (2)
Non-credit laboratory to accompany BIOL 2220. Coreq: BIOL 2220.

BIOL 2230 Human Anatomy and Physiology II 4 (3)
Continuation of BIOS 2220 covering endocrine, reproductive, cardiovascular, lymphatic, respiratory, urinary, and digestive systems; fluid and electrolyte balance. Physiology is stressed. Prereq: BIOL 2220. Coreq: BIOL 2231.

BIOL 2231 Human Anatomy and Physiology II Laboratory 0 (2)
Non-credit laboratory to accompany BIOL 2230. Coreq: BIOL 2230.

BIOL 3010 Insect Biology and Diversity 4 (3)
Introduction to the study of insects, with emphasis on their structure, function, ecology, and behavior. Identification of commonly encountered species is highlighted. Relationships between insect and human populations are discussed. Control technologies are introduced, with emphasis on environmentally responsible tactics. Offered fall semester only. Coreq: BIOL 3011.

BIOL 3011 Insect Biology and Diversity Laboratory 0 (3)
Non-credit laboratory to accompany BIOL 3010. Coreq: BIOL 3010.

BIOL 3020 Invertebrate Biology 3 (3)
In-depth survey and comparison of free-living invertebrate animals emphasizing functional anatomy, development, and evolutionary relationships. Includes Honors sections. Prereq: Introductory two-semester biology sequence with laboratory. Prereq: BIOL 1040 and BIOL 1060; or BIOL 1110. Prereq or concurrent enrollment: BIOL 3060.

BIOL 3030 Vertebrate Biology 3 (3)
Comprehensive survey of vertebrate animals, including their taxonomy, morphology, evolution, and selected aspects of the natural history and behavior. Includes Honors sections. Prereq: BIOL 1040 and BIOL 1060; or BIOL 1110.

BIOL 3040 Biology of Plants 3 (3)
Survey of the major groups of plants, their biology, diversity, and evolution. Includes Honors sections. Prereq: BIOL 1040 and BIOL 1060; or BIOL 1110. Prereq or concurrent enrollment: BIOL 3080.

BIOL 3060 Invertebrate Biology Laboratory 1 (3)
Survey and comparison of the biology of living invertebrates, examples of which are drawn primarily from the southeastern coast of the United States. Prereq: Introductory two-semester biology sequence with laboratory. Prereq or concurrent enrollment: BIOL 3020.

BIOL 3070 Vertebrate Biology Laboratory 1 (3)
Comparative and phylogenetic study of the gross morphology of vertebrates. Prereq or concurrent enrollment: BIOL 3030.
## Courses of Instruction

### BIOL 3080 Biology of Plants Practicum 1 (3) Labaratory exercises that explore the major groups of plants, their biology, diversity, and evolution. Preq or concurrent enrollment: BIOL 3040.

### BIOL 3130 Conservation Biology 3 (3) Study of the biological bases for the conservation of flora, fauna, and habitats. Biological factors that influence the decision-making process are also addressed. Preq: BIOL 1030 and BIOL 1050 and BIOL 1040 and BIOL 1060; or BIOL 1100 and BIOL 1110.

### BIOL 3150 Functional Human Anatomy 4 (3) Introduction to the anatomical structures associated with all organ systems found in the human body at both the gross and microscopic level. Basic physiology is integrated to assist with understanding the function of the anatomical systems. Preq: BIOL 1030 and BIOL 1050; or BIOL 1100. Coreq: BIOL 3151.

### BIOL 3151 Functional Human Anatomy Laboratory 0 (3) Non-credit laboratory to accompany BIOL 3150. Coreq: BIOL 3150.

### BIOL 3160 Human Physiology 4 (3) Study of the functional processes associated with the various organ systems in the human body. Students develop a basic understanding of the important and fundamental concepts in human physiology and how organ systems maintain homeostasis. Preq: BIOL 1040 and BIOL 1060; or BIOL 1110; and CH 1020. Coreq: BIOL 3161.

### BIOL 3161 Human Physiology Laboratory 0 (3) Non-credit laboratory to accompany BIOL 3160. Coreq: BIOL 3160.

### BIOL 3200 Field Botany 4 (2) Introductory study of the taxonomy, ecology, and evolution of plants in their natural environment with an emphasis on identification and characteristics of representative species and plant communities in the Carolinas. Includes one or two required Saturday field trips.

### BIOL 3201 Field Botany Laboratory 0 (4) Non-credit laboratory to accompany BIOL 3200. Coreq: BIOL 3200.

### BIOL 3350 Evolutionary Biology 3 (3) Introduction to basic concepts and underlying principles of modern evolutionary biology. Topics include a historical overview of evolutionary theories, elementary population genetics, principles of adaptation, speciation, systematics and phylogenetic inference, fossil record, biogeography, molecular evolution, and human evolution. Preq: GEN 3000 or GEN 3020.

### BIOL 3400 Plant Medicine and Magic 3 (3) Study of the use of compounds of plant and fungal origin as poisons, hallucinogens, and pharmaceuticals. Preq: BIOL 1040 and BIOL 1060 and CH 1020.

### BIOL 3510 Biological Anthropology 3 (3) Study of human evolution, primate social behavior, human physiological variations and disease resistance, and human skeletal anatomy and forensics. Preq: ANTH 2010 or BIOL 1100.

### BIOL 3530 Forensic Anthropology 3 (3) Introduction to forensic anthropology, the science that utilizes methods from skeletal biology and archaeology as tools in human identification in a medicolegal context. Preq: Junior standing.

### BIOL 3940 Selected Topics in Creative Inquiry I 3 (1) Disciplinary and multidisciplinary group research projects develop the students ability to discover, analyze, and evaluate data. Students are required to document their research activities in their portfolios. May be repeated for a maximum of six credits. Honors students must take at least six credits over a two-semester period with the same research advisor and write an honors thesis. The credits may include BIOL 3940, BIOL 4940 or both. Includes Honors sections. Preq: Consent of instructor. Coreq: BIOL 3941.

### BIOL 3941 Selected Topics in Creative Inquiry I Laboratory 0 (6) Non-credit laboratory to accompany BIOL 3940. Coreq: BIOL 3940.


### BIOL 4001, 6001 Insect Morphology Laboratory 0 (3) Non-credit laboratory to accompany BIOL 4000, 6000. Coreq: BIOL 4000, 6000.

### BIOL 4010, 6010 Plant Physiology 3 (3) Relation and processes pertaining to maintenance, growth, and reproduction of plants, including absorption of matter and energy, water relations of the plant, utilization of reserve products and liberation of energy. Includes Honors sections. Preq: BIOL 1040 and BIOL 1060; or BIOL 1110; and CH 1020. Preq or concurrent enrollment: BIOL 4020.

### BIOL 4020, 6020 Plant Physiology Laboratory 1 (3) Laboratory exercises and experiments designed to indicate the relations and processes which pertain to maintenance, growth, and reproduction of plants, including absorption of matter and energy, water relations of the plant, utilization of reserve products, and liberation of energy. Preq or concurrent enrollment: BIOL 4010.

### BIOL 4040, 6050 Molecular Genetics of Eukaryotes 3 (3) Molecular genetic analyses of eukaryotes in relation to mutations and repair, complex phenotypes, developmental pathways, short and long-term regulation of gene expression, and evolution. Preq for BIOL 4060: one of the following combinations: BCHM 100 or BCHM 3050; or GEN 3000 and GEN 3020. Preq: for BIOL 6050: Consent of instructor.

### BIOL 4060, 6060 Introductory Plant Taxonomy 3 (3) Introduction to the basic principles and concepts of plant systematics with emphasis on the plants of South Carolina. Includes Honors sections. Preq: BIOL 1040 and BIOL 1060; or BIOL 1110. Coreq: BIOL 4070, 6070.

### BIOL 4070, 6070 Plant Taxonomy Laboratory 1 (3) Introduction to basic techniques of plant taxonomy with laboratory and field emphasis on the flora of South Carolina. Coreq: BIOL 4060, 6060.

### BIOL 4080, 6080 Comparative Vertebrate Morphology 3 (3) Phylogeny and diversity of vertebrates and study of their comparative morphology, leading to an understanding of the relationships and functioning of living organisms. Includes Honors sections. Preq: BIOL 1040 and BIOL 1060; or BIOL 1110. Coreq: BIOL 4090, 6090.

### BIOL 4090, 6090 Comparative Vertebrate Morphology Laboratory 2 (5) Comparative anatomy of representative vertebrates; methods used in preparing specimens for study and display. Includes Honors sections. Coreq: BIOL 4080, 6080.

### BIOL 4100, 6100 Limnology 3 (3) Detailed introduction to the physical, chemical, and biological interrelationships that characterize inland water environments. A fundamental approach to the interactions of components of the environment is developed at a theoretical level. Preq: BIOL 1040 and BIOL 1060; or BIOL 1110.

### BIOL 4110, 6110 Limnological Analyses 2 (1) Examines a broad range of topics covered with both standing and running fresh waters. About one-third of the laboratory exercises address the major physical components of lakes and streams. The remainder provides rationale and methods for quantitative analyses of biota, as well as some integrated analyses of whole ecosystems. Includes Honors sections. Preq or concurrent enrollment: BIOL 4100 or BIOL 4430. Coreq: BIOL 4111, 6111.

### BIOL 4111, 6111 Limnological Analyses Laboratory 0 (2) Non-credit laboratory to accompany BIOL 4110, 6110. Coreq: BIOL 4110, 6110.

### BIOL 4130, 6130 Restoration Ecology 3 (3) Applies ecological principles to the restoration of disturbed terrestrial, wetland, and aquatic ecosystems. Includes the restoration of soils and waterways, of flora and fauna, and of natural ecological processes such as plant succession and nutrient cycling. Preq: BIOL 3130 or BIOL 4410 or WFB 3130.

### BIOL 4140, 6140 Basic Immunology 3 (3) Introduction to the immune system of vertebrate animals, with an emphasis on structure, function, regulation, and cellular and molecular mechanisms of immune responses. Preq: BIOL 4610 and MICR 3050.

### BIOL 4150, 6150 Insect Taxonomy 3 (1) Identification of the principal families of the major orders of adult insects. Laboratory work consists of intensive practice of such identification. Lecture material deals with theoretical discussion of taxonomic features observed in the laboratory. Preq: BIOL 4040 or ENT 4000. Coreq: BIOL 4151, 6151.

### BIOL 4151, 6151 Insect Taxonomy Laboratory 0 (6) Non-credit laboratory to accompany BIOL 4150, 6150. Coreq: BIOL 4150, 6150.

### BIOL 4170, 6170 Marine Biology 3 (3) Survey of the organisms that live in the sea and their adaptation to the marine environment. Emphasizes characteristics of marine habitats, organisms, and the ecosystems. Preq: BIOL 1040 and BIOL 1060; or BIOL 1110.

### BIOL 4200, 6200 Neurobiology 3 (3) Broad background in neurobiology. Topics include neuroanatomical structure-function; conduction in the neuron; neurite growth and development; neuromuscular junction; chemistry, physiology, and pharmacology of specific neurotransmitters and receptors; visual process; axoplasmic transport; hypothalamic-pituitary regulation; theories of behavior; theories of learning and memory. Includes Honors sections. Preq: BIOL 1040 and BIOL 1060; or BIOL 1110.

### BIOL 4240 Immunology Laboratory 1 (3) This course is designed to apply the knowledge gained in MICR 4140, Immunology lecture, in an applied setting. The experiments in this beginning immunology laboratory are designed to study both the innate and acquired immune systems. Experimentation into the formation, function and detection of antibodies provides students with skills in basic immunologic techniques. Preq: MICR 3050. Preq or concurrent enrollment: MICR 4140.
BIOL 4250, 6250 Introductory Mycology 3 (3) Introduction to the biology of all the groups of fungi and some related organisms, with considerations of the taxonomy, morphology, development, physiology, and ecology of representative forms. Prereq: BIOL 1040 and BIOL 1060; or BIOL 1110. Coreq or concurrent enrollment: BIOL 4260 or PLPA 4260.

BIOL 4260, 6260 Mycology Practicum 2 (1) Application of the principles of mycological techniques, microscopic study of fungi. Examples from all major groups of fungi are included. Prereq or concurrent enrollment: BIOL 4250 or PLPA 4250. Coreq: BIOL 4261, 6261.

BIOL 4261, 6261 Mycology Practicum Laboratory 0 (2) Non-credit laboratory to accompany BIOL 4260, 6260. Coreq: BIOL 4260, 6260.

BIOL 4280 Quantitative Biology 4 (3) Applies quantitative methods to a wide range of biological problems. Main focus is on building modeling skills using population, physiological, genetic, and evolutionary problems. Also includes a review of statistical principles and introduces basic bioinformatics techniques. Prereq: BIOL 1040 and BIOL 1060; or BIOL 1110 and MTHS 1080 or MTHS 1110. Coreq: BIOL 4281, 6281.

BIOL 4281, 6281 Quantitative Biology Laboratory 0 (3) Non-credit laboratory to accompany BIOL 4280, 6280. Coreq: BIOL 4280, 6280.

BIOL 4320, 6320 Animal Histology 3 (3) Structural and functional study of the basic tissues of animals and tissue makeup of organs. Emphasizes light microscopy level with selected tissue studied at the electron microscope level. Includes Honors sections. Prereq: BIOL 1040 and BIOL 1060; or BIOL 1110. Coreq: BIOL 4330, 6330.

BIOL 4330, 6330 Animal Histology Laboratory 2 (1) Microscopic examination of basic animal tissue types and the tissue makeup of organs which comprise systems. Includes Honors sections. Coreq: BIOL 4320 and BIOL 4331, 6331.

BIOL 4331, 6331 Animal Histology Laboratory 0 (2) Noncredit laboratory to accompany BIOL 4330, 6330. Coreq: BIOL 4330, 6330.

BIOL 4340 Biological Chemistry Laboratory Techniques 2 (1) Theory and application of some of the routine tools and techniques used in biological chemistry. Lectures introduce laboratory theory and provide additional laboratory instructions; discuss results; and conduct student evaluations. Laboratory periods are used to conduct each activity. Prereq or concurrent enrollment: BCHM 3010 or BCHM 3050. Coreq: BIOL 4341.

BIOL 4341 Biological Chemistry Laboratory Techniques Laboratory 0 (0) Non-credit laboratory to accompany BIOL 4340. Coreq: BIOL 4340.

BIOL 4360, 6360 Insect Behavior 3 (2) Fundamentals of insect behavior in an evolutionary and ecological perspective. Laboratory emphasizes generation and testing of hypotheses and observation, description, and quantification of insect behavior. Prereq: ENT 3010. Coreq: BIOL 4361, 6361.

BIOL 4361, 6361 Insect Behavior Laboratory 0 (3) Noncredit laboratory to accompany BIOL 4360, 6360. Coreq: BIOL 4360, 6360.

BIOL 4400, 6400 Developmental Animal Biology 3 (3) Events and mechanisms responsible for the development of multicellular animals. Gametogenesis, fertilization, embryonic development, cellular differentiation, morphogenesis, larval forms and metabolism, asexual reproduction, regeneration, malignancy, and aging are analyzed in terms of fundamental concepts and control processes. Includes Honors sections. Prereq for BIOL 4400: BCHM 3010 or 3050 or consent of instructor. Prereq for BIOL 6400: BCHM 3010 or 3050. Coreq: BIOL 4401, 6401.

BIOL 4410, 6410 Ecology 3 (3) Study of basic ecological principles underlying the relationships between organisms and their biotic and abiotic environments. Includes physiological, population, and community ecology, with applications of each to human ecological concerns. Includes Honors sections. Prereq: BIOL 1040 and BIOL 1060; or BIOL 1110.

BIOL 4420, 6420 Biogeography 3 (3) Study of patterns of distribution of plants and animals in space and time. Includes Honors sections. Prereq: BIOL 3020 or BIOL 3030 or BIOL 3040.

BIOL 4430, 6430 Freshwater Ecology 3 (3) Study of basic ecological principles and concepts as they apply to freshwater environments: rivers, streams, wetlands, lakes, ponds, and reservoirs. Prereq: BIOL 1040 and BIOL 1060; or BIOL 1110.

BIOL 4440, 6440 Freshwater Ecology Laboratory (Lecture Portion) 2 (1) Laboratory-based course providing a synthesis of major components of freshwater ecosystems. Activities are hypothesis driven and related to each other to form an overall synthesis of the field. Honors experience allows engagement in creative inquiry. Prereq or concurrent enrollment: BIOL 4430. Coreq: BIOL 4441, 6441.

BIOL 4441, 6441 Freshwater Ecology Laboratory 0 (2) Non-credit laboratory to accompany BIOL 4440, 6440. Coreq: BIOL 4440, 6440.

BIOL 4450, 6450 Ecology Laboratory (Lecture Portion) 2 (1) Modern and classical approaches to the study of ecological problems discussed in BIOS 4410 are introduced to field, laboratory and computer-based analyses of plant and animal populations and communities. Includes Honors sections. Prereq or concurrent enrollment: BIOL 4440. Coreq: BIOL 4451, 6451.

BIOL 4451, 6451 Ecology Laboratory 0 (2) Non-credit laboratory to accompany BIOL 4450. Coreq: BIOL 4450, 6450.

BIOL 4460, 6460 Plant Ecology 3 (3) Ecology of plants in relation to their biotic and abiotic environments. Individual organisms, populations, and communities are considered with an emphasis on seed plants in terrestrial environments. Includes Honors sections. Prereq: BIOL 1040 and BIOL 1060; or BIOL 1110. Coreq: BIOL 4470, 6470.

BIOL 4470, 6470 Plant Ecology Laboratory (Lecture Portion) 2 (1) Experimental and observational approach to addressing principles discussed in BIOS 4460. Students are introduced to field and laboratory methods involving individual organisms, populations, and communities. Includes Honors sections. Prereq or concurrent enrollment: BIOL 4460. Coreq: BIOL 4471, 6471.

BIOL 4471, 6471 Plant Ecology Laboratory 0 (2) Non-credit laboratory to accompany BIOL 4470, 6470. Coreq: BIOL 4470, 6470.

BIOL 4500, 6500 Developmental Biology Laboratory (Lecture Portion) 2 (1) Examines a broad range of topics concerned with the development of multicellular animals such as gametogenesis, fertilization, embryonic development, cell differentiation, morphogenesis, larval metamorphosis, and regeneration. Laboratory exercises provide the rationale and methods for the descriptive and experimental analysis of development in representative invertebrates and vertebrates. Includes Honors sections. Prereq or concurrent enrollment: BIOL 4400. Coreq: BIOL 4501, 6501.

BIOL 4501, 6501 Developmental Biology Laboratory 0 (2) Non-credit laboratory to accompany BIOL 4500, 6500. Coreq: BIOL 4500, 6500.

BIOL 4510 Biological Variation in Human Populations 3 (3) Provides an indepth discussion of the most influential topics in human skeletal biology. Course explores the history and ethical dilemmas of the field, and examines how biological anthropologists use skeletons to reconstruct patterns of diet, disease, demography and physical activity in human populations. May be offered as ANTH 4510. Prereq: ANTH 3020.

BIOL 4540, 6540 Plant Virology 4 (3) Study of plant viruses: their morphology, biochemistry, purification, and transmission; symptoms resulting from virus infection; virus vector relationships. Segregative and nucleic acid hybridization procedures. Diagnosis of viral diseases and the identification of causal agents. Replication of plant viruses, the interaction between viral host and plant genome. Control of plant viral diseases. Prereq: BCHM 3010 or BCHM 3050 or MICR 3050. Coreq: BIOL 4541, 6541.

BIOL 4541, 6541 Plant Virology Laboratory 0 (3) Non-credit laboratory to accompany BIOL 4540, 6540. Coreq: BIOL 4540, 6540.

BIOL 4560, 6560 Medical and Veterinary Parasitology 3 (3) Introduction to parasitism in the animal kingdom. Emphasizes basic and applied principles related to economically and medically important diseases. Classical and experimental approaches to the study of parasitism are examined in reference to protozoa, helminths, and arthropods. Includes Honors sections. Prereq: BIOL 1040 and BIOL 1060; or BIOL 1110. Coreq: BIOL 4570, 6570.

BIOL 4570, 6570 Medical and Veterinary Parasitology Laboratory (Lecture Portion) 2 (1) Laboratory to reinforce material presented in BIOS 4560. Introduces students to both live and preserved human/animal parasites. Also introduces techniques used in collection, preservation, and examination of animal parasites. Includes Honors sections. Coreq: BIOL 4560, 6560 and BIOL 4571, 6571.

BIOL 4571, 6571 Medical and Veterinary Parasitology Laboratory 0 (2) Non-credit laboratory to accompany BIOL 4570, 6570. Coreq: BIOL 4570, 6571.

BIOL 4580, 6580 Cell Physiology 3 (3) Study of the chemical and physical principles of cell function emphasizing bioenergetics and membrane phenomena. Includes Honors sections. Prereq: BCHM 3010 or BCHM 3050.
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BIOL 4590, 6590 Systems Physiology 3 (3) Physiological systems of vertebrates and their homeostatic controls. Describes the function of the major physiological systems in terms of anatomical structure and chemical and physical principles. Includes Honors sections. Preq: [BIOL 1040 and BIOL 1060; or BIOL 1110] and [CH 1020; or PHYS 2080 and PHYS 2100; or PHYS 2210 and PHYS 2230.]

BIOL 4600, 6600 Systems Physiology Laboratory (Lecture Portion) 2 (1) Modern and classical experimental methods are used to demonstrate fundamental physiological principles discussed in BIOS 4590. Students are introduced to computer-aided data acquisition and computer simulations of physiological function. Preq or concurrent enrollment: BIOL 4590. Coreq: BIOL 4601, 6601.

BIOL 4601, 6601 Systems Physiology Laboratory 0 (2) Non-credit laboratory to accompany BIOL 4600, 6600. Coreq: BIOL 4600, 6600.

BIOL 4610, 6610 Cell Biology 3 (3) In-depth analysis of how and where intracellular and extracellular molecules control general and specific cellular functions such as gene expression, secretion, motility, signaling, cell-cycle control and differentiation. Taught and graded at a level where students are expected to infer from and integrate cellular events. Includes Honors sections. Preq: BCHM 3010 or BCHM 3050.

BIOL 4620, 6620 Cell Biology Laboratory (Lecture Portion) 2 (1) Laboratory to accompany BIOS 4610. Focuses on molecular and microscopic analysis of eukaryotic cells. Preq or concurrent enrollment: BIOL 4610. Coreq: BIOL 4621, 6621.

BIOL 4621, 6621 Cell Biology Laboratory 0 (2) Non-credit laboratory to accompany BIOL 4620, 6620. Coreq: BIOL 4620, 6620.

BIOL 4640, 6640 Mammalogy 4 (3) Origin, evolution, distribution, structure, and function of mammals, with laboratory emphasis on the mammals of the Southeast. Field trips are required. Preq for 4640: BIOL 3030. Preq for 6640: BIOL 4640 with consent of instructor. Coreq: BIOL 4641, 6641.

BIOL 4641, 6641 Mammalogy Laboratory 0 (3) Non-credit laboratory to accompany BIOL 4640. Coreq: BIOL 4640, 6640.

BIOL 4660, 6660 Evolution of Human Behavior 3 (3) Familiarizes students with the evolutionary basis of human behavior. Examines topics such as altruism, cooperation, mating systems, parental investment, and social systems using diverse examples, from hunter-gatherer to technological societies. Preq: ANTH 3510 or BIOL 3350 or BIOL 4700 or BIOL 6700 or PSYC 2100.

BIOL 4700 Principles of Hematology 3 (3) Hematological principles as they relate to normal blood cell production, as well as in abnormal conditions that result in diseases of the hematological system. Clinical practice, ethics and controversies in hematology are discussed. Preq: BIOL 1040 and BIOL 1060; or BIOL 1110.

BIOL 4680, 6680 Herpetology 4 (3) Physiology, functional morphology, ecology, evolution, biomechanics and current literature of amphibians and reptiles. Laboratory study examines morphology and identification of world families and United States genera, as well as southeastern species. Field trips are required. Preq: BIOL 1040 and BIOL 1060; or BIOL 1110. Coreq: BIOL 4681, 6681.

BIOL 4681, 6681 Herpetology Laboratory 0 (3) Non-credit laboratory to accompany BIOL 4680, 6680. Coreq: BIOL 4680, 6680.

BIOL 4690, 6690 Aquatic Insects 3 (1) Identification, life history, habitats, and interrelationships of aquatic insects; techniques of qualitative field collecting; important literature and research workers. Includes Honors sections. Preq: ENT 3010. Coreq: BIOL 4691, 6691.

BIOL 4691, 6691 Aquatic Insects Laboratory 0 (6) Non-credit laboratory to accompany BIOL 4690, 6690. Coreq: BIOL 4690, 6690.

BIOL 4700, 6700 Behavioral Ecology 3 (3) Historical and modern developments in animal behavior emphasizing the evolutionary and ecological determinants of behavior. A synthesis of ethology and comparative psychology. Includes Honors sections. Preq: BIOL 1040 and BIOL 1060; or BIOL 1110.

BIOL 4710, 6710 Behavioral Ecology Laboratory (Lecture Portion) 2 (1) Laboratory exercises that explore the behavior of animals. Emphasizes behavioral observation and analysis and presentation of findings in a report format. Includes a semester-long independent research project. Preq or concurrent enrollment: BIOL 4710. Coreq: BIOL 4711, 6711.

BIOL 4711, 6711 Behavioral Ecology Laboratory 0 (2) Non-credit laboratory to accompany BIOL 4710, 6710. Coreq: BIOL 4710, 6710.

BIOL 4720, 6720 Ornithology 4 (3) Biology of birds: their origin and diversification, adaptations, phylogeny, classification, structure and function, behavior, ecology, and biogeography. Field identification is emphasized, and field trips are required. Preq: BIOS 1040 and BIOS 1060; or BIOS 1110. Coreq: 4721, 6721.

BIOL 4721, 6721 Ornithology Laboratory 0 (3) Non-credit laboratory to accompany BIOL 4720, 6720. Coreq: BIOL 4720, 6720.

BIOL 4720, 6720 History of Modern Biology 3 (3) Examines the intellectual and social factors defining the study of life from the scientific revolution of the 1600s to the modern biological sciences. Investigates the historical origins of biological disciplines and explores the differing cultures, methodologies, and philosophical commitments of these communities. Preq: BIOL 1040 and BIOL 1060; or BIOL 1110.

BIOL 4740, 6740 Primatology 4 (3) Biology of nonhuman primates, including their evolution, taxonomy, physiology, life history, behavioral ecology and conservation. Three field trips are required, during which students conduct behavioral observations and later analyze their data and present it in report format. Preq: ANTH 3510; and either BIOL 1110 or both BIOL 1040 and BIOL 1060. Coreq: BIOL 4741, 6741.

BIOL 4741, 6741 Primatology Laboratory 0 (3) Non-credit laboratory to accompany BIOL 4740, 6740. Coreq: BIOL 4740, 6740.

BIOL 4740, 6740 Vertebrate Endocrinology 3 (3) Physiological systems of invertebrates and vertebrates emphasizing environmental adaptation. Physiological principles as they relate to metabolism, thermoregulation, osmoregulation, respiration, and neural and integrative physiology. Includes Honors sections. Preq: CH 1020; and either BIOL 1110 or both BIOL 1040 and BIOL 1060.

BIOL 4760, 6760 Comparative Physiology Laboratory (Lecture Portion) 2 (1) Modern classical experimental methods are used to demonstrate fundamental physiological principles discussed in BIOL 4750. Introduces students to computer-aided data acquisition and manipulation as well as computer simulations of physiological function. Includes Honors sections. Preq or concurrent enrollment: BIOL 4750. Coreq: 4761, 6761.

BIOL 4761, 6761 Comparative Physiology Laboratory 0 (2) Non-credit laboratory to accompany BIOL 4760, 6760. Coreq: BIOL 4760, 6760.

BIOL 4770, 6770 Ichthyology 3 (2) Systems, life history, distribution, ecology, and current literature of fish. Laboratory study of morphology and identification of U.S. genera, as well as all southeastern species. Field trips are required. Preq: BIOS 3104 and BIOS 1060; or BIOS 1110. Coreq: BIOL 4771, 6771.

BIOL 4771, 6771 Ichthyology Laboratory 0 (3) Non-credit laboratory to accompany BIOL 4770, 6770. Coreq: BIOL 4770, 6770.

BIOL 4780 Exercise Physiology 3 (3) Introduction to the physiology of exercise. Focuses on the function and adaptations of body systems in response to exercise. Structured primarily for students interested in Prehabilitation Sciences. Preq: BIOS 2220 and BIOS 2230; or BIOS 3150 and BIOS 3160.

BIOL 4790 Kinesiology 3 (3) Introduction to the study of human movement. Focuses on the application of biomechanical and motor control principles to human motion, including daily living, sport, and work activities. Structured primarily for students interested in Prehabilitation Sciences. Preq: BIOS 2220 or BIOS 3150.

BIOL 4800, 6800 Vertebrate Endocrinology 3 (3) Introduction to the basic principles of neuro-endocrine integration and homeostatic maintenance in vertebrates. Comparative morphology and physiology of various endocrine tissues and hormone chemistry and modes of action are considered. Preq: BCHM 3010 or BCHM 3050.

BIOL 4810, 6810 Web Design for the Life Sciences and Agriculture 3 (2) Addresses basic principles and theories of Web design and site construction, including usability and accessibility considerations. Web and graphics design software are used to develop sites suitable for life science and agricultural organizations. Service-learning is used with student projects. Preq: AGED 2000 and CPSC 1200. Coreq: BIOL 4811, 6811.

BIOL 4811, 6811 Web Design for the Life Sciences and Agriculture 0 (2) Non-credit laboratory to accompany BIOL 4810, 6810. Coreq: BIOL 4810, 6810.
BIOL 4820, 6820 Laboratory Techniques for Teaching Science 3 (1) Focuses on basic lab skills needed to plan, prepare, and conduct inquiry-based laboratories and to familiarize pre-service teachers with a variety of scientific equipment and their methodologies. Topics include ways to integrate technology into the classroom, lab safety, and the development of inquiry-based classroom activities. Preq: BIOL 1040 and BIOL 1060; or BIOL 1110. Coreq: BIOL 4821, 6821.

BIOL 4821, 6821 Laboratory Techniques for Teaching Science 0 (6) Non-credit laboratory to accompany BIOL 4820, 6820. Coreq: BIOL 4820, 6820.

BIOL 4840, 6840 Human and Comparative Vertebrate Embryology 3 (3) Study of human and comparative embryology with an introduction to related clinical correlations. Students develop an understanding of normal and abnormal human and comparative vertebrate embryonic development. Includes Honors sections. Preq: BIOL 1040 and BIOL 1060; or BIOL 1110.

BIOL 4860 Natural History 3 (3) Interdisciplinary examination, through readings and critical discussion, of concepts of nature and biodiversity in relation to human endeavors. Course seeks to achieve a balanced perspective from which to seek compromises between conflicting views of nature. Preq: BIOL 1040 and BIOL 1060; or BIOL 1110.

BIOL 4870, 6870 Electron and Optical Microscopy Theory 3 (2) Offers a theoretical and practical introduction to light and electron microscopy. Topics include Koehler illumination, polarization, interference, phase contrast, DIC epifluorescence, laser scanning light microscopy, SEM, TEM, EDS, ultramicrotomy, tomography, and digital imaging. Preq: Consent of instructor. Coreq: BIOL 4871, 6871.

BIOL 4871, 6871 Electron and Optical Microscopy Laboratory 0 (2) Non-credit laboratory to accompany BIOL 4870, 6870. Coreq: BIOL 4870, 6870.

BIOL 4890 Clinical Applications and Medical Practice 3 (2) Explores the various fields, specialties, and subspecialties in medicine. Provides students with the opportunity to shadow physicians in a hospital and/or office setting and to discuss current issues and advances in medicine with practicing physicians and other health care professionals. Preq: Consent of instructor. Coreq: BIOL 4891.

BIOL 4891 Clinical Applications and Medical Practices Laboratory 0 (2) Non-credit laboratory to accompany BIOL 4890, Coreq: BIOL 4890.

BIOL 4910 Undergraduate Research in Biological Sciences 1 4-16) Mentored research projects introduce undergraduate students to the planning and execution of research and the presentation of research findings. May be repeated for a maximum of eight credits. Honors students must take at least six credits under a single research advisor over two semesters and must write an honors thesis. Includes Honors sections. Preq: Consent of instructor.

BIOL 4920 Internship in Biological Sciences 1 4 (3-12) Preplanned internship at an advisor-approved facility to give students learning opportunities beyond their classroom experiences. Students submit a Student Internship Contract and a two-page study plan before the internship and a comprehensive report within one week of the end of the internship. May be repeated for a maximum of six credits. To be taken Pass/No Pass only. Preq: Consent of instructor.

BIOL 4930 Senior Seminar 2 (2) Capstone course engaging students in analysis and discussion of publications from the technical and non-technical literature in biological sciences and from current topics of biology appearing in other media. Students complete their undergraduate on-line digital portfolios. Emphasis is placed on ethical issues that arise as a result of biological research. Preq: Senior standing; COMM 1500 or COMM 2500 or ENGL 3140 or ENGL 3150.

BIOL 4940 Selected Topics in Creative Inquiry II 2-3 (1) Disciplinary and multidisciplinary group research projects with the goal of developing the students ability to discover, analyze, and evaluate data. Students are required to document their research activities in their portfolios. May be repeated for a maximum of six credits. Honors students must take at least six credits over a two-semester period with the same research advisor and write an honors thesis. These credits may include BIOL 3940, BIOL 4940 or both. Includes Honors sections. Preq: Consent of instructor. Coreq: BIOL 4941.

BIOL 4941 Selected Topics in Creative Inquiry II Laboratory 0 (3-6) Non-credit laboratory to accompany BIOL 4940. Coreq: BIOL 4940.

BIOL 4950 Service Learning in Biology 2-4 (1-2) Combines service and academic learning while helping precollege or college students learn about the fundamental aspects of science. Provides lecture and laboratory experiences as students learn to prepare and participate in supervised laboratory teaching for precollege or college students. May be repeated for a maximum of six credits. Preq: Consent of instructor. Coreq: BIOL 4951.

BIOL 4951 Service Learning in Biology Laboratory 0 (3-9) Non-credit laboratory to accompany BIOL 4950. Coreq: BIOL 4950.

BIOL 4960 Selected Topics 1-4 (1-4) Lecture coverage of selected topics in cellular and developmental biology, ecology, behavior, evolutionary biology, molecular biology, physiology, systematics, and other topics in the biological sciences. May be repeated for a maximum of nine credits, but only if different topics are covered. Preq: Consent of instructor.

BIOL 4970 Special Topics Laboratory 1-3 (2-9) Specialized laboratory experiences in cellular and developmental biology, ecology, behavior, evolutionary biology, molecular biology, molecular biology, physiology, systematics, and other topics of interest in the biological sciences. May be repeated for a maximum of nine credits, but only if different topics are covered. Preq: Consent of instructor.

BIOL 4970 Special Topics Laboratory 1-3 (2-9) Specialized laboratory experiences in cellular and developmental biology, ecology, behavior, evolutionary biology, molecular biology, molecular biology, physiology, systematics, and other topics of interest in the biological sciences. May be repeated for a maximum of nine credits, but only if different topics are covered. Preq: Consent of instructor.

BIOL 4970 Special Topics Laboratory 1-3 (2-9) Specialized laboratory experiences in cellular and developmental biology, ecology, behavior, evolutionary biology, molecular biology, molecular biology, physiology, systematics, and other topics of interest in the biological sciences. May be repeated for a maximum of nine credits, but only if different topics are covered. Preq: Consent of instructor.

BIOMOLECULAR ENGINEERING

BMOL 4030, 6030 Biotransport Phenomena 3 (3) Analysis of single and multidimensional steady-state and transient problems in momentum, mass, and energy transfer in biological systems. Mathematical similarities and differences in these mechanisms are stressed, and mathematical descriptions of physiological and engineering systems are formulated. Preq: CHE 3300 and MATHS 2080.

BMOL 4230, 6230 Bioseparations 3 (3) Study of principal methods of separation and purification of bioproducts, such as proteins, amino acids, and pharmaceuticals. Topics include analytical bioseparations, membrane separations, sedimentation, cell disruption, extraction, adsorption, chromatography, precipitation, crystallization, and drying. Preq: CHE 3300; and BCHM 3010 or BCHM 3050 or BCHM 4230.

BMOL 4250, 6250 Biomedical Engineering 3 (3) Introduction to basic principles of biomolecular engineering: the purposeful manipulation of biological molecules and processes applied to problems and issues in the life sciences, biotechnology, and medicine. Topics include carbohydrates, proteins, nucleic acids, and lipids with emphasis on their structures-function-relationship; molecular recognition; biochemical pathway engineering; and cell growth. Preq: CHE 2300 and CHE 3190.

BMOL 4260, 6260 Biosensors and Bioelectronic Devices 3 (3) Development of methodologies used to design, fabricate, and apply biosensors and bioelectronic devices for the environmental, medical, and chemical industries. Application of the fundamentals of measurement science to optical, electrochemical, mass, and thermal means of signal transduction. Use of the fundamentals of surface science to interpret bio-immobilization and biomolecule-surface interactions. Preq: CHE 3300; and BCHM 3010 or BCHM 3050.

BMOL 4270, 6270 Membranes for Biotechnology and Biomedicine 3 (3) Students learn principles of membrane science and technology and study membrane applications in the biotechnology and biomedical industries. Advanced topics include surface modification of membranes, synthesis of porous membranes for biomedical applications such as tissue engineering, environmentally responsive membranes, and membrane-based biomedical devices. Preq: CHE 3300.

BIOSYSTEMS TECHNOLOGY

Professor: T.R. Dobbins; Associate Professor: C.M. Drapcho

BT 2200 Biosystems Technology I 3 (2) Introduces fundamental and applied concepts used in bioprocessing for biofuels and other high value compounds. Topics include operation of batch and continuous flow bioreactors, microbial growth in anaerobic and aerobic environments, fermentation for biofuel production, and use of renewable energy in bioprocessing. Laboratory includes hands-on exercises, problem-solving/computer sessions and oral presentations. Preq: BIOL 1030 and BIOL 1050 and CH 1010. Coreq: BT 2201.

BT 2201 Biosystems Technology I Laboratory 0 (3) Non-credit laboratory to accompany BT 2200. Coreq: BT 2200.

BT 2400 Biosystems Technology II 3 (2) Introduces basic unit operations used in bioprocessing for biofuels and other bioproducts. Covers operation and selection of pumps, heat exchangers, separation systems and sensors used in bioprocessing. Laboratory includes hands-on exercises, problem-solving/computer sessions, and oral presentations. Preq: BT 2200. Coreq: BT 2401.
BUS 4920 Creative Inquiry Business 1-4 (1-4)
In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of four credits.

COLLEGE OF ARCHITECTURE, ARTS AND HUMANITIES

CEAH 2010 Cultural Literacies Across Media 3 (3) Hands-on practice in which students reflect critically on the cultural, aural, visual, professional and technological literacies learned as a result of a semester-long study abroad experience. May be repeated for a maximum of six credits. Preq: Enrollment in a study abroad program and ENGL 1030.

CIVIL ENGINEERING

CE 1990 Creative Inquiry Civil Engineering 1-4 (4)
In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of four credits. Preq: Consent of faculty member/mentor.

CE 2010 Statics 3 (3) Forces and force systems and their external effect on bodies, principally the condition of equilibrium. The techniques of vector manipulation are employed, and the rigor of physical analysis is emphasized. Includes Honor sections. Preq: PHYS 1220 with a C or better. Preq or concurrent enrollment: ENGR 1410 and MTHS 2060.

CE 2060 Structural Mechanics 4 (3) Builds on statics to develop relationships between external loads on structural elements of civil engineering interest and the resulting internal loads and deformations. Preq: CE 2010 and ENGR 1410 and MTHS 2060.

CE 2061 Structural Mechanics Laboratory 0 (3) Non-credit laboratory to accompany CE 2060. Coreq: CE 2060.

CE 2080 Dynamics 2 (2) Study of kinetics and kinematics of particles and rigid bodies, work and energy, impact and momentum. Preq: CE 2010 and ENGR 1410, each with a C or better, and MTHS 2060.

CE 2550 Geomatics 3 (2) Spatial data collection methods, including surveying, digital photogrammetry and remote sensing, and global positioning systems. Methods and technologies used to manage, manipulate, and analyze spatial and associated attribute data, including geographic information systems. Preq or concurrent enrollment: ENGR 2100. Coreq: CE 2551.

CE 2551 Geomatics Laboratory 0 (3) Non-credit laboratory to accompany CE 2550. Coreq: CE 2550.

CE 2990 Creative Inquiry—Civil Engineering 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of four credits. Preq: Consent of faculty member/mentor.

CE 3010 Structural Analysis 3 (3) Calculation of design loads and load paths for buildings and other structures. Use of classical analysis techniques to determine support reactions, internal member forces, and structural displacements of statically determinate and indeterminate structural systems. Preq: CE 2060.

CE 3110 Transportation Engineering Planning and Design 3 (3) Covers planning, design, and operation of transportation facilities, including highways and airports. Includes economic, safety, and environmental considerations. Public transit systems are covered. Preq: CE 2550. Preq or concurrent enrollment: EXST 3010.

CE 3210 Geotechnical Engineering 4 (3) Mechanical and physical properties of soils and their relation to soil action in problems of engineering, such as classification, permeability, shearing strength, and consolidation; design of embankments and retaining walls with geotextiles. Preq: CE 2060 and GEOL 1010 and GEOL 1030. Coreq: CE 3211.

CE 3211 Geotechnical Engineering Laboratory 0 (3) Non-credit laboratory to accompany CE 3210. Coreq: CE 3210.

CE 3310 Construction Engineering and Management 3 (3) Considers construction contracts, technical specifications, cost estimating, project scheduling, cost control, materials management, quality control, and quality assurance. Preq: Junior standing.

CE 3410 Introduction to Fluid Mechanics 4 (3) Introduction to fluid mechanics, including hydrostatics and fluid flow. Includes principles of mass, momentum, and energy conservation. Other topics include conduit flow, pump systems, and open channel flow. Laboratory experiments familiarize students with laboratory techniques and instrumentation. The Effective Technical Communications Laboratory is used to prepare a presentation for a lab assignment. Preq: CE 2080 with a C or better or EM 2020 with a C or better. Coreq: CE 3411.

CE 3411 Introduction to Fluid Mechanics Laboratory 0 (3) Non-credit laboratory to accompany CE 3410. Coreq: CE 3410.

CE 3420 Applied Hydraulics and Hydrology 3 (3) Study of hydrologic cycle, including precipitation, evapotranspiration, infiltration, and runoff. Includes hydrograph analysis, gradually varied flow in open channel flow, design of stable channels, flood routing, groundwater hydraulics, flood frequency analysis, and hydrologic design. Preq: CE 3410.
CE 3510 Civil Engineering Materials Laboratory O (3) Non-credit laboratory to accompany CE 3510. Coreq: CE 3510.

CE 3520 Economic Evaluation of Projects 2 (2)
Introduction to economic evaluation of projects and estimating. Non-credit laboratory to accompany CE 3510. Coreq: CE 3510.

CE 4040, 6040 Masonry Structural Design 3 (3)
Introduction to design of structural elements for masonry buildings, including lintels, walls, shear walls, columns, pilasters, and retaining walls. Reinforced and unreinforced elements of concrete or clay masonry are designed by allowable stress and strength design methods. Introduces construction techniques, materials, and terminology used in masonry. Preq: For CE 4040: CE 3010. Preq for CE 6040: CE 3010 or consent of instructor.

CE 4060 Structural Steel Design 3 (3)
Introduction to the design of structural elements found in steel buildings, in particular the design of steel tension members, beams, columns, beam-columns, and connections. Emphasizes the AISC LRFD Specifications for steel design, though reference is made to the ASD Specification with comparisons made where appropriate. Preq: CE 3010 or consent of instructor.

CE 4070, 6070 Wood Design 3 (3) Introduction to wood design and engineering; properties of wood and wood-based materials; design of beams, columns, walls, roofs, panel systems, and connections. Preq: for CE 4070: CE 3010. Preq for CE 6070: CE 3010 or consent of instructor.

CE 4080, 6080 Structural Loads and Systems 3 (3)
In-depth discussion of minimum design loads and load combinations. Includes overviews of various steel and concrete systems. Discusses practical selection and design issues and design of proprietary building materials and components, such as steel joists, diaphragms, engineered wood products, etc. Preq for CE 4080: CE 3010. Preq for CE 6080: CE 3010 or consent of instructor.

CE 4100, 6100 Traffic Engineering Operations 3 (3) Basic characteristics of motor vehicle traffic, highway capacity, applications of traffic control devices, traffic design of working facilities, engineering studies, traffic safety, traffic laws and ordinances, and public relations. Preq for CE 4100: CE 3110. Preq for CE 6100: CE 3110 or consent of instructor.

CE 4110, 6110 Roadway Geometric Design 3 (2) Geometric design of roadways, at-grade intersections, and interchanges in accordance with conditions imposed by driver ability, vehicle performance, safety, and economics. Preq for CE 4110: CE 3110. Preq for CE 6110: CE 3110 or consent of instructor. Coreq: CE 4111, 6111.

CE 4111, 6111 Roadway Geometric Design Laboratory O (3) Noncredit laboratory to accompany CE 4110, 6110. Coreq: CE 4110, 6110.

CE 4120, 6120 Urban Transportation Planning 3 (3) Consideration of urban travel characteristics, characteristics of transportation systems, transportation and land-use studies, trip distribution and trip assignment models, city patterns and subdivision layout. Preq for CE 4120: CE 3110. Preq for CE 6120: CE 3110 or consent of instructor.

CE 4210, 6210 Geotechnical Engineering Design 3 (3) Study of the relationship of local geology to soil formations, groundwater, planning of site investigation, sampling procedures, determination of design parameters, foundation design, and settlement analysis. Preq for CE 4210: CE 3210. Preq for CE 6210: CE 3210 or consent of instructor.

CE 4240, 6240 Earth Slopes and Retaining Structures 3 (3) Considers the principles of geology, groundwater and seepage, soil strength, slope stability, and lateral earth pressure and their application to the design of excavations, earth fills, dams, and earth-retaining structures. Preq for CE 4240: CE 3210. Preq for CE 6240: CE 3210 or consent of instructor.

CE 4250 Soil-Structure Interaction 3 (3) Study of the interaction between soil and structural elements such as pile foundations and retaining structures subjected to static and dynamic loads; application of general purpose finite element software for solving soil-structure interaction problems; introduction to the theory of finite element method, beams on elastic foundation, p-y curves and advanced testing procedures. Preq for CE 3210 and CE 3101.

CE 4330, 6330 Construction Planning and Scheduling 3 (3) Study of principles and applications of the Critical Path Method (CPM) and Project Evaluation and Review Techniques (PERT). Includes project breakdown and network graphics; identification of the critical path and resulting float, definition and allocation of materials, equipment, and manpower resources; resource leveling, compression, and other network adjustments; and computer applications using packaged routines. Preq for CE 4330: CE 3310. Preq for CE 6330: CE 3310 or consent of instructor.

CE 4340, 6340 Construction Estimating and Project Control 3 (3) Instruction in specifications, contracts, and bidding strategies; purchasing and subcontracting policies; accounting for materials, supplies, subcontracts, and labor; procedural details for estimating work, reinforced concrete, steel, and masonry. Also considers overhead and profit items. Preq for CE 4340: CE 3310. Preq for CE 6340: CE 3310 or consent of instructor.

CE 4350, 6350 Infrastructure Project Planning 3 (3) Covers concepts related to planning, cost estimating, financing and executing public works projects from the agency owner perspective. Advanced concepts of engineering economic analysis, risk analysis and database management systems are addressed. Traditional and innovative project contracting strategies, including incentive contracts and public-private partnerships, are discussed. Preq for CE 4350: CE 3320. Preq for CE 6350: CE 3320 or consent of instructor.

CE 4360, 6360 Sustainable Construction 3 (3) Presents the why, what and how for sustainable construction projects. Students gain a working understanding of how to minimize the negative impacts of buildings and other large construction projects. Preq for CE 4360: CE 3310. Preq for CE 6360: CE 3310 or consent of instructor.

CE 4370, 6370 Sustainable Energy Project Design and Analysis 3 (3) Students develop their technical and creative ability to plan and design for a sustainable future. Students perform quantitative analyses of the environmental and economic impacts of engineering alternatives. Students work in small groups and learn techniques for the collaborative, multidisciplinary approach required for sustainable solutions. Preq for CE 4370: CE 3310. Preq for CE 6370: CE 3310 or consent of instructor.
Courses of Instruction

CE 4380, 6380 Construction Support Operations 3 (3) Describes activities necessary for the completion of a construction job although not specifically recognized as direct construction activities: general conditions, safety, security, quality assurance, value engineering; organizational support features and typical implementation procedures. Prereq: CE 3310 and EXST 3010.

CE 4390, 6390 Construction Equipment Selection and Maintenance 3 (3) Methodology of selecting the right equipment for the right size for each task of the construction job on the basis of power-train characteristics, crew size, terrain conditions, and job requirements. Cycle time, cost, specifications, maintenance, replacement policy, monitoring. Prereq: CE 3310.

CE 4400, 6400 Sustainable Energy Engineering 3 (2) Investigation into merging renewable energy resources, including studies of solar, wind, and bioenergy alternatives. Also includes principles, technologies, and performance evaluation of components for these technologies and an introduction to tidal, hydro, geothermal, and other energy; energy conservation; cogeneration; financial, economical, and other issues related to alternative energy sources. Prereq for CE 4400: Junior standing in engineering. Coreqs: CE 4401, 6601.

CE 4401, 6401 Sustainable Energy Engineering Laboratory 0 (2) Non-credit laboratory to accompany CE 4400, 6600. Coreqs: CE 4400, 6600.

CE 4430, 6430 Water Resources Engineering 3 (3) Extension of the concepts of fluid mechanics to applications in water supply, water resource assessment, water transmission, water distribution networks, pump and pipe selection, pipe networks, and analysis of open channel appurtenances. Prereq: CE 3410.

CE 4460, 6460 Flood Hazards and Protective Design 3 (3) Study of flood hazards and methods of protective design of the built environment; floodplain mapping and delineation; methods for determining base flood elevations. Discusses flood-resistant construction, flood proofing, and governmental regulations. Includes case studies and design projects. Prereq or concurrent enrollment: CE 3420.

CE 4470, 6470 Stormwater Management 3 (3) Evaluation of peak discharges for urban and rural basins, design of highway and drainage structures such as inlets and culverts; stormwater and receiving water quality; best management practices, detention and retention ponds, and erosion and sediment control. Prereq: CE 3420. Prereq or concurrent enrollment: EES 4010.

CE 4560, 6560 Pavement Design and Construction 3 (3) Introduction to design methods, construction practices, maintenance strategies, and decision making process related to pavements. Other topics, such as environmental considerations and special pavement types and materials, are also covered. Prereq: CE 3110 and CE 3510. Prereq or concurrent enrollment: CE 3210.

CE 4570, 6570 Materials Testing and Inspection 3 (3) Introduction to the role of testing and inspection professionals in civil engineering projects. Uses a practical approach to applying concepts to real-world situations through the completion of several team projects such as material characterization, construction QC/QA, forensic evaluation, and proposal development. Prereq: CE 3210 and 3510.

CE 4590 Capstone Design Project 3 (3) Students apply creativity with their engineering knowledge in the solution of open-ended civil engineering problems. Problems are formulated and solutions are evaluated by faculty and practicing engineers. Communication skills are developed through presentations, correspondence and project reports. Students are expected to have completed all required 300-level CE courses and a Technical Design Requirement. Coreqs: CE 4591.

CE 4591 Capstone Design Project Laboratory 0 (6) Non-credit laboratory to accompany CE 4590. Coreq: CE 4590.

CE 4620, 6620 Coastal Engineering I 3 (3) Introduction to coastal and oceanographic engineering principles, including wave mechanics, wave-structure interaction, coastal water-level fluctuations, coastal-zone processes, and design considerations for coastal structures and beach nourishment projects. Prereq for CE 4620: CE 3410. Prereq for CE 6620: CE 3410 or consent of instructor.

CE 4820, 6820 Groundwater and Contaminant Transport 3 (3) Basic principles of groundwater hydrology and transport of contaminants in groundwater systems; groundwater system characteristics; steady and transient flow; well hydraulics, design, and testing; contaminant sources, movement and transformations. Prereq: CE 3410. Prereq or concurrent enrollment: EES 4010.

CE 4870 Senior Honors Project 1-3 (1-3) Studies or laboratory investigations on special topics in civil engineering with care of mentor to individual students and faculty member. Arranged on a project basis for a maximum of individual student effort under faculty guidance. May be repeated for a maximum of three credits. Prereq: Senior standing in Civil Engineering and/or Departmental Honors programs.

CE 4880, 6880 Honors Research I 2-3 (2-3) Individual research under the direction of a Civil Engineering faculty member. Prereq: CE 3890.

CE 4890, 6890 Honors Research II 3 (3) Individual research under the direction of a Civil Engineering faculty member. Prereq: CE 4880.

CE 4900 Special Projects 1-3 (1-3) Studies or laboratory investigations on special topics in civil engineering which are of interest to individual students and staff members. Arranged on a project basis with a maximum of individual student effort and a minimum of staff guidance. May be repeated for a maximum of three credits. Prereq: Senior standing.

CE 4910, 6910 Selected Topics in Civil Engineering 1-6 (1-6) Structured study of civil engineering topics not found in other courses. May be repeated for a maximum of six credits, but only if different topics are covered. Prereq: Consent of instructor.

CE 4990 Creative Inquiry—Civil Engineering 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of four credits. Prereq: Consent of faculty member/mentor.

COLLEGE OF ENGINEERING AND SCIENCE

CES 1900 Creative Inquiry in Engineering and Science I 1-3 (1) Individual or group projects in engineering and/or science. Projects may be interdisciplinary and involve analysis, design, and/or implementation. Instruction in methods, tools, and equipment will be included when appropriate. May be repeated for a maximum of six credits. Includes Honors sections. Prereq: Consent of instructor.

CES 2900 Creative Inquiry in Engineering and Science II 1-3 (1) Individual or group projects in engineering and/or science. Projects may be interdisciplinary and involve analysis, design, and/or implementation. Instruction in methods, tools, and equipment will be included when appropriate. May be repeated for a maximum of six credits. Includes Honors sections. Prereq: Sophomore standing and consent of instructor.

CES 3900 Creative Inquiry in Engineering and Science III 1-3 (1) Individual or group projects in engineering and/or science. Projects may be interdisciplinary and involve analysis, design, and/or implementation. Instruction in methods, tools, and equipment will be included when appropriate. May be repeated for a maximum of six credits. Includes Honors sections. Prereq: Junior standing and consent of instructor.

CES 4030, 6030 Career Success in Research and Development I (1) Assists students in making personal and professional transition into industrial research careers. Introduces and demonstrates practical advice and techniques to help students avoid early career land mines. Prereq: Junior standing in engineering or science discipline.

CES 4900 Creative Inquiry in Engineering and Science IV 1-3 (1) Individual or group projects in engineering and/or science. Projects may be interdisciplinary and involve analysis, design, and/or implementation. Instruction in methods, tools, and equipment will be included when appropriate. May be repeated for a maximum of six credits. Includes Honors sections. Prereq: Senior standing and consent of instructor.

CHEMISTRY

Courses of Instruction

CH 1010 General Chemistry 4 (3) Introduction to the elementary concepts of chemistry through classroom and laboratory experience. Emphasizes chemical reactions and the use of symbolic representation, the mole concept and its applications and molecular structure. Credit toward a degree will be given for only one of CH 1010 and CH 1050. Prereq: CMPT score of 3 or higher or preq or concurrent enrollment: MTHS 1010 or MTHS 1020 or MTHS 1030 or MTHS 1050. Includes Honors sections. Coreq: CH 1011.

CH 1011 General Chemistry Laboratory 0 (3) Non-credit laboratory to accompany CH 1010. Coreq: CH 1010.

CH 1020 General Chemistry 4 (3) Continuation of CH 1010; treating solutions, rates of reactions, chemical equilibrium, electrochemistry, chemistry of selected elements, and an introduction to organic chemistry. Credit toward a degree will be given for only one of CH 1020 or CH 1060. Includes Honors sections. Prereq: CH 1010 with a C or better. Coreq: CH 1021.

CH 1021 General Chemistry Laboratory 0 (3) Non-credit laboratory to accompany CH 1020. Coreq: CH 1020.

CH 1050 Chemistry in Context I 4 (3) The chemistry of societal issues, including air quality, global warming, acid rain, and alternative energy sources is discussed in the context of their impact on society. May not be taken as a prerequisite for organic chemistry. Credit toward a degree will be given for only one of CH 1010 or CH 1050. Coreq: CH 1051.

CH 1051 Chemistry in Context I Laboratory 0 (3) Non-credit laboratory to accompany CH 1050. Coreq: CH 1050.

CH 1060 Chemistry in Context II 4 (3) Continuation of CH 1050. Topics include the chemistry of nuclear energy, new energy sources, nutrition, medicines, new materials, and genetic engineering. May not be taken as a prerequisite for organic chemistry. Credit toward a degree will be given for only one of CH 1020 or CH 1060. Prereq: CH 1060 or CH 1050. Coreq: CH 1061.

CH 1061 Chemistry in Context II Laboratory 0 (3) Non-credit laboratory to accompany CH 1060. Coreq: CH 1060.

CH 1410 Chemistry Orientation 1 (1) Lectures, discussions, and demonstrations devoted to health and safety in chemistry laboratories; use of the chemical literature; and career planning. Prereq or concurrent enrollment: CH 1010.

CH 1520 Chemistry Communication I 2 (2) Methods for scientific communication, including oral, written, and electronic formats. Service-learning projects engage participants with community needs pertaining to chemistry issues.

CH 1990 Creative Inquiry—Chemistry I 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Prereq: Consent of faculty member/mentor.

CH 2010 Survey of Organic Chemistry 4 (3) Introduction to organic chemistry emphasizing nomenclature, classes of organic compounds, and chemistry of functional groups. For students needing a one-semester course in organic chemistry. Credit toward a degree will be given for only one of CH 2010 or CH 2230. Prereq: CH 1020. Coreq: CH 2011.


CH 2050 Introduction to Inorganic Chemistry 3 (3) One semester treatment which emphasizes the properties and reactions of the more common chemical elements. Prereq: CH 1020.

CH 2230 Organic Chemistry 3 (3) Introductory course in the principles of organic chemistry and the derivation of these principles from a study of the properties, preparations, and interrelationships of the important classes of organic compounds. Credit toward a degree will be given for only one of CH 2120 or CH 2330. Prereq: CH 2200.

CH 2240 Organic Chemistry 3 (3) Continuation of CH 2230. Prereq: CH 2230.

CH 2270 Organic Chemistry Laboratory I 3 (3) Synthesis and properties of typical molecules of the classes of organic compounds. Credit toward a degree will be given for only one of CH 2270 or CH 2290. Prereq or concurrent enrollment: CH 2270.

CH 2280 Organic Chemistry Laboratory I 3 (3) Continuation of CH 2270. Prereq: CH 2270. Coreq or concurrent enrollment: CH 2240.

CH 2290 Organic Chemistry Laboratory I 3 (3) One-semester laboratory for Chemical Engineering students. Credit toward a degree will be given for only one of CH 2270 or CH 2290. Prereq: CH 2270.

CH 2300 Creative Inquiry—Chemistry II 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Prereq: Consent of faculty member/mentor.

CH 3130 Quantitative Analysis 3 (3) Fundamental principles of volumetric, gravimetric, and certain elementary instrumental chemical analyses. Prereq or concurrent enrollment: CH 3150 or CH 3170.

CH 3150 Quantitative Analysis Laboratory 2 (6) Laboratory techniques of volumetric, gravimetric, and elementary instrumental chemical analyses. Credit toward a degree will be given for only one of CH 3150 or CH 3170. Prereq or concurrent enrollment: CH 3130.

CH 3170 Quantitative Analysis Laboratory 1 (3) Standard techniques of analytical chemistry gravimetric, volumetric, and instrumental. Credit toward a degree will be given for only one of CH 3150 or CH 3170. Prereq or concurrent enrollment: CH 3130.

CH 3300 Introduction to Physical Chemistry 3 (3) One-semester treatment of physical chemistry emphasizing topics that are especially useful in the life sciences, agriculture, and medicine: chemical thermodynamics, equilibria, solutions, kinetics, electrochemistry, macromolecules, and surface phenomena. Credit toward a degree will be given for only one of CH 3300 or CH 3310. Prereq: MTHS 1060.

CH 3310 Physical Chemistry 3 (3) Includes the gaseous state, thermodynamics, chemical equilibrium, and atomic and molecular structure, from both experimental and theoretical points of view. Credit toward a degree will be given for only one of CH 3300 or CH 3310. Prereq: MTHS 2060 and PHYS 2210.

CH 3320 Physical Chemistry 3 (3) Continuation of CH 3310, including chemical kinetics, liquid and solid state, phase equilibria, solutions, electrochemistry and surfaces. Includes Honors sections. Prereq: CH 3310.

CH 3390 Physical Chemistry Laboratory 1 (3) Experiments are selected to be of maximum value to chemistry and Chemical Engineering majors. Prereq or concurrent enrollment: CH 3310 or CHE 2200.

CH 3400 Physical Chemistry Laboratory 1 (3) Continuation of CH 3390. Prereq or concurrent enrollment: CH 3320.

CH 3600 Chemical Biology 3 (3) Introduction to the chemical foundations of biological phenomena, focusing on bioorganic, biophysical, bioinorganic, and bioanalytic chemistry principles. Prereq: CH 2010 or CH 2230.

CH 3990 Creative Inquiry—Chemistry III 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Prereq: Consent of faculty member/mentor.

CH 4000 Selected Topics in Chemistry 1-3 (1-3) Comprehensive study of topics of current interest in chemistry. May be repeated for a maximum of twelve credits, but only if different topics are covered.

CH 4010 Organometallic Chemistry 3 (3) Organometallic compounds are useful in applications ranging from large-scale industrial reactions to antibiotics, and this versatility arises from the chemically unique metalcarbon bond. Course begins with fundamental coordination chemistry, then progresses through ligand substitution, oxidative addition/reductive elimination, catalytic transformations and polymerization reactions. Includes honors sections. Prereq for CH 4010; CH 2230, Prereq for CH 6010: Consent of instructor.

CH 4020, 6020 Inorganic Chemistry 3 (3) Basic principles of inorganic chemistry are discussed with special emphasis on atomic structure, chemical bonding, solid state, coordination chemistry, organometallic chemistry, and acid-base theories. The chemistry of certain selected elements is treated. Includes Honors sections. Prereq: CH 3310 and CH 3320.
Courses of Instruction

CH 4030 Advanced Synthetic Techniques 2 (6) Introduction to advanced laboratory techniques in synthesis and characterization of inorganic and organic compounds. Laboratory sessions consist of a set of eight experiments in modern fields of chemistry, including superconductivity, buckminsterfullerene, bioinorganic chemistry, medicinal chemistry, asymmetric synthesis, and polymer chemistry. Preq: CH 2050 and CH 2270 and CH 2280; and either CH 3150 or CH 3170.

CH 4040, 6040 Bioinorganic Chemistry 3 (3) Covers fundamentals of bioinorganic chemistry with review of necessary inorganic and biochemical concepts. Topics include metal uptake, transport, and storage in biological systems; functions of metals in proteins; metal ion interactions with nucleic acids; physical methods used in bioinorganic chemistry; heavy element toxicity, radiopharmaceuticals, and the polymer. Includes Honors sections. Preq: CH 4110.

CH 4110, 6110 Instrumental Analysis 3 (3) Principles of operation and application of modern chemical instrumentation in the field of analytical chemistry. Topics include basic electronics, statistics, optical, mass, magnetic resonance, electron and x-ray spectroscopies, radiochemistry, and separation science. Preq: CH 3310 and CH 3320.

CH 4120 Instrumental Analysis Laboratory 2 (5) Reinforces principles of chemical instrumentation described in CH 4110 by practical, hands-on experience. Aspects of sample preparation, standardization, data acquisition and interpretation, and report formulation procedures common in chemical analyses are considered for a range of modern instrumental methods. Preq or concurrent enrollment: CH 4110.

CH 4130 Chemistry of Aqueous Systems 3 (3) Study of chemical equilibria in aqueous systems, especially natural waters; acids and bases, dissolved CO2, precipitation and dissolution, oxidation-reduction, adsorption, etc. Includes Honors sections. Preq: CH 1020 or 1060.

CH 4140, 6140 Bioanalytical Chemistry 3 (3) Survey of selected areas of importance in bioanalytical chemistry. Fundamental principles, advanced topics, and applications of analytical measurements of biomolecules, bioassays, immunosassays, separations, mass spectrometry, method validation, macromolecular crystallography, microscopy, and imaging. Preq for CH 4140: CH 3130 and CH 4110. Preq for CH 6140: CH 3130 and CH 4110; or consent of instructor.


CH 4250 6250 Medicinal Chemistry 3 (3) Survey of the pharmaceutical drug discovery process. Covers discovery of candidate compounds, bioassay methods, and associated regulatory and commercial issues. Case studies are selected from the current literature. Preq for 4250: CH 2240. Preq for 6250: CH 2240 or consent of instructor.

CH 4270, 6270 Organic Spectroscopy 3 (2) Survey of modern spectroscopic techniques used in the determination of molecular structure. Emphasizes the interpretation of spectra: nuclear magnetic resonance, ultraviolet, infrared, mass spectrometry, optical rotatory dispersion, and circular dichroism. Includes Honors sections. Students are expected to have completed one year each of organic chemistry and physical chemistry. Coreq: CH 4271, 6271.

CH 4271, 6271 Organic Spectroscopy Laboratory 0 (3) Non-credit laboratory to accompany CH 4270, 6270. Coreq: CH 4270, 6270.

CH 4350, 6350 Atomic and Molecular Structure 3 (3) Introduction to quantum theory and its application to atomic and molecular systems. Topics include harmonic oscillator, hydrogen atom, atomic and molecular orbital methods, vector model of the atom, atomic spectroscopy, and molecular spectroscopy. Includes Honors sections. Preq for CH 4350: CH 3320. Preq for CH 6350: CH 3320 or consent of instructor.

CH 4440 Research Problems 1-6 (1-6) Original investigation of an assigned problem in a fundamental branch of chemistry. Work must be carried out under the supervision of a member of the staff. May be repeated for a maximum of six credits. Includes Honors sections. Preq: Senior standing in Chemistry.

CH 4440 Research Problems 1-6 (1-6) Continuation of CH 4440. Original investigation of an assigned problem in a fundamental branch of chemistry. Work must be carried out under the supervision of a member of the staff. May be repeated for a maximum of six credits. Includes Honors sections. Preq: Senior standing in Chemistry.

CH 4500 Chemistry Capstone 3 (1) Students undertake capstone projects in a team format. Projects necessitate usage of electronic and print resources, demonstrate expertise with a specific instrument or experimental technique, require strong collaboration within a team setting, and produce peer-reviewed oral and written report. Preq: Senior standing. Coreq: CH 4501.

CH 4501 Chemistry Capstone Laboratory 0 (6) Non-credit laboratory to accompany CH 4500. Coreq: 4500.

CH 4510, 6510 Frontiers in Polymer Chemistry 3 (3) Survey of selected areas of current research in polymer science with particular emphasis on polymer synthesis. Although a text is required for review and reference, course is primarily literature based and focused on areas of high impact to multidisciplined technology. Preq for CH 4510: CH 2230 and CH 2240 and MSE 4150. Preq for CH 6510: CH 2230 and CH 2240 and MSE 4150 or consent of instructor.

CH 4520 Chemistry Communication II 1 (1) Methods for scientific communication, including oral, written, and electronic formats. Student presentations focus on current chemical literature topics pertinent to their CH 4430/444 undergraduate research or results of that work are appropriate. Preq: CH 1520.

CH 4710, 6710 Teaching Chemistry 3 (3) Study of topics in chemistry addressed in the context of constructivist methodologies. Also considers laboratory work and management, laboratory safety, and the use of technology in the chemistry classroom. Preq for CH 4710: Any 3000-level chemistry course. Students who have not completed a 3000-level chemistry course but have high school teaching experience may request an override from the instructor. Preq for 6710: 3000-level chemistry course or high school teaching experience or consent of instructor.

CH 4990 Creative Inquiry—Chemistry IV 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor.

CHEMICAL ENGINEERING


CHE 1300 Chemical Engineering Tools 2 (1) Tools and methods for analyzing engineering problems with applications in chemical and biochemical processes, including development of process flow diagrams, numerical methods, graphing, and applied statistics. Problem-solving and computer skills are developed in the lecture and laboratory activities. Preq: ENGR 1020 with a C or better. Preq or concurrent enrollment: MATH 1060 or MATH 1070, and PHYS 1220. Coreq: CHE 1301.

CHE 1301 Chemical Engineering Tools Laboratory 0 (2) Non-credit laboratory to accompany CHE 1300. Coreq: CHE 1300.

CHE 1990 Creative Inquiry—Chemical and Biomolecular Engineering 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor.

CHE 210 Introduction to Chemical Engineering 4 (3) Introduction to fundamental concepts of chemical engineering, including mass and energy balances, PVT relationships for gases and vapors, and elementary phase equilibria; problem-solving and computer skills are developed in lab. Preq: CH 1020 and MATH 1080 and PHYS 1220; and one of CHE 1300 or ENGR 1300. Coreq: CHE 2111.

CHE 2111 Introduction to Chemical Engineering Laboratory 0 (2) Non-credit laboratory to accompany CHE 2110. Coreq: CHE 2110.

CHE 2200 Chemical Engineering Thermodynamics I 3 (3) Topics include first and second laws of thermodynamics, ideal gases, PVT properties of real fluids, energy balances with chemical reactions, and thermodynamic properties of real fluids. Preq: CHE 2110 and MATH 2060.

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CHE 2300 Fluids/Heat Transfer 4 (3) General principles of chemical engineering and study of fluid flow, fluid transportation, and heat transmission. Special emphasis is placed on theory and its practical application to design. Preq: CHE 2110. Preq or concurrent enrollment: CHE 2200 and MTHS 2060. Coreq: CHE 2301.

CHE 2301 Fluids/Heat Transfer Laboratory 0 (2) Non-credit laboratory to accompany CHE 2300. Coreq: CHE 2300.

CHE 2990 Creative Inquiry—Chemical and Biomolecular Engineering 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor.

CHE 3000 Honors Seminar 1 (1) Acquaints students enrolled in the Departmental Honors Program with current research issues in the profession. This assists the student in preparing a research proposal for the Senior Thesis. To be taken Pass/No Pass only. Preq: CHE 2200 and CHE 2300; and admission to departmental honors program.

CHE 3070 Unit Operations Laboratory I 3 (2) Laboratory work in the unit operations of fluid flow, heat transfer, and evaporation. Stress is on the relation between theory and experimental results and the statistical interpretation of those results and on report preparation and presentation. Preq: CHE 2200 and CHE 2300. Coreq: CHE 3071.

CHE 3071 Unit Operations Laboratory I Laboratory 0 (3) Non-credit laboratory to accompany CHE 3070. Coreq: CHE 3070.


CHE 3210 Chemical Engineering Thermodynamics II 3 (3) Continuation of CHE 2210. Topics include thermodynamics of power cycles and refrigeration/liquefaction, thermodynamic properties of homogeneous mixtures, phase equilibria, and chemical reaction equilibria. Preq: CHE 2200 and MTHS 2080.

CHE 3300 Mass Transfer and Separation Processes 4 (3) Study of mass transport fundamentals and application of these fundamentals to separation technologies, with emphasis on gas absorption, stripping, distillation, and liquid-liquid extraction. Preq: CHE 2300. Preq or concurrent enrollment: CHE 3210. Coreq: CHE 3301.

CHE 3301 Mass Transfer and Separation Processes Laboratory 0 (2) Non-credit laboratory to accompany CHE 3300. Coreq: CHE 3300.

CHE 3530 Process Dynamics and Control 3 (3) Mathematical analysis of the dynamic response of process systems. Basic automatic control theory and design of control systems for process applications. Preq: CHE 2300 and MTHS 2080. Preq or concurrent enrollment: CHE 3300.

CHE 3950 Honors Research 1 3 (9) Individual research under the direction of a Chemical Engineering faculty member. Preq: CHE 3000.

CHE 3990 Creative Inquiry—Chemical and Biomolecular Engineering 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor.

CHE 4010, 6010 Transport Phenomena 3 (3) Mathematical analysis of single and multidimensional steady-state and transient problems in momentum, energy, and mass transfer. Both the similarities and differences in these mechanisms are stressed. Preq: CHE 3300 and MTHS 2080.

CHE 4070 Unit Operations Laboratory II 3 (1) Continuation of CHE 3070 with experiments primarily on the diffusional operations. Additional lecture material on report writing and general techniques for experimental measurements and analysis of data, including statistical design of experiments. Preq: CHE 3070 and CHE 3300. CHE 4071.

CHE 4071 Unit Operations Laboratory II Laboratory 0 (6) Non-credit laboratory to accompany CHE 4070. Coreq: CHE 4070.

CHE 4120, 6120 Polymer Engineering 3 (3) Design-oriented course in synthetic polymers. Topics include reactor design used in polymer production, effect of step versus addition kinetics on reactor design, epoxy curing reactions, polymer solubility, influence of polymerization and processing conditions on polymer crystallinity. Preq: CHE 2240 and CHE 3320.

CHE 4310 Chemical Process Design I 3 (3) Steps in creating a chemical process design from original concept to successful completion and operation. Topics include process layout, equipment selection and costing, safety and environmental evaluation, engineering economics, simulation, evaluation of alternatives, and optimization. Preq: CHE 3070 and CHE 3310 and CHE 3300. Preq or concurrent enrollment: CHE 4500.

CHE 4310 Process Design II 3 (1) Continuation of CHE 4310. Principles of process development, design, and optimization are applied in a comprehensive problem carried from a general statement of the problem to detailed design and economic evaluations. Preq: CHE 3300 and CHE 4070 and CHE 4310 and CHE 4500. Coreq: CHE 4311.

CHE 4311 Process Design II Laboratory 0 (6) Non-credit laboratory to accompany CHE 4310. Coreq: CHE 4330.

CHE 4430 Chemical Engineering Senior Seminar I 1 (1) Preparation of senior chemical engineering students for entry into the profession. Timely information on job interviewing skills, career placement and guidance, professional registration, professional behavior and ethics, and management of personal finances. Outside speakers are used frequently. To be taken Pass/No Pass only. Preq or concurrent enrollment: CHE 4310.

CHE 4440 Chemical Engineering Senior Seminar II 1 (1) Working in groups, students present and discuss topics related to professional practice, ethics, business, industrial safety, the environment, and selected technical subjects of interest to society. To be taken Pass/No Pass only. Preq: CHE 4430. Preq or concurrent enrollment.

CHE 4450, 6450 Selected Topics in Chemical Engineering 3 (3) Topics not covered in other courses, emphasizing current literature, research, and practice of chemical engineering. Topics vary from year to year. May be repeated, but only if different topics are covered. Preq: Consent of instructor.

CHE 4500, 6500 Chemical Reaction Engineering 3 (3) Review of kinetics of chemical reactions and an introduction to the analysis and design of chemical reactors. Topics include homogeneous and heterogeneous reactions, batch and continuous flow reaction systems, catalysis, and design of industrial reactors. Preq: CHE 3210 and CHE 3300 and CH 3320.

CHE 4910 Special Projects in Chemical Engineering 1-3 (1-3) Topics requested by students or offered by faculty as the need arises. Topics may include review of current research in an area, technological advances, and national engineering goals. May be repeated for a maximum of six credits, but only if different topics are covered. Includes Honors sections.

CHE 4950 Honors Research II 3 (9) Individual research under the direction of a chemical engineering faculty member. Preq: CHE 3950.

CHE 4970 Honors Thesis 1 (1) Preparation of honors thesis based on research conducted in CHE 3950 and CHE 4950. Preq: CHE 4950.

CHE 4990 Creative Inquiry—Chemical and Biomolecular Engineering 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor.

CHINESE

Associate Professors: Y. An, Y. Zhang; Lecturer: S. Chen

CHIN 1010 Elementary Chinese 4 (3) Introductory course stressing speaking, listening, and writing. Attention is given to the sound system of Chinese to enable students to distinguish the four tones and to develop basic communication skills. Participation in cultural activities is encouraged. Coreq: CHIN 1011.

CHIN 1011 Elementary Chinese Laboratory 0 (1) Noncredit laboratory to accompany CHIN 1010. Coreq: CHIN 1010.


CHIN 1021 Elementary Chinese Laboratory 0 (1) Noncredit laboratory to accompany CHIN 1020. Coreq: CHIN 1020.

CHIN 2010 Intermediate Chinese 3 (3) Intermediate course with more emphasis on communication skills and structure. Reading and writing practice without phonetic aids; oral practice in and outside the class, paying special attention to idiomatic usage; introduction to cultural perspectives through readings and cultural activities. Preq: CHIN 2010. Coreq: CHIN 2011.


CHIN 2970 Creative Inquiry—Chinese 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Arrangements with faculty members must be established prior to registration. Preq: Consent of faculty member(s).

CHIN 3050 Chinese Conversation and Composition 1 3 (3) Practice in the spoken language emphasizing vocabulary, word-combinations, pronunciation, and comprehension. Learning practical language skills and intercultural communication by studying various topics. Preq: CHIN 2020.

CHIN 3060 Chinese Conversation and Composition II 3 (3) Continuation of CHIN 3050. More practice in the spoken language emphasizing vocabulary, word combinations, pronunciation, and comprehension. Learning practical language skills and intercultural communication by studying various topics. Preq: CHIN 3050.

CHIN 3120 Philosophy in Ancient China 3 (3) Study of the history of Chinese philosophy from fifth century BCE, including Confucianism, Daoism, Moism, legalism, Buddhism, Neo-Daoism, and Neo-Confucianism. Examination of Chinese philosophers’ views and arguments on questions of life and death, history and society, education and personal cultivation. May not be used to satisfy general foreign language requirements.

CHIN 3130 Philosophy in Modern China 3 (3) Study of the history of Chinese philosophy from the 19th century BCE, including Confucianism, Daoism, Moism, legalism, Buddhism, Neo-Daoism, and Neo-Confucianism. Examination of Chinese philosophers’ views and arguments on questions of life and death, history and society, education and personal cultivation. May not be used to satisfy general foreign language requirements.

CHIN 3160 Chinese for International Trade 1 3 (3) Study of spoken and written Chinese common to the Chinese-speaking business community emphasizing business practices and writing/ translating business letters and professional documents. Cross-cultural references are provided for comparative analyses of American and Chinese business behavior. Classes are conducted in Chinese. Preq or concurrent enrollment: CHIN 2020 and CHIN 3050.

CHIN 3170 Chinese for Health Professionals 1 3 (3) Study of medical concepts and terminology emphasizing communicative competence in health-related settings in a Chinese-speaking community. Designed for students who plan to work in public health-related professions. Preq: CHIN 2020 and CHIN 3050.

CHIN 3970 Creative Inquiry—Chinese 1-4 (1-4) Students focus on a special research area under the guidance of a faculty member. After acquiring the requisite background, students formulate hypotheses for a group project, develop a critical framework, and initiate research on a specific topic. CHIN 3980 Directed Reading 3 (3) Directed readings in Chinese literature, language, society, and culture. Taught in Chinese. May be repeated for a maximum of six credits. Preq: Consent of department chair.

CHIN 4010 Pre-Modern Chinese Literature in Translation 3 (3) Chinese literature from 8th century B.C.E. to 19th century C.E., including poetry, prose, drama, fiction, and literary criticism. All readings and discussions are in English.

CHIN 4110 Studies in the Chinese Language I: Literature 3 (3) Advanced training in the spoken and written language through readings in contemporary literature emphasizing vocabulary, syntax, and stylistics. All readings and discussions are in Chinese. Preq: CHIN 3600.

CHIN 4120 Studies in the Chinese Language II: Social Issues 3 (3) In-depth study of terminology and syntax for specific subject areas in contemporary social issues. All readings and discussions are in Chinese. Preq: CHIN 3600.

CHIN 4160 Chinese for International Trade II 3 (3) Study of language, concepts, and the environment of Chinese-speaking markets of the world. Considers sociocultural, political, and economic issues relevant to the Chinese-speaking business world and the ramifications of these issues in global marketing. Classes are conducted in Chinese. Preq: CHIN 3610.

CHIN 4170 Chinese for Health Professionals II 3 (3) Continuation of CHIN 3170 with increased emphasis on managerial aspects of the health-care system in China. Taught in Chinese. Preq: CHIN 3170.

CHIN 4180 Chinese Culture and Society 3 (3) Examines cultural values and the patterns of social interactions in China. Focuses on Chinese social organization and interpersonal dynamics, including the family system, gender identities, social exchanges and networks. All readings and discussions are in English. May not be used to satisfy general foreign language requirements.

CHIN 4190 Creative Inquiry—Chinese 1-4 (1-4) Continuation of research initiated in CHIN 3970. Students complete their projects and disseminate their research results. Preq: CHIN 3970.

CHIN 4980 Independent Study 1-3 (1-3) Supervised study and research on selected topics in Chinese studies. May be repeated for a maximum of six credits. Preq: Junior standing and consent of department chair.

CHIN 4990 Selected Topics in Chinese Culture 3 (3) Examination of various social and cultural topics, including art and literature, philosophical and religious traditions, health and healing, and folk and popular cultures. May be repeated for a maximum of six credits, but only if different topics are covered. Readings and discussions are in English. May not be used to satisfy general foreign language requirements.

COMM 1010 Communication Academic and Professional Development I 1 (1) Introduces students to General Education and Communication Studies major requirements, explains connections between general education and major courses, explores careers in communication, and prepares students to develop digital portfolios, résumés, and interview skills specific to communication professions and/or graduate school. To be taken Pass/No Pass.

COMM 1070 Media Representations of Science and Technology 3 (3) Examines mediated representations of science and technology from a communicative perspective. Attention is paid to portrayals/coverage of science and technology in popular film, television, Internet, journalism, and other media. Students examine an array of theoretical issues and case studies in this area.

COMM 1500 Introduction to Human Communication 3 (2) Overview of theoretical approaches to the study of communication, including the theory and practice of interpersonal/small group/intercultural/public communication. Includes a laboratory. Coreq: COMM 1501.

COMM 1501 Introduction to Human Communication Laboratory 0 (2) Non-credit laboratory to accompany COMM 1500. Coreq: COMM 1500.

COMM 1620 Forensic Laboratory 1 (3) Research, preparation, and practice leading to participation in on-campus and intercollegiate debate and individual events competition. May be repeated for a maximum of four credits.

COMM 1630 Advanced Forensic Laboratory 1 (3) Advanced research, preparation, and practice leading to continued participation in on-campus and intercollegiate debate and individual events competition. May be repeated for a maximum of four credits. Preq: COMM 1620.

COMM 2010 Introduction to Communication Studies 4 (3) Introduces Communication Studies majors to and prepares them for continued study in the discipline by providing them with an overview of important issues, areas of study, and approaches to the field. Includes a writing laboratory experience. Preq: COMM 1010. Coreq: COMM 2011.

COMM 2011 Introduction to Communication Studies Laboratory 0 (2) Non-credit laboratory to accompany COMM 2010. Coreq: COMM 2010.

COMM 2500 Public Speaking 3 (3) Practical instruction in public speaking practice in the preparation, delivery, and criticism of short speeches. Develops an understanding and knowledge of the process of communication. Includes a laboratory. Includes Honors sections. Coreq: COMM 2501.

COMM 2501 Public Speaking Laboratory 0 (1) Noncredit laboratory to accompany COMM 2500. Coreq: COMM 2500.
COMM 3010 Communication Theory 3 (3) Students explore the breadth and depth of theories within the major frameworks of the communication studies discipline. Preq: COMM 2010 with a C or better.

COMM 3020 Mass Communication Theory 3 (3) Survey of the breadth and history of theories of mass communication and mass media from the 19th century to the present. Emphasizes contemporary schools of thought, theoretical debates, and the continuing controversies in the field. Preq: COMM 2010 with a C or better.

COMM 3030 Communication Law and Ethics 3 (3) Major topics in communication law and free expression in public discourse. Focuses on issues such as how youth are portrayed in media, how youth navigate the products of mass media/culture, and how youth creates its own media culture. Preq: COMM 2010 with a C or better.

COMM 3040 Youth, Media, and Culture 3 (3) Grounded in the cultural studies paradigm, examines the relationship among youth, mass media, and popular culture. Focuses on issues such as how youth are portrayed in media, how youth navigate the products of mass media/culture, and how youth creates its own media culture. Preq: COMM 2010 with a C or better.

COMM 3050 Persuasion 3 (3) Study of the processes by which communication influences attitudes, beliefs, and behaviors in our personal, social, civic, and professional lives. After discussion of definitional and methodological issues, particular theories of persuasion are examined. Treatment of political, market-driven, and social persuasion concludes the course. Preq: COMM 2010 with a C or better.

COMM 3060 Discourse, Criticism, and Society 3 (3) Students explore theoretically-grounded methods of critical and cultural description, analysis, interpretation, and evaluation of public discourse. Preq: COMM 2010 with a C or better.

COMM 3070 Public Communication of Science and Technology 3 (3) Examines the role of science and technology in society from a communication perspective. Particular attention is paid to the dynamic in public culture. Students examine an array of theoretical issues and case studies in this area. Preq: COMM 2010 with a C or better.

COMM 3080 Public Communication and Popular Culture 3 (3) Examines artifacts of popular culture paying particular attention to their relationship to politics and public life. Explores the structures and constraints of the culture industry. Studies apply communication principles to various examples. Preq: COMM 2010 with a C or better.

COMM 3090 Visual Discourse and the Public 3 (3) Examines the role of visibility in society and the cultural implications for ways of seeing. Using visual artifacts of various types, students learn the logic of visual representation. Preq: COMM 2010 with a C or better.

COMM 3100 Quantitative Research Methods in Communication Studies 3 (3) Explores methods of quantitative communication inquiry, including theory/research relationship, conducting studies, and utilizing statistical software. Methods may include experiments, surveys, and content analysis. Preq: COMM 2010 with a C or better.

COMM 3110 Qualitative Research Methods in Communication Studies 3 (3) Explores methods of qualitative communication inquiry, including theory/research relationship and conducting studies. Methods may include interviewing, focus groups, textual analysis, and ethnography. Preq: COMM 2010 with a C or better.

COMM 3150 Critical Discourse Theory 3 (3) Introduction to a variety of theoretical concepts associated with the critical study of public discourse. Students analyze theories related to the strategic use of language and its epistemological characteristics. Theoretical topics may include critical/cultural studies, visual communication, ideology, persona, social change, and identity studies. Preq: COMM 2010 with a C or better.

COMM 3160 Girlhood, Media, and Popular Culture 3 (3) Explores how the mass media and popular culture contribute to social constructions of girlhood. Employing the critical lens of feminist and communication theories, students examine mediated depictions of girls as well as how girls actively produce and negotiate media and popular culture. Preq: COMM 2010 with a C or better or WS 3010.

COMM 3200 Broadcast Production 3 (2) Explores the broadcast side of journalism. Students produce broadcast video packages, as well as newscasts. Students learn news writing, filming and video editing. Coreq: COMM 3201.

COMM 3201 Broadcast Production Laboratory 0 (2) Non-credit laboratory to accompany COMM 3200. Coreq: COMM 3201.

COMM 3210 Communication Across Media Platforms 3 (C) Provides an overview of the communication convergence strategies and practices used across multiple media platforms, including print, broadcast, Internet and social media. Emphasis is placed on media literacy and communication practices used across multiple media platforms. Preq: COMM 2010 with a C or better.

COMM 3220 Communication Design 3 (2) Provides an overview of the communication theories, tools and techniques available to design, manipulate and convey technological messages and experiences in social contexts. Provides knowledge and critical skills necessary to consider communication design as an important and inevitable component of communication studies careers.

COMM 3221 Communication Design Laboratory 0 (2) Non-credit laboratory to accompany COMM 3220.

COMM 3240 Communication, Sport and Society 3 (3) Covers the cultural influence of communication about sports on society. Explores how communication enables cultural meanings and values to become associated and established within sports. Explores students to the ways factors such as race, gender and nationalism manifest and perpetuate via communication about sports. Preq: COMM 2010 with a C or better.

COMM 3250 Survey of Sports Communication 3 (3) Examines and analyses the communication practices involved in college and professional sports, and developing an understanding of sports promotion and advertising. Preq: COMM 2010 with a C or better.

COMM 3260 Public Relations in Sports 3 (3) Focuses on the preparation of professional sports communication materials for both internal and external audiences. Topics include the mechanics of creating press releases and other materials, as well as techniques in managing crises. Preq: COMM 2010 with a C or better.

COMM 3270 Sports Media Criticism 3 (3) Students gain in-depth understanding of sports communication issues through critically analyzing actual media coverage of sporting events, addressing social issues involved in college and professional sports, and developing an understanding of sports promotion and advertising. Preq: COMM 2010 with a C or better.

COMM 3300 Nonverbal Communication 3 (3) Explores the role of nonverbal behaviors in human interaction. This includes the study of gesture and movement, physical appearance, vocal behavior, immediacy, time and space, and intercultural differences. Promotes understanding of nonverbal rules. Preq: COMM 2010 with a C or better.

COMM 3480 Interpersonal Communication 3 (3) Explores the theories and research in interpersonal communication with emphasis on the application of research findings and developmental strategies for intra- and intercultural relationships. Preq: COMM 2010 with a C or better.

COMM 3500 Small Group and Team Communication 3 (3) Examines the principles and skills involved in effective small-group communication. Preq: COMM 2010 with a C or better.

COMM 3550 Principles of Public Relations 3 (3) Students learn the principles, theories, process, history and contexts of public relations. Preq: COMM 2010 with a C or better.

COMM 3560 Stakeholder Communication 3 (3) Explores the cultural influence of communication about sports on society. Explores how communication enables cultural meanings and values to become associated and established within sports. Explores students to the ways factors such as race, gender and nationalism manifest and perpetuate via communication about sports. Preq: COMM 2010 with a C or better.

COMM 3640 Organizational Communication 3 (3) Examines the process, theories, and techniques of communications within small groups and other organized bodies. Preq: COMM 2010 with a C or better.

COMM 3660 Special Topics in Communication Studies 3 (3) Consideration of select major areas of practice in the field with a focus on application of communication concepts. May be repeated for a maximum of nine credits, but only if different topics are covered.
COMM 3680 Applied Communication 3 (3) Students apply and develop practical knowledge and skills relevant to specific research areas in communication studies as determined by instructor. Areas may include organizational, health, media and technological communication. Preq: COMM 2010 with a C or better; and COMM 3060 or 3100, each with a C or better.

COMM 3690 Political Communication 3 (3) Examination of American political rhetoric after 1900, focusing on such notable speakers as Franklin D. Roosevelt, John F. Kennedy, and Martin Luther King Jr. Preq: COMM 2010 with a C or better.

COMM 3900 Communication Studies Internship 3 (9) Preplanned, preapproved, faculty-supervised internship provides Communication Studies majors with field experience in areas related to their curriculum. May be repeated for a maximum of six credits. To be taken Pass/No Pass only. Preq: Junior standing and consent of instructor.

COMM 3990 Creative Inquiry in Communication Studies 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue small group work on a particular research topic or practical problem. Arrangements with mentors must be established prior to registration. Content varies. May be repeated for a maximum of nine credits. Preq: COMM 2010 with a C or better.

COMM 4000 Communication and Globalization 3 (3) Indepth examination of the role communication plays in globalization processes, including case studies of contemporary social, technical, professional and ethical issues. Preq: COMM 2010 with a C or better.

COMM 4020 Mass Communication: History and Criticism 3 (3) Critical examination of the mass communication in America, including discussions of history, theory, and current issues in television, film, popular music, telecommunications, and other media. Preq: COMM 2010 with a C or better.

COMM 4050 Public Contest and Change 3 (3) Examines the role of public communication in the process of contesting social values and practices and in the subsequent change that sometimes occurs. Students explore the publics relationship with mass media as well as other forms of communication practices that can produce cultural change. Preq: COMM 2010 with a C or better and COMM 3050.

COMM 4250 Advanced Sports Communication 3 (3) Combination seminar and primary research class that explores contemporary sports communication issues. Students write position papers on seminar topics and conduct primary research on sports communication topics of their choice. Preq: COMM 3250.

COMM 4260 Social Media and Sports Communication 3 (3) Covers the influence of communication and social media in sports and how these technologies are changing the communicative infrastructure of sports. Students explore how social media is reconfiguring sports media, how sports organizations are managing social media, and how social media affects fan behavior and athlete communication. Preq: COMM 2010 with a C or better.

COMM 4270 Communication in Sports Organizations 3 (3) Examines communication dynamics in sports organizations. Among others, topics may include identifying how sports organizations manage crisis communication, communication with stakeholders, sexual harassment, ethical issues, and dissent. Preq: COMM 2010 with a C or better.

COMM 4280 Interpersonal/Family Communication and Sport 3 (3) Examines how communication functions in interpersonal and family contexts as it pertains to sports. Exposes students to positive and negative communicative behavior with athletes, coaches and families. Challenges students to identify ways that sports can be a healthy, rather than destructive, communicative topic for for families and interpersonal relationships. Preq: COMM 2010 with a C or better.

COMM 4300 Legal Communication 3 (3) Explores the theory and practice of communication in the legal setting, including the trial and appeal processes. Emphasizes the importance of effective communication in the legal profession.

COMM 4310 Legal Communication Trial 3 (3) Advanced study in communication and the legal analysis and the elements of trial preparation, including out of court preparation, jury selection, limited motion practice, opening statements, direct examination and cross examination of witnesses, closing arguments, and jury charges. Preq: COMM 4300.

COMM 4510, 6510 Film Theory and Criticism 3 (2) Advanced study into the theory of film/video making emphasizing understanding a variety of critical methodological approaches to film. Examines the history of film theory and defines the many schools of film criticism including realism, formalism, feminism, semiotics, Marxism, and expressionism. Preq for COMM 4510: ENGL 3570. Preq for COMM 6510: ENGL 3570 or consent of instructor. Coreq: COMM 4511, 6511.

COMM 4511, 6511 Film Theory and Criticism Laboratory 0 (3) Non-credit laboratory to accompany COMM 4510, 6510. Coreq: COMM 4510, 6510. Coreq: COMM 4510: ENGL 3100 or consent of instructor. Coreq: COMM 6510: ENGL 3100 or consent of instructor. Coreq: COMM 4510: ENGL 3100 or consent of instructor. Coreq: COMM 6510: ENGL 3100 or consent of instructor.

COMM 4910, 6910 Classical Rhetoric 3 (3) Traces the development of rhetoric from Protagoras through Isocrates, Plato, Aristotle, Cicero and Quintillian and considers questions essential to understanding persuasive theory and practice. Preq: COMM 4910: ENGL 3100. Preq for COMM 6910: ENGL 3100 or consent of instructor.

COMM 4920, 6920 Modern Rhetoric 3 (3) Examines the new rhetorics of the 20th century, which are grounded in classical rhetoric but include findings from biology, psychology, linguistics and anthropology, among other disciplines. Preq: COMM 4920: ENGL 3100. Preq for COMM 6920: ENGL 3100 or consent of instructor.

COMM 4950 Senior Capstone Seminar 3 (3) In-depth exploration and analysis of a special topic in Communication Studies, culminating in a senior project documented in written, oral, visual and/or multimedia presentations. Topics vary based on faculty expertise and research interests. May be repeated for a maximum of six credits. Preq: Senior standing in Communication Studies and one of the following courses with a C or better: COMM 3010 or COMM 3020 or COMM 3150.

COMM 4960 Honors Creative Inquiry Capstone 3 (3) Capstone course for honors students in the departments creative inquiry sequence. Working with their departmental honors advisor, students apply theoretical understanding and research skills in completing a written product of conference or publication length/quality. Must be taken for a total of six credits over the course of two semesters. Preq: Two of the following courses with a C or better in each: COMM 3060 or COMM 3100 or COMM 3110; and Senior standing in Communication Studies.
COMM 4980 Communication Academic and Professional Development II 1 (1) Students reflect upon curricular relationships among general education, major, and minor courses. They complete and revise digital portfolios for presentation to the major, University, graduate schools, or potential employers. Students participate in résumé building, job seeking, and interviewing activities. Preq or concurrent enrollment: COMM 4950 or COMM 4960.

COMM 4990 Independent Study 1-3 (1-3) Tutorial work for students with special interests or projects in communication studies outside the scope of existing courses. May be repeated for a maximum of nine credits. Preq: Consent of department chair.

COMPUTER SCIENCE


CPSC 1010 Computer Science I 4 (3) Introduction to modern problem solving and programming methods. Special emphasis is placed on algorithm development and software life cycle concepts. Includes use of appropriate tools and discusses issues arising from the impact of computing upon society. Intended for students concentrating in computer science or related fields. Includes Honors sections. Preq: MTHS 1050. Coreq: CPSC 1011. Students who have not completed MTHS 1050 but who score a satisfactory score on the Clemson Mathematics Placement Test, may request a registration override from the instructor.

CPSC 1011 Computer Science I Laboratory 0 (2) Non-credit laboratory to accompany CPSC 1010. Coreq: CPSC 1010.

CPSC 1020 Computer Science II 4 (3) Continuation of CPSC 1010. Continued emphasis on problem solving and program development techniques. Examines typical numerical, nonnumerical, and data processing problems. Introduces basic data structures. Credit may not be received for both CPSC 1020 and 2100. Includes Honors sections. Preq: CPSC 1010 with a C or better. Coreq: CPSC 1021.

CPSC 1021 Computer Science II Laboratory 0 (2) Non-credit laboratory to accompany CPSC 1020. Coreq: CPSC 1020.

CPSC 1040 Introduction to the Concepts and Logic of Computer Programming 2 (1) Introduction to the concepts and logic of computer programming. Simple models are used to introduce basic techniques for developing a programmed solution to a given problem. Problem solving techniques are considered. Not open to students who have received credit for CPSC 1010, CPSC 1110, CPSC 1570, or CPSC 2100. Coreq: CPSC 1041.

CPSC 1041 Introduction to the Concepts and Logic of Computer Programming Laboratory 0 (99) Non-credit laboratory to accompany CPSC 1040. Coreq: CPSC 1040.

CPSC 1110 Introduction to Programming in C 3 (2) Introduction to computer programming in C and its use in solving problems. Intended primarily for technical majors. Basic instruction in programming techniques, algorithms and standard Unix software development tools and utilities. Credit may not be received for both CPSC 1010 and CPSC 1110. Coreq: CPSC 1111.

CPSC 1111 Introduction to Programming in C Laboratory 0 (2) Non-credit laboratory to accompany CPSC 1110. Coreq: CPSC 1110.

CPSC 1150 Introduction to Computational Science 3 (3) Introduction to systems thinking. Includes development of dynamical systems models using visual modeling tools and development of dynamical systems using agent based software. Class material investigates elementary science and engineering models.

CPSC 1200 Introduction to Information Technology 3 (2) Introduction to ethical and societal issues based on the expanding integration of computers into our everyday lives. Considers historical background, terminology, new technologies and the projected nature of computers. Includes practical experience with common computer software technologies. Will not satisfy Computer Science requirements in any Computer Science major. Coreq: CPSC 1201.

CPSC 1201 Introduction to Information Technology Laboratory 0 (2) Non-credit laboratory to accompany CPSC 1200. Coreq: CPSC 1200.

CPSC 1610 Introduction to Visual Basic Programming 3 (3) Introduction to programming using the Visual Basic language. Topics include simple and complex data types, arithmetic operations, control flow, files, and database programming. Several projects are implemented during the semester. Coreq: CPSC 1611.

CPSC 1611 Introduction to Visual Basic Programming Laboratory 0 (2) Non-credit laboratory to accompany CPSC 1610. Coreq: CPSC 1610.

CPSC 2070 Discrete Structures for Computing 3 (3) Introduces ideas and techniques from discrete structures that are widely used in the computing field. Topics include sets, logic, functions and relations, induction, recursion, numerical sequences, graphs, the formal languages of computer science, abstract data-type concepts; measures of program running time and time complexity; algorithm analysis and design techniques. Preq: CPSC 1020 with a C or better or CPSC 2100 with a C or better. Coreq: CPSC 2126.

CPSC 2120 Algorithms and Data Structures 4 (3) Study of data structures and algorithms fundamental to computer science; abstract data-type concepts; measures of program running time and time complexity; algorithm analysis and design techniques. Preq: CPSC 1020 with a C or better or CPSC 2100 with a C or better. Coreq: CPSC 2120.

CPSC 2121 Programming Methodology Laboratory 0 (2) Non-credit laboratory to accompany CPSC 2100. Coreq: CPSC 2101.

CPSC 2150 Software Development Foundations 3 (2) Intensive study of software development foundations. Advanced coverage of programming language primitives, function-level design principles, and standard development and debugging tools. Introductory coverage of module-level design principles, program specification and reasoning principles, and validation and verification techniques. Preq: CPSC 1020 with a C or better or CPSC 2100 with a C or better. Coreq: CPSC 2150.

CPSC 2151 Software Development Foundations Laboratory 0 (2) Non-credit laboratory to accompany CPSC 2150. Coreq: CPSC 2150.

CPSC 2200 Microcomputer Applications 3 (3) Applications of microcomputers to formulate and solve problem models. Emphasizes applications development in database and spreadsheet environments. Current software products are used. Students are expected to have experience with word processing and spreadsheet applications.

CPSC 2310 Introduction to Computer Organization 4 (3) Study of the machine architectures on which algorithms are implemented and requirements of architectures that support high-level languages, programming environments, and applications. Preq: CPSC 1020 with a C or better or 2100 with a C or better. Coreq: CPSC 2311.

CPSC 2311 Introduction to Computer Organization Laboratory 0 (2) Non-credit laboratory to accompany CPSC 2310. Coreq: CPSC 2310.

CPSC 2810 Selected Topics in Computer Science 1-4 (1-4) Areas of computer science in which new trends arise. Innovative approaches to a variety of problems in the use and understanding of basic computing concepts are developed and implemented. May be repeated for a maximum of eight credits, but only if different topics are covered. Coreq: CPSC 2811.

CPSC 2811 Selected Topics in Computer Science Laboratory 0 (99) Non-credit laboratory to accompany CPSC 2810. Coreq: CPSC 2810.
CPSC 2910 Seminar in Professional Issues 1 I (1) Considers the impact of computer use on society. Discusses ethical use of software and protection of intellectual property rights. Profession is viewed historically; organizations important to the profession are discussed; the development process for standards is presented; and students are introduced to the professional literature. Preq: CPSC 2020 or CPSC 2100.

CPSC 3220 Introduction to Operating Systems 3 (3) Detailed study of management techniques for the control of computer hardware resources. Topics include interrupt systems, primitive level characteristics of hardware and the management of memory, processor, devices, and data. Credit may not be received for both CPSC 3220 and 3320. Preq: CPSC 2120 and CPSC 2310, each with a C or better; or ECE 2230 and ECE 2720, each with a C or better.

CPSC 3300 Computer Systems Organization 3 (3) Introduction to the structure of computer systems. Various hardware/software configurations are explored and presented as integrated systems. Topics include digital logic, basic computer organization, computer arithmetic, memory organization, input/output organizations, interrupt processing, multiprocessors, and cluster computers. Preq: CPSC 2120 and CPSC 2310, each with a C or better.

CPSC 3500 Foundations of Computer Science 3 (3) Development of the theoretical foundations of programming, algorithms, languages, automata, computability, complexity, data structures, and operating systems; a broad range of fundamental topics is consolidated and extended in preparation for further study. Preq: CPSC 2070 and CPSC 2120, each with a C or better.

CPSC 3520 Programming Systems 3 (3) Second course in programming languages and systems. Topics include assemblers, compilers, and syntactical methods; string manipulation and list processing; concepts of executive programs and operating systems; introduction to time-sharing systems; object-oriented programming. Preq: ECE 2230; or CPSC 2120 and CPSC 2150. Preq or concurrent enrollment: MTHS 2190 or MTHS 4190.

CPSC 3600 Networks and Network Programming 3 (3) Introduction to basic concepts of computer network technologies and network programming. Topics include network programming, layered protocol architectures, local and wide area networks, internetwork and intranetwork concepts, security. Socket level programming is introduced and used throughout the course. Preq: CPSC 2120 and CPSC 2150, each with a C or better.

CPSC 3620 Distributed and Cluster Computing 3 (3) Introduction to the basic technology of and programming techniques for distributed and cluster computing. Standard techniques for developing parallel solutions to problems are introduced and implemented. Software systems that provide high-level abstractions for data communications are considered. Preq: CPSC 3600 with a C or better.

CPSC 3700 Systems Analysis 3 (3) Incorporates a study of the decision-making process at all levels with the logical design of information systems. Extensive study of the system life cycle with emphasis on current as well as classical techniques for describing data flows, data structures, file design, etc. Preq: CPSC 3600.

CPSC 3720 Introduction to Software Engineering 3 (3) Intensive introduction to software engineering. Focuses on each major phase of the software lifecycle. Introductory coverage of requirements analysis, requirements modeling, design modeling, and project management. Intermediate coverage of module-level design principles, program specification and reasoning principles, and program validation and verification techniques. Preq: CPSC 2120 and CPSC 2150, each with a C or better.

CPSC 3950 Honors Seminar 1 (1) Research topics in various areas of computer science are presented. Methods for identifying and initiating research projects are considered. May be repeated for a maximum of two credits. Preq: Admission to Departmental Honors Program.

CPSC 4040, 6040 Computer Graphics Images 3 (3) Presents the theory and practice behind the generation and manipulation of two-dimensional digital images within a computer graphics context. Image representation and storage, sampling and reconstruction, color systems, affine and general warps, enhancement and morphology, compositing, morphing, and non-photorealistic transformations. Students are expected to have completed coursework in data structures and linear algebra. Preq for CPSC 4040: CPSC 2120 and MTHS 3110; or DPA 4010. For CPSC 6040: students are expected to have completed coursework in data structures and linear algebra.

CPSC 4050, 6050 Computer Graphics 3 (3) Computational, mathematical, physical and perceptual principles underlying the production of effective three-dimensional computer graphics imagery. Preq for CPSC 4050: CPSC 2120 and MTHS 3110; or DPA 4010. For CPSC 6050: students are expected to have completed coursework in data structures and linear algebra.

CPSC 4110, 6110 2-D Game Engine Construction 3 (3) Introduction to tools and techniques necessary to build 2-D games. Topics draw from subject areas such as software engineering, algorithms, and artificial intelligence. Students employ techniques such as sprite animation, parallax scrolling, sound, AI incorporated into game sprites, and the construction of a game shell. Preq for CPSC 4110: CPSC 2120 and 2150, each with a C or better. For CPSC 6110: Students are expected to have completed coursework in data structures and linear algebra.

CPSC 4140, 6140 Human and Computer Interaction 3 (3) Explores methods for understanding human behavior and designing usable computer systems. Topics include human factors, user interaction techniques, usability, task-oriented design, cognitive and perceptual models, human-computer interface technologies, and usability evaluation. Preq for CPSC 4140: CPSC 2120 and MTHS 3110; or DPA 4010. For CPSC 6140: students are expected to have completed coursework in data structures and linear algebra.

CPSC 4160, 6160 2-D Game Engine Construction 3 (3) Introduction to tools and techniques necessary to build 2-D games. Topics draw from subject areas such as software engineering, algorithms, and artificial intelligence. Students employ techniques such as sprite animation, parallax scrolling, sound, AI incorporated into game sprites, and the construction of a game shell. Preq for CPSC 4160: CPSC 2120 and 2150, each with a C or better. For CPSC 6160: Students are expected to have completed coursework in data structures and linear algebra.

CPSC 4200, 6200 Computer Security Principles 3 (3) Covers principles of information systems security, including security policies, cryptography, authentication, access control mechanisms, system evaluation models, auditing, and intrusion detection. Computer security system case studies are analyzed. Preq for CPSC 4200: CPSC 2320 or ECE 3220; and 3600, each with a C or better. For CPSC 6200: Students are expected to have completed coursework in operating systems and networking.

CPSC 4240, 6240 System Administration and Security 3 (3) Covers topics related to the administration and security of computer systems. Primary emphasis is on the administration and security of contemporary operating systems. Preq for CPSC 4240: CPSC 3220 or ECE 3220; and 3600, each with a C or better. For CPSC 6240: Students are expected to have completed coursework in operating systems and networking.

CPSC 4280, 6280 Design and Implementation of Programming Languages 3 (3) Overview of programming language structures and features and their implementation. Control and data structures found in various languages are studied. Also includes runtime organization and environment and implementation models. Preq for CPSC 4280: CPSC 2310 and 3500, each with a C or better. For CPSC 6280: Students are expected to have completed coursework in assembly language and formal language theory.
COMMUNITY AND RURAL DEVELOPMENT
See also courses listed under Applied Economics.
Professors: M. Espey, D.W. Hughes; Associate Professors: R.D. Lamie, K.L. Robinson, S.R. Templeton

CRD 2350 Introduction to Leadership 3 (3) Introduction to leadership in various organizational settings from a sociological perspective. Examines the concept of leadership, leadership traits, types of leadership, and the evolution of leadership behaviors in the 19th and 20th centuries.

CRD 3350 Leadership in Organizations and Communities 3 (3) Students present leadership models, principles, skills, negotiation techniques, and practices to improve effectiveness in organizations and communities; use current theory and research findings to evaluate effective leadership; demonstrate the role of effective leadership in shaping future organizations and social structures in public and private sectors. Students are expected to have completed an introductory course in a social science (sociology recommended).

CRD 3360 Community Development Methodology 3 (3) Research methodology is applied to community, leadership, and economic development. Steps include problem identification, data collection, analysis, and interpretation. Special attention is given to case study approach, applied research design, data collection options, and computer-based analysis of community-based data to generate findings and implications for policy change. Preq: CRD 3350 and STAT 321.

CRD 3570 Natural Resources Economics 3 (3) Principles and problems involved in the use of soil, water, forest, and mineral resources, with special emphasis on economic aspects of alternative uses of soil and resource utilization. Preq: APEC 2020 or ECON 2000 or ECON 2110.

CRD 3610 Introduction to Health Care Economics 3 (3) Introductory course in which students learn the basic economics of the institutions comprising the health care industry. Topics include the underlying supply, demand, and institutional factors impacting health-care availability and cost of health care.

CRD 4110, 6110 Regional Impact Analysis 3 (3) Techniques for analysis of the growth and decline of regions, including economic-base theory, shift share, regional input-output, regional econometric models, and fixed impact models. Preq: APEC 2020; or both ECON 2110 and ECON 2120.


CRD 4910 Internship, Agribusiness, and Community and Rural Development 1-6 (1-6) Internship under faculty supervision in an approved agency or firm. Internships provide students with work experience in agribusiness or community and rural development. Students submit a comprehensive report within one week of the end of the internship. A maximum of six internship credits may be earned. Preq: Junior standing and consent of instructor.

CRD 4920, 6920 Case Study Project 3 (3) Capstone course engaging students in in-depth case study projects in community and economic development. Designed to enhance professional development, career interests, and practical experience. Students may participate in an internship, field experience, service learning activity, or investigation of a community, leadership, or economic development topic. Preq: CRD 3360 and consent of instructor.

CRD 4940 Creative Inquiry—Community and Rural Development 1-3 (1-3) Multi-semester commitment to participate in agricultural and applied economics and community and economic development related research experience for students working in teams, mentored and directed by a faculty member. Students learn to collect, analyze, evaluate, and present information. Suitable for inclusion in the students e-portfolio. May be repeated for a maximum of 12 credits. Preq: Consent of instructor.

CITY AND REGIONAL PLANNING

CRP 4010 Introduction to City and Regional Planning 3 (3) Introduces students from other disciplines to city and regional planning. Spatial and nonspatial areas of the discipline are explored through a wide ranging lecture/semester program. Preq: Consent of instructor.

CRP 4300 Seminar on Planning Communication 3 (3) In-depth analysis of methods to communicate planning and policy decisions effectively. Familiarizes students with the various communication skills needed by planners, policy makers, and other professionals to become successful practitioners. Preq: Consent of instructor.

CRP 4120 Urban Transportation Planning 3 (3) Consideration of urban travel characteristics, characteristics of transportation systems, transportation and land-use studies, trip distribution and trip assignment models, city patterns and subdivision layout. Preq: CE 3110.

CROP AND SOIL ENVIRONMENTAL SCIENCE

Professor: H. Liu; Associate Professors: J. Andrae, E. Mikhailova; Assistant Professors: Y. Araki, D. Park, N. Tharayil

CSE 2020 Soils 4 (3) Introduces world land resources, soil formation, classification, and mineralogy. Emphasizes basic chemical and physical properties of soil. Also discusses soil microorganisms, plant nutrients, and fertilization. Soil properties are related to growth. Preq: CH 1010 or CH 1020 or GEOL 1010. Coreq: CSEN 2021.

CSEN 2021 Soils Laboratory 0 (2) Non-credit laboratory to accompany CSEN 2020. Coreq: CSEN 2020.
CSEN 3500 Practicum 16 (1-6) Preplanned practical or research experience related to student-selected Soils and Sustainable Crop Systems concentration. Practicum is undertaken with an approved advisor or agency. May be repeated for a maximum of six credits. Preq: Soils and Sustainable Crop Systems field of study.


CSEN 4031, 6031 Soil Genesis and Classification Laboratory 0 (3) Non-credit laboratory to accompany CSEN 4030, 6030. Coreq: CSEN 4030, 6030.

CSEN 4050, 6050 Plant Breeding 3 (3) Application of genetic principles to the development of improved crop plants. Principal topics include the genetic and cytogenetic basis of plant breeding, mode of reproduction, techniques in selfing and crossing, methods of breeding, inheritance in the major crops, and biometrical methods. Offered spring semester only. Preq: GEN 3000. Coreq: CSEN 4051, 6051.

CSEN 4051, 6051 Plant Breeding Laboratory 0 (2) Non-credit laboratory to accompany CSEN 4050, 6050. Coreq: CSEN 4050, 6050.

CSEN 4060 Special Problems 1-3 (1-3) Acquaints students with the scientific method. Literature investigation, planning, and execution of an experiment are integral parts of the course. Not open to AGR H491 and H492 students. May be repeated for a maximum of six credits. Preq: Senior standing.

CSEN 4080, 6080 Land Treatment of Wastewater and Sludges 3 (3) Principles for designing environmentally acceptable land application systems using municipal and industrial wastewater and sludges are presented. Topics include land-limiting constituent analysis; soil-plant interactions; system equipment and design; system operation and management; public acceptance, social, and regulatory issues. Case studies and field trips are planned. Preq: Senior standing.

CSEN 4090, 6090 Biology of Invasive Plants 3 (3) Introductory course covering mechanisms of plant invasions. Emphasizes unique traits that confer invasiveness and/or weediness to plants, and how these plant traits interact with the environment to facilitate invasion of agricultural lands, forests, rangelands and less-managed landscapes. Covers various cultural, chemical and biological control aspects. Preq: BIOL 1040 and BIOL 1060; or BIOL 3040.

CSEN 4210, 6210 Principles of Field Crop Production 3 (3) Principles for production of field crops. Topics include botany and physiology, tillage, harvesting, storage, and crop quality. Principles are illustrated using examples from various crops. Preq: CSEN 2020; and AGR 1040 or SSCS 1010.

CSEN 4220, 6220 Major World Crops 3 (3) Examines the distribution, adaptation, production, and utilization of major agronomic crops of the world. Emphasizes crops important to U.S. agriculture. Specific crops discussed in more detail include corn, wheat, rice, sorghum, soybeans, cotton, tobacco, and peanuts. Preq: CSEN 2020; and AGR 1040 or SSCS 1010.


CSEN 4260, 6260 Cropping Systems Analysis 3 (2) Application of agronomic and economic principles in solving problems related to the production and marketing of agronomic crops. Major part of the course is a case study in which detailed analysis of a farm, ageability, or environmental situation is made with students making formal written and oral presentations of results. Preq: AGR 1040; and Junior standing; and APEC 2020 or ECON 2000 or ECON 2110. Coreq: CSEN 4261, 6261.

CSEN 4261, 6261 Cropping Systems Analysis Laboratory 0 (2) Non-credit laboratory to accompany CSEN 4260, 6260. Coreq: CSEN 4260, 6260.

CSEN 4330, 6330 Landscape and Turf Weed Management 3 (2) Weed management strategies that include cultural, biological, and chemical methods are studied for landscape and turfgrass areas. Problem-solving skills and herbicide characteristics are emphasized. Coreq: CSEN 4331, 6331.

CSEN 4331, 6331 Landscape and Turf Weed Management Laboratory 0 (2) Non-credit laboratory to accompany CSEN 4330, 6330. Coreq: CSEN 4330, 6330.

CSEN 4460, 6460 Soil Management 3 (3) Basic soil properties are related to compaction, water and solute movement, and root growth. Considers practical management problems and develops solutions based on soil characteristics. Problems include erosion, nutrient and water scavenging, leaching, water applications, soil green management, and crop establishment. Preq: CSEN 2020.


CSEN 4550 Seminar 1 (1) Presentation of interdisciplinary topics and original research in agronomy, entomology, plant pathology, soils, and related sciences.

CSEN 4850, 6850 Environmental Soil Chemistry 3 (3) Study of soil chemical processes (sorption, desorption, ion exchange, precipitation, dissolution, and redox reactions) of nutrients and inorganic and organic contaminants in soils and organic matter. Chemical complex equilibria and adsorption phenomena at the solid (soil, sediment, and mineral) water interface are emphasized. Preq: CH 1020 or CSEN 2020.

CSEN 4900, 6900 Beneficial Soil Organisms in Plant Growth 3 (3) Aspects of biological nitrogen fixation, mycorrhizal fungi, microbial-pesticide interactions, bioremediation, nutrient cycles, and biological pest control related to plant growth, soil/ environmental quality; and sustainable agriculture are covered. Students who desire laboratory experience in these topics may register for CSEN 4060 after consultation with instructor. Preq: CSEN 2020 or MIRC 3050 or PLPA 3100.
CSM 2050 Materials and Methods of Construction II 3 (3) Descriptive study of materials and methods of construction, focusing on nomenclature, building materials, and assembly of building systems consisting primarily of steel and concrete, in addition to roofing assemblies and interior and exterior commercial finishes. Prereq: CSM 2030; and Construction Science and Management or Architecture major.

CSM 3030 Soils and Foundations 3 (2) Study of various types of soils and foundations, including soil testing, reports, compaction, stability, and function, as they relate to the construction process. Prereq: CSM 2020, and Construction Science and Management major. Coreq: CSM 303L.

CSM 3031 Soils and Foundations Laboratory 0 (3) Non-credit laboratory to accompany CSM 3030. Coreq: CSM 3030.

CSM 3040 Environmental Systems I 3 (3) Theory and practice of heating, ventilating, air conditioning, and plumbing systems for buildings. Prereq: CSM 2050 and PHYS 2080, and Construction Science and Management or Architecture major.

CSM 3050 Environmental Systems II 3 (3) Theory and practice of fire protection, specialty piping, lighting, and electrical systems for buildings. Prereq: CSM 3040 and Construction Science and Management or Architecture major.

CSM 3510 Construction Estimating 3 (2) Study of basic estimating as applied to construction projects. Includes the take-off of material quantities, assigning labor and equipment production rates, and applying material prices, wage rates, and equipment costs to derive a total job cost. Prereq: CSM 2040 and CSM 2050 and CPSC 1200, all required MTHS courses, Construction Science and Management major. Prereq or concurrent enrollment: BE 2220 and CSM 3030. Coreq. CSM 3511.

CSM 3511 Construction Estimating Laboratory 0 (2) Non-credit laboratory to accompany CSM 3510. Coreq. CSM 3510.


CSM 3521 Construction Scheduling Laboratory 0 (2) Non-credit laboratory to accompany CSM 3520. Coreq. CSM 3520.

CSM 3530 Construction Estimating II 3 (2) Continuation of basic construction estimating with the additional component of computerized estimating. Includes material, labor, and equipment costs, production rates, bid ethics, constructability analysis, and understanding of other types of estimating procedures. Prereq: CSM 3510 and Construction Science and Management major. Prereq or concurrent enrollment: CSM 3040. Coreq. CSM 3520 and CSM 3531.

CSM 3531 Construction Estimating II Laboratory 0 (2) Non-credit laboratory to accompany CSM 3530. Coreq. CSM 3530.


CSM 4200 Highway Construction and Contracting 3 (3) Study of contracting and construction of highways, including selection and use of equipment, construction of pavements, bridges, and drainage structures, and related processes. Prereq: CSM 3030 and CSM 3520 and CSM 3530.

CSM 4500 Construction Internship 1 (1) Documentation of 8000 hours of approved experience in the construction industry with evaluation of student portfolio and preparation and sitting for the American Institute of Constructors CFC Level I examination. Prereq: Consent of department chair.

CSM 4530 Construction Project Management 3 (3) Study of construction business organization, methods of project delivery, field organization, policy, ethics, project management, control systems, labor management relations, and productivity. Prereq: CSM 3520 and CSM 3530, and Construction Science and Management major. Prereq or concurrent enrollment: LAW 3220 and MGT 3070. Coreq. CSM 4110 and CSM 4610.

CSM 4540 Construction Capstone 6 (5) Students develop a capstone project that entails the knowledge obtained in all previous courses in the Construction Science and Management Program. Students must take the capstone course at Clemson University. Prereq: CSM 4530 and Construction Science and Management major. Coreq. CSM 4541.

CSM 4541 Construction Capstone Laboratory 0 (3) Non-credit laboratory to accompany CSM 4540. Coreq. CSM 4540.

CSM 4550, 6550 Reducing Adversarial Relations in Construction 3 (3) Study of the delivery of projects and how adversarial relations can affect the successful completion of the venture. Topics include management of human resources, understanding the needs and processes of the participants, where problems lie, methods of avoiding and settling disputes. Prereq for CSM 4550: Construction Science and Management or Architecture major, and senior standing. Prereq for CSM 6550: Construction Science and Management or Architecture major, and senior standing or consent of department chair.


CSM 4900 Directed Studies 1-3 (1-3) Comprehensive studies and research of special topics not covered in other courses. Emphasizes field studies, research activities, and current developments in construction science. May be repeated for a maximum of six credits. Includes Honors sections. Prereq: Consent of Instructor.

CSM 4980 Current Topics in Construction 1-3 (1-3) Study of current topics in the construction industry not central to other construction science courses. Specific titles and course descriptions are announced for each semester. May be repeated for a maximum of six credits. Prereq: Consent of department chair.

CAREER AND TECHNOLOGY EDUCATION

Professors: W.L. Havice, W.D. Paige; Associate Professor: C.C. Poston; Lecturers: H.L. Harrison

CTE 1150 Contemporary Technological Problems 3 (3) Provides students with an understanding of the problems and contributions of technology. Examples are taken from historical accounts and from analyses of contemporary technological intervention both in industrialized and nonindustrialized countries.

CTE 2210 Exploring Technology 3 (3) Covers a wide range of technological concepts along with familiar examples of how technology impacts our lives as individuals, a society, and a global community.

CTE 3100 Designing Creative Instruction 3 (2) Provides preservice teachers with opportunities to develop skills in technological literacy, design, inquiry-based instruction, and problem solving using a variety of media, with emphasis on their applications in the elementary curriculum. Prereq: Junior standing in Early Childhood or Elementary Education. Coreq. CTE 3101.

CTE 3101 Designing Creative Instruction Laboratory 0 (2) Non-credit laboratory to accompany CTE 3100. Coreq. CTE 3100.

CLEMSON UNIVERSITY

CU 1000 Clemson Connect 0 (0) Introduction to the learning experience at Clemson University. Includes instruction in information technology and information skills. To be taken Pass/No Pass only.

CU 1010 University Success Skills 2 (3) Introduction to a variety of topics critical to students success. Topics include time management, goal setting, test taking, campus resources and policies, critical thinking, and diversity. Students are given opportunities to discover and practice many procedures, techniques, and tips. Limited to freshmen and first semester transfer students.

CU 1100 Introduction to Tutoring 1 (1) Students develop and reinforce skills in tutoring and communication through use of techniques based in educational research. To be taken Pass/No Pass only.

CU 1110 Introduction to Supplemental Instruction 1 (1) Students develop and reinforce interpersonal relationship skills in listening, decision making, communicating, group dynamics, leadership, assertiveness, time management, problem solving, and conflict resolution. To be taken Pass/No Pass only.

CU 1970 New Student Seminar 1-3 (1-3) Introduction to the university academic environment. Class meeting instruction focuses on discussion of a topic selected by a faculty member. Includes additional online and workshop instruction in information technology, global citizenship and academic success skills. To be taken Pass/No Pass only.

CU 2010 Sustainability Leadership 3 (3) Participants learn how principles of environmental, social and economic sustainability apply in contexts ranging from personal lifestyle choices, to the built environment, to operation of public and private institutions. Participants also develop and practice skills to act as agents of change in the university and the broader community.
CARTIOVASCULAR TECHNOLOGY

Lecturer: E.J. Walker

CVT 2250 Ultrasound Physics 3 (3) Explanation of the basic principles and characteristics associated with diagnostic ultrasound.

CVT 2260 Introduction to Cardiovascular Sonography 3 (3) Introduces students to patient care, patient confidentiality, blood components, lymphatics, cardiovascular pharmacology, heart embryology, cardiovascular anatomy and physiology, standard sonography views, and Doppler/instrumentation. Prereq: CVT 2250 and CVT 2260. Coreq: CVT 3251.

CVT 3250 Echocardiography Principles 4 (3) Study of two-dimensional, m-mode, Doppler echocardiography and left ventricular systolic function. Includes discussion of various pathologies, the resulting echocardiographic findings and treatments. Prereq: CVT 2250 and CVT 2260. Coreq: CVT 3251.

CVT 3251 Echocardiography Principles Laboratory 0 (2) Non-credit laboratory to accompany CVT 3250. Coreq: CVT 3250.

CVT 3260 Echocardiography Methods 4 (3) Study of two-dimensional, Doppler echocardiography and transesophageal echocardiography. Includes discussion of various pathologies, the resulting echocardiographic findings and treatments. Prereq: CVT 3250. Coreq: CVT 3261.

CVT 3261 Echocardiography Methods Laboratory 0 (2) Non-credit laboratory to accompany CVT 3260. Coreq: CVT 3260.

CVT 3350 Vascular Sonography Principles 4 (3) Study of two-dimensional, color Doppler, spectral Doppler and other testing modalities in peripheral and cerebrovascular disease. Includes discussion of various pathologies, the resulting sonographic findings and treatments. Prereq: CVT 2260. Coreq: CVT 3351.

CVT 3351 Vascular Sonography Principles Laboratory 0 (2) Non-credit laboratory to accompany CVT 3350. Coreq: CVT 3350.

CVT 3360 Vascular Sonography Methods 4 (3) Study of two-dimensional, color Doppler, spectral Doppler and other testing modalities in peripheral arterial, abdominal vascular and intracranial cerebrovascular disease. Includes discussion of various pathologies, the resulting sonographic findings and treatments. Prereq: CVT 3350. Coreq: CVT 3361.

CVT 3361 Vascular Sonography Methods Laboratory 0 (2) Non-credit laboratory to accompany CVT 3360. Coreq: CVT 3360.

CVT 4240 CVS Field Experience I 6 (30) Students complete 4400 hours of uninterrupted, supervised work in a clinical care setting. Under direct supervision of GHS registered sonographers, students are introduced to scanning protocols and techniques, instructed in principles, techniques and applications of multiple diagnostic modalities, including echocardiography, vascular duplex imaging, Doppler, and plethysmography. Prereq: CVT 3260 and 3360.

CVT 4250 CVS Field Experience II 6 (30) Intermediate level course expands on introductory skills learned in CVT 4240. Students apply scanning protocols and techniques, and improve their use of multiple diagnostic modalities, including echocardiography, vascular duplex imaging, Doppler, and plethysmography. Students become proficient with all aspects of paper work and communication within the health care organization. Prereq: CVT 4240.

CVT 4260 CVS Field Experience III 6 (30) In this advanced course, students complete 4400 hours in a clinic setting under the supervision of registered sonographers. Students are tested in all aspects of fundamental principles, techniques and applications of multiple diagnostic modalities, including echocardiography, vascular duplex imaging, Doppler and plethysmography. Prereq: CVT 4250.

DANCE

Lecturer: C.L. Hosler

DANC 1300 Tap Dance I 1 (3) Introduces fundamentals and vocabulary of tap dancing with opportunities to develop rhythmic patterns of various origins. May be repeated for a maximum of eight credits, with a maximum of 16 credits of dance applied toward a degree. Applied dance fee is assessed.

DANC 1400 Jazz Dance I 1 (3) Introduces basic principles and fundamentals of jazz technique and explores flexibility and strength-building exercises. May be repeated for a maximum of eight credits, with a maximum of 16 credits of dance applied toward a degree. Applied dance fee is assessed.

DANC 1500 Modern Dance I 1 (3) Introduces basic principles, dance movement and vocabulary, and actively explores and applies different methods of choreography. May be repeated for a maximum of eight credits, with a maximum of 16 credits of dance applied toward a degree. Applied dance fee is assessed.

DANC 1600 Ballet Dance I 1 (3) Introduces basic principles and fundamentals of classical ballet, with emphasis on good technique, center work, and across the floor work. May be repeated for a maximum of eight credits, with a maximum of 16 credits of dance applied toward a degree. Applied dance fee is assessed.

DANC 3300 Company Dance Company I 1 (3) Performance ensemble for advanced dance students. Provides opportunities to learn and develop choreographic skills as well as to improve personal dance techniques. Company is selected by audition. May include public recital(s). May be repeated for a maximum of eight credits. Applied dance fee is assessed. Prereq: Consent of instructor.

DIGITAL PRODUCTION ARTS

Professors: A.T. Duchowski, R.M. Geist III, D.H. House, J.A. Tessendorf; Director; Associate Professors: T.A. Davis, D.S. Donar, B.A. Malloy, A.M. Penna; Assistant Professors: S. Joerg, J. Levine; Lecturer: L.J. House

DPA 3070 Studio Methods for Digital Production 3 (1) Introduces students to current studio practice in the development of 3-D computer graphics and animation for film, electronic games, and visualizations. Topics include modeling, rigging, animation, texturing, lighting, rendering, compositing and editing. Open source tools are used so methods are transportable to most computing environments. Coreq: DPA 3071.

DPA 3071 Studio Methods for Digital Production Laboratory 0 (4) Non-credit laboratory to accompany DPA 3070. Coreq: DPA 3070.

DPA 4000, 6000 Technical Foundations of Digital Production I 3 (3) The technical, conceptual, and algorithmic foundations of computer graphics. Covers the Unix operating system, scripting, C programming, and an interactive graphics API. Not open to Computer Science, Computer Engineering, or Computer Information Systems majors.


DPA 4020, 6020 Visual Foundations of Digital Production I 3 (6) Presents the visual foundations underlying computer graphics production. Covers perspective, observational drawing, color and value, principles of composition and design, and storyboarding. Incorporates the studio method, involves students in hands-on work and the critique process, and stresses examples from the history of art, animation and film. Not open to Architecture or Visual Arts majors.

DPA 4030, 6030 Visual Foundations of Digital Production II 3 (6) Extends the foundational visual principles underlying computer graphics production begun in DPA 4020. Stresses representation of the figure in drawing and the use of cameras. Incorporates the studio method and the critique process, and stresses examples from the history of art, animation and film. Prereq for DPA 4030: DPA 4020. Not open to Architecture or Visual Arts majors. Prereq for DPA 6030: DPA 6020 or consent of instructor. Not open to Architecture or Visual Arts majors.
ECE 2010 Logic and Computing Devices 2 (2) Introduction to Boolean algebra and digital logic. Topics include number systems and representation of information; Boolean operators and algebra; expression minimization; combinational circuits, including adders, comparators, decoders and multiplexors; sequential logic, including flip-flops, shift registers, counters and memory. Includes Honors sections. Prereq: MTHS 1080 and PHYS 1220, each with a C or better.

ECE 2020 Electric Circuits I 3 (3) Study of DC circuits, Kirchhoff’s Laws, Nodal and Mesh emphasis, sources, Thévenin and Norton’s theorems, RC, RL, RCL circuit solutions with initial condition using homogeneous or nonhomogeneous ordinary differential equations having constant coefficients. Develop sinusoidal steady state solution. Includes Honors sections. Prereq: MTHS 1080 and PHYS 1220, each with a C or better. Prereq or concurrent enrollment: PHYS 2210 with a C or better.

ECE 2040 Circuit Analysis Problems I 3 (3) Analysis and solution of electrical network problems using mesh and nodal analysis, Thévenin and Norton’s theorems and equivalent circuits and other circuit analysis from ECE 2020. Prereq or concurrent enrollment: ECE 2020 with a C or better.

ECE 2900 Logic and Computing Devices I 2 (2) Introduction to designing, building, simulating and testing digital logic circuits. Topics include SSI and MSI ICs; general combinational circuits; adders, decoders and multiplexors; general sequential circuits; shift registers, counters and memory. Includes Honors sections and concurrent enrollment: ECE 2010 with a C or better.

ECE 2110 Electrical Engineering Laboratory I 1 (2) Prerequisite: consent of faculty. Laboratory enhances students understanding of DC and AC circuit theory, and numerous electrical devices, apparatus, systems, instrumentation and measurement systems. Preq or concurrent enrollment: ECE 2020 with a C or better.

ECE 2120 Electrical Engineering Laboratory II 1 (2) Emphasizes measurement techniques in AC steady-state circuits and comparison to theoretical predictions. Two-port network methodology and transfer functions are studied experimentally and related to analysis using transform techniques. Prereq: ECE 2020 and ECE 2110, each with a C or better. Prereq or concurrent enrollment: ECE 2620 with a C or better.

ECE 2220 Systems Programming Concepts for Computer Engineering 3 (3) Development of computer systems programming and code reading techniques. Tools, programming languages, libraries, operating systems, and hardware. Code reading is emphasized. Programming projects reinforce course topics. Prereq: CPSC 1110 with a C or better.

ECE 2230 Computer Systems Engineering 3 (3) Analysis of implementation techniques for systems software. Applying engineering principles including code reading to the design of data structures and algorithms for low level computer systems, embedded systems, and hardware/software systems. Includes coverage of address translation, memory management, file systems, and process management. Prereq: ECE 2220 with a C or better.

ECE 2620 Electric Circuits II 3 (3) Continuation of the study of electric circuits, including three-phase circuits, complex frequency and network functions, frequency response, two-port parameters, magnetically-coupled circuits, Laplace transforms, and introduction to Fourier series and transforms. Includes Honors sections. Prereq: ECE 2020 and MTHS 2060 and PHYS 2210, each with a C or better. Prereq or concurrent enrollment: MTHS 2080 with a C or better.

ECE 2630 Circuit Analysis Problems II 1 (3) Analysis of basic AC circuit analysis techniques to analyze the transient and steady-state behavior of both simple and complex circuits. Prereq or concurrent enrollment: ECE 2620 and MTHS 2080, each with a C or better.

ECE 2720 Computer Organization 3 (3) Introduc- tory course in computer organization and architecture. Topics include CPUs, memory, I/O, processor families, buses, peripherals, microarchitectures, and instruction sets. Includes Honors sections. Prereq: ECE 210 and CPSC 1110, each with a C or better.

ECE 2730 Computer Organization Laboratory 1 (1) Laboratory enhances students understanding of computer organization via assignments involving assembly language programming. Topics include basic syntax, branching and loops, addressing modes, arrays and pointers, subroutines and stacks. Includes Honors sections. Prereq or concurrent enrollment: ECE 2720 with a C or better.

ECE 2990 Creative Inquiry—Electrical and Computer Engineering 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Includes Honors sections. Prereq: Consent of faculty member/mentor.

ECE 3000 Junior Honors Seminar 1 (2) Acquaints students enrolled in the Departmental Honors Program with current research activities in the Department. Faculty provide seminars where research interests are summarized. Seminars are planned to prepare students in choosing research topics for their senior thesis.

ECE 3070 Basic Electrical Engineering 2 (2) A first course in electrical engineering to provide non-Electrical Engineering majors with a knowledge of DC and AC circuit theory, AC power distribution, and numerous electrical devices, apparatus, and digital systems. Credit may not be received for both ECE 3070 and ECE 3080. Prereq: MTHS 2060 and PHYS 2210.

ECE 3080 Fundamentals of Electrical Engineering 3 (3) A first course in electrical engineering to provide non-Electrical Engineering majors with a knowledge DC and AC circuit theory, AC power distribution, numerous electrical devices, digital systems, instrumentation and measurement systems, electronics, electromechanics, and electric motors. Credit may not be received for both ECE 3070 and 3080. Prereq: MTHS 2060 and PHYS 2210.

ECE 3090 Electrical Engineering Laboratory I 1 (2) Laboratory to accompany ECE 3070. Basic electrical circuits and instrumentation. Prereq or concurrent enrollment: ECE 3070.
ECE 3110 Electrical Engineering Laboratory III 1 (2) Measurements and characteristics of electronic devices and circuits; use of manual and automated instruments to acquire data; oral and written engineering reports. Preq: ECE 2120 and ECE 2620 and MTHS 2080 and PHYS 2210, each with a C or better. Preq or concurrent enrollment: ECE 3200 with a C or better.

ECE 3120 Electrical Engineering Laboratory IV 1 (2) Design and characterization of functional circuits using solid-state devices; use of manual and automated instruments for measurements; statistical analysis of data; preparation of engineering reports. Preq: ECE 3110 and ECE 3200, each with a C or better. Preq or concurrent enrollment: ECE 3210 with a C or better.

ECE 3170 Random Signal Analysis 3 (3) Introduction to engineering problems of a probabilistic nature. Systems transformations, statistical averages, simulation, and estimation of system parameters. Includes Honors sections. Preq: ECE 2620 and MTHS 2080, each with a C or better. Preq or concurrent enrollment: ECE 3300 with a C or better.

ECE 3200 Electronics I 3 (3) Introduction to electronic materials and devices; principles of design; design of DC and AC circuits using diodes, bipolar junction transistors, field-effect transistors and use of transistors in digital circuits. Includes Honors sections. Preq: ECE 2620 and MTHS 2080 and PHYS 2210, each with a C or better.

ECE 3210 Electronics II 3 (3) Analysis and design of discrete amplifier circuits at low and high frequencies; operational amplifiers, distortion in amplifiers, oscillators, design, and circuit analysis of active digital devices. Preq: ECE 3200 with a C or better.

ECE 3220 Introduction to Operating Systems 3 (3) Detailed study of management techniques for the control of computer hardware resources. Topics include interrupt systems, primitive level characteristics of hardware and the management of memory, processor, devices, and data systems. May not be received for both ECE 3220 and CPSC 3320. Preq: CPSC 2120 and CPSC 2310, each with a C or better; or ECE 2230 and ECE 2720, each with a C or better.

ECE 3270 Digital Computer Design 3 (3) Design of high-speed ALUs, control and timing circuitry, memory systems and I/O circuitry; microprogrammed computer design using bit-slice microprocessors; current hardware topics related to computer design; hands-on design experience; and use of logic analyzer for system debugging. Preq: ECE 3710 with a C or better.

ECE 3290 Computer Systems Structures 3 (3) Fundamental structures and issues that arise in the analysis and implementation of computer systems. Topics include operating systems structures and data structures and their relationship to computer organization. Engineering science background for computer systems design. Preq: ECE 2230 and ECE 2720, each with a C or better.

ECE 3300 Signals, Systems, and Transforms 3 (3) Study of systems models, analysis of signals, Fourier series and transforms, sampling and Z transforms, discrete Fourier transforms. Includes Honors sections. Preq: ECE 2620 and MTHS 2080, each with a C or better.

ECE 3520 Programming Systems 3 (3) Second course in programming languages and systems. Topics include assemblers, compilers, and syntactical methods; string manipulation and list processing; concepts of executive programs and operating systems; introduction to time-sharing systems. Preq: ECE 2230 with a C or better; or CPSC 2120 and CPSC 2150, each with a C or better. Preq or concurrent enrollment: MTHS 3110 or MTHS 4190 with a C or better.

ECE 3600 Electric Power Engineering 3 (3) Presents the basic principles of electromagnetic induction and electromagnetic forces developed. Topics include synchronous machines, power transformers, electric power transmission, and distribution systems, DC motors, and induction motors. Preq: ECE 2620 and PHYS 2210, each with a C or better.

ECE 3710 Microcontroller Interfacing 3 (3) Discusses the programming and interfacing of microcontrollers in order to control their integrated devices and external peripherals. Topics include memory and I/O; interrupts, counters and timers; ADCs and DACs; PWMs; and parallel and serial communication. Preq: ECE 2620 and ECE 2720, each with a C or better. Preq or concurrent enrollment: ECE 3200 with a C or better.

ECE 3720 Microcontroller Interfacing Laboratory I 3 (3) Discusses the programming and interfacing of microcontrollers in order to control their integrated devices and external peripherals. Topics include memory and I/O; interrupts, counters and timers; ADCs and DACs; PWMs; and parallel and serial communication. Preq: ECE 2620 and ECE 2720, each with a C or better. Preq or concurrent enrollment: ECE 3200 with a C or better.

ECE 3800 Electromagnetics 3 (3) Introduction to electromagnetic field, potential field, capacitive, inductive, magnetic field, forces, work and energy, induction of varying fields, and Maxwell's equations. Preq: ECE 2620 and MTHS 2060 and PHYS 2210, each with a C or better.

ECE 3810 Fields, Waves, and Circuits 3 (3) Covers foundations of circuit theory, transmission lines and circuits, plane-wave propagation, fiber optics, radiation and antennas, and coupled circuits. Preq: ECE 3000 and MTHS 2080, each with a C or better.

ECE 3990 Creative Inquiry—Electrical and Computer Engineering 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursuing scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Includes Honors sections. Preq: Consent of faculty member/mentor.

ECE 4040, 6040 Semiconductor Devices 3 (3) Consideration of the principles of operation, external characteristics, and applications of some of the more important semiconductor devices presently available. Preq: ECE 3200 with a C or better. Preq or concurrent enrollment: MTHS 3110 or MTHS 4190, each with a C or better.

ECE 4050 Design Projects in Electrical and Computer Engineering 1-3 (1-3) Individually defined projects oriented toward providing experience in establishment of objectives and criteria, synthesis, analysis, construction, testing, and evaluation. Develops student creativity through the solution of open-ended problems. Includes individual instruction in design methodology. May be repeated for a maximum of three credits. Preq: ECE 3300 or ECE 4090, each with a C or better; and consent of project supervisor.

ECE 4060, 6060 Introduction to Microelectronics Processing 3 (3) Microelectronic processing, MOS and bipolar monolithic circuit fabrication, thick and thin film hybrid fabrication, applications to linear and digital circuits, fundamentals of device design. Preq: ECE 3200 with a C or better. Preq or concurrent enrollment: MTHS 3110 or MTHS 4340, each with a C or better.

ECE 4090 Continuous and Discrete Systems Design 3 (3) Introduction to classical linear control systems. Topics include continuous and discrete descriptions of systems, time and frequency response, stability, system specification, system design of continuous and discrete systems. Preq: ECE 3300 with a C or better.

ECE 4120 Electrical Machines Laboratory 1 (2) Selected experiments to familiarize students with characteristics of transformers, DC and AC motors and generators. Measurement techniques and component modeling are included. Preq or concurrent enrollment: MTHS 4340 with a C or better; and ECE 3600 or ECE 4190, each with a C or better.

ECE 4170, 6170 Elements of Software Engineering 3 (3) Foundations of software design, reasoning about software, the calculus of programs, survey of formal specification techniques and design languages. Preq: ECE 3220 and ECE 3520 and MTHS 4190, each with a C or better.

ECE 4180, 6180 Power System Analysis 3 (3) Study of power system planning and operational problems. Topics include load flow, economic dispatch, fault studies, transient stability, and control of problems. System modeling and computer solutions are emphasized through class projects. Preq: ECE 3600 and ECE 3800, each with a C or better.

ECE 4190, 6190 Electric Machines and Drives 3 (3) Performance, characteristics, and modeling of AC and DC machines during steady-state and transient conditions. Introduction to power electronics devices and their use in adjustable speed motor drives. Preq: ECE 3210 and ECE 3600 and ECE 3800, each with a C or better. Preq or concurrent enrollment: MTHS 4340 with a C or better.

ECE 4200 Renewable Energy Penetration on the Power Grid 3 (3) Introduces the basic definition of electrical power, interfacing primary sources, generator/load characteristics, and renewable energy resources. Topics include solar energy grid interfacing, wind energy grid interfacing, battery charging/management, harmonic distortion, voltage sags, and national standards. Preq: ECE 3070 or ECE 3200, each with a C or better.
ECE 4220, 6220 Electronic System Design I 3 (2)
Emphasizes the application of theory and skills to the design, building, and testing of an electronic system with both analog and digital components. Application varies each semester. Computer software tools are used extensively in the design process. Preq: ECE 3210 and ECE 3300 and ECE 3600 and ECE 3710 and ECE 3810, each with a C or better. Coreq: ECE 4221, 6221.

ECE 4221, 6221 Electronic System Design I Laboratory 0 (2) Non-credit laboratory to accompany ECE 4220, 6220. Coreq: ECE 4220, 6220.

ECE 4270 Communications Systems 3 (3) Study of communication systems design and analysis. Topics include signals and spectra, baseband signaling and detection in noise, digital and analog modulation and demodulation techniques, communications link budget analysis. Preq: ECE 3170 and ECE 3300, each with a C or better.

ECE 4290, 6290 Organization of Computers 3 (3)
Computer organization and architecture. Topics include a review of logic circuits, bus structures, memory organization, interrupt structures, arithmetic units, input-output structures, state generation, central processor organization, control function implementation, and data communication. Registered Transfer Language (RTL) for description and design of digital systems. Preq: ECE 2720 with a C or better.

ECE 4300, 6300 Digital Communications 3 (3)
Introduction to modern digital communication systems, emphasizing modulation and detection, taking into account the effects of noise. Includes Honors sections. Preq: ECE 3170 and ECE 3300, each with a C or better; and consent of instructor. Consent is not required for honors students.

ECE 4320, 6320 Instrumentation 3 (3) Theory and analysis of transducers and related circuits and instrumentation. Generalized configurations and performance characteristics of instruments are considered. Transducer devices for measuring physical parameters such as motion, force, torque, pressure, flow, and temperature are discussed. Preq: ECE 3210 with a C or better. Preq or concurrent enrollment: MTHS 3110 or MTHS 4340, each with a C or better.

ECE 4340, 6340 Antennas and Propagation 3 (3) Study of the theoretical and practical aspects of antennas and their utilization. Topics include impedances, structural considerations, and wave propagation. Preq: ECE 3300 and ECE 3810 and MTHS 3110 or MTHS 4340, each with a C or better.

ECE 4380, 6380 Computer Communications 3 (3) Digital data transmission techniques, modern and communications channels, communications software and protocols, multiprocessors and distributed processing; concurrency and cooperation of dispersed processors. Preq: Senior standing in Electrical or Computer Engineering or Computer Science.

ECE 4390, 6390 Fiber Optics 3 (3) Covers the underlying principles of design for optical fibers in practical systems. Examines optical fiber as a waveguide using wave optics and ray optics. Discusses design criteria for using monomode and multimode fibers. Other topics include fabrication, measurement. Preq: ECE 3810 with a C or better. Preq or concurrent enrollment: MTHS 4340 with a C or better.

ECE 4400, 6400 Performance Analysis of Local Computer Networks 3 (3) Introduction to the design and performance analysis of local computer networks. Emphasizes performance analysis of representative multi-access procedures. Three common types of networks are considered in detail. Preq: ECE 2720 and ECE 3170, each with a C or better.

ECE 4420, 6420 Knowledge Engineering 3 (3) Introduction to the theoretical and practical aspects of knowledge engineering or artificial intelligence. Topics include symbolic representation structures and manipulation, unification, production systems and structures, rule-based and expert systems, planning and AI system architectures; system design in PROLOG and LISP. Project is required. Preq: ECE 3220 and ECE 3520, each with a C or better.

ECE 4440, 6440 Computer Network Security 3 (3) Principles and methods suited to the solution of engineering problems on the digital computer. Topics include widely used methods for the solution of the systems of algebraic and/or differential equations which arise in modeling of engineering systems, data approximation and curve fitting, continuous system simulation languages, and design-oriented programming systems. Preq: ECE 2620 and MTHS 3110 and MTHS 4340, each with a C or better.

ECE 4450, 6450 Computer-Aided Design 3 (3) Introduces digital electronics design concepts and techniques. Topics include environmental benefits of solar energy, solar thermal systems, concentration solar power, photovoltaic (PV) cell design and manufacturing, sizing of PV systems, hybrid photovoltaic/thermal systems, energy storage, and urban/rural applications. Preq: ECE 3200 with a C or better.

ECE 4460, 6460 Introduction to Digital Signal Processing 3 (3) Introduction to characteristics, design, and applications of discrete time systems; design of digital filters; introduction to the Fast Fourier Transform (FFT); LSI hardware for signal processing applications. Preq: ECE 3300 with a C or better.

ECE 4480, 6480 Embedded Computing 3 (2) Principles of using computing in the larger context of a system. Topics include bus and processor design types (e.g. microprocessor, microcontroller, DSP), codecs, digital circuit power management, real time scheduling, and embedded operating systems. Lab work consists of projects on embedded hardware (e.g. PC-104+). Preq: ECE 2230 and ECE 3710, each with a C or better.

ECE 4481, 6481 Embedded Computing Laboratory 0 (2) Non-credit laboratory to accompany ECE 4480, 6480. Coreq: ECE 4480, 6480.

ECE 4530 Software Practicum 0 (4) Non-credit laboratory to accompany ECE 4430. Coreq: ECE 4430, 6430.

ECE 4531 Software Practicum Laboratory 0 (4) Non-credit laboratory to accompany ECE 4430. Coreq: ECE 4430, 6430.

ECE 4532 Software Practicum Laboratory 0 (4) Non-credit laboratory to accompany ECE 4430. Coreq: ECE 4430, 6430.

ECE 4570 Fundamentals of Wind Power 3 (3) Introduces wind turbine systems, including wind energy potential and application to power generation. Topics include wind energy principles, wind site assessment, wind turbine components, power generation machinery control systems, connection to the electric grid, and maintenance. Preq: ECE 3070 or ECE 3200 with a C or better.

ECE 4590, 6590 Integrated Circuit Design 3 (2) Design concepts and factors influencing the choice of technology; fundamental MOS device design; silicon foundries, custom and semicustom integrated circuits; computer-aided design software/hardware trends and future developments; hands-on use of CAD tools to design standard library cells; systems design considerations, testing, and packaging. Preq: ECE 3210 with a C or better. Preq or concurrent enrollment: MTHS 3110 or MTHS 4340, each with a C or better. Coreq: ECE 4591, 6591.

ECE 4591, 6591 Integrated Circuit Design Laboratory 0 (2) Non-credit laboratory to accompany ECE 4590, 6590. Coreq: ECE 4590, 6590.

ECE 4600 Computer-Aided Analysis and Design 3 (3) Principles and methods suited to the solution of engineering problems on the digital computer. Topics include widely used methods for the solution of the systems of algebraic and/or differential equations which arise in modeling of engineering systems, data approximation and curve fitting, continuous system simulation languages, and design-oriented programming systems. Preq: ECE 2620 and MTHS 3110 and MTHS 4340, each with a C or better.

ECE 4610 Fundamentals of Solar Energy 3 (3) Introduces solar energy conversion systems. Topics include environmental benefits of solar energy, solar thermal systems, concentration solar power, photovoltaic (PV) cell design and manufacturing, sizing of PV system, hybrid photovoltaic/thermal systems, energy storage, and urban/rural applications. Preq: ECE 3200 with a C or better.

ECE 4670, 6670 Introduction to Computer Networks 3 (3) Introduction to characteristics, design, and applications of discrete time systems; design of digital filters; introduction to the Fast Fourier Transform (FFT); LSI hardware for signal processing applications. Preq: ECE 3300 with a C or better.

ECE 4680, 6680 Embedded Computing 3 (2) Principles of using computing in the larger context of a system. Topics include bus and processor design types (e.g. microprocessor, microcontroller, DSP), codecs, digital circuit power management, real time scheduling, and embedded operating systems. Lab work consists of projects on embedded hardware (e.g. PC-104+). Preq: ECE 2230 and ECE 3710, each with a C or better.

ECE 4681, 6681 Embedded Computing Laboratory 0 (2) Non-credit laboratory to accompany ECE 4680, 6680. Coreq: ECE 4680, 6680.

ECE 4700 Vehicle Electronics 3 (3) Introduction to vehicle electronic systems and networks. Topics include a review of electronic systems in automotive and aerospace applications; vehicle components, sensors and actuators; communication busses; electric power generation and distribution in vehicle systems; vehicle diagnostics; reliability; and trends in vehicle system design. Preq: ECE 3200 with a C or better.
ECE 4710 Electric Vehicles and Energy Storage 3 (3)
Introduction to hybrid electric propulsion systems and energy storage systems. Topics include a review of fundamentals of electric vehicles and hybrid electric vehicle architectures covering reasons for hybridization, energy analysis of architecture and components; overview of energy storage systems (batteries and supercapacitors); modeling of components; vehicle simulation; and supervisory control. Preq: ECE 3200 with a C or better.

ECE 4730, 6730 Introduction to Parallel Systems 3 (3)
Introduces parallel computer architectures and their programming. Includes an introduction to MPI and OpenMP and a number of engineering problems, including numerical simulations. Introduces scalability analysis. Preq: ECE 3220 or ECE 3290, each with a C or better.

ECE 4910 Undergraduate Honors Research 1-6 (1-6)
Individual research projects conducted under the direct supervision and guidance of a faculty member. May be repeated for a maximum of six credits.

ECE 4920, 6920 Special Problems 1-3 (1-3)
Special assignment in electrical or computer engineering. Some typical assignments include computer programs, term papers, technical literature searches, hardware projects, and design project leadership. May be taken only once for credit.

ECE 4930, 6930 Selected Topics 1-3 (1-3)
Classroom study of current and new technical developments in electrical and computer engineering. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: Consent of instructor.

ECE 4950 Integrated System Design I 2 (1) Consider engineering design of systems in a continuous process of project definition, planning, execution, and evaluation. This process includes consideration of both technical and non-technical factors in design. Strong emphasis is placed on the development of effective technical communications skills, particularly oral communications component. Preq: Electrical Engineering major and ECE 3200 and ECE 3320 and ECE 3200 and ECE 3220 and ECE 3320 and ECE 3520 and ECE 3710, each with a C or better; or Computer Engineering major and ECE 3200 and ECE 3220 and ECE 3320 and ECE 3520 and ECE 3710, each with a C or better. Coreq: ECE 4951.

ECE 4951 Integrated System Design I Laboratory 0 (3) Non-credit laboratory to accompany ECE 4950. Coreq: ECE 4950.

ECE 4960 Integrated System Design II 2 (6) Project-oriented course which brings together electrical and computer engineering students of dissimilar training in teams or project groups. Group assignments are designed to develop an appreciation for individual and creative thinking, as well as team effort. Preq: Electrical Engineering major and ECE 3210 and ECE 3710 and ECE 3810 and ECE 4090 and ECE 4950, each with a C or better or Computer Engineering majors and ECE 4090 and ECE 4950, each with a C or better.

ECE 4990 Creative Inquiry—Electrical and Computer Engineering 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Includes Honors sections. Preq: Consent of faculty member/mentor.

ECON 2110 Principles of Microeconomics 3 (3)
Introduction to economic reasoning and its application to the study of the behavior of consumers and business firms. Particular topics include competition, monopoly, international trade, and the impact of selected public policies. Intended as the first of a two-semester sequence in the foundations of economics includes Honors sections.

ECON 2121 Principles of Microeconomics II 3 (3)
Continuation of ECON 2110 in which fundamental economic principles are applied to the study of aggregate economic performance. Topics include the forces determining the rates of inflation, unemployment and economic growth, with particular emphasis on the influence of fiscal and monetary policies through financial markets. Includes Honors sections. Preq: ECON 2110.

ECON 3010 Economics of Labor 3 (3)
Introduces students to the economics of the labor market and labor relations. Particular topics include wages, wage determination, unemployment, investment in human capital, discrimination, and public policy toward the labor market. Also considers the role of labor unions. May not be used to satisfy requirements for a degree in Economics. Preq: ECON 2110.

ECON 3020 Money and Banking 3 (3)
Considers the functions of money and banking in both the product and financial markets. Special emphasis is placed on monetary theory and current problems of monetary policy. May not be used to satisfy requirements for a degree in Economics. Preq: ECON 2120.

ECON 3030 Economics and Sports 3 (3) Economic analysis of sports teams, leagues, and institutions. Analyzes basic economic issues using sports data. May not be used to satisfy requirements for a degree in Economics. Credit will not be given to students who have completed ECON 4260. Preq: Sophomore standing and ECON 2110.

ECON 3060 Managerial Economics 3 (3) Uses tools of economic analysis in classifying problems in organizing and evaluating information, and in comparing alternative courses of action. Bridges the gap between economic theory and managerial practices. May not be used to satisfy requirements for a degree in Economics. Preq: ECON 2110.

ECON 3070 Arbitration 3 (3) Analyzes dispute settlement procedures emphasizing mediation, fact-finding, and arbitration as they are used to resolve labor-management disputes in the public and private sectors. Preq: Consent of instructor.

ECON 3090 Government and Business 3 (3) Relationships between government and business, including, among other topics, government efforts to enforce competition; to regulate public utilities; and to protect the special interest of laborers, farmers, and consumers. May not be used to satisfy requirements for a degree in Economics. Preq: ECON 2110.

ECON 3100 International Economy 3 (3) Studies of the process of international commerce. Covers basic theory of trade and exchange rates, institutional and legal environment, current policy issues. Not open to students who have taken ECON 4120. May not be used to satisfy requirements for a degree in Economics. Preq: ECON 2110 and ECON 2120.

ECON 3140 Intermediate Microeconomics 3 (3) Analytical study of basic concepts of value and distribution under alternative market conditions. Includes Honors sections. Preq: ECON 2110.

ECON 3150 Intermediate Macroeconomics 3 (3) Macroeconomic problems of inflation and unemployment are focal points. Includes statistics (measures of real output and the price level) and theory (covering the sources of short-run fluctuations and long-run growth). Analyzes appropriate public policies addressing these issues. Includes Honors sections. Preq: ECON 2120.

ECON 3190 Environmental Economics 3 (3) Study of the application of economic logic to issues surrounding environmental management and policy. Examines individual, firm, and collective decision making as well as the evolution of regulatory approaches for controlling environmental use. Preq: ECON 3140.

ECON 3210 Economics of Innovation 3 (3) Examines the nature of entrepreneurship and the contribution of innovation to economic growth. Investigates the organizational and institutional sources of innovation in different firms and different countries as well as the work of economic theorists concerning the role entrepreneurs play in bringing new products to market. Preq: ECON 3060 or ECON 3140.

ECON 3250 Personnel Economics 3 (3) Study of various compensation and personnel practices firms employ. Examines when and how such practices should be selected to elicit desired employee effort and labor force quality. Topics include piece-rate and team-rate systems, seniority-based incentive schemes, promotion contests, evaluation systems, mandatory retirement, and up-or-out rules. Preq: ECON 2110.
ECON 3400 Behavioral Economics 3 (3) Introduces the economic, sociological, and psychological aspects of decision making under uncertainty. Presents the psychology of prediction, intuitive prediction; biases and corrective procedures. Topics also include framing, choice with costly information, and social influences on individual behavior. Preq: ECON 2110.

ECON 3440 Economics of Institutions and Property Rights 3 (3) Study of fundamental property rights structures and institutions in the capitalist economy and the arrangements that create incentives to produce and exchange. Preq: ECON 2110 and ECON 2120.

ECON 3500 Moral and Ethical Aspects of a Market Economy 3 (3) Can a market system produce results that are fundamentally just? Is justice possible without voluntary exchange? Applies both economic and philosophical analyses to these questions. Emphasizes the causes, consequences, and morality of the distribution of wealth and income in a free-market system. Includes Honors sections. Preq: ECON 3140.

ECON 3600 Public Choice 3 (3) Covers the economic approach to political activities and institutions. Topics include voting, voting rules, constitutions, political competition, political business cycles, voting against interest groups, bureaucracy, committees, legislatures, executives, and judges. Designed for Economics and non-Economics majors and requires only basic skills in microeconomics. Preq: ECON 2110.

ECON 3900 Junior Honors Research 1 (1) Readings and research in conjunction with an approved economics course at the 3000 or 4000 level. Honors status required. May be repeated for a maximum of three credits.

ECON 3970 Creative Inquiry—Economics 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of four credits.

ECON 4010 Labor Market Analysis 3 (3) Develops the methods of economic analysis of labor markets. Requires students to apply these methods to problems of the labor market. Topics include labor demand and supply, human capital, occupational choice, compensating wage differentials, organizational wage structures and incentive systems, unemployment, and discrimination. Preq: ECON 3140.

ECON 4020 Law and Economics 3 (3) Application of economics to the law of property, torts, and contracts; regulation of markets, business organizations, and financial transactions; distribution of income and wealth; and criminal law. Preq: ECON 2110.

ECON 4040 Comparative Economic Systems 3 (3) Comparative analytical and historical study of the principal economic systems which have been important in the modern world including, among others, capitalism and socialism. Preq: ECON 3140.

ECON 4050, 6050 Introduction to Econometrics 4 (3) Introduction to methods of quantitative analysis of economic data. Reviews basic statistical methods and probability distribution. Topics include data management using professional statistical software applications; multiple regression analysis; hypothesis testing under conditions of multicollinearity, heteroscedasticity, and serial correlation. Preq: ECON 2110 and ECON 2120; and either MTHS 1080 or MTHS 2070; and one of EXST 3010 or MTHS 3010 or MTHS 3090. Coreq: ECON 4051, 6051.

ECON 4051, 6051 Introduction to Econometrics Laboratory 0 (3) Non-credit laboratory to accompany ECON 4050, 6050. Coreqs: ECON 4050, 6050.

ECON 4060, 6060 Advanced Econometrics 3 (3) Reviews statistical inference using multiple regression (OLS) analysis and model specification. Topics include multicollinearity, heteroscedasticity, and serial correlation; two-staged least squares and instrumental variables models; simultaneous equations models; limited dependent variable models using maximum likelihood estimation and time-series analysis; and presentation of results in technical writing. Preq for ECON 4260: ECON 4050. Preq for ECON 6060: ECON 4050 or consent of instructor.

ECON 4100, 6100 Economic Development 3 (3) Consideration and analysis of economic and related problems of underdeveloped countries. Attention is given to national and international programs designed to achieve solution of these problems. Preq for ECON 4230, 6230: ECON 3140. Preq for ECON 6100: ECON 4050 or consent of instructor.

ECON 4110, 6110 Economics of Education 3 (3) Analysis of economic issues related to education. Focuses on issues relating to investment in education, elementary and secondary school markets and reform, the market for college education, teacher labor markets, and education effects on economic growth and income distribution. Preq for ECON 4110: ECON 3140. Preq for ECON 6110: ECON 4100 or consent of instructor.

ECON 4120, 6120 International Microeconomics 3 (3) Analysis of the essential aspects of international economic linkages. Discusses gains and redistributive effects of trade and the barriers to trade within the context of a variety of economic models. Also discusses the history of trade policy and the political economy of its determination. Preq for ECON 4120: ECON 3140. Preq for ECON 6120: ECON 4100 or consent of instructor.

ECON 4130, 6130 International Macroeconomics 3 (3) Examination of macroeconomic linkages between an individual country and the rest of the world and how these linkages are affected by the choice of exchange rate regimes. Topics include the relation between domestic and foreign interest rates and exchange rates and the ability to pursue independent monetary policies. Preq: ECON 3150.

ECON 4190 Economics of Defense 3 (3) Examines the American defense establishment in terms of resources utilized, alternative uses, and the contribution to the national economy and scientific progress generated by resources in a defense use. Discusses economic problems inherent in shifting resources between defense and nondefense uses and among alternative defense uses. Preq: ECON 3140.

ECON 4200 Public Sector Economics 3 (3) Study of the role of government and its proper functions and limitations in a market. Provision of goods and services by all levels of government and instruments of taxation are evaluated according to efficiency and equity criteria. Contemporary public sector issues are emphasized throughout. Preq: ECON 3140.

ECON 4220, 6220 Monetary Economics 3 (3) Intensive study of the role of monetary factors in economic change. Modern monetary theories and their empirical relevance for policy are developed against a background of monetary history and institutions. Preq for ECON 4220: ECON 3140 and ECON 3150. Preq for ECON 6220: ECON 3140 and ECON 3150 or consent of instructor.

ECON 4230, 6230 Economics of Health 3 (3) Applies microeconomic theory to examine the demand for health services and medical care, the market for medical insurance, the behavior of physicians and hospitals, and the role of government in health-care provision and regulation. Preq: ECON 3140.

ECON 4240, 6240 Organization of Industries 3 (3) Empirical, historical, and theoretical analyses of market structure and concentration in American industry: the effects of oligopoly, monopoly, and cartels. Preq for ECON 4240: ECON 3140. Preq for ECON 6240: ECON 3140 or consent of instructor.

ECON 4250, 6250 Antitrust Economics 3 (3) Analysis of the economic and legal issues created by the exercise of market power. The motivation and execution of government policy towards mergers, predatory conduct, and various restraints of trade are intensively examined. Preq for ECON 4250: ECON 3090 or ECON 3140. Preq for ECON 6250: ECON 3090 or ECON 3140 or consent of instructor.

ECON 4260, 6260 Seminar in Sports Economics 3 (3) Economic analysis of sports teams, leagues, and institutions. Topics include antitrust issues, public funding of sports venues, labor relations, wagering markets, athlete compensation, and application of economic principles to sports settings. Preq for ECON 4260: ECON 3140 and ECON 4050. Preq for ECON 6260: ECON 3140 and ECON 4050 or consent of instructor.

ECON 4270, 6270 Development of the American Economy 3 (3) Explores several topics relevant to understanding the American experience. Considers the institutions and developments critical to America's ascendency from a small country to a dominant global economic power. Preq: ECON 3140. Preq for ECON 6270: ECON 3140 and ECON 4050; or consent of instructor.

ECON 4280, 6280 Cost-Benefit Analysis 3 (3) Develops techniques for the appraisal of public expenditure programs with particular emphasis on investment in infrastructure. Topics include analysis of costs and benefits in the presence of market distortions. Preq for ECON 4280: ECON 3140. Preq for ECON 6280: ECON 3140 or consent of instructor.
EDC 1990 Creative Inquiry—Counselor Education 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor.

EDC 2340 Introduction to Addictions: Basic Education and Prevention 3 (3) Basic review of addictions and chemical dependence. Gives future educators skills in the identification of chemical abuse, techniques for intervention, and methods of prevention education. SOC 3960 and 3970 are recommended as follow-up courses for those interested in pursuing the topic.
EDC 2990 Creative Inquiry—Counselor Education 14 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor.

EDC 3090 Student Development Theory, Leadership, and Counseling Skills for Student Leaders 3 (3) Introduction to theoretical and practical applications of student development and leadership on the university campus. Develops skills assisting students with leadership development, problem solving, conflict resolution, confrontation, and referral. Explores legal and ethical issues for practitioners and effective utilization of resources available on the campus. May be repeated for a maximum of nine credits.

EDC 3990 Creative Inquiry—Counselor Education 14 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor.

EDC 4990 Creative Inquiry—Counselor Education 14 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor.

EARLY CHILDHOOD EDUCATION

Professor: D.A. Stegelin; Assistant Professors: Y. Selrood, A. Hall, S.M. Linder; Clinical Faculty: R.S.S. Wilson

EDEC 2200 Family, School, and Community Relationships 3 (3) Historical trends, theoretical models, and strategies of effective family/school/community relationships are examined. Special emphasis is placed on multicultural issues and on programs that support collaborative interaction with families that benefit children. Preq: Sophomore standing.

EDEC 3000 Foundations of Early Childhood Education 3 (3) Philosophical and historical foundations of early childhood education; societal changes and influences, needs of young children and families, program differentiation, and future trends are examined through coursework and experiential activities. Preq: EDEC 2200.

EDEC 3360 Social Development of Infants and Young Children 3 (3) Study of the behavior of the preschool child from infancy through age five. Theoretical concepts and observation of children's behavior are integrated, analyzed, and evaluated to discover implications for teaching and guiding preschool children. Includes a minimum of 10 one-hour observation-participation visits in public kindergarten. Includes Honors sections. Preq: EDEC 2200.

EDEC 4000 Observation and Assessment in Clinical Settings 3 (9) Clinical experiences in early childhood settings prior to student teaching provide opportunities for observing, guiding, and assessing young children, birth to age eight, in a variety of high quality preschool and primary settings. Practicum spans the entire semester. To be taken Pass/No Pass only. Preq: EDEC 4500. Coreq: EDEC 4300 and EDEC 4400 EDEC 4600.

EDEC 4200 Early Childhood Science 3 (2) Students develop knowledge, skills, and attitudes needed to foster science education among young children. Emphasizes teaching strategies and techniques appropriate for young children (birth to age eight), understanding the unique learning needs of special populations, and integrating science across the curriculum. Preq: EDEC 3360. Coreq: EDEC 4201 and EDEC 4500.

EDEC 4201 Early Childhood Science Laboratory 0 (2) Non-credit laboratory to accompany EDEC 4200. Coreq: EDEC 4200.

EDEC 4300 Early Childhood Mathematics 3 (3) Examination of theories and methods of teaching mathematics in terms of how young children develop mathematical thinking. Topics include problem solving, current issues, diverse current technologies, reflective teaching, and applications of math in everyday life. Preq: General Education mathematics requirement; admission to the professional level. Preq: MTHS 1150 and MTHS 1160 and MTHS 2160 and EDEC 4500. Coreq: EDEC 4000 and EDEC 4400 and EDEC 4600.

EDEC 4400 Integrated Language Arts and Social Studies in Primary Schools 3 (3) Integrates social studies and language arts in a course that reflects recommended teaching practices for young children (birth to age eight). Uses language arts as an approach for teaching social studies content, technology, and methods in primary schools. Preq: EDEC 4200. Coreq: EDEC 4400 and EDEC 4300 and EDEC 4600.

EDES 4500 Early Childhood Curriculum 3 (3) Constructivist approach is used to explore children's thinking as it influences curriculum design in early childhood. Analyzes the educational needs of the young child in the cognitive realm and examines the implementation of activities, experiences, and play-based program models. Preq: EDEC 3360. Coreq: EDEC 4200.

EDEC 4600 Critical Issues in Early Childhood Education 3 (3) In depth analysis of current and critical issues in early childhood education, with an emphasis placed on trends in prekindergarten through third grade. Topics include classroom and behavior management, early childhood assessment, working in diverse settings, and meeting the educational needs of all learners. Preq: EDEC 4500. Coreq: EDEC 4000 and EDEC 4300 and EDEC 4400.

EDEC 4840 Directed Teaching in Early Childhood Education 9 (1) Supervised observation and teaching experiences in cooperation with nursery schools, kindergartens, and early elementary schools. Restricted to seniors or graduates who have completed prerequisite courses and have the cumulative grade-point average for graduation. Preq: EDEC 4000 and EDEC 4300 and EDEC 4400 and EDEC 4600. Coreq: EDEC 4841 and EDEC 4850.

EDEC 4841 Directed Teaching in Early Childhood Education Laboratory 0 (24) Non-credit laboratory to accompany EDEC 4840. Coreq: EDEC 4840.

EDEC 4850 Early Childhood Capstone 3 (3) Taken concurrently with student teaching. Students strengthen connections between theory and pedagogy; analyze and solve contemporary problems in early childhood education; and reflect upon their personal growth as educators. Preq: EDEC 4000 and EDEC 4300 and EDEC 4400 and EDEC 4600. Coreq: EDEC 4840.

ELEMENTARY EDUCATION

Professor: D.P. Reinking, D.A. Smith; Associate Professors: D.B. Fleming, M.J. Spearman; Assistant Professors: M.W. Cole, C.C. Deaton, J.K. Doghey, A. Leonardi, J. Malloy, A.M. Tyminski; Clinical Faculty: R.A. Kamienski; Lecturer: W.E. Holton

EDEL 3040 Instructional Planning, Management, and Communications 3 (3) Provides students with knowledge and techniques for short- and long-term planning of developmentally appropriate lessons. Students learn how to structure ADEPT lessons and activities to meet the needs of students; and learn techniques for time and behavior management, organization and effective communication with school audiences. Preq: EDF 3340 and admission to the professional level.

EDEL 3100 Arts in the Elementary School 3 (2) Introduces skills, theories and practices used to integrate visual arts, drama, music and dance in the elementary classroom. Emphasizes philosophies associated with art education, content information, curriculum for diverse learners, and use of tools, media, materials and techniques. Preq: Admission to Elementary Education, Special Education or Early Childhood Education majors. Coreq: EDEL 3100.

EDEL 3101 Arts in the Elementary School Laboratory 0 (3) Non-credit laboratory to accompany EDEL 3100. Coreq: 3100.

EDEL 3110 Teaching Diverse Populations 3 (3) Preservice teachers examine the role of teachers as they relate to culturally appropriate curricula, instruction, and evaluation. Preq: Admission to the professional level.

EDEL 3210 Physical Education Methods and Content for Classroom Teachers 3 (3) Provides education majors with a basic understanding of the methods and techniques utilized in teaching elementary physical education. Emphasizes acquiring a basic understanding of the movement education approach and the ability to teach integrated lessons utilizing this approach. Preq: Junior standing and admission to the professional level.

EDEL 4010 Elementary Field Experience 3 (1) Practical classroom experience prior to the student teaching semester for Elementary Education majors. For a twelve-week period, students spend two days per week in schools observing, tutoring individuals, conducting small group activities, and teaching the class. Students attend seminars on topics related to field experience. Preq: EDF 3340 and EDEL 3100 and EDEL 3210 and EDEL 4520, and admission to the professional level. Coreq: EDEL 4011 and EDEL 4510 and EDEL 4870 and EDEL 4880 and EDLT 4610.
EDEL 4010 Elementary Field Experience Laboratory 0 (6) Non-credit laboratory to accompany EDEL 4010. Coreq: 4010.

EDEL 4050 Social Justice and 21st Century Learners 3 (3) Using an integrated focus approach to social justice education, preserve teachers investigate an educational event and/or issue through a combination of race, gender or socioeconomic factors. Preserve teachers write personal classroom stories related to practice/praxis, and use technology to document stories of themselves, their mentor and/or their teacher education preparation. Preq: Admission to the professional level. Coreq: EDEL 4670 and EDLT 4620 and EDLT 4630.

EDEL 4510 Elementary Methods in Science Teaching 3 (2) Development of process skills, technical skills, and attitudes needed to foster increased confidence and commitment to the teaching of elementary science, with emphasis on teaching strategies and techniques and their implications for what we know of how children learn science. Includes Honors sections. Preq: BIOL 1090 and PHSC 1170 and PHSC 1180; and admission to the professional level. Coreq: EDEL 4511 and EDEL 4010 and EDEL 4870 and EDEL 4880 and EDLT 4610.

EDEL 4511 Elementary Methods in Science Teaching Laboratory 0 (3) Non-credit laboratory to accompany EDEL 4510. Coreq: 4510.

EDEL 4520 Elementary Methods in Mathematics Teaching 3 (2) Special emphasis is given to the development of understanding, skills, and attitudes in the elementary curriculum with focus on strategies, techniques, and materials for teaching elementary mathematics. Preq: MTHS 1150 and MTHS 1160 and MTHS 2160 and MTHS 3160; and admission to the professional level. Coreq: EDEL 4521 and EDLT 4620.

EDEL 4521 Elementary Methods in Mathematics Teaching Laboratory 0 (3) Non-credit laboratory to accompany EDEL 4520. Coreq: 4520.

EDEL 4580 Health Education Methods and Content for the Classroom Teacher 3 (3) Study of the content, methodology, and resource materials necessary for teaching comprehensive health education in public schools. Emphasizes the National Health Education Standards and the health behaviors of youth that are allied with the Coordinated School Health Program. Preq: Minimum grade-point average of 2.0.

EDEL 4670 Principles and Strategies for Teaching English to Speakers of Other Languages in Elementary Schools 3 (3) Introduces preservice teachers to theories and principles related to second language acquisition as applied in culturally and linguistically responsive classrooms. Presents instructional models and strategies for teaching the language acquisition process within a context of academics supportive of English language learners (ELLs) and their needs. Preq: Admission to the professional level. Coreq: EDEL 4050 and EDLT 4620 and EDLT 4630.

EDEL 4810 Directed Teaching in the Elementary School 12 (1) Supervised observation and teaching experiences in cooperation with selected elementary schools. Restricted to seniors or graduates who have completed prerequisite courses. Preq: EDEL 3210 and EDEL 4010 and EDEL 4510 and EDEL 4520 and EDEL 4870 and EDEL 4880 and EDLT 4610; admission to the professional level; and consent of area committee chair. Coreq: EDEL 4811.

EDEL 4811 Directed Teaching in the Elementary School Laboratory 0 (3) Non-credit laboratory to accompany EDEL 4810. Coreq: 4810.

EDEL 4820 Capstone Seminar in Elementary Teaching 3 (3) Students strengthen connections between theory and pedagogy; analyze and solve contemporary problems in elementary education; and reflect upon their personal growth as educators within a social justice framework. Preq: EDEL 3100 and EDEL 3210 and EDEL 4010 and EDEL 4510 and EDEL 4520 and EDEL 4870 and EDEL 4880 and EDLT 4610; admission to the professional level; and consent of area committee chair. Coreq: EDEL 4830.

EDEL 4830 Directed Teaching in the Elementary School 9 (27) Supervised observation and teaching experience in cooperation with selected elementary schools. Restricted to seniors or graduates who have completed prerequisite courses. Preq: EDEL 3100 and EDEL 3210 and EDEL 4010 and EDEL 4510 and EDEL 4520 and EDEL 4870 and EDEL 4880 and EDLT 4610; admission to the professional level; and consent of area committee chair. Coreq: EDEL 4820.

EDEL 4870 Elementary Methods in Social Studies Teaching 3 (2) Introduction to methods, materials, and techniques needed to teach social studies in the elementary school. Preq: EDEL 1030 and HIST 1001 or HIST 1002 and admission to the professional level. Coreq: EDEL 4010 and EDEL 4510 and EDEL 4870 and EDEL 4880 and EDLT 4610.

EDEL 4871 Elementary Methods in Social Studies Teaching Laboratory 0 (3) Non-credit laboratory to accompany EDEL 4870. Coreq: EDEL 4870.

EDEL 4880 Elementary Methods in Language Arts Teaching 3 (2) Introduction for pre-service teachers to the skills of the language arts other than reading and the methods, materials, and techniques needed to teach these skills to students in the elementary school. Preq: ENGL 1030 or ENGL 3850; and admission to the professional level. Coreq: EDEL 4010 and EDEL 4510 and EDEL 4870 and EDEL 4881 and EDLT 4610.

EDEL 4881 Elementary Methods in Language Arts Teaching Laboratory 0 (3) Non-credit laboratory to accompany EDEL 4880. Coreq: EDEL 4880.

EDF 4800 Philosophy, Socializing, and Educational Policy 3 (3) Analysis of the development of contemporary educational theory and its impact on current schooling practices and educational policy development.

EDF 4820 Instructional Technology Strategies 1 (2) Helps future teachers learn to use technology effectively in support of content area instruction. To be taken concurrently with either methods classes or during student teaching as directed by major. Preq: EDF 3150 or EDF 4800.

EDF 4830 Foundations of Digital Media and Learning 3 (2) Critical use of digital media for leadership and learning within societal and educational contexts. Course focuses on learner impact while exploring, developing, and evaluating technology-enhanced applications. Further develops competencies with new media literacies and addresses societal, cultural, ethical, and participatory issues and uses of digital media. Coreq: EDF 4801, 6801.

EDF 4840, 6801 Foundations of Digital Media and Learning Laboratory 0 (2) Non-credit laboratory to accompany EDF 4840, 6800. Coreq: EDF 4800, 6800.
EDLT 4820, 6820 Advanced Educational Applications of Microcomputers 3 (2) Provides students with the knowledge and skills needed to apply microcomputer technology to the utilization and generation of educational software in accordance with sound educational principles. Preq: AGED 4800 or EDF 4800. Coreq: EDF 4821, 6821.

EDLT 4821, 6821 Advanced Educational Applications of Microcomputers Laboratory 0 (2) Non-credit laboratory to accompany EDF 4820, 6820. Coreq: EDF 4821, 6821.

EDF 4900, 6900 Classroom Management 3 (3) Aids students in developing strategies and plans to manage a classroom effectively. Topics include both time and behavioral management. Students learn how to prevent problems as well as address problems once they have occurred. Includes Honors sections. Preq for EDF 4900: EDF 3020 or PSYC 2010; and EDF 3340 or EDF 3350; and a 2.0 minimum grade-point ratio. Preq for EDF 6900: EDF 3020 or PSYC 2010; and EDF 3340 or EDF 3350; and a 2.0 minimum grade-point ratio; or consent of instructor.

EDF 4970, 6970 Instructional Media in the Classroom 3 (3) Integrated approach to the use of audiovisual media stressing systematic planning, selection, utilization, and evaluation as well as production of materials and equipment operation. Preq: 2.0 minimum grade-point ratio.

LITERACY
Professor: L.B. Gambrell; Associate Professors: P.J. Dunston, S.K. Fullerton, J.C. McNair; Assistant Professor: C.C. Bates; Visiting Lecturer: M.A. McBride

EDLT 1030 Learning Strategies 2 (3) Students learn strategies of active learning and critical thinking skills, which become an integral part of their natural thinking processes. Students learn how to generalize and apply newly acquired strategies to a variety of settings and situations.

EDLT 4580 Early Literacy: From Birth to Kindergarten 3 (3) Provides Early Childhood Education majors with knowledge of theory and research-based, developmentally appropriate instructional practices related to children’s literacy development within the home and school from birth to kindergarten. Factors related to assessment and communication within and between the family, school, and teacher are addressed. Preq: Admission to the professional level.

EDLT 4980 Teaching Reading in the Early Grades K-3 3 (3) Provides early childhood and Elementary Education majors an understanding of teaching reading in the elementary school setting in kindergarten through third grade. Students investigate general principles of language and literacy development and learn methods for teaching and assessing children’s literacy. Preq: EDEC 3360 and EDF 3010 and EDF 3020 and admission to the professional level. Early Childhood Education majors must enroll in EDEC 4000 and EDLT 4590 during the same term.

EDLT 4600 Teaching Reading in the Elementary Grades 2-6 3 (3) Provides preservice teachers with an understanding of teaching content area literacy in grades 2-6. Students learn methods and strategies for teaching children to learn with and make use of expository texts. Comprehension, the role of expository texts, and vocabulary learning in content areas are presented. Preq: EDLT 4600 and admission to the professional level. Coreq: EDLT 4611. Elementary Education majors must enroll in EDLT 4610 and EDEL 4510 and EDEL 4610 and EDEL 4870 and EDEL 4880 during the same term.

EDLT 4611 Content Area Reading: Grades 2-6 Laboratory 0 (3) Non-credit laboratory to accompany EDLT 4610. Coreq: EDLT 4610.

EDLT 4620 Reading and Responding to Children’s Literature in the Elementary Classroom 3 (3) Introduces children’s literature across genres. Participants examine strategies for responding to children’s literature through various modes and explore cultural issues and controversies related to children’s literature. Preq: EDLT 4600 and admission to the professional level.

EDLT 4630 Teaching Reading and Writing to English Language Learners 3 (3) Within a framework of the dimensions of cross-cultural knowledge and knowledge of theories and principles related to second language acquisition, participants develop understanding of the reading and writing processes and instructional models, strategies and tools that offer supportive learning for English language learners. Preq: EDLT 4600 and admission to the professional level.

EDLT 4980 Secondary Content Area Reading 3 (2) Designed for preservice teachers who are involved with field experiences prior to student teaching full time. Preps: Content area teachers to teach the reading skills necessary for effective teaching of content area material. Preq: Admission to the professional level. Coreq: EDLT 4981.

EDLT 4981 Secondary Content Area Reading Laboratory 0 (2) Non-credit laboratory to accompany EDLT 4980. Coreq: EDLT 4980.

SECONDARY EDUCATION
Professor: R.M. Horton; Associate Professor: J.C. Marshall; Assistant Professors: S.M. Che, M.P. Cook, J.C. Marshall; Assistant Professors: S. Cridland-Hughes, L.J. King; Clinical Faculty: C.L. Haltiwaner

EDSC 2260 A Professional Approach to Secondary Algebra 3 (3) Focuses on the pedagogical content knowledge needed to teach algebra effectively. It helps students master algebraic concepts, connections and representations at a deep level and solve meaningful real world problems. Students also explore the history of mathematical and algebraic thought and create meaningful and engaging lessons. Preq: Secondary Education major in Mathematics Teaching Area or Mathematics Teaching major.

EDSC 3240 Practicum in Secondary English 3 (2) Pre-service secondary English teachers gain both content and pedagogical knowledge by observing and reflecting upon the classroom practices of selected in-service high school English teachers. Coreq: EDSC 3241.

EDSC 3241 Practicum in Secondary English Laboratory 0 (3) Non-credit laboratory to accompany EDSC 3240. Coreq: EDSC 3240.

EDSC 3260 Practicum in Secondary Mathematics 3 (2) Pre-service secondary mathematics teachers gain both content and pedagogical knowledge by observing and reflecting upon the classroom practices of selected in-service high school mathematics teachers. Coreq: EDSC 3261.

EDSC 3261 Practicum in Secondary Mathematics Laboratory 0 (3) Non-credit laboratory to accompany EDSC 3260. Coreq: EDSC 3260.

EDSC 3270 Practicum in Secondary Science 3 (2) Pre-service secondary science teachers gain both content and pedagogical knowledge by observing and reflecting upon the classroom practices of selected in-service high school science teachers. Coreq: EDSC 3271.

EDSC 3271 Practicum in Secondary Science Laboratory 0 (3) Non-credit laboratory to accompany EDSC 3270. Coreq: EDSC 3270.

EDSC 3280 Practicum in Secondary Social Studies 3 (2) Pre-service secondary social studies teachers gain both content and pedagogical knowledge by observing and reflecting upon the classroom practices of selected in-service high school social studies teachers. Coreq: EDSC 3281.

EDSC 3281 Practicum in Secondary Social Studies Laboratory 0 (3) Non-credit laboratory to accompany EDSC 3280. Coreq: EDSC 3280.

EDSC 4120 Directed Student Teaching in Secondary School Subjects 12 (1) Program of supervised observation and teaching in cooperation with selected public schools. Opportunities are provided for prospective teachers to obtain experiences in the subject area. Students are sectioned according to teaching fields: English, social science, mathematici sciences, modern languages, science. Enrollment is limited. Coreq: EDSC 4121.

EDSC 4121 Directed Student Teaching in Secondary School Subjects Laboratory 0 (33) Non-credit laboratory to accompany EDSC 4120. Coreq: EDSC 4120.

EDSC 4170 Teaching Internship in the Secondary School 0 (16) Full-time, supervised teaching internship for one semester in cooperation with a participating South Carolina secondary school. Reserved for students seeking certification in critical-need teaching areas. May be repeated for a maximum of 12 credits. To be taken Pass/No Pass only. Preq: EDF 3010 and EDF 3020 and EDF 3350 and EDF 4980; and one of the following: EDSC 4240, 4250, 4260, 4270; and consent of School of Education by way of approving student’s application.

EDSC 4240 Teaching Secondary English 3 (2) Development of instructional practices and materials appropriate for secondary English; familiarization with curriculum materials; includes field experiences in local schools in preparation for student teaching. Taught fall semester only. Includes Honors sections. Preq: Second semester Junior standing, admission to the professional level, ED 1050 and EDF 3010 and EDF 3020 and EDF 3350; at least 18 hours of English coursework and a minimum grade-point average of 2.5. Preq or concurrent enrollment: EDLT 4980. Coreq: EDSC 4241.
EDSC 4241 Teaching Secondary English Laboratory 0 (2) Non-credit laboratory to accompany EDSC 4240. Coreq: EDSC 4240.

EDSC 4250 Teaching Secondary Modern Languages 3 (2) Development of instructional practices and materials appropriate for secondary modern languages; familiarization with curriculum materials; includes field experiences in local schools. Taught fall semester only. Preq: Second semester Junior standing, admission to the professional level, ED 1050 and EDF 3010 and EDF 3020 and EDF 3350; at least 18 hours of English coursework and a minimum grade-point average of 2.5. Preq or concurrent enrollment: EDLT 4980. Coreq: EDSC 4251.

EDSC 4251 Teaching Secondary Modern Languages Laboratory 0 (2) Non-credit laboratory to accompany EDSC 4250. Coreq: EDSC 4250.

EDSC 4260 Teaching Secondary Mathematics 3 (2) Development of instructional practices appropriate for secondary mathematics; familiarization with curriculum materials, planning, and implementation of lessons; includes field experiences in local schools. Taught fall semester only. Includes Honors sections. Preq: Admission to the professional level, ED 1050 and EDF 3010 and EDF 3020 and EDF 3350; at least 18 hours of English coursework and a minimum grade-point average of 2.5. Preq or concurrent enrollment: EDLT 4980. Coreq: EDSC 4261.

EDSC 4261 Teaching Secondary Mathematics Laboratory 0 (2) Non-credit laboratory to accompany EDSC 4260. Coreq: EDSC 4260.

EDSC 4270 Teaching Secondary Science 3 (2) Development of instructional practices and materials for teaching secondary school science (biological, earth, and physical sciences); familiarization with secondary science curriculum materials; includes field experiences in local schools. Taught fall semester only. Includes Honors sections. Preq: Second semester Junior standing, admission to the professional level, ED 1050 and EDF 3010 and EDF 3020 and EDF 3350; at least 18 hours of English coursework and a minimum grade-point average of 2.5. Preq or concurrent enrollment: EDLT 4980. Coreq: EDSC 4271.

EDSC 4271 Teaching Secondary Science Laboratory 0 (2) Non-credit laboratory to accompany EDSC 4270. Coreq: EDSC 4270.

EDSC 4280 Teaching Secondary Social Studies 3 (2) Development of instructional practices and materials appropriate for secondary social studies; familiarization with curriculum materials; includes field experiences in local schools in preparation for student teaching. Taught fall semester only. Includes Honors sections. Preq: Second semester Junior standing, admission to the professional level, ED 1050 and EDF 3010 and EDF 3020 and EDF 3350; at least 18 hours of English coursework and a minimum grade-point average of 2.5. Preq or concurrent enrollment: EDLT 4980. Coreq: EDSC 4281.

EDSC 4281 Teaching Secondary Social Studies Laboratory 0 (2) Non-credit laboratory to accompany EDSC 4280. Coreq: EDSC 4280.

EDSC 4370 Technology in Secondary Mathematics 3 (3) Students learn how to integrate calculators, data collectors, and computers in the secondary mathematics curriculum. They solve problems from middle school, Algebra I, Geometry, and Algebra II courses. Preq: Second semester Junior standing, admission to the professional level.

EDSC 4440 Teaching Internship in Secondary English 9 (27) Interns design, implement, and critically reflect upon instructional units and teaching practices in supervised secondary English classes. Interns must provide evidence of performance that meets national and state teaching standards for secondary English. Taught spring semester only. Preq: EDSC 4240. Coreq: EDSC 4540.


EDSC 4490 Secondary English Capstone Seminar 3 (27) Seminar in conjunction with EDSC 4440. Interns reflect upon and solve problems regarding teaching units, share effective teaching practices, and devise ways to document dimensions of effective teaching. Taught spring semester only. Preq: EDSC 4490. Coreq: EDSC 4541.

EDSC 4510 Secondary English Capstone Seminar Laboratory 0 (3) Non-credit laboratory to accompany EDSC 4510. Coreq: EDSC 4540.

EDSC 4520 Secondary Mathematics Capstone Seminar 3 (27) Seminar in conjunction with EDSC 4560. Interns reflect upon and solve problems regarding teaching units, share effective teaching practices, and devise ways to document dimensions of effective teaching. Taught spring semester only. Preq: EDSC 4540. Coreq: EDSC 4541.

EDSC 4530 Secondary Mathematics Capstone Laboratory 0 (3) Non-credit laboratory to accompany EDSC 4530. Coreq: EDSC 4540.


EDSC 4550 Secondary Science Capstone Seminar 3 (2) Capstone seminar accompanying supervised high school science teaching internship. Satisfies part of requirement for South Carolina secondary science certification. Offered spring semester only. Preq: EDSC 4270. Coreq: EDSC 4460 and EDSC 4570.

EDSC 4560 Secondary Science Capstone Laboratory 0 (3) Non-credit laboratory to accompany EDSC 4560. Coreq: EDSC 4570.

EDSC 4570 Secondary Science Capstone Seminar Laboratory 0 (3) Non-credit laboratory to accompany EDSC 4570. Coreq: EDSC 4570.


EDSC 4581 Secondary Social Studies Capstone Seminar Laboratory 0 (3) Non-credit laboratory to accompany EDSC 4580. Coreq: EDSC 4580.

EDSC 4850, 6850 Composition and Language Studies for Teachers 3 (3) Examines the principles and practices of composing and teaching composition. Includes a historical study of English language with attention to phonology, morphology, syntax, semantics, and practical aspects of language grammars. Serves as a practicum in composing and assessing processes, collaborative learning, writers purposes, audience expectations, and language conventions. Preq for EDSC 4850: ENGL 3100. Preq for EDSC 6850: ENGL 3100 or consent of instructor.

EDSP 3700 Introduction to Special Education 3 (3) Survey of students with disabilities and with gifts/talents. Individuals with Disabilities Education Act is emphasized, including general educators role in serving students with special needs. Characteristics, assessment, and effective instructional procedures for students of varying exceptionalities are addressed. Includes Honors sections. Students must have a minimum grade-point average of 2.0 to enroll in this course.

EDSP 3710 Characteristics of the Mildly Handicapped 3 (3) Surveys the characteristics which distinguish the mildly/moderately handicapped from the more severely handicapped. Students must have a minimum grade-point average of 2.0 to enroll in this course.

EDSP 3720 Characteristics and Instruction of Individuals with Learning Disabilities 3 (3) In-depth coverage of characteristics and identification procedures for individuals with learning disabilities. Effective instructional strategies are addressed. Students participate in field experiences throughout the semester. Offered fall semester only. Preq: EDSP 3700. Coreq: EDSP 3712 and EDSP 3740.

EDSP 3721 Characteristics and Instruction of Individuals with Learning Disabilities Laboratory 0 (1) Non-credit laboratory to accompany EDSP 3720. Coreq: EDSP 3720.

EDSP 3730 Characteristics and Instruction of Individuals with Intellectual Disabilities and Autism 3 (3) In-depth study of the etiology, assessment procedures, learning and behavioral characteristics, and effective instructional strategies related to the education of individuals with intellectual disabilities and autism. Students participate in a field experience throughout the semester. Preq: EDSP 3720 and EDSP 3740; and admission to professional level. Preq or concurrent enrollment: EDSP 3750. Coreq: 3731 and EDSP 4910.
EDSP 3731 Characteristics and Instruction of Individuals with Intellectual Disabilities and Autism Laboratory 0 (1) Non-credit laboratory to accompany EDSP 3730. Coreq: EDSP 3730.

EDSP 3740 Characteristics and Strategies for Individuals with Emotional/Behavioral Disorders 3 (3) In-depth coverage of characteristics and identification procedures for individuals with emotional or behavioral disorders. Effective instructional strategies and behavior management are addressed. Students participate in field experiences throughout the semester. Preq: EDSP 3720; and admission to professional level. Coreq: EDSP 3720 and EDSP 3741.

EDSP 3741 Characteristics and Strategies for Individuals with Emotional/Behavioral Disorders Laboratory 0 (1) Non-credit laboratory to accompany EDSP 3740. Coreq: EDSP 3740.

EDSP 3750 Early Intervention Strategies for Young Children with Special Needs 3 (3) Provides students with a working knowledge of the history and legal precedent for providing early intervention services, the characteristics of young children with special needs and their families, and effective instructional techniques for working with this population. Students participate in field experiences throughout the semester. Preq: EDSP 3700. Coreq: EDSP 3751.

EDSP 3751 Early Intervention Strategies for Young Children with Special Needs Laboratory 0 (1) Non-credit laboratory to accompany EDSP 3750. Coreq: EDSP 3750.

EDSP 4690, 6690 Characteristics of Individuals with Emotional and Behavioral Disorders 3 (3) Addresses the characteristics of individuals with emotional and behavioral disorders. Consideration is given to historical and legal aspects, definitions, comprehensive assessment, and the impact of school, home, culture, and society on individuals with behavior disorders. Research findings in the field of behavior disorders are emphasized. Preq: EDSP 3700.

EDSP 4740, 6740 Procedures for Individuals with Emotional and Behavioral Disorders 3 (3) Assists students in developing specific strategies for teaching individuals with emotional and behavioral disorders, utilizing preventive measures, expanding skills in behavior analysis, and implementing the least restrictive intervention warranted. Includes programmatic considerations, social skill instruction, curriculum selection, IEP development, and effective transition. Preq: EDSP 4690.

EDSP 4780, 6780 Practicum in Emotional and Behavioral Disorders 3 (2) Addresses content knowledge, performance skills, and professional values for successful teaching of students with emotional and behavioral disorders. Focuses on teacher-directed instruction and the use of critical instructional factors, the use of recommended practice for students with disabilities, and the measurement and analysis of student performance data. Students must have completed student teaching to enroll in this course. Preq: EDSP 4740.

EDSP 4781 Practicum in Emotional and Behavioral Disorders Laboratory 0 (3) Non-credit laboratory to accompany EDSP 4780. Coreq: EDSP 4780.

EDSP 4910 Educational Assessment of Individuals with Disabilities 3 (2) Introduction to assessment process (verification) in special education. Includes procedural safeguards; data collections via informal and standardized procedures; issues in assessment; psychometric properties of standardized tests; and administration, scoring, and interpretation of selected instruments. Offered spring semester only. Preq: EDSP 3720 and EDSP 3740; and admission to the professional level. Coreq: EDSP 3730 and EDSP 4911.

EDSP 4911 Educational Assessment of Individuals with Disabilities Laboratory 0 (2) Non-credit laboratory to accompany EDSP 4910. Coreq: EDSP 4910.

EDSP 4920 Mathematics Instruction for Individuals with Mild Disabilities 3 (3) Prepares students to provide explicit instruction in mathematics for individuals with mild disabilities. Students learn to assess, analyze and teach math skills systematically. Offered fall semester only. Preq: EDSP 4910; and admission to the professional level. Coreq: EDSP 4930 and EDSP 4940 and EDSP 4960 and EDSP 4970.

EDSP 4930 Classroom and Behavior Management for Special Educators 3 (3) Students describe various intervention strategies for increasing and maintaining appropriate behaviors, and for decreasing or eliminating inappropriate behaviors. Students accurately recognize, record, and chart inappropriate behaviors; employ the least restrictive intervention; foster self-management skills; and develop preventive strategies and class-wide systems for managing academic and social behavior. Offered fall semester only. Preq: EDSP 4910; and admission to the professional level. Coreq: EDSP 4920 and EDSP 4940 and EDSP 4960 and EDSP 4970.

EDSP 4940 Teaching Reading to Students with Mild Disabilities 3 (3) Emphasizes the knowledge and skills necessary for teaching reading to students with mild disabilities. Offered fall semester only. Preq: EDSP 4910; and admission to the professional level. Coreq: EDSP 4920 and EDSP 4930 and EDSP 4960 and EDSP 4970.

EDSP 4950 Communication and Collaboration in Special Education 3 (3) Focuses on effective communication skills for preserve special education teachers to encourage collaboration among relevant stakeholders and improve outcomes for individuals with disabilities. Preq: EDSP 4960. Coreq: EDSP 4980.

EDSP 4960 Special Education Field Experience 3 (9) Supervised practical experience prior to Directed Teaching for preserve special education teachers preparing to teach individuals with mild/moderate disabilities. Offered fall semester only. Preq: EDSP 4910; and admission to the professional level. Coreq: EDSP 4920 and EDSP 4930 and EDSP 4940 and EDSP 4970.

EDSP 4970 Secondary Methods for Individuals with Disabilities 3 (3) Preparation for working with students with mild/moderate disabilities in secondary schools. Focus is on literature, methods, and materials for providing instruction in transition, self-determination, knowledge within content areas, functional skills, and integration into the community. Offered fall semester only. Preq: EDSP 4910; and admission to the professional level. Coreq: EDSP 4920 and EDSP 4930 and EDSP 4940 and EDSP 4960.

EDSP 4980 Directed Teaching in Special Education 12 (34) Comprehensive course providing a full-time, semester-long experience for preserve special education teachers who plan to teach individuals with mild/moderate disabilities. Generally the last course in the program; provides teaching experience under the supervision of University and school personnel. Offered spring semester only. Preq: EDSP 4960 Coreq: EDSP 4950.

ENVIRONMENTAL ENGINEERING AND SCIENCE


EES 2010 Environmental Engineering Fundamentals I 3 (3) Overview of topics and engineering application areas that comprise the environmental engineering profession. Significant emphasis is given to development of oral and written communication skills needed by the engineering professional and application of engineering fundamentals to environmental systems. Preq: CH 1010; and MTHS 1080; ENGR 1020 with a grade of C or better. Preq or concurrent enrollment: CHE 1300 or ENGR 1300 or ENGR 1410.

EES 2020 Environmental Engineering Fundamentals II 4 (3) Overview of fundamentals related to environmental engineering processes, including water treatment, wastewater treatment, solid and hazardous waste management, air pollution control, risk assessment, and pollution prevention strategies. Laboratories cover measurement techniques and applications to process engineering. Preq: CH 1020; and EES 2010; and CHE 1300 or ENGR 1300 or ENGR 1410, with a grade of C or better.


EES 4010, 6010 Environmental Engineering 3 (3) Introduction to the field of environmental engineering. Topics include environmental phenomena, impact of pollutants in the aquatic environment, solid waste management, air pollution control, radiological health, and simple water and wastewater treatment systems. Preq for EES 4010: Junior standing in engineering or consent of instructor. Preq or concurrent enrollment: CE 3410 or CHE 2300 or ME 3080. Preq for EES 6010: Junior standing in engineering or consent of instructor. Coreq for EES 6010: CE 3410, CHE 2300, ME 3080, or consent of instructor.

EES 4020, 6020 Water and Waste Treatment Systems 3 (3) Study of fundamental principles, rational design considerations, and operational procedures of the unit operations and processes employed in water and waste treatment. Both physicochemical and biological treatment techniques are discussed. Introduces the integration of unit operations and processes into water and waste treatment systems. Preq for EES 4020: EES 2020 or 4010.
Courses of Instruction

EES 4030 Water and Waste Treatment Laboratory I (3) Laboratory exercises to accompany EES 4020 in selected water and wastewater treatment operations and processes. Emphasis is on understanding of fundamental principles and operational procedures, experimental design, data analysis, use of experimental data in engineering design applications, and writing of engineering reports. Preq: EES 2020; Preq or concurrent enrollment: EES 4020.

EES 4100, 6100 Environmental Radiation Protection I 3 (3) Fundamental principles of radiological health and radiation safety. Topics include radiation fundamentals, basic concepts of environmental radiation protection, internal and external dosimetry, environmental dose calculations and radiation protection standards. Preq for EES 4100: PHYS 2210 with a grade of C or better.

EES 4110, 6110 Ionizing Radiation Detection and Measurement Laboratory I 3 (3) Laboratory exercises in ionizing radiation detection and measurements. Topics include nuclear electronics; counting statistics; radiation interactions; basic gas, scintillation, and semiconductor detectors; gamma-ray spectroscopy; health physics survey instrumentation; and thermoluminescent dosimetry. Preq for EES 4110: EES 4000. Preq for EES 6110: EES 4100 or EES 6100. Coreq: EES 4111, 6111.

EES 4111, 6111 Ionizing Radiation Detection and Measurement Laboratory II 0 (3) Non-credit laboratory to accompany EES 4110, 6110. Coreq: EES 4110, 6110.

EES 4300, 6300 Air Pollution Engineering 3 (3) Introductory course in air pollution and its control. Topics include air pollutants and effects, sources, dispersion models, engineering controls, and air-quality legislation. Preq for EES 4300: EES 2020 or EES 4010.

EES 4500 Professional Seminar I (1) Covers various topics related to skills and techniques for evaluating career opportunities, seeking and obtaining environmental engineering employment, professional development, professional registration, professional ethics, and other factors necessary for achieving success in a professional career. Course enables students to make decisions that will help them succeed in their careers. Preq or concurrent enrollment: EES 4020 and EES 4030.

EES 4510, 6510 Newman Seminar and Lecture Series in Natural Resources Engineering I (2) Topics dealing with development and protection of land, air, water, and related resources are covered by seminar with instructor and invited lecturers. Current environmental and/or resource conservation issues are addressed. Includes Honors sections. Preq for EES 4510: Senior standing.

EES 4750 Capstone Design Project 3 (3) Students apply creativity and their engineering knowledge to solve open-ended environmental engineering problems. Problems are formulated and solutions are evaluated by faculty and practicing engineers. Oral and written communication skills are developed through presentations, correspondence and project reports. Preq: CE 3410 and EES 4020 and EES 4030 and EES 4300. Coreq: EES 4751.

EES 4751 Capstone Design Project Laboratory 0 (6) Non-credit laboratory to accompany EES 4750. Coreq: EES 4750.

EES 4800, 6800 Environmental Risk Assessment 3 (3) Quantitative estimation of human health risk posed by the release of a contaminant to the environment. Topics include methods for analyzing emission rates, environmental transport, exposure, and health effects; methods of uncertainty analysis; and the role of risk assessment in environmental regulation and environmental decision making. Preq for EES 4800: EES 2020 or EES 4010; and MTHS 2080 with a grade of C or better.

EES 4840, 6840 Municipal Solid Waste Management 3 (3) Introduction to the problems, regulations, collection, handling, recycling, and disposal of municipal solid wastes in the urban and rural sectors. Emphasizes an integrated waste-management system with resource recovery, composting, incineration, landfill disposals, and their costs. Preq for EES 4840: EES 2020 or EES 4010.

EES 4850, 6850 Hazardous Waste Management 3 (3) Introduction to the problems, regulations, treatment, and ultimate disposal of hazardous and toxic materials. Spill cleanup, groundwater transport, land disposal, incineration, and treatment technologies are discussed. Preq for EES 4850: EES 2020 or EES 4010; and CH 2010 or CH 2230.

EES 4860, 6860 Pollution Prevention and Industrial Ecology 3 (3) Topics include pollution prevention technology, the role of pollution prevention within a corporation, source reduction and recycling assessments, treatment to reduce disposal, life-cycle assessment, design for environment, and industrial ecology. Emphasizes case studies. Preq for EES 4860: Junior standing in College of Engineering and Science.

EES 4900-4990 Special Projects 1-3 (1-3) Studies or laboratory investigations in special topics in the environmental engineering and science field. Offered on a project basis with a maximum of individual student effort and a minimum of staff guidance may be repeated for a maximum of three credits. Includes Honors sections. Preq: Consent of instructor.

EES 4910 Selected Topics in Environmental Engineering I-3 (1-3) Study of the dynamic role of environmental engineering in maintaining environmental quality. A comprehensive study of any phase of environmental engineering. May be repeated for credit, but only if different topics are covered. Preq: Consent of department chair.

EXECUTIVE LEADERSHIP AND ENTREPRENEURSHIP

Professor: W.B. Gartner; Associate Professor: W.H. Stewart; Assistant Professors: P.T. Gianiodis, A.E. Ingram, J.W. Ridge; Lecturers: J.E. Hopkins, D.M. Wyma

ELE 3140 New Venture Creation I 3 (3) First in a two-part series that continues with MGT (ELE) 3150 assessing entrepreneurial opportunities. Focuses on creativity, idea generation, market opportunity analysis, strategy, and methods of entry. Opportunity analysis may be developed into a full new venture plan in ELE 3150 or MGT 3150. Preq: Junior standing.

ELE 3150 New Venture Creation 3 (3) Through the development of a business plan, the course focuses on creating an organization capable of effectively exploiting a viable opportunity. Topics include strategic planning, business model, market capital, operations and sourcing issues, leadership, team building, and management of rapid growth. Preq: ELE 3140.

ELE 3150 Social Science of Entrepreneurship 3 (3) Examines the nature of entrepreneurship and the contribution of innovation to economic growth. Investigates the organizational and institutional sources of innovation in different firms and different countries as well as the work of economic theorists concerning the role entrepreneurs play in bringing new products to market. Preq: ECON 3060 or ECON 3140.

ELE 3160 Technology Entrepreneurship 3 (3) Examines those areas of the social sciences that have direct relevance for entrepreneurs. Topics include processes by which entrepreneurs are shaped by social institutions such as the family and community, public policy implications and influences on entrepreneurship, risk perception, decision making, motivation, leadership, and group dynamics. Preq: SOC 2010 or SOC 2020 or SOC 2350 or CRD 2350 or PSYC 2010 or POSC 1010 or POSC 1020 or POSC 1040.

ELE 4000, 6000 Technology Entrepreneurship 3 (3) Introduction to technology entrepreneurship emphasizing ideation, opportunity assessment, market and technology forecasting, intellectual property protection, financial modeling and business valuation, project management, and cross-functional team building. Preq: Junior standing in science or engineering.

ELE 4010 Executive Leadership and Entrepreneurship II 3 (3) Continuation of ELE 3140 with extensive use of a computersimulated business start-up. Preq: ELE 3140.

ELE 4190 Agribusiness Innovation and Entrepreneurship 3 (3) Emphasis on assessing students' abilities as agribusiness entrepreneurs, evaluating the feasibility of a business idea, creating strategies for organizing and marketing the agricultural business, exploring pricing for products or services, developing capital needs and sound financial statements, and researching, developing and writing a comprehensive plan for the business. Preq: AGM 2190 or AGM 3190 or APEX 3020 or APEX 3190 or MGT 3190.

ELE 4990 Executive Leadership and Entrepreneurship III 3-6 (3-6) Continuation of ELE 3140 and 4010. Directed practical study of entrepreneurship and leadership. Students work closely with external infant firms to develop new products and bring existing products to market successfully. Preq: ELE 4010.
Courses of Instruction

ENGINEERING MECHANICS
Professors: N.M. Aziz, S.D. Schiff; Assistant Professors: N.B. Kaye, W. Pang, F.Y. Testrik; Senior Lecturers: B.G. Nielsen, M.M. Sternhagen

EM 2020 Engineering Mechanics: Dynamics 3 (3) Continuation of CE 2010. Principal topics are kinematics and kinetics of particles and rigid bod-

ENGLISH

ENGL 1010 Composition I 3 (3) Training in correct and effective expression in brief expository essays; review of the fundamentals of grammar and punctuation; instruction in common expository methods.

ENGL 2020 Composition II 3 (3) Continued emphasis on correct and effective expression; training in the organization and writing of the research paper. Preq: ENGL 1010.

ENGL 2030 Accelerated Composition 3 (3) Training in composing correct and effective expository and argumentative essays, including writing documented essays. Students who have received credit for ENGL 2020 will not be allowed to enroll in or receive credit for ENGL 2030. Includes Honors sections. Coreq: ENGL 2031.

ENGL 3010 Accelerated Composition Laboratory 0 (0) Noncredit laboratory to accompany ENGL 1030. Coreq: ENGL 1030.

ENGL 1110 English as a Second Language 3 (3) Special course for students learning English as a second language. Intensive study and drill in American English pronunciation and listening comprehension. Required of all foreign students who do not make a satisfactory grade on screening examination in oral English. To be taken Pass/No Pass only. Carries no credit for graduation. Coreq: ENGL 1111.

ENGL 3110 English as a Second Language Laboratory 0 (0) Non-credit laboratory to accompany ENGL 1110. Coreq: ENGL 1110.

ENGL 2020 The Major Forms of Literature 3 (3) Study of the basic structures and elements of fiction, poetry, and drama, including literary and critical theory, with readings in American, British, and world literature. Proficiency in composition must be demonstrated. Includes Honors sections. Preq: ENGL 1030.

ENGL 2120 World Literature 3 (3) Introduction to selected works from the Americas Africa, Asia, Europe, and the Middle East from ancient to modern eras, with emphasis on major authors. Includes Honors sections. Preq: ENGL 1030.

ENGL 2130 British Literature 3 (3) Introduction to selected authors and major periods of the British literary tradition, from the Middle Ages to World War II, with attention to poetry, fiction, and drama. Includes Honors sections. Preq: ENGL 1030.

ENGL 2140 American Literature 3 (3) Introduction to selected authors and major periods of the American literary tradition from 1620 to 1945. Includes Honors sections. Preq: ENGL 1030.

ENGL 2150 Literature in 20th- and 21st-Century Contexts 3 (3) Introduction to major contemporary cultural movements via selected authors in 20th- and 21st-century literature, primarily American and British, with attention to poetry, fiction, and drama since World War II. Includes Honors sections. Preq: ENGL 1030.

ENGL 2310 Introduction to Journalism 3 (3) Instruction in writing for mass media; editorial responsibilities. Preq: ENGL 2130.

ENGL 3000 Professional Development 2 (2) Orientation to the English major as a discipline and as a preparation for a range of careers. Introduction to and assistance with the compilation of the digital portfolios a plus to collect, synthesize and reflect on learning.

ENGL 3110 Great Books of the Western World 3 (3) Introduces Great Works minor. Includes readings about the Great Books concept, as well as various great books from the humanities, arts and natural and social sciences. Includes Honors sections. Preq: ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.

ENGL 3040 Business Writing 3 (3) Introduction to audience, context, purpose, and writing strategies for texts common in professional business settings: memoranda, letters, reports, and proposals. Includes individual and team projects. Preq: Junior standing.

ENGL 3100 Critical Writing About Literature 3 (3) Terms and techniques for literary analysis, including close reading, vocabulary for analysis, research and writing skills, casebook study of critical approaches. Discussion of poetry and genres preferred. Preq or concurrent enrollment: ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.

ENGL 3120 Advanced Composition 3 (3) Workshop in practical writing focusing on principles and style. Preq: ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.

ENGL 3140 Technical Writing 3 (3) Intensive, project-based application of principles of audience, context, purpose, and writing strategies of technical writing: proposals, reports, communication deliverables. Individual and team projects. Includes Honors sections. Preq: Junior standing.

ENGL 3150 Scientific Writing and Communication 3 (3) Study and practice of rhetorical conventions in professional scientific communication through the analysis and writing of major genres. Focuses on principles, strategies, and styles of scientific argumentation and audience adaptation in written, oral, and visual media. Intended for students majoring in the sciences. Preq: ENGL 1030; and BIOL 1030 or [BIOL 1100 and BIOL 1110]; and Junior standing.

ENGL 3320 Visual Communication 3 (3) Hands-on survey of visual communication theories and practices used by technical communicators in business and industry environments. Class meets regularly in computer classrooms. Preq: ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.

ENGL 3330 Writing for the News Media 3 (3) Practical experience in gathering and writing news and feature copy for the media, preparing for an array of writing styles as demanded by the broad spectrum of print and media outlets. Examination of the modern media specialist, laws governing the profession, and journalistic ethics. Preq: ENGL 2310.

ENGL 3450 The Structure of Fiction 3 (3) Introduction to the creative writing and critical study of prose fiction.

ENGL 3460 The Structure of Poetry 3 (3) Introduction to the creative writing and critical study of poetry.

ENGL 3470 The Structure of Drama 3 (3) Introduction to the creative writing and critical study of drama. Preq: ENGL 3100.

ENGL 3480 The Structure of the Screenplay 3 (3) Introduction to the creative writing and critical study of the screenplay. Screenplays vary from semester to semester. May be repeated once for credit with consent of instructor.

ENGL 3490 Technology and the Popular Imagination 3 (3) Examines relationship between technology and fiction and creative nonfictional texts, including print, film, and electronic media. Preq: ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.

ENGL 3500 Mythology 3 (3) Study of the great myths of the world emphasizing their applications to literature. Preq: ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.

ENGL 3530 Ethnic American Literature 3 (3) Critical examination of essays, poetry, fiction, and drama written by members of a variety of American racial and ethnic groups, such as Native Americans, African Americans, Chicano/Mexican Americans, Asian Americans, Italian Americans, and American Jews. Preq: ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.

ENGL 3550 Global Studies in Popular Culture 3 (3) Examination of the nature, functions, history, and effect of global culture upon societies throughout our digitally connected world of various media, such as best sellers, popular magazines, television, movies, Internet, gaming platforms, and emerging electronic genres. Preq: ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.

ENGL 3560 Science Fiction 3 (3) Readings in science fiction from the 17th century to the present, with special emphasis on writers since Verne and Wells. Preq: ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.
ENGL 3570 Film 3 (2) Examination of the film medium as an art form: its history, how films are made, why certain types of films (western, horror movies, etc.) have become popular, and how critical theories provide standards for judging film. Preq: ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150. Coreq: ENGL 3571.

ENGL 3571 Film Laboratory 0 (3) Non-credit laboratory to accompany ENGL 3570. Coreq: ENGL 3570.

ENGL 3670 Special Topics for Honors Students 3 (3) Varied topics of general interest in literature, language, rhetoric, or culture for all honors students. Specific topics announced each semester. May be repeated for a maximum of nine credits. Preq: ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.

ENGL 3800 British and American Women Writers 3 (3) Poetry, drama, fiction, and prose by established and little-known women writers in Britain and America. Particular attention to works treating themes and issues concerning women’s lives. Readings on such topics as women and work, education, religion, creativity. Preq: ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.

ENGL 3850 Children’s Literature 3 (3) Reading and analysis in a wide range of authors, illustrators, and genres appropriate for children from preschool through eighth grade, classic as well as modern. Critical approaches include historical, thematic, and social. Preq: ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.

ENGL 3860 Adolescent Literature 3 (3) Reading and analysis of literature written for readers age 12-18. Emphasis is on historical context, chief themes and motifs, and censorship issues, as well as connections with classic literature. Preq: ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.

ENGL 3960 British Literature Survey I 3 (3) Examines key texts in British literature to 1789. Preq: ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.

ENGL 3970 British Literature Survey II 3 (3) Examines key texts of British literature from 1789 to the present. Preq: ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.

ENGL 3980 American Literature Survey I 3 (3) Examines key texts of American literature from the 13th Century to 1840. Preq: ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.

ENGL 4000, 6000 The English Language 3 (3) Studies in English usage and historical development of the language. Preq for ENGL 4000: ENGL 3100. Preq for ENGL 6000: ENGL 3100 or consent of instructor.

ENGL 4010, 6010 Grammar Survey 3 (3) Survey of modern grammars with a focus on exploring the impact structural grammar has had on traditional grammar. Recommended for English teachers. Preq for ENGL 4010: ENGL 3100. Preq for ENGL 6010: ENGL 3100 or consent of instructor.

ENGL 4030 The Classics in Translation 3 (3) Examination of Homers Iliad and Odyssey, Virgilis Aeneid, and Ovids Metamorphoses. A few shorter works by other Greek and Roman writers may also be read. Preq: ENGL 3100.

ENGL 4070, 6070 The Medieval Period 3 (3) Selected works of Old and Middle English literature, exclusive of Chaucer. Preq for ENGL 4070: ENGL 3100. Preq for ENGL 6070: ENGL 3100 or consent of instructor.

ENGL 4080, 6080 Chaucer 3 (3) Selected readings in Middle English from The Canterbury Tales and other works by Chaucer. Preq for ENGL 4080: ENGL 3100. Preq for ENGL 6080: ENGL 3100 or consent of instructor.

ENGL 4100, 6100 Drama of English Renaissance 3 (3) Selected readings in non-Shakespearean dramatic literature of the 16th and 17th centuries. Preq for ENGL 4100: ENGL 3100. Preq for ENGL 6100: ENGL 3100 or consent of instructor.

ENGL 4110, 6110 Shakespeare 3 (3) Study of selected tragedies, comedies, and history plays of Shakespeare. Required of all English majors. Preq or concurrent enrollment for ENGL 4110: ENGL 3100. Preq or concurrent enrollment for ENGL 6110: ENGL 3100 or consent of instructor.

ENGL 4140, 6140 Milton 3 (3) Development of Milton’s art and thought from the minor poems and selected prose through Paradise Lost, Paradise Regained, and Samson Agonistes, set against the background of the Reformation. Preq for ENGL 4140: ENGL 3100. Preq for ENGL 6140: ENGL 3100 or consent of instructor.

ENGL 4150, 6150 The Restoration and Eighteenth Century 3 (3) Readings by Dryden, Swift, Pope, and Dr. Johnson. Preq: ENGL 3100 or consent of instructor.

ENGL 4160, 6160 The Romantic Period 3 (3) Readings from the poetry and critical prose of Blake, Wordsworth, Coleridge, Byron, Shelley, Keats, and other representative figures. Preq for ENGL 4160: ENGL 3100. Preq for ENGL 6160: ENGL 3100 or consent of instructor.

ENGL 4170, 6170 The Victorian Period 3 (3) Reading from the poetry and nonfiction prose of selected Victorian authors, including works of Carlyle, Tenerson, Browning, Arnold, and other representative figures. Preq for ENGL 4170: ENGL 3100. Preq for ENGL 6170: ENGL 3100 or consent of instructor.

ENGL 4180, 6180 The English Novel 3 (3) Study of the English novel from its 18th century beginnings through the Victorian Period. Preq for ENGL 4180: ENGL 3100. Preq for ENGL 6180: ENGL 3100 or consent of instructor.

ENGL 4190, 6190 Postcolonial and World Literatures 3 (3) Selected readings in post-colonial literature and theory, focusing on issues of nationalism, migration, resistance, race, language, and master narratives. Preq for ENGL 4190: ENGL 3100. Preq for ENGL 6190: ENGL 3100 or consent of instructor.

ENGL 4200, 6200 American Literature to 1799 3 (3) Focused study of authors, movements, themes, critical approaches, and genres in literature of colonial and early national America from early European explorations of the continent to 1799. Preq for ENGL 4200: ENGL 3100. Preq for ENGL 6200: ENGL 3100 or consent of instructor.

ENGL 4210, 6210 American Literature from 1800 to 1899 3 (3) Focused study of authors, movements, themes, critical approaches, and genres in the poetry and prose of major American authors and literary movements from the nineteenth century. Preq for ENGL 4210: ENGL 3100. Preq for ENGL 6210: ENGL 3100 or consent of instructor.

ENGL 4250, 6250 The American Novel 3 (3) Survey of the most significant forms and themes of the American novel from its beginnings to 1900. Preq for ENGL 4250: ENGL 3100. Preq for ENGL 6250: ENGL 3100 or consent of instructor.

ENGL 4260, 6260 Southern Literature 3 (3) Intellectual and literary achievement of the South from 1607 to the present, with emphasis on the writers of the 19th century. Preq for ENGL 4260: ENGL 3100. Preq for ENGL 6260: ENGL 3100 or consent of instructor.

ENGL 4280, 6280 Contemporary Literature 3 (3) Focuses on American, British, and other fiction, poetry, and drama from Post-World War II to the present. Preq for ENGL 4280: ENGL 3100. Preq for ENGL 6280: ENGL 3100 or consent of instructor.

ENGL 4290, 6290 Dramatic Literature I 3 (3) Selected reading in the dramatic literature from the classical era of Greece and Rome to the Renaissance. Preq for ENGL 4290: ENGL 3100. Preq for ENGL 6290: ENGL 3100 or consent of instructor.

ENGL 4300, 6300 Dramatic Literature II 3 (3) Principles and progress of drama from the Restoration to the present; analysis of representative plays; critical reports; discussion of trends in dramatic literature. Preq for ENGL 4300: ENGL 3100. Preq for ENGL 6300: ENGL 3100 or consent of instructor.

ENGL 4310, 6310 Modern Poetry 3 (3) The modern tradition in English and American poetry from Yeats to the present; relevant critical essays. Preq for ENGL 4310: ENGL 3100. Preq for ENGL 6310: ENGL 3100 or consent of instructor.

ENGL 4320, 6320 Modern Fiction 3 (3) American and British novels and short stories of the 20th century. Preq for ENGL 4320: ENGL 3100. Preq for ENGL 6320: ENGL 3100 or consent of instructor.

ENGL 4330, 6330 The Anglo-Irish Literary Tradition 3 (3) Exploration of the unique literary heritage and achievement of English-language Irish writers in the 19th and 20th centuries. Major figures of the Irish tradition: W. B. Yeats, James Joyce, Samuel Beckett, and other writers; consideration of the specifically Irish aspects of their works. Preq for ENGL 4330: ENGL 3100. Preq for ENGL 6330: ENGL 3100 or consent of instructor.

ENGL 4340, 6340 Environmental Literature 3 (3) Survey of literature that examines the relationship between human beings and the natural world, including analysis of environmental themes in myths and legends and in selected poetry and prose of 19th and 20th century England and America. Preq for ENGL 4340: ENGL 3100. Preq for ENGL 6340: ENGL 3100 or consent of instructor.
ENGL 4350, 6350 Literary Criticism 3 (3) Major critical approaches to literature. Preq for ENGL 4350: ENGL 3100. Preq for ENGL 6350: ENGL 3100 or consent of instructor.

ENGL 4360, 6360 Feminist Literary Criticism 3 (3) Introduces the germinal works of feminist literary theory and criticism. Outlines the development of modern literary criticism by studying feminist versions of the major critical methodologies. Preq for ENGL 4360: ENGL 3100. Preq for ENGL 6360: ENGL 3100 or consent of instructor.

ENGL 4370, 6370 Directed Studies 1-3 (1-3) Class and tutorial work for students with special interests or projects in American, British, or European literature outside the scope of existing courses. Applications must be approved during the registration period of the semester preceding the one in which directed studies will occur. May be repeated by arrangement with the department. Preq for ENGL 4370: ENGL 3100. Preq for ENGL 6370: ENGL 3100 or consent of instructor.

ENGL 4380 Departmental Honors Research 3 (3) Research for the preparation of an honors project. Preq: ENGL 3100.

ENGL 4390 Departmental Honors Project 3 (3) Preparation of an honors project. Preq: ENGL 3100.

ENGL 4400, 6400 Literary Theory 3 (3) Examination of how approaches such as Marxism, Psychoanalysis, Feminism, Deconstruction, New Historicism, Post-Colonialism, Cultural Studies, and Queer Theory answer the question, "What is literature?" Preq for ENGL 4400: ENGL 3100. Preq for ENGL 6400: ENGL 3100 or consent of instructor.

ENGL 4410, 6410 Literary Editing 3 (3) Examination of how the theories and practices of editing construct texts, stressing the problems and objectives of editing and providing practical experience with literary editing. Preq: ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.

ENGL 4420, 6420 Cultural Studies 3 (3) Investigation of the similarities and connections between a wide variety of cultural products, events, and practices - from fast food to opera to online shopping - using theories ranging from Marxism to hybridity. Preq for ENGL 4420: ENGL 3100. Preq for ENGL 6420: ENGL 3100 or consent of instructor.

ENGL 4430 Theories of World Literature 3 (3) Examination of the historical and contemporary theories of world literature, including theories of worldliness, planetary, globalism, and late capitalism. These theories are used in pursuit of world literature on a worldwide and planetary scale. Preq: ENGL 3100.

ENGL 4440, 6440 Renaissance Literature 3 (3) Selected readings in non-Shakespearean British literature from 1500-1660. Includes drama, poetry, and prose. Preq for ENGL 4440: ENGL 3100. Preq for ENGL 6440: ENGL 3100 or consent of instructor.

ENGL 4450, 6450 Fiction Workshop 3 (3) Workshop in the creative writing of prose fiction. May be repeated once for credit. Preq for ENGL 4450: ENGL 3450. Preq for ENGL 6450: ENGL 3450 or consent of instructor.

ENGL 4460, 6460 Poetry Workshop 3 (3) Workshop in the creative writing of poetry. May be repeated once for credit. Preq for ENGL 4460: ENGL 3460. Preq for ENGL 6460: ENGL 3460 or consent of instructor.

ENGL 4470, 6470 Playwriting Workshop 3 (3) Workshop in the creative writing of plays. May be repeated once. Preq for ENGL 4470: ENGL 3470 or THEA 3470. Preq for ENGL 6470: ENGL 3470 or THEA 3470 or consent of instructor.

ENGL 4480, 6480 Screenwriting Workshop 3 (3) Workshop in the creative writing of screenplays. May be repeated once for credit. Preq for ENGL 4480: ENGL 3480. Preq for ENGL 6480: ENGL 3480 or consent of instructor.

ENGL 4490, 6490 Creative Non-Fiction 3 (3) Advanced workshop in writing non-fiction prose for magazine and freelance markets. Preq for ENGL 4490: ENGL 3450 or ENGL 3460. Preq for ENGL 6490: ENGL 3450 or ENGL 3460 or consent of instructor.

ENGL 4500, 6500 Film Genres 3 (2) Advanced study of films that have similar subjects, themes, and techniques, including such genres as the Western, horror, gangster, science fiction, musical, and/or screwball comedy. Also considers non-traditional genres, screen irony, genre theory, and historical evolution of genres. Topics vary. Preq for ENGL 4500: ENGL 3570. Preq for ENGL 6500: ENGL 3570 or consent of instructor. Coreq: ENGL 4501, 6501.

ENGL 4501, 6501 Film Genre Laboratory 0 (3) Non-credit laboratory to accompany ENGL 4500, 6500. Coreq: ENGL 4500, 6500.

ENGL 4510, 6510 Film Theory and Criticism 3 (2) Advanced study into the theory of film/video making emphasizing understanding a variety of critical methods to approach a film. Examines the history of film theory and defines the many schools of film criticism, including realism, formalism, feminism, semiotics, Marxism, and expressionism. Preq for ENGL 4510, 6510: ENGL 3570. Preq for ENGL 6510: ENGL 3570 or consent of instructor. Coreq: ENGL 4511, 6511.

ENGL 4511, 6511 Film Theory and Criticism Laboratory 0 (3) Non-credit laboratory to accompany ENGL 4500, 6500. Coreq: ENGL 4500, 6500.

ENGL 4520, 6520 Great Directors 3 (2) Intensive study of one to three film directors emphasizing understanding the entire canon of each director. Students study similarities in techniques, shifts in thematic emphasis, and critical methodologies for approaching the works of each director. Topics vary. Preq for ENGL 4520: ENGL 3570. Preq for ENGL 6520: ENGL 3570 or consent of instructor. Coreq: ENGL 4521, 6521.

ENGL 4521, 6521 Great Directors Laboratory 0 (3) Non-credit laboratory to accompany ENGL 4520, 6520. Coreq: ENGL 4520, 6520.

ENGL 4530, 6530 Sexuality and the Cinema 3 (2) Examination of male/female sexual roles and their evolution in American genre films, avant-garde cinema, and international films. Includes the study of movies in relation to cultural values and social stereotypes, introduction to feminist film theory, and consideration of film pornography. Preq for ENGL 4530: ENGL 3570. Preq for ENGL 6530: ENGL 3570 or consent of instructor. Coreq: ENGL 4531, 6531.

ENGL 4531, 6531 Sexuality and the Cinema Laboratory 0 (3) Non-credit laboratory to accompany ENGL 4530, 6530. Coreq: ENGL 4530, 6530.

ENGL 4540 Selected Topics in International Film 3 (2) Presents subtitled films of specific world cultures and basic film theory and discourse applicable to the selected areas. Taught in English. May be repeated for a maximum of six credits with consent of department chair. Preq: ENGL 3100. Coreq: ENGL 4541.

ENGL 4541 Selected Topics in International Film Laboratory 0 (3) Non-credit laboratory to accompany ENGL 4540. Coreq: ENGL 4540.

ENGL 4550, 6550 American Humor 3 (3) Native American humor of the 19th and 20th centuries. Preq for ENGL 4550: ENGL 3100. Preq for ENGL 6550: ENGL 3100 or consent of instructor.

ENGL 4560, 6560 Literature and Arts of the Holocaust 3 (3) Addresses the Holocaust through literature, art, architecture, music, and film. Beginning with historical, political, and economic forces that contributed to the Holocaust, course then focuses on highly diverse creative responses to these events - responses that often reflect the difficulties and politics of these commemorative gestures. Preq for ENGL 4560: ENGL 3100. Preq for ENGL 6560: ENGL 3100 or consent of instructor.

ENGL 4590, 6590 Special Topics in Language, Criticism, Theory 3 (3) Advanced studies in topics not central to other English courses, such as certain authors, works, genres, themes, or areas of knowledge and culture. Specific topics are announced when offered. May be repeated once for credit with department chair’s consent. Preq for ENGL 4590: ENGL 3100. Preq for ENGL 6590: ENGL 3100 or consent of instructor.

ENGL 4600, 6600 Issues in Writing Technologies 3 (3) Examination of writing technologies from different historical periods. Investigates how writing is understood, circulated, legislated, and protected in terms of its production technology. Preq for ENGL 4600: ENGL 3100 and ENGL 2020 or ENGL 2130 or ENGL 2140 or ENGL 2150. Preq for ENGL 6600: ENGL 3100 and ENGL 2020 or ENGL 2130 or ENGL 2140 or ENGL 2150.

ENGL 4630, 6630 Topics in Literature to 1699 3 (3) Selected readings in literature from antiquity through the 17th century for focused study of authors, movements, themes, critical approaches, and genres. Topics vary and are constructed by individual faculty. May be repeated for a maximum of six credits, but only if different topics are covered. Preq for ENGL 4630: ENGL 3100. Preq for ENGL 6630: ENGL 3100 or consent of instructor.

ENGL 4640, 6640 Topics in Literature from 1700 to 1899 3 (3) Selected readings in 18th- and 19th-century literature for focused study of authors, movements, themes, critical approaches, and genres. Special topics vary and are constructed by individual faculty. May be repeated for a maximum of six credits, but only if different topics are covered. Preq for ENGL 4640: ENGL 3100. Preq for ENGL 6640: ENGL 3100 or consent of instructor.
ENGL 4650, 6650 Topics in Literature from 1900 to 21st Century (3) Selected readings in 20th- and 21st-century literature for focused study of authors, movements, themes, critical approaches, and genres. Topics vary and are constructed by individual faculty. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: ENGL 4650: ENGL 3100. Preq for ENGL 6650: ENGL 3100 or consent of instructor.

ENGL 4750, 6750 Writing for Electronic Media (3) Workshop in new forms of writing and hypertextual design for interactive electronic media, including social networks, online and video communities. May be repeated once for credit at the undergraduate level. Preq for ENGL 4750: ENGL 3100. Preq for ENGL 6750: ENGL 3100 or consent of instructor.

ENGL 4780, 6780 Digital Literacy (3) Examines how technology has expanded ideas of literacies and texts. Includes reading, studying and analyzing print and digital texts to determine how digital techniques change patterns of reading and how readers make sense of electronic texts. Preq for ENGL 4780: ENGL 3100. Preq for ENGL 6780: ENGL 3100 or consent of instructor.

ENGL 4820, 6820 African American Literature from 1920 to the Present (3) Critical examination of the development of the African American literary tradition from the Colonial Period to the Harlem Renaissance. Considers the historical and cultural contexts of a variety of texts, themes and theories. Preq for ENGL 4820: ENGL 3100. Preq for ENGL 6820: ENGL 3100 or consent of instructor.

ENGL 4830, 6840 African American Literature from 1920 to the Present (3) Critical examination of the development of the African American literary tradition from the Colonial Period to the Harlem Renaissance to the present. Considers historical and cultural contexts of a variety of texts, themes, theories and literary movements. Preq for ENGL 4830: ENGL 3100. Preq for ENGL 6830: ENGL 3100 or consent of instructor.

ENGL 4850, 6850 Composition and Language Studies for Teachers (3) Examines the principles and practices of composing and teaching composition. Includes a historical study of English language with attention to phonology, morphology, syntax, semantics, and practical aspects of language grammar. Serves as a practicum in composing and assessing processes, collaborative learning, writers purposes, audience expectations, and language conventions. Preq for ENGL 4850: ENGL 3100. Preq for ENGL 6850: ENGL 3100 or consent of instructor.

ENGL 4870, 6870 Topics in Book History (3) Examines the material and theoretical constructions of the book. Covers both historical and contemporary dimensions of dissemination, reception, artistry, and influence of books. Preq: ENGL 1030.

ENGL 4880, 6880 Genre and Activity Theory (3) Examination of the forms that texts take, of the print and digital media in which they are composed, and of the ways they circulate among experts, in the public, and around the world. Preq: Junior standing.

ENGL 4890, 6890 Special Topics in Writing and Publication Studies (3) Selected readings from topics in writing and publication studies, emphasizing areas such as major theories, practices, research, and critical approaches. May be repeated for a maximum of six credits, but only if different topics are covered. Preq for ENGL 4890: ENGL 3100. Preq for ENGL 6890: ENGL 3100 or consent of instructor.

ENGL 4900, 6900 Advanced Technical and Business Writing (3) Advanced work in writing proposals, manuals, reports and publishable articles. Client-based and collaborative writing. Preq: ENGL 3040 or 3140 or consent of instructor.

ENGL 4910, 6910 Classical Rhetoric (3) Traces the development of rhetoric from Protagoras through Cicero and Quintillian and considers questions essential to understanding persuasive theory and practice. Preq for ENGL 4910: ENGL 3100. Preq for ENGL 6910: ENGL 3100 or consent of instructor.

ENGL 4920, 6920 Modern Rhetoric (3) Examines the new rhetorics of the 20th century, which are grounded in classical rhetoric but include findings from biology, psychology, linguistics and anthropology, under other disciplines. Preq for ENGL 4920: ENGL 3100. Preq for ENGL 6920: ENGL 3100 or consent of instructor.

ENGL 4940, 6940 Writing About Science (3) Advanced work in scientific writing and editing for peer and lay audiences. Preq for ENGL 4940: ENGL 3100. Preq for ENGL 6940: ENGL 3100 or consent of instructor.

ENGL 4950, 6950 Technical Editing (3) Practicalexperience in editing and preparing technical manuscripts for publication. General introduction to the functions of the technical editor. Preq for ENGL 4950: ENGL 3100. Preq for ENGL 6950: ENGL 3140 or consent of instructor.

ENGL 4960, 6960 Senior Seminar (3) Capstone course requires participation and a substantial essay, involving gathering English majors the chance to work closely with faculty and other English majors on a special topic in the advanced study of literature, rhetoric, writing, and/or publication studies. Preq: ENGL 3100 and Senior standing in English.

ENGL 4970, 6970 Writing Center Theory and Practice (3) Preparation for students to work in the Clemson University Writing Center. Required of all undergraduate Writing Fellows. Preq: Sophomore standing and consent of instructor. Coreq: ENGL 4981, 6981.

ENGL 4980, 6980 Writing Center Theory and Practice Laboratory (0) (1) Non-credit laboratory to accompany ENGL 4970, 6970. Coreq: ENGL 4980, 6980.

ENGL 4990 Practicum in Writing (3) Students apply their knowledge of concepts and principles to a substantive project involving their internship experiences and/or writing and publishing interests. To be taken Pass/No Pass only. Preq: ENGL 2100 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150; and Junior standing.

ENGLISH
Professor: D.E. Beasley; Associate Professor: W.J. Park; Senior Lecturers: J.C. Minor, E.A. Stephan; Lecturers: S.C. Brandon, D.J. Ewing, J.R. Maier

ENGR 1020 Engineering Disciplines and Skills (2) Provides solid foundation of skills to solve engineering problems. Students demonstrate problem solving solutions with spreadsheets, dimensions and units; use modeling techniques and interpret validity of experimental results. Students design projects on multidiscipline teams. Introduces professional and societal issues appropriate to engineering. Various forms of technical communication are emphasized. Includes Honors sections. Preq or concurrent enrollment: MTHS 1040 or MTHS 1060. Coreq: ENGR 1021.

ENGR 1021 Engineering Disciplines and Skills Laboratory (2) Non-credit laboratory to accompany ENGR 1020. Coreq: ENGR 1020.

ENGR 1200 Engineering Problem Solving and Design (3) Methodology and practice of engineering problem solving and engineering design. Selects computer tools, teamwork, and communication skills are employed. Ethics, safety, economics, and environmental concerns are considered. Includes Honors sections. Preq: ENGR 1010 and MTHS 1060. Preq or concurrent enrollment: PHYS 1220. Coreq: ENGR 1201.

ENGR 1201 Engineering Problem Solving and Design Laboratory (0) (2) Non-credit laboratory to accompany ENGR 1200. Coreq: ENGR 1200.

ENGR 1300 Engineering Fundamentals (2) (1) Students formulate and solve engineering problems using advanced spreadsheet applications, dimensional analysis, graphical representation of various physical phenomena, mathematical models and statistics. Various forms of technical communication are emphasized. Credit toward a degree will be given for only one of ENGR 1300 or 1410. Preq: ENGR 1020. Preq or concurrent enrollment: MTHS 1060 or MTHS 1070. Coreq: ENGR 1301.

ENGR 1301 Engineering Fundamentals Laboratory (0) (2) Non-credit laboratory to accompany ENGR 1300. Coreq: ENGR 1300.

ENGR 1410 Programming and Problem Solving (3) (2) Students formulate and solve engineering problems using MATLAB; estimate answers for comparison to computed solutions; read, interpret and write programs, instructions and output; iterate, evaluate conditional statements; and debug. Various forms of technical communication are emphasized. Credit toward a degree will be given for only one of ENGR 1300 or 1410. Includes Honors sections. Preq: ENGR 1020 with a C or better. Preq or concurrent enrollment: MTHS 1060 or MTHS 1070. Coreq: ENGR 1411. Additional prerequisites for honors students. Membership in Calloway Honors College and MTHS 1080 or concurrent enrollment.

ENGR 1411 Programming and Problem Solving Laboratory (0) (2) Non-credit laboratory to accompany ENGR 1410. Coreq: ENGR 1410.

ENGR 1900 Special Projects in Engineering (1-3) Individual or group projects in engineering. Projects may be interdisciplinary in nature and may involve analysis, design, and/or implementation. Instruction in use of necessary tools and test equipment is included when appropriate. May be repeated for a maximum of six credits. Includes Honors sections. Preq: Consent of instructor.
ENGR 2080 Engineering Graphics and Machine Design 2 (1) Introduction to engineering graphics and machine design. Sketching and CAD tools are used to visualize, communicate, rapid prototype and analyze engineering problems. Credit toward a degree will be given only for ENGR 2080, 2090, or 2100. Includes Honors sections. Coreq: ENGR 2081.

ENGR 2081 Engineering Graphics and Machine Design Laboratory 0 (2) Non-credit laboratory to accompany ENGR 2080. Coreq: ENGR 2080.

ENGR 2090 Introduction to Engineering/Computer Graphics 2 (1) Introduction to engineering graphics principles. Sketching and CAD tools are used to visualize, communicate, and perform graphical analysis of engineering problems. Credit toward a degree will be given only for one of ENGR 2080, 2090, or 2100. Coreq: ENGR 2091.

ENGR 2091 Introduction to Engineering/Computer Graphics Laboratory 0 (2) Non-credit laboratory to accompany ENGR 2090. Coreq: ENGR 2090.

ENGR 2100 Computer-Aided Design and Engineering Applications 2 (1) Introduction to graphics applications for engineering and related professions. 2-D and 3-D drawings are used to visualize, communicate, rapid prototype and analyze engineering problems. Engineering applications include site plans, contour plots, grading, and architectural, transportation and hydrology drawings. Credit toward a degree will be given only for one of ENGR 2080, 2090, or 2100. Includes Honors sections. Preq or concurrent enrollment: ENGR 1410 and MTHS 1080. Coreq: ENGR 2101.

ENGR 2101 Computer-Aided Design and Engineering Laboratory Applications 0 (2) Non-credit laboratory to accompany ENGR 2100. Coreq: ENGR 2100.

ENGR 2900 Special Projects in Engineering II 1-3 (1-3) Individual or group projects in engineering. Projects may be interdisciplinary in nature and may involve analysis, design, and/or implementation. Instruction in use of necessary tools and test equipment is included when appropriate. May be repeated for a maximum of six credits. Includes Honors sections. Preq: Sophomore standing and consent of instructor.

ENGR 3000 Special Projects in Engineering III 1-3 (1-3) Individual or group projects in engineering. Projects may be interdisciplinary in nature and may involve analysis, design, and/or implementation. Instruction in use of necessary tools and test equipment is included when appropriate. May be repeated for a maximum of six credits. Includes Honors sections. Preq: Junior standing and consent of instructor.

ENGR 4000 Special Projects in Engineering IV 1-3 (1-3) Individual or group projects in engineering. Projects may be interdisciplinary in nature and may involve analysis, design, and/or implementation. Instruction in use of necessary tools and test equipment is included when appropriate. May be repeated for a maximum of six credits. Includes Honors sections. Preq: Senior standing and consent of instructor.

ENVIRONMENTAL AND NATURAL RESOURCES

Professors: M. Espy, J.D. Lanham, P.A. Layton, T. Straka; Associate Professors: R.F. Baldwin, L. Gering, A. Johnson, C.J. Post, S.R. Templeton; Assistant Professor: K. Barrett; Lecturer: J. Davis

ENR 1010 Introduction to Environmental and Natural Resources I 1 (1) Informative overview of environmental and natural resources and their impact on society. Education and career opportunities are emphasized.

ENR 3020 Natural Resources Measurements 3 (2) Introduction to measurements of natural resources including land, vegetation, animal habitat, water quality and quantity, climate, and recreation. Remote sensing techniques are also introduced. May not be taken for credit by Forest Resource Management majors. Preq or concurrent enrollment: EXST 3010. Coreq: ENR 3021.

ENR 3021 Natural Resources Measurements Laboratory 0 (3) Non-credit laboratory to accompany ENR 3020. Coreq: ENR 3020.

ENR 3120 Environmental Risks and Society 3 (3) Examines the perception, analysis and management of natural and technological risks in modern society, such as how society responds to natural or human-caused disasters and global environmental challenges; and the roles of experts, the government and the general public. Case studies foster debate and critical analysis of controversial issues. Preq: Junior standing. Students must have completed the General Education mathematics requirement.

ENR 4130/4130 Restoration Ecology 3 (3) Applies ecological principles to the restoration of disturbed terrestrial, wetland, and aquatic ecosystems. Includes the restoration of soils and waterways, of flora and fauna, and the natural ecological processes such as plant succession and nutrient cycling. Preq: BIOL 1040 or BIOL 4410 or WFB 3130.

ENR 4160, 6160 Forest Policy and Administration 3 (3) Develops an understanding of the three branches of government that affect and dictate terrestrial use and protection of natural resources. Attention is given to major federal environmental statutes. Includes examination of how policy is developed, implemented, and evaluated in the public and private sectors. Preq: Junior standing.

ENR 4340, 6340 Geographic Information Systems for Landscape Planning 3 (2) Develops competence in geographic information systems (GIS) technology and its application to various spatial analysis problems in landscape planning. Topics include data development and management, spatial analysis techniques, critical review of GIS applications, needs analysis and institutional context. GIS hardware and software, hands-on application. Credit may be received for only one of ENR 4340 or FOR 4340. Coreq: ENR 4341, 6341.

ENR 4341, 6341 Geographic Information Systems for Landscape Planning Laboratory 0 (3) Non-credit laboratory to accompany ENR 4340, 6340. Coreq: ENR 4340, 6340.

ENR 4500, 6500 Conservation Issues 3 (3) Interactive study and discussion of issues related to the conservation of natural resources, emphasizing current issues in the conservation of biodiversity, identification of conflicting issues between consumptive and nonconsumptive resource management, and development of viable solutions for conservation of natural resources. Preq: BIOL 3130 or WFB 3130.

ENVIRONMENTAL SCIENCE AND POLICY

Professor: A.W. Elsnerman; Associate Professor: E.R. Carraway; Assistant Professors: S. Brame, J.T. Coates, M.L. Thompson

ENSP 1250 Sustainable Resource Use 3 (3) This course explores the challenges our society faces in making the transition to renewable resource use in a way that is truly sustainable environmentally, economically and socially. The conflicting demands of each system will be examined and used to critically examine possible solutions using a systems based approach.

ENSP 2000 Introduction to Environmental Science 3 (3) Basic principles of environmental science, including ecology, energy, resources, waste management; and air, water, and soil pollution. Consideration of issues, specific cases, investigative approaches, and remedial actions. Preq: BIOL 1040 or BIOL 1100 or CH 1020 or CH 1060.

ENSP 2010 Introduction to Environmental Science for Education Majors 3 (3) Introduction to basic principles of environmental science including physical science of the environment, energy, resources, waste management, air and water pollution. Emphasizes the practical applications to demonstrations and activities appropriate for the elementary classroom. Credit toward a degree will be given for only one of ENSP 2000 or 2010. Preq: PHSC 1170, PHSC 1180, and BIOL 1090. Preq or concurrent enrollment: MTHS 3160.

ENSP 3150 Environment and Agriculture 3 (3) Survey of the interrelationships of the environment and current agriculture and agricultural practices to include both the environmental impacts of agriculture and the role of agriculture in conservation and improving the environment. Includes Honors sections. Preq: Sophomore standing and one of the following combinations: BIOL 1040 and BIOL 1060; or BIO 1100 and BIOL 1110; or CH 1010 and CH 1020; or CH 1050 and CH 1060.

ENSP 4000 Studies in Environmental Science 3 (3) Study of historical perspectives, attitudes, and government policy within the framework of environmental case studies to illustrate the interaction between human and natural factors as they mutually affect the environment and man's ability to deal with that environment. Preq: ENSP 2000 or EES 2020 or ENR 2570.

ENSP 4720, 6720 Environmental Planning and Control 2 (2) Application of planning and control to effective environmental quality improvement. Considers water supply and treatment, wastewater treatment and disposal, solid waste disposal, air pollution abatement, and land use and zoning from the standpoint of control. Not intended for graduate students in engineering. Preq: Consent of instructor.
Courses of Instruction

ENTOMOLOGY

Professors: P.H. Adler, R.G. Bellinger, E.P. Benson, J.D. Culin, P.A. Zungoli; Associate Professor: M.W. Turnbull

ENT 2000 Six-Legged Science 3 (3) Introduction to insects, their various relationships with humans, other animals, and plants. The general nature of this course makes it beneficial to all students regardless of specialty. Not open to students who have received credit for ENT 3010 or equivalent.

ENT 2010 Selected Topics 1 (1) Discussion course covering topics dealing with insects and related arthropods. Subjects are chosen to reflect issues of current interest as well as those having significance in human history. May be repeated for a maximum of three credits.

ENT 3000 Environmental Entomology 3 (3) Exploration of diversity and roles of insects in natural and affected environments, impact of insects and pesticides on environmental quality, and discussion of environmental ethics in entomological science. Preq: BIOL 1030 or BIOL 1040.

ENT 3010 Insect Biology and Diversity 4 (3) Introduction to the study of insects, with emphasis on their structure, function, ecology, and behavior. Identification of commonly encountered species is highlighted. Relationships between insect and human populations are discussed. Control technologies are introduced, with emphasis on environmentally responsible tactics. Offered fall semester only. Coreq: ENT 3011.

ENT 3011 Insect Biology and Diversity Laboratory 0 (3) Non-credit laboratory to accompany ENT 3010. Coreq: ENT 3010.

ENT 3080 Apiculture 3 (2) Detailed study of the honey bee and its economic importance in pollination and honey production. Attention is given to bee behavior, colony management, equipment, honey-plant identification, and honey production and processing. Preq: BIOL 1040 and BIOL 1060; or BIOL 1110; and consent of instructor. Coreq: ENT 3081.

ENT 3081 Apiculture Laboratory 0 (3) Non-credit laboratory to accompany ENT 3080. Coreq: ENT 3080.


ENT 4001, 6001 Insect Morphology Laboratory 0 (3) Non-credit laboratory to accompany ENT 4000, 6000. Coreq: ENT 4000, 6000.

ENT 4040, 6040 Urban Entomology 3 (3) Study of pests common to the urban environment with emphasis on arthropod pest biology, pest importance, and management strategies. Students learn both theoretical and practical aspects of urban pest management. Includes Honors sections. Preq: BIOL 1030 and BIOL 1040; or BIOL 1100 and BIOL 1110; or ENT 3010.

ENT 4060, 6060 Diseases and Insects of Turfgrasses 2 (2) Host-parasite relationships, symptomatology, diagnosis, economics, and control of infectious diseases of turfgrasses and life histories, diagnosis, and control of important insect pests of turfgrasses. Preq: ENT 3010 and PLPA 3100.

ENT 4070, 6070 Applied Agricultural Entomology 4 (3) Topics include recognition, biology, damage, and control of economically important insects and mites found on major Southeastern field, fruit, nut, and vegetable crops. Principles and practices of crop protection, including pesticide application, economic basis for decision making, and development of scouting programs are introduced. Preq: ENT 3010. Coreq: ENT 4071, 6071.

ENT 4071, 6071 Applied Agricultural Entomology Laboratory 0 (3) Non-credit laboratory to accompany ENT 4070, 6070. Coreq: ENT 4070, 6070.

ENT 4080, 6080 Diseases and Insects of Turfgrasses Laboratory 1 (1) Laboratory to complement PLPA 4060 or ENT 4060 to learn symptomatology, diagnosis, and control of infectious diseases of turfgrasses and diagnosis of damage caused by important insect pests of turfgrasses. Preq: PLPA 4060 or ENT 4060.

ENT 4090, 6090 Urban Entomology Laboratory 1 (3) Identification of household and structural pests common to the urban environment. Students also gain hands-on experience in termite and general pest control. Includes Honors sections. Preq: BIOL 1030 and BIOL 1040; or BIOL 1100 and and BIOL 1110; or ENT 3010. Preq or concurrent enrollment: ENT 4040.

ENT 4150, 6150 Insect Taxonomy 3 (1) Identification of the principal families of the major orders of adult insects. Laboratory work consists of intensive practice of such identification. Lecture material deals with theoretical discussion of taxonomic features observed in the laboratory. Preq: BIOL 4000 or ENT 4000. Coreq: ENT 4151, 6151.

ENT 4151, 6151 Insect Taxonomy Laboratory 0 (6) Non-credit laboratory to accompany ENT 4150, 6150. Coreq: ENT 4150, 6150.

ENT 4160, 6160 Insect Behavior 3 (2) Fundamentals of insect behavior in an evolutionary and ecological perspective. Laboratory emphasizes generation and testing of hypotheses and observation, description, and quantification of insect behavior. Preq: ENT 3010. Coreq: ENT 4361, 6361.

ENT 4361, 6361 Insect Behavior Laboratory 0 (3) Non-credit laboratory to accompany ENT 4360, 6360. Coreq: ENT 4360, 6360.

ENT 4610 Directed Research in Entomology 1-3 (1-3) Development of a senior thesis based on a research problem in a selected entomological area. Emphasis is on integrating the knowledge gained in the students program with the results of the research project. May be repeated for a maximum of three credits. Preq: Senior standing and consent of instructor.

ENT 4690, 6690 Aquatic Insects 3 (1) Identification, life history, habitats, and interrelationships of aquatic insects; techniques of qualitative field collecting; important literature and research workers. Includes Honors sections. Preq: ENT 3010. Coreq: ENT 4691, 6691.

ENT 4691, 6691 Aquatic Insects Laboratory 0 (6) Non-credit laboratory to accompany ENT 4690, 6690. Coreq: ENT 4690, 6690.

ENT 4900 Practicum 1-4 (1-4) Supervised entomological learning opportunity providing highly individualized experiences to complement other programs and courses. Must be prearranged at least two months in advance. Students must file written reports midway during enrollment period and at its conclusion and must appear for oral evaluation at the end of the period. Preq: Junior standing and consent of instructor.

ENT 4950, 6950 Insect Biotechnology 3 (3) Considers many unique genetic features exhibited by insects and describes the applications of biotechnology to enhance useful products from insects and to affect the control of destructive insects. Preq: ENT 3010 and GEN 3020.

ENT 4960 Selected Topics in Creative Inquiry Laboratory 1-2 (1-2) Disciplinary and multidisciplinary projects with the goal of developing the student's ability to discover, analyze, evaluate, and present data. Students are required to document their activities in their ePortfolios. May be repeated for a maximum of six credits. Preq: Consent of instructor.

ENVIRONMENTAL TOXICOLOGY


ETOX 4000, 6000 Wildlife Toxicology 3 (3) Assessment of impacts of toxic substances on reproduction, health, and well-being of wildlife species; acute and chronic effects of agricultural chemicals, pesticides, hazardous waste, industrial waste, and oil releases are discussed. Preq: BCHM 3010 or BCHM 3050; or both CH 2230 and CH 2270 and [BCHM 1040 and BIOL 1060; or BIOL 1110 and WFBP 1500].

ETOX 4210, 6210 Chemical Sources and Fate in Environmental Systems 3 (3) Discusses chemical cycles in the environment on global and microcosm scales. Examines the dependence of fate processes on physical and chemical properties and environmental conditions. Addresses breakdown, movement, and transport of selected toxicants to illustrate the mechanisms that govern chemical fate. Includes Honors sections. Preq: CH 2230 and CH 2270.

ETOX 4300, 6300 Toxicology 3 (3) Basic principles of toxicology, including quantitation of toxicity, toxicokinetics, biochemical action of poisons, and environmental toxicology, are studied. Acute and chronic effects of various classes of poisons (e.g., pesticides, drugs, metals, and industrial pollutants) are discussed in relation to typical routes of exposure and regulatory testing methods. Preq: CH 2230 and CH 2270; and either BIOL 1040 and BIOL 1060; or BIOL 1110.
ETOX 4370, 6370 Ecotoxicology 3 (3) Study of the effects of stressors on the ecosystem. Explores the integrative relationships that comprise the field of ecotoxicology in a hierarchical format that focuses on the various levels of ecological organization. Coreq: ETOX 4300.

ETOX 4460 Soil and Water Quality: Fundamentals 3 (3) Studies those aspects of water quality that are influenced by soil systems. Many water quality concerns arise from land-applied chemicals, natural or manufactured. Basic soil and water chemistry principles including sorption, solution chemistry, and soil chemical transport are studied. Prereq: CSEN 4750 and CH 2240.

ETOX 4470 Soil and Water Quality: Applications 3 (3) Potential for water quality concerns arising from land application of natural or manufactured chemicals is varied. Case studies of potential water quality concerns related to fertilizers, pesticides, biosolids, manures, and other sources are presented. Practices that can improve water quality are also studied and evaluated. Prereq: CH 2240 and CSEN 4750.

ETOX 4850, 6850 Environmental Soil Chemistry 3 (3) Study of soil chemical processes (sorption, desorption, ion exchange, precipitation, dissolution, and redox reactions) of nutrients and inorganic and organic contaminants in soils and organic matter. Chemical complex equilibria and adsorption phenomena at the solid (soil, sediment, and mineral) water interface are emphasized. Prereq: CH 1020 or CSEN 2020.

EXPERIMENTAL STATISTICS


EXST 3010 Introductory Statistics 3 (2) Basic concepts and methods of statistical inference; organization and presentation of data, elementary probability, measures of central tendency and variation, tests of significance, sampling, simple linear regression and correlation. Stresses the role of statistics in interpreting research and the general application of the methods. Credit toward a degree will be given for only one of EXST 3010, MTHS 3010, 3020, 3090. Includes Honors sections. Coreq: EXST 3011.

EXST 3011 Introductory Statistics Laboratory 0 (2) Non-credit laboratory to accompany EXST 3010. Coreq: EXST 3010.

EXST 4020, 6020 Introduction to Statistical Computing 3 (3) Introduction to statistical computing packages. Topics include data importation, basic descriptive statistic computation, basic graphic preparation, and statistical analysis methods and procedures. Prereq: EXST 3010.

EXST 4110, 6110 Statistical Methods for Process Development and Control 3 (3) Experimental design techniques for use in process development and application of screening experiments and response surface experiments, techniques for process control with implications for product quality control. Includes discussions of the use of statistical computer analyses and interpretations including computer-generated graphics. Prereq for EXST 4110: MTHS 2060. Prereq for EXST 6110: MTHS 2060 or consent of instructor.

EXST 4620 Statistics Applied to Economics 3 (3) Continuation of EXST 3010 emphasizing statistical methods used in the collection, analysis, presentation, and interpretation of economic data. Special attention is given to time-series analysis, the construction of index numbers, and the designing of samples for surveys in the social science fields. Coreq: EXST 3010.

FOOD SCIENCE


FDSC 1010 Introduction to Food Science and Human Nutrition 3 (1) Introductory course providing an overview of career opportunities in both food science and human nutrition disciplines. Provides an orientation to principles related to food and human nutrition.

FDSC 1020 Perspectives in Food and Nutrition Sciences 1 (1) Discussion course covering topics related to food science and human nutrition. Subjects include topics of current interest and involve familiarization with scientific literature in nutrition and food sciences. Prereq: Food Science major or minor.

FDSC 2010 Man and His Food 2 (2) Study of food and foods emphasizing nutrients, nutrient needs, and the relationship between nutrient intake and health. Also discusses food additives, nutritional awareness (including nutrition labeling), food protection, and the influence of processing on nutritional quality of food.

FDSC 2140 Food Resources and Society 3 (3) Introduces the basics of food science (food chemistry, food microbiology, and food processing principles) and relates how advances in food science have paralleled societal advances and created social controversy.

FDSC 2150 Culinary Fundamentals 2 (1) Emphasizes the safe handling of food utilizing recognized procedures in equipment safety and sanitation. Cooking methods are investigated, along with ingredient functionality and flavor development. Organizational skills utilized in a real-world environment assist students in preparing, presenting and evaluating their finished products. Prereq: Food Science major. Coreq: FDSC 2151.

FDSC 2151 Culinary Fundamentals Laboratory 0 (3) Noncredit laboratory to accompany FDSC 2150. Prereq: Food Science major. Coreq: FDSC 2150.

FDSC 2160 Fundamentals of Baking Science 2 (1) Emphasizes the science of baking, ingredient functionality, formulas and Bakers Percentages, and various mixing methods used to produce an array of baked products. Organizational skills utilized in a real world environment, assist students in preparing, presenting and evaluating their finished products. Prereq: Food Science major. Coreq: FDSC 2161.

FDSC 2161 Fundamentals of Baking Science Laboratory 0 (3) Noncredit laboratory to accompany FDSC 2160. Prereq: Food Science major. Coreq: FDSC 2160.

FDSC 2500 Culinary Science Internship 0 (0) Students experience the science and art of food preparation, with the ultimate object of improving the ease of manufacture as well as the overall quality and nutrition of the food produced. Students are able to observe, interact, and practice principles of culinary sciences. To be taken Pass/No Pass only. Prereq: FDSC 2150.

FDSC 3010 Food Regulation and Policy 1 (1) Identifies the role of the FDA and FSIS in food regulations, regulatory compliance and enforcement. Other agencies involved in peripheral decisions are also discussed (U.S. Customs, EPA, USDA-AMS, USDA-APHIS, etc.) Introduces food safety concepts, such as HACCP, GMPs, SSOps, and food defense/security. Prereq: Food Science or Packaging Science major or minor; and BCHM 3050 and FDSC 2140.

FDSC 3040 Evaluation of Dairy Products 2 (1) Emphasizes sensory evaluation of dairy products. Discusses basic principles of organoleptic evaluation, fundamental rules for scoring and grading dairy products; evaluation of all classes of dairy products based on established grades and score cards. Prereq: Food Science major or minor. Coreq: FDSC 3041.

FDSC 3041 Evaluation of Dairy Products Laboratory 0 (2) Non-credit laboratory to accompany FDSC 3040. Coreq: FDSC 3040.

FDSC 3060 Institutional Foodservice Management 3 (3) Principles of management of resources in institutional food service systems. Emphasizes financial management, menu planning, principles of quantity food production, and safety and sanitation. Prereq: Food Science major.
Courses of Instruction

FDSC 3070 Restaurant Food Service Management 3 (3) Essentials of successful operation of restaur-
ants, including menu design and pricing, market-
ing, customer satisfaction, purchasing, kitchen 
operations, and employment relationships.

FDSC 3500 Food Science Internship 0 (0) Summer 
internship offered by Food Science and Human 
Nutrition and Packaging Sciences Department 
and the Clemson Micro-Creamery and Food 
Manufacturing Industries. Students are able to 
observe, interact, and practice principles of food 
science within the food industry. To be taken Pass/ 
No Pass only. Preq: FDSC 2140.

FDSC 4010, 6010 Food Chemistry I 3 (3) Basic 
composition, structure, and properties of foods and 
the chemistry of changes occurring during 
processing utilization. Includes Honors sections. 
Preq for FDSC 4010: Food Science or Packaging 
Science major or minor and BCHM 3050. Preq for 
FDSC 6010: BCHM 3050 or consent of instructor.

FDSC 4020, 6020 Food Chemistry II 3 (3) Application 
of theory and procedures for quantitative 
and qualitative analysis of food ingredients and 
food products. Methods for protein, moisture, 
lipid, carbohydrate, ash, fiber, rancidity, color, 
and vitamin analyses and tests for functional properties of 
ingredients are examined. Includes Honors sections. 
Preq for FDSC 4020: Food Science major or minor and 
BCHM 3050. Preq for FDSC 6020: 
BCHM 3050 or consent of instructor.

FDSC 4030, 6030 Food Chemistry and Analysis 
2 (1) Principles of analytical procedures and 
techniques used to quantitatively and qualitatively determine chemical composition of foods, and 
elucidate the physio-chemical properties of food 
materials. Laboratories provide experience in criti-

cal thinking, performing food analysis, and analyz-
ing data. Preq for FDSC 4030: Food Science major 
or minor and BCHM 3050 and BIOL 4340 and 
FDSC 2140. Coreq: FDSC 4031. Preq for FDSC 
6030: BCHM 3050 and BIOL 4340 or consent of 
instructor. Coreq: FDSC 6031.

FDSC 4031, 6031 Food Chemistry and Analysis Laboratory 0 (3) Non-credit laboratory to accompany 
FDSC 4030, 6030. Coreq: FDSC 4030, 6030.

FDSC 4040, 6040 Food Preservation and Processing 3 (3) Principles of food preservation applied to food 
processes, ingredient functions, and importance of 
composition and physical characteristics of foods 
related to their processing; product recalls and 
product development concepts. Preq for 4040: 
Food Science or Packaging Science major or minor; 
and BCHM 3050 and one of FDSC 2140 or 
FDSC 3010; and one of PHYS 1220 or PHYS 2000 
or PHYS 2070. Preq for 6040: BCHM 3050 and one 
of FDSC 2140 or FDSC 3010; and one of PHYS 
1220 or PHYS 2000 or PHYS 2070.

FDSC 4060, 6060 Food Preservation and Processing 
Laboratory 1 (1) Laboratory exercises on preservation methods, equipment utilized, and 
processes followed in food manufacture. Preq: 
FDSC 4040.

FDSC 4070, 6070 Quantity Food Production 2 (1) 
Principles of the production of food in quantity for 
use in food service systems. Emphasizes functions of 
components of foods and of ingredients in food, 
and focuses on the quality of the final product, 
on safe production of food, and on proper use of 
equipment. Preq for FDSC 4070: Food Science 
or Packaging Science major or minor. Coreq for 
FDSC 4070: FDSC 4071. Coreq for FDSC 6070: 
FDSC 6071.

FDSC 4071, 6071 Quantity Food Production Labora-
	ry 0 (3) Non-credit laboratory to accompany 
FDSC 4070, 6070. Coreq: FDSC 4070, 6070.

FDSC 4080, 6080 Food Process Engineering 4 (3) Study of basic engineering principles and their application in food processing operations. Emphasizes the relation between engineering principles and fundamentals of food processing. Preq for FDSC 4080: Food Science major or minor; and CH 1020 and 
FDSC 2140; and one of MTHS 1020 or MTHS 1060; and one of PHYS 1220 or PHYS 2000 or PHYS 2070. Preq for FDSC 6080: CH 1020 and 
FDSC 2140; and one of MTHS 1020 or MTHS 1060; and one of PHYS 1220 or PHYS 2000 or PHYS 2070. Coreq: FDSC 4081, 6081.

FDSC 4081, 6081 Food Process Engineering Labora-

try 0 (3) Non-credit laboratory to accompany 
FDSC 4080, 6080. Coreq: FDSC 4080, 6080.

FDSC 4090, 6090 Total Quality Management for 
the Food and Packaging Industries 3 (3) Introduction to the principles of modern quality management emphasizing quality standards and issues and the practices necessary for food processing and packaging companies to survive in a customer-
driven marketplace.

FDSC 4100, 6100 Food Product Development 
4 (3) A strategic and systems approach to integrated product development practices for developing new food products within a team setting. Focuses on the Stage-Gate process for moving from product idea to launch and application of sensory analysis techniques. Preq for 4100: Food Science major or minor and Junior standing. Preq or concurrent enrollment for FDSC 4100. FDSC 4030. Coreq: 
FDSC 4101, 6101.

FDSC 4101, 6101 Food Product Development Labora-

try 0 (3) Non-credit laboratory to accompany 
FDSC 4100, 6100. Coreq: FDSC 4100, 6100.

FDSC 4170 Seminar 1 (1) Literature research and 
oral presentation of a current food science topic. 
Preq: Food Science major.

FDSC 4180 Seminar 1 (1) Literature research and 
oral presentation of a current food science topic.

FDSC 4200 Special Topics in Food Science 1-3 (1-3) Special topics in food science not covered in other 
courses. May be repeated for a maximum of 12 credits, but only if different topics are covered. Includes 
Honors sections. Preq: Consent of instructor.

FDSC 4210 Special Problems in Food Science 1- 
4 (1-4) Independent research investigation in food science areas not conducted in other courses. May be repeated for a maximum of 12 credits. Includes 
Honors sections. Preq: Consent of instructor.

FDSC 4300, 6300 Dairy Processing and Sanitation 
3 (2) Processing, manufacture and distribution of 
fluid, frozen, cultured and other dairy products. 
Emphasizes sanitation in a commercial food processing plant environment, chemical and 
microbiological aspects, processing procedures, 
equipment operation, ingredient applications, 
formulaion and functional properties. Preq: BIOL 
1040 and BIOL 1060 and CH 1020. Coreq: FDSC 
4301, 6301.

FDSC 4301, 6301 Dairy Processing and Sanitation 
Laboratory 0 (3) Non-credit laboratory to accompany 

FDSC 4500 Creative Inquiry—Food Science 1-6 
(1-6) Individual or small team research experience in close collaboration with a faculty member. 
Expands undergraduate learning by application of the scientific method. Research is selected by the 
student with approval of faculty. May be repeated for a maximum of ten credits.

FDSC 4910 Practicum 1-4 (1-4) Supervised experi-

tional opportunities in the food industry. May be 
repeated for a maximum of 12 credits. Preq: Food 
Science major and Junior standing and consent of 
department chair.

FINANCE

Professors: J.C. Alexander Jr., M.F. Spivey, T.M. 
Springer, N.G. Waller; Associate Professors: J.M. 
Harris Jr., A.G. Morgan, J.G. Wolf, F. Xie; Assistant 
Professors: G.B. Lockhart, T. Tang; Lecturer: K.D. 
McMillan

FIN 3010 Personal Finance 3 (3) Analysis of the 
preparations of personal financial plans. Topics 
include savings and budgeting, personal taxes, 
housing and automobile decisions, loans, insurance 
needs, investments, and retirement needs. May not 
be counted toward a major or minor in Financial 
Management.

FIN 3040 Risk and Insurance 3 (3) Studies the 
nature of risk and the role of insurance in risk 
management from individual and business view-
points. Topics include probability, theory of the 
firm under uncertainty, insurance carriers and 
contracts, underwriting, and regulation. Preq: FIN 
3060 or FIN 3110.

FIN 3050 Investment Analysis 3 (3) Study of tech-

niques useful in analyzing alternative investment opportunities with emphasis on corporate securi-
ties. Investment planning and portfolio manage-
ment are considered. Preq: FIN 3060 or FIN 3110, 
each with a C or better.

FIN 3060 Corporation Finance 3 (3) Introduction 
to financial management of nonfinancial firms. 
Includes such topics as analysis of financial state-
ments, financial forecasting, capital budgeting, 
working capital management, and long-term 
financing decisions. Credit may not be received 
for both FIN 3060 and 3100. Preq: ACCT 2010; and 
one of the following courses: EXST 3010 or 
IE 3060 or MTHS 3010 or MTHS 3020 or MTHS 
3090 or PSYC 3090.

FIN 3070 Principles of Real Estate 3 (3) Acquaints 
students with the theories, practices, and principles 
that govern real estate markets. Major emphasis is 
on specifics of real estate brokerage, property rights, 
and ownership; making real estate investment deci-
sions; and financing real estate investments. Preq: 
FIN 3060 or FIN 3110, each with a C or better.
FIN 3080 Financial Institutions and Markets 3 (3)
Study of the various types of financial institutions and of topics critical to the financial institutions practitioner. Topics include financial regulations, financial security types and their yields, interest rate risk management, foreign currency risks management, and stock index futures. Preq: FIN 3060 or FIN 3110, each with a C or better.

FIN 3110 Financial Management I 3 (3)
First in a two-course sequence to provide in-depth exposure to the theory and practice of corporate financial management and to demonstrate how financial management techniques are applied in decision making. Credit may not be received for both FIN 3060 and 3110. Includes Honors sections. Preq: ACCT 2010 and 2040, each with a C or better; and one of the following: EXST 3010 or IE 3610 or MTHS 3010 or MTHS 3020 or MTHS 3090 or PSYC 3090.

FIN 3120 Financial Management II 3 (3)
Continuation of the two-course sequence that begins with FIN 3110. Includes Honors sections. Preq: FIN 3060 or FIN 3110, each with a C or better.

FIN 3980 Creative Inquiry—Finance 1-4 (1-4)
In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of six credits. Preq: Consent of faculty member/mentor.

FIN 3990 Finance Internship 1-3 (1-3)
Pre-planned, pre-approved, faculty-supervised internships to give students on-the-job learning in support of classroom education. Internships must be no fewer than six full-time, consecutive weeks with the same internship provider. Restricted to students with a major or minor in Financial Management. To be taken Pass/No Pass only. Preq: Consent of instructor.

FIN 4020, 6020 Advanced Corporate Finance 3 (3)
Study of the decision process and analytical techniques used in evaluating corporate investment and financing decisions. Topics include capital budgeting, capital structure and bankruptcy, valuation, corporate governance, executive compensation, mergers and acquisitions, and restructurings. Includes Honors sections. Preq: FIN 3120 with a C or better.

FIN 4040 Financial Modeling 3 (3)
Helps students develop the practical skills that combine theory, business planning, and forecasting needed to make financial decisions. Emphasizes the use of spreadsheet software used to set up and solve these models. Topics include financial statement analysis, valuation, and cost of capital. Includes Honors sections. Preq: FIN 3120 with a C or better; and either CPSC 2200 or MGT 2180.

FIN 4050 Portfolio Management and Theory 3 (3)
Introduction to portfolio management. Includes the underlying theory, managing the equity and the fixed-income portfolios, portfolio evaluation, options-pricing theory, futures markets and instruments. Includes Honors sections. Preq: FIN 3050 with a C or better.

FIN 4060, 6060 Analysis and Use of Derivatives 3 (3)
Consideration of the option pricing theory and strategy techniques most commonly used in the market for options. Also considers an overview of the futures markets. Special emphasis is given to interest-rate futures, stock-index futures, and foreign-exchange futures. Includes Honors sections. Preq: FIN 3550 with a C or better.

FIN 4080 Management of Financial Institutions 3 (3)
Detailed study of the operational, marketing, and regulatory aspects of the management of depository financial institutions. Emphasizes decision making through the extensive use of cases. Preq: FIN 3080 with a C or better.

FIN 4090 Professional Financial Planning 3 (3)
Concepts and practical implementation of professional financial planning focusing on essentials of budgeting and saving, risk management, tax planning, investment planning, and retirement and estate planning. Emphasizes integrating these elements into a comprehensive personal financial plan. Preq: ACCT 4040 and ACCT 4080 and FIN 3400 and FIN 3500.

FIN 4100 Research in Finance I 3 (1-3) Directed research for students interested in careers in finance. Research topic is selected by student and approved by instructor. A formal research paper is required. Includes Honors sections. Preq: FIN 3060 or FIN 3120; and consent of instructor.

FIN 4110 International Financial Management 3 (3)
Extension of the principles of finance to the international context. Focuses on implications of the existence of multiple currencies and the operations across borders of sovereign nation-states for the multinational corporation. Preq: FIN 3060 or FIN 3120 with a C or better.

FIN 4150, 6150 Real Estate Investment 3 (3)
Focuses on the structure and analysis of real estate investment emphasizing financial theory and analysis techniques. Case study and project-oriented homework assignments facilitate the understanding of real estate investments. Preq: FIN 3070 with a C or better.

FIN 4160, 6160 Real Estate Valuation 3 (3) Advanced course in commercial real estate valuation. Topics include income capitalization, cash equiva-

lency, highest and best use analysis, the cost approach, direct sales comparison approach, and DCF analysis. Preq: FIN 3070 with a C or better.

FIN 4170, 6170 Real Estate Finance 3 (3)
Advanced course applying financial analysis and theory to real estate. Emphasizes mortgage credit analysis and current financing techniques for residential and commercial properties. Topics include financial institutions, syndications, and construction financing. Preq: FIN 3070 with a C or better.

FIN 4980 Creative Inquiry—Finance 1-4 (1-4)
In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registra-

tion. May be repeated for a maximum of six credits. Preq: Consent of faculty member/mentor.

FORESTRY AND NATURAL RESOURCES

Professors: J.D. Lanham, P.A. Layton, Director; G.K. Yarrow; Associate Professors: R.F. Baldwin, W.R. Eng-

lish, E. Mikhailova, C.J. Post; Extension Associate: R.D. Willey.

FNR 1020 Forestry and Natural Resources Fresh-

man Portfolio 1 (4) Informative sketch of forestry, wildlife biology, and natural resources; education and career opportunities for natural resource professionals. Students initiate their Web-based student portfolios, which showcase their skills and experiences (e.g., résumés, accomplishments, and work samples) during their undergraduate degree. To be taken Pass/No Pass only. Restricted to students enrolled in one of the following majors: Environmental and Natural Resources; or Forest Resource Management; or Forestry and Natural Resources Undeclared; or Wildlife and Fisheries Biology.

FNR 2040 Soil Information Systems 4 (3) Includes input, storage, analysis, and output of soil informa-
tion through the use of global positioning systems, remote sensing, geographic information systems, and soil survey. Provides fundamental knowledge of the role of soils in forest and wildlife management. Preq: One of the following combinations: CH 1010 and CH 1020; or CH 1050 and CH 1060. Coreq: FNR 2041.

FNR 2041 Soil Information Systems Laboratory 0 (3) Non-credit laboratory to accompany FNR 2040. Coreq: FNR 2040.

FNR 4660, 6660 Stream Ecology 3 (2) Covers the ecology of flowing water systems. Topics include geomorphology, physical and chemical factors of streams, biology of stream-dwelling organisms, trophic relationships, competition, colonization, drift, community structure, disturbance, and human impacts. Preq: Junior standing. Coreq: FNR 4661, 6661.

FNR 4661, 6661 Stream Ecology Laboratory 0 (3) Non-credit laboratory to accompany FNR 4660, 6660. Coreq: FNR 4660, 6660.

FNR 4700 Creative Inquiry 1-3 (1-3) Multi-semester commitment to participate in forestry and natural resources research with a group of peers, mentored by a faculty member or advanced graduate student. Students learn to collect, analyze, evaluate, and present information. May be repeated for a maximum of six credits. Preq: Consent of instructor.

FNR 4900 Field Training in Natural Resources 3 (9) Four to eight week internship in which students work in natural resources. Students have supervised management responsibility. Total of 1350 hours required. Must be arranged at least two months in advance. To be taken Pass/No Pass only. Preq: Senior standing in one of the following majors: Environmental and Natural Resources; or Forestry; or Wildlife and Fisheries Biology.

FNR 4910 Senior Honors Thesis I 3 (3) Individual research for students in the Forestry and Natural Resources Honors Program. Focuses on developing a plan of research under the direction of a faculty advisory committee. Preq: Senior standing, mem-

bership in Calhoun Honors College, and consent of instructor.
Courses of Instruction

FNR 4920 Senior Honors Thesis II 3 (3) Individual natural resources research for students in the Forestry and Natural Resources Honors Program. Focuses on data collection, analysis, report writing, and oral presentation. Preq: FNR 4910.

FNR 4990 Natural Resources Seminar 1 (1) Exploration of current literature and research in natural resources. Students participate in the analysis of research findings, utilizing skills acquired in their undergraduate programs. May be repeated for maximum of two credits.

FORESTRY


FOR 1010 Introduction to Forestry 1 (1) Informative sketch of forestry, forests, and forestry tasks of the nation. Includes education and career opportunities for foresters. Offered fall semester only.

FOR 2050 Dendrology 2 (1) Classification, nomenclature, and identification of the principal forest trees of the United States, their geographical distribution, ecological requirements, and economic importance. Includes field identification of native trees and commonly planted exotics of the Southeast. Preq: BIOL 1030 and BIOL 1050. Coreq: FOR 2051 and FOR 2210.

FOR 2051 Dendrology Laboratory 0 (3) Non-credit laboratory to accompany FOR 2050. Coreq: FOR 2050.

FOR 2060 Forestry Ecology 3 (2) Study of the nature of forests and forest trees, how they grow, reproduce, and their relationships to the physical and biological environment. Offered spring semester only. Preq: BIOL 1030 and BIOL 1050; or CSSN 2020; or FOR 2050. Coreq: FOR 2061.

FOR 2061 Forestry Ecology Laboratory 0 (3) Non-credit laboratory to accompany FOR 2060. Coreq: FOR 2060.

FOR 2110 Forest Biology 3 (3) Study of woody plant form and function, wood properties, general physiology and forest biomes of North America. Presented as a companion course to dendrology lab. Preq: BIOL 1030 and BIOL 1050. Coreq: FOR 2050.

FOR 2270 Arboricultural Field Techniques 1 (3) Skills and techniques required to safely climb trees for tree maintenance. Emphasizes safety, proper equipment, and basic tree maintenance treatments. To be taken Pass/No Pass only.

FOR 2510 Forest Communities 2 (6) Study of forest plant species and their successful status and habitat requirements with respect to landform, soil type, and other appropriate aspects of site classification. Preq: FOR 2050.

FOR 2520 Forest Operations 1 (3) Introduction and tour of forest operations activities throughout South Carolina. Includes timber harvesting, site preparation, and applied silvicultural processes. Preq: Junior standing.

FOR 2530 Forest Mensuration 4 (12) Introduction to measurements of land, individual trees, forest stands, forest products, and the application of mensurational techniques to the statistical and physical design of forest sampling methods, including measurement techniques of non-timber components of forest resources. Preq: FOR 2050.

FOR 2540 Forest Products (Summer Camp) 1 (3) Tour of the forest products industry of South Carolina emphasizing those products and processes of some distinction or special interest. Preq: FOR 2050.

FOR 3000 Christmas Tree Production 2 (2) Theory and practice of establishing, managing, and marketing trees emphasizing Christmas tree production in the South. Preceptor Consent of instructor.

FOR 3020 Forest Biometrics 2 (1) Application of statistical methods to forestry problems, including sampling theory and methods, growth measurements and prediction, and application of micro-computing to analysis of forestry data. Preq: FOR 2530. Preq or concurrent enrollment: EXST 3010. Coreq: FOR 3021.

FOR 3021 Forest Biometrics Laboratory 0 (3) Non-credit laboratory to accompany FOR 3020. Coreq: FOR 3020.

FOR 3040 Forest Resource Economics 3 (3) Economic problems and principles involved in the utilization of forest resources and distribution of forest products. Includes analysis of integrated forest operations. Preq: FACS 2570, ECON 2000, or ECON 2110, or ECON 2120.

FOR 3050 Woodland Management 3 (2) Compendium of forestry subjects providing a broad view of the forest environment and its relation to ecology, management, and utilization of forests, especially those of S.C. Field and laboratory exercises in the fundamentals of forest management. Not open to Resource Management majors. Preq: BIOL 1030 and BIOL 1050. Coreq: FOR 3051.

FOR 3051 Woodland Management Laboratory 0 (3) Non-credit laboratory to accompany FOR 3050. Coreq: FOR 3050.

FOR 3080 Remote Sensing in Forestry 2 (1) Introduction to remote sensing, aerial photo interpretation, computer mapping, aerial photo timber estimating, and geographical information systems. Preq: FOR 2510 and FOR 2520 and FOR 2530 and FOR 2540. Coreq: FOR 3081.

FOR 3081 Remote Sensing in Forestary Laboratory 0 (3) Non-credit laboratory to accompany FOR 3080. Coreq: FOR 3080.

FOR 3140 Harvesting and Forest Products 4 (3) Harvesting of forest products, structure and properties of economically important timbers, and production and properties of primary forest products. Preq: Preq: FOR 2510 and FOR 2520 and FOR 2530 and FOR 2540. Coreq: FOR 3141.

FOR 3141 Harvesting and Forest Products Laboratory 0 (3) Non-credit laboratory to accompany FOR 3140. Coreq: FOR 3140.

FOR 3150 Woodland Ecology 3 (3) Overview of the forest emphasizing living and nonliving components of the woodland habitat. Understanding man's use of the forest and interpreting the signs of plants, wildlife, and landscapes.

FOR 3160 Wood Procurement Practices in the Forest Industry 3 (3) Study of wood raw material procurement practices currently employed by the forest products industry, including pulp, paper, and related areas. Preq: FOR 2510 and FOR 2520 and FOR 2530 and FOR 2540.

FOR 4000, 6000 Public Relations in Natural Resources 3 (3) Identifying relevant policies, their characteristics and acceptance to natural resource management, and techniques of maintaining appropriate public relations. Preq: Senior standing.


FOR 4061 Forested Watershed Management Laboratory 0 (3) Non-credit laboratory to accompany FOR 4060. Coreq: FOR 4060.

FOR 4080, 6080 Wood and Paper Products 3 (3) Study of wood structures and identification; physical and mechanical properties of wood products; standard testing procedures; manufacture of lumber, plywood, oriented strand board; drying, preservation, grading, and use of wood products. Also discusses common grades of paper and paperboard; fiber sources; pulping and papermaking equipment and processes; chemical recovery process; and environmental issues. Preq: Junior standing.

FOR 4100, 6100 Harvesting Processes 4 (3) Study of forest harvesting processes with detailed analysis of production, cost, environmental impacts, safety, transportation, and business considerations. Preq: Senior standing. Coreq: FOR 4101, 6101.

FOR 4101, 6101 Harvesting Processes Laboratory 0 (3) Non-credit laboratory to accompany FOR 4100, 6100. Coreq: FOR 4100, 6100.


FOR 4131, 6131 Integrated Forest Pest Management Laboratory 0 (3) Non-credit laboratory to accompany FOR 4130, 6130. Coreq: FOR 4130, 6130.

FOR 4150, 6150 Forest Wildlife Management 3 (2) Principles, practices, and problems of wildlife management emphasizing upland forest game species. Habitat manipulation through use of appropriate silvicultural practices in association with other techniques is evaluated. Preq: FOR 4600. Coreq: FOR 4151, 6151.

FOR 4151, 6151 Forest Wildlife Management Laboratory 0 (3) Non-credit laboratory to accompany FOR 4150, 6150. Coreq: FOR 4150, 6150.

FOR 4160, 6160 Forest Policy and Administration 3 (3) Introduction to the development, principles, and legal provisions of forest policy in the United States and an examination of administrative and executive management in forestry.

FOR 4170, 6170 Forest Resource Management and Regulation 3 (3) Fundamental principles and analytical techniques in planning, management, and optimization of forest operations. Preq: FOR 3020 and FOR 3080 and FOR 4180 and FOR 4650.
FOR 4180, 6180 Forest Resource Valuation 3 (3) Analysis of capital investment tools and their application to decision making among forestry investment alternatives; valuation of land, timber, and other resources associated with forestry, including the impact of inflation and taxes. Preq: FOR 3040.

FOR 4190 Senior Problems 1-3 (1-3) Problems chosen with faculty approval in selected areas of forestry. With department chairs approval, may be repeated once for credit. Preq: Senior standing.

FOR 4230, 6330 Current Issues in Natural Resources 2 (2) Lectures in various fields of forestry delivered by selected representatives from forest industries, consultants, agencies, associations, and other forestry operations. Will not be taught when enrollment is less than 15. To be taken Pass/No Pass only. Preq: Junior standing.


FOR 4251 Forest Resource Management Plans Laboratory 0 (3) Non-credit laboratory to accompany FOR 4250. Coreq: FOR 4250.

FOR 4260 Forest Resource Management Plans Seminar 1 (1) In-depth exploration of topics and problems presented in FOR 4250. To earn honors credit, students must be enrolled in corequisite FOR 4250 and earn a B or better in both courses. Includes Honors sections. Preq: Senior standing and consent of instructor. Preq or concurrent enrollment: FOR 4250.

FOR 4270, 6270 Urban Tree Care 3 (3) Principles, practices, and problems of protecting and maintaining trees in urban and recreational areas. Examines environmental and biological factors affecting trees in high-use areas, their management and cultural requirements, and the practices necessary for their protection and care as valuable assets in the landscape. Preq for FOR 4270: FOR 2050 or HORT 3030. Preq for 6270: Consent of instructor.

FOR 4310, 6310 Recreation Resource Planning in Forest Management 2 (1) Analysis of forest recreation as a component of multiple-use forest management; techniques of planning; physical and biological effects on forest environments; and forest site, user, and facility management. Coreq: FOR 4311, 6311.

FOR 4311, 6311 Recreation Resource Planning in Forest Management Laboratory 0 (3) Non-credit laboratory to accompany FOR 4310, 6310. Coreq: FOR 4310, 6310.

FOR 4330, 6330 GPS Applications 3 (2) Develops competence in global positioning system (GPS) technology, including theory, methods, and application to natural resources mapping. Topics include basic concepts of GPS; projection systems; types of data; mission planning and data capture, correction, and export to geographical information systems (GIS). Preq: FOR 4331, 6331.

FOR 4331, 6331 GPS Applications Laboratory 0 (3) Non-credit laboratory to accompany FOR 4330, 6330. Coreq: FOR 4330, 6330.

FOR 4340, 6340 Geographic Information Systems for Landscape Planning 3 (2) Develops competence in geographic information systems (GIS) technology and its application to various spatial analysis problems in landscape planning. Topics include data development and management, spatial analysis techniques, critical review of GIS applications, needs analysis and institutional context. GIS hardware and software, hand-on application. Credit may be received for only one of ENR 434 or FOR 4340. Coreq: FOR 4341, 6341.

FOR 4341, 6341 Geographic Information Systems for Landscape Planning Laboratory 0 (3) Non-credit laboratory to accompany FOR 4340, 6340. Coreq: FOR 4340, 6340.

FOR 4410, 6410 Properties of Wood Products 3 (3) Basic properties of wood, including the hygroscopic, thermal, electrical, mechanical, and chemical properties; standard testing procedures for wood. Preq: Junior standing.

FOR 4420, 6420 Manufacture of Wood Products 3 (3) Study of the manufacture of lumber, plywood, poles, piles; drying, preservation, grading, and uses of wood products. Considers the manufacture of particleboard, flakeboard, oriented strandboard, fiberboard, and paper products. Includes physical, mechanical, and chemical properties of wood products. Preq: Consent of instructor.

FOR 4440, 6640 Forest Products Marketing and International Trade 3 (3) Study of marketing and international trade practices currently employed by the forest products industry and the application of basic marketing principles and global trade concepts in the industry's current and future environments. Preq: FOR 4420.

FOR 4470 Special Problems in Forest Products 1-3 (1-3) Laboratory, library, or field study of problems in selected areas of forest products. Emphasizes the planning, execution of research and the reporting of results. Research must be conducted under the guidance of a Forest Products faculty member. May be repeated for a maximum of three credits, but only if different topics are covered. Preq: Senior standing and consent of instructor.

FOR 4500, 6500 Woody Plant Stress Physiology 3 (3) Structure, function, and physiology of tree shoot and crown growth, wood formation, diameter growth, root growth, and reproduction, especially as related to stress factors. Preq: BIOL 4010 or FOR 4600.

FOR 4510, 6510 Newman Seminar and Lecture Series in Natural Resources Engineering 1 (2) Topics dealing with development and protection of land, air, water, and related resources are covered by seminar with instructor and invited lecturers. Current environmental and/or resource conservation issues are addressed. Includes Honors sections. Preq: Senior standing.

FOR 4610 Silviculture Honors Seminar 1 (1) In-depth exploration of topics and problems presented in FOR 4650. To earn honors credit, students must be enrolled in FOR 4650 and earn a B or better in both courses. Preq: Junior standing and consent of instructor. Preq or concurrent enrollment: FOR 4650.

FOR 4630 Silviculture Honors Seminar II 1 (1) In-depth exploration of topics and problems presented in FOR 4650. To earn honors credit, students must be enrolled in FOR 4650 and earn a B or better in both courses. Preq: Junior standing and consent of instructor. Preq or concurrent enrollment: FOR 4650.

FOR 4650, 6650 Silviculture 4 (3) Discussion of the theory and practice of manipulating forests to meet the needs and values of landowners and society in accordance with biological, ecological, and economic principles. Preq: FOR 2060 and FOR 2510 and FOR 2520 and FOR 2530 and FOR 2540. Coreq: FOR 4651, 6651.

FOR 4651, 6651 Silviculture Laboratory 0 (3) Non-credit laboratory to accompany FOR 4650, 6650. Coreq: FOR 4650, 6650.

FOR 4800 Selected Topics in Urban Forestry 1-3 (1-3) Study of selected and varied topics, problems, and issues in urban forestry and arboriculture through readings, class discussion, and individual and group projects. Preq: FOR 4270 or HORT 4270.

FOR 4930 Selected Topics in Forest Resources Laboratory 0 (99) Non-credit laboratory to accompany FOR 4930. Coreq: FOR 4930.

FOR 4931 Selected Topics in Forest Resources Laboratory 0 (99) Non-credit laboratory to accompany FOR 4930. Coreq: FOR 4930.

FOR 4980 Senior Portfolio 1 (1) Collection of Web-based materials representing the creative and scientific papers, presentations, and résumés written by students to satisfy curriculum requirements. Students are informed in FNR 1020 and regularly thereafter regarding the format and content of their portfolios. Preq or concurrent enrollment: FOR 4250.

FRENCH


FR 1010 Elementary French 4 (3) Multimedia course for beginners that combines video, audio, and print to teach the fundamentals of the French language and culture. Emphasizes communicative proficiency (listening comprehension, speaking, reading, and writing). Coreq: FR 1011.

FR 1011 Elementary French Laboratory 0 (1) Non-credit laboratory to accompany FR 1010. Coreq: FR 1010.

FR 1020 Elementary French 4 (3) Continuation of FR 1010; three hours a week of classroom instruction and one hour a week in the language laboratory. Coreq: FR 1021.

FR 1021 Elementary French Laboratory 0 (1) Non-credit laboratory to accompany FR 1020. Coreq: FR 1020.
Courses of Instruction

FR 1040 Basic French 4 (3) Intensive one-semester program combining FR 1010 and 1020 for students who have previously studied French. Includes fundamentals of grammar and vocabulary as a foundation for building written and oral proficiency. Coreq: FR 1041.

FR 1041 Basic French Laboratory 0 (1) Non-credit laboratory to accompany FR 1040. Coreq: FR 1040.

FR 1510 French for Graduate Students 3 (3) Intensive program only for graduate students preparing for the reading examination in French. A minimum grade of B on a final examination will satisfy graduate school foreign language requirement. May be repeated once for credit. To be taken Pass/No Pass only. Prq: Graduate standing.


FR 2970 Creative Inquiry—French 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Arrangements with faculty members must be established prior to registration. Prq: Consent of faculty member.

FR 2990 Foreign Language Drama Laboratory 1 (3) Participation in foreign language productions. No formal class meetings, but an average of three hours per week in a foreign language drama workshop for production. May be repeated for a maximum of three credits. Prq: Consent of instructor directing the play.


FR 3040 French Short Story 3 (3) Introduction to the study of French narrative literature and the elements of critical analysis through the examination of short stories spanning the medieval era to the present. Prq: FR 3050.


FR 3070 French Civilization 3 (3) Study of significant aspects of French culture from its origins to the present. Prq: FR 3050.


FR 3100 Summer Immersion Program 6 (6) Conducted entirely in French for eight hours daily, this summer immersion program consists of activities that combine interrelating cultural topics with language skill practice. Frequent opportunities to converse with native speakers during meals and on excursions. Students receive six credits, three of which may be taken in lieu of FR 2020. Prq: FR 2010.

FR 3120 Writing in French I 3 (3) Study of the vocabulary, syntax, and stylistics in short compositions and creative papers in French, on both fiction and non-fiction topics. Prq: FR 2020.

FR 3160 French for International Trade I 3 (3) Spoken and written French common to the French-speaking world of business and industry, emphasizing business practices and writing and translating business letters and professional reports. Cross-cultural references provide opportunity for comparative and contrastive analyses of American and French cultural patterns in a business setting. Prq or concurrent enrollment: FR 3050 and FR 3050.

FR 3170 Contemporary French Civilization 3 (3) Study of significant aspects of France today; the country, its economy, government, and society. Taught in French. Prq: FR 3050.

FR 3200 Studies in French Theatre 3 (3) Explores a variety of genres (medieval farce, classical comedy and tragedy, romantic melodrama, and the Nouveau Théâtre) with emphasis on staging. Class materials consist of scripts, videotaped performances, and critical readings on issues pertaining to spectacle in social, political, and artistic terms. May be repeated for a maximum of six credits. Prq: FR 2020.

FR 3570 Selected Topics in the Culture of Paris 3 (3) Onsite study of Paris and its relationship to France and Europe through readings, lectures, field trips, small student group explorations, and reporting sessions. All activities are conducted in French. Prq: FR 2020.

FR 3630 French and Francophone Poetry 3 (3) Study of traditions and major works of French and/or Francophone poetry in their historical, cultural, and aesthetic contexts. Topics may include genres, periods, traditions (romanticism, symbolism, cubism, surrealism), or themes. Prq: FR 3050.


FR 3910 Survey of French Literature (Honors) 1 (1) One-hour independent study to allow honors students to pursue supervised research on a topic relating to the literary, cultural, and artistic movement in France. Prq: Membership in Calhoun Honors College. Prq or concurrent enrollment: FR 3000.

FR 3970 Creative Inquiry—French 1-4 (1-4) Students focus on a special research area under the guidance of a faculty member. After acquiring the requisite background, students formulate hypotheses for a group project, develop a critical framework, and initiate research on a specific topic.

FR 3980 Directed Reading 1-3 (1-3) Directed study of selected topics in French literature, language, and culture. May be repeated for a maximum of six credits. Prq: Consent of department chair.


FR 4090 Writing in French II 3 (3) Intensive study of syntax and stylistics through composition and translations. Prq: Senior standing.

FR 4100 Francophone Literature 3 (3) Study of selected works of francophone literature emphasizing Africa and the Caribbean in their artistic, cultural, historical, and political contexts. Prq: FR 3000.


FR 4121 French and Francophone Cinema Laboratory 0 (3) Non-credit laboratory to accompany FR 4120. Coreq: FR 4120.

FR 4150 Translation Seminar 3 (3) Methods and theory of translation and a comparison of French and English structures. Practical exercises in translating from French to English and vice versa in a variety of texts.

FR 4160 French for International Trade II 3 (3) Study of language and cultural environment of the French-speaking markets of the world, including the linguistic and cultural idioms that support global marketing in general and the international marketing of textiles, agricultural products, and tourism in particular. Prq: FR 3160.

FR 4200 French Enlightenment, Revolution and Romanticism 3 (3) Cultural and literary studies of the century and a half (1715-1851) in which France occupied the center stage of world history and its modern institutions came into being. Emphasizes the free intellectual inquiry championed by philosophers and the romantic melancholy in the aftermath of the Revolution. Prq: FR 3050.
FR 4380 French Honors Research 3 (3) Individual honors research conducted under the direction of Language Department faculty. May not be used to satisfy requirements for the major in Modern Languages–French or Language and International Trade or the minor in Modern Languages. Preq: Junior standing and membership in Calhoun Honors College.

FR 4390 French Honors Thesis 3 (3) Individual honors research conducted and thesis completed under the direction of Language Department faculty member. May not be used to satisfy requirements for the major in Modern Languages–French or Language and International Trade or the minor in Modern Languages. Preq: Junior standing and FR 4380 and membership in Calhoun Honors College.

FR 4750 Advanced French Seminar 3 (3) Concentrated research and discussion on an advanced topic in French literature, film, drama, music, or philosophy. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: FR 3040 or FR 3050 and Senior standing.

FR 4760 Advanced Seminar on French Thought 3 (3) Research and discussion of an advanced topic, text, or group of texts with a particular focus on French theory and philosophy but including works of French literature. Conducted in English. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: Senior standing.

FR 4770 Advanced Seminar on the French and Francophone Novel 3 (3) Examination of the French novel and/or narrative prose focusing on a theme, genre, or period. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: FR 3040 or FR 3050 and Senior standing.

FR 4910 Modern French Literature (Honors) 1 (1) Independent study to allow honors students to pursue in depth an author, work, movement, or genre related to contemporary French culture, art, or literature. Preq or concurrent enrollment: FR 4000 and membership in Calhoun Honors College.

FR 4920 The French Corporation (Honors) 1 (1) Independent study to allow honors students to pursue an in-depth study of the organization, structure, functions, and economic role of a French business enterprise. Preq or concurrent enrollment: FR 4170 and membership in Calhoun Honors College.

FR 4970 Creative Inquiry—French 1-4 (1-4) Continuation of research initiated in FR 3970. Students complete their projects and disseminate their research results. Preq: FR 3970.

FR 4980 Independent Study 1-3 (1-3) Directed study of a selected topic in French literature, language, or culture. May be repeated for a maximum of six credits. Preq: Consent of department chair.

FR 4990, 6990 Selected Topics in French Literature 3 (3) Selected topics that have characterized French literature, language, and culture. May be repeated for a maximum of six credits. Preq: Consent of department chair.

GRAPHIC COMMUNICATIONS

Professors: S.T. Ingram, Chair; J.M. Leininger; Associate Professors: E.M. Weisennmiller, N.L. Woolbright; Assistant Professor: L.H. O’Hara; Senior Lecturers: C.D. Jones, P.G. Rose; Lecturers: K.T. Cox, E.B. Walker

GC 1010 Creative Inquiry to Graphic Communications I (1) Introduction to the curriculum and the industry, including its processes, products, and careers. Emphasizes the attributes most desirable for successful entry and advancement up a variety of career ladders.

GC 1020 Computer Art and CAD Foundations 2 (2) Graphic Communications industries make extensive use of software and best practices from concept through production. This course provides a solid foundation in drawing, imaging and layout software; packaging structure and 3-D CAD; design principles and problem solving relative to audience, need, typography, color, materials, printing and end use. Coreq: GC 1021.

GC 1021 Computer Art and CAD Foundations Laboratory 0 (0) Non-credit laboratory to accompany GC 1020. Coreq: GC 1020.

GC 1030 Graphic Communications I for Packaging Science 4 (2) Emphasizes the interrelationships of packaging and graphic arts. Topics include theory and practice in packaging requirements related to basic graphic arts concepts, principles, and practices; layout; design; electronic copy preparation; the printing processes of offset lithography; screen printing; gravure; and flexography. Includes digital and specialty printing processes, environmental, health, and safety concerns. Coreq: GC 1031.

GC 1031 Graphic Communications I Laboratory 1-3 (1-3) Under the direction of a faculty member, students pursue approved scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of six credits. Preq: Sophomore standing.

GC 1040 Digital Imaging and eMedia 4 (2) Course seminars around digital camera capture and control, and provides students with experience, techniques and processing options for creating interactive, integrated eMedia. Coursework includes commercial photography, color profiling, digital asset management, personalized cross-media campaigns, Web design and podcasts. Preqs: GC 1020 and GC 1040. Coreq: GC 3401.

GC 1041 Graphic Communications I Laboratory 0 (0) Non-credit laboratory to accompany GC 1040. Coreq: GC 1040.

GC 1043 Graphic Communications Internship I 1 (1) Fulltime supervised employment in an industrial in-plant setting for expansion of experience with materials and processes, production people, and organizations. Preq: GC 1040 and Graphic Communications major and consent of instructor. Preq or concurrent enrollment: COOP 2010.

GC 1055 Creative Inquiry—Graphic Communications III 1-3 (1-3) Under the direction of a faculty member, students pursue approved scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of six credits. Preq: Junior standing and consent of faculty member/mentor.

GC 4060, 6060 Package and Specialty Printing 4 (2) In depth study of the problems and processes for printing and converting in package label and specialty printing industries. Flexographic preparation, printing, die making, diecutting, screen printing, converter printing, pad printing and bar code production are covered. New developments and trends are discussed. Laboratory in techniques includes printing and converting. Includes Honors sections. Preq for GC 4060: GC 3400. Preq for GC 6060: GC 3400 or consent of instructor. Coreq: GC 4060, 6061.

GC 4061, 6061 Package and Specialty Printing Laboratory 0 (0) Non-credit laboratory to accompany GC 4060, 6060. Coreq: GC 4060, 6060.
GC 4070, 6070 Advanced Flexographic Methods 4 (2) In-depth study of the methods used in flexographic printing and converting of porous and nonporous substrates. Theory and laboratory applications include setting standards for process color, preparation of plate systems, ink mixing and color matching, testing of films and foils, analysis of recent developments, and prediction of future markets. Preq for GC 4070: GC 4060. Preq for GC 6070: GC 6060 or consent of instructor. Coreq: GC 4071, 6071.

GC 4071, 6071 Advanced Flexographic Methods Laboratory 0 (6) Non-credit laboratory to accompany GC 4070, 6070. Coreq: GC 4070, 6070.

GC 4400, 6400 Commercial Printing 4 (2) Advances skills learned in previous graphic communications courses and applies the knowledge to large format presses. Students work from the design conception stage through all aspects of preparation, production, and finishing. Emphasizes understanding and incorporating emerging technologies into the production workflow. Includes Honors sections. Preq for GC 4400: GC 3400. Preq for GC 6400: GC 3400 or consent of instructor. Coreq: GC 4401, 6401.

GC 4401, 6401 Commercial Printing Laboratory 0 (6) Non-credit laboratory to accompany GC 4400, 6400. Coreq: GC 4400, 6400.

GC 4440, 6440 Current Developments and Trends in Graphic Communications 4 (2) Advanced course for Graphic Communications majors. Emphasizes the theory and technical developments that affect process and equipment selection. Topics include color theory and application, electronic color scanning, electronic prepress and communications, gravure color quality control and analysis. Includes Honors sections. Preq: GC 4070 and GC 4440. Coreq: GC 4441, 6441.

GC 4441, 6441 Current Developments and Trends in Graphic Communications Laboratory 0 (6) Non-credit laboratory to accompany GC 4440, 6440. Coreq: GC 4440, 6440.

GC 4450, 6450 Advanced Screen Printing Methods 3 (2) Advanced course for Graphic Communications majors. Emphasizes the theory and technical developments that affect process and equipment selection. Topics include color theory and application, electronic color scanning, electronic prepress and communications, gravure color quality control and analysis. Includes Honors sections. Preq: GC 4070 and GC 4440. Coreq: GC 4441, 6441.

GC 4445, 6445 Advanced Screen Printing Methods Laboratory 0 (3) Non-credit laboratory to accompany GC 4450, 6450. Coreq: GC 4450, 6450.

GC 4460, 6460 Ink and Substrates 3 (2) Covers components, manufacturing, process use as well as end use of ink and substrates used in lithography, flexography, gravure, and screen printing. Examines the interrelationship between inks, substrates, and the printing process. Through controlled testing and examination, optimum conditions for improved printability are determined. Preq for GC 4460: GC 4060 or GC 4440. Preq for GC 6460: GC 6060 or GC 6440 or consent of instructor. Coreq: GC 4461, 6461.

GC 4461, 6461 Ink and Substrates Laboratory 0 (3) Non-credit laboratory to accompany GC 4460, 6460. Coreq: GC 4460, 6460.
GEN 4200, 6200 Molecular Genetics and Gene Regulation 3 (3) Molecular genetics, including replication, transcription and translation, gene expression, recombinant DNA technology, development, human, cancer, and behavioral genetics. Includes Honors sections. Preq for GEN 4200: BCHM 3010 and GEN 3020, each with a C or better. Preq for GEN 6200: Consent of instructor.

GEN 4210 Molecular Genetics and Gene Regulation Laboratory 2 (4) Explores molecular genetics techniques (transformation, cloning, PCR, gel electrophoresis, Southern Blotting, reporter genes, gene mapping) using prokaryotic and eukaryotic organisms. Preq or concurrent enrollment: GEN 4200.

GEN 4400, 6400 Bioinformatics 3 (3) Theory and application of computational technology to analysis of the genome, transcriptome, and proteome. Includes Honors sections. Preq for GEN 4400: BCHM 3010 and GEN 3020, each with a C or better. Preq for GEN 6400: Consent of instructor.

GEN 4500, 6500 Comparative Genetics 3 (3) Outlines the genome structure, function, and evolution based on available complete genome sequences. Topics include the evolution of multigene families, origin of eukaryotic organelles, molecular phylogeny, gene duplication, domain shuffling, transposition, and horizontal gene transfer. Includes Honors sections. Preq: GEN 4200 with a C or better. Preq or concurrent enrollment for GEN 4500: GEN 4400. Preq for GEN 6500: Consent of instructor.

GEN 4700, 6700 Human Genetics 3 (3) Basic principles of inheritance; population, molecular and biochemical genetics; cytogenetics; immunogenetics; complex traits; cancer genetics; treatment of genetic disorders; genetic screening and counseling; and the Human Genome Project. Preq for GEN 4700: GEN 3000 with a C or better; or GEN 3020 with C or better. Preq for GEN 6700: Consent of instructor.

GEN 4900 Selected Topics in Genetics 1-4 (1-4) Comprehensive study of selected topics not covered in other courses. May be repeated for maximum of eight credits, but only if different topics are covered. Preq: Consent of instructor.

GEN 4910 Directed Research in Genetics 1-8 (3-24) Orientation in genetic research (i.e. experimental planning, execution, and reporting). May be repeated for a maximum of eight credits. Includes Honors sections. Preq: Consent of instructor.

GEN 4930 Senior Seminar 2 (2) Analysis and discussion of papers from the primary literature in the life sciences particularly in genetics. Students find pertinent articles in the primary literature and present and analyze the selected reading. Includes Honors sections. Preq: BCHM 3010 and GEN 3020, each with a C or better; and one of the following with a C or better: GEN 4100 or GEN 4200 or GEN 4500.

GEN 4950, 6950 Insect Biotechnology 3 (3) Considers many unique genetic features exhibited by insects and describes the applications of biotechnology to enhance useful products from insects and to affect the control of destructive insects. Preq: ENT 3010 and GEN 3020.

GEOGRAPHY Associate Professor: C.A. Smith; Assistant Professor: W.C. Terry; Lecturer: L.F. Howard

GEOG 1010 Introduction to Geography 3 (3) Survey of the nature of geography emphasizing the discipline’s organizing themes of earth science, relations between people and their environments, interrelations between places, locational analysis, and area studies.

GEOG 1090 Orientation in genetic research (i.e. experimental planning, execution, and reporting). May be repeated for a maximum of nine credits. Preq: GEOG 1010 or GEOG 1030.

GEOG 2040, 6040 Historical Geography of the United States 3 (3) Study of the geography of a selected world region, such as North America, Europe, or the Middle East, or the geography of a topic, such as the geography of oil or the geography of underdevelopment. May be repeated once for credit with departmental consent. Preq for GEOG 2040: GEOG 1010 or GEOG 6130. Preq for GEOG 6200: GEOG 1010 or GEOG 1030 or consent of instructor.

GEOG 2060, 6060 World Geography of Parks and Recreation 3 (3) Study of the geography of the American South 3 (3) Study of the geography of the American South in its changing complexities across almost 400 years of development. Preq for GEOG 2060: GEOG 1010 or GEOG 1030. Preq for GEOG 6060: GEOG 1010 or GEOG 1030 or consent of instructor.

GEOG 2200, 6200 Historical Geography of the United States 3 (3) Survey that places the spatial concepts of geography into a time sequence with special emphasis upon the United States. Preq for GEOG 2200: GEOG 1010 or GEOG 1030. Preq for GEOG 6200: GEOG 1010 or GEOG 1030 or consent of instructor.

GEOG 4300, 6300 World Geography of Parks and Equivalent Reserves 3 (3) Major international patterns in the provision and use of urban and rural parks and recreation are examined. Preq: 2.0 cumulative grade-point ratio.

GEOG 4400, 6400 Geography of Historic Preservation 3 (3) Aspects of historic preservation emphasizing sites and structures in their geographical, historical, and socioeconomic contexts. Examples are drawn from American architectural styles and settlement forms. Preq for GEOG 4400: GEOG 1010 or GEOG 1030. Preq for GEOG 6400: GEOG 1010 or GEOG 1030 or consent of instructor.

GEOG 4990 Independent Study in Geography 3 (3) Study of selected topics in geography under the direction of a faculty member chosen by the student. Student and faculty member develop a course of study designed for the individual student and approved by the department chair prior to registration.

GEOL 2070 Mineralogy and Introductory Petrology Laboratory I 1 (3) Identification of rock-forming minerals and important ore minerals based on their physical properties. Includes hand specimen petrology of igneous, sedimentary, and metamorphic rocks. Credit toward a degree will be given for only one of GEOL 2070 or GEOL 2080. Coreq: GEOL 2050.

GEOL 2080 Mineralogy and Petrography Laboratory 2 (6) Identification of rock-forming minerals and important ore minerals based on their physical and optical properties. Hand specimen petrology and petrography of igneous, sedimentary, and metamorphic rocks. Study of minerals in thin section using polarizing microscope. Credit toward a degree will be given for only one of GEOL 2070 or GEOL 2080. Preq or concurrent enrollment: GEOL 2050.

GEOL 2100 Geology of the National Parks 3 (3) Survey of selected national parks and monuments emphasizing the dynamic geological processes that have shaped the landscapes of these areas. Special attention is focused on parks exhibiting recent geological activity such as volcanoes, earthquakes, and glaciers. Slide films and maps are used to highlight specific geologic structures and processes. Coreq: GEOL 2101.

GEOL 2120 Geology of the National Parks Laboratory 0 (3) Non-credit laboratory to accompany GEOL 2120. Coreq: GEOL 2100.

GEOL 2121 Structural Geology Laboratory 0 (3) Laboratory to accompany GEOL 2121. Provides instruction in the identification of minerals and rocks and in the interpretation of geologic processes through study of topographic maps. Field trips provide direct observation of processes and results. Includes Honors sections. Preq: GEOL 1010 and 1030. Coreq: GEOL 2101.

GEOL 2130 Structural Geology 3 (3) Differentiation of geologic structures; man's role as a geologic agent, social and ethical contexts, and analytical methods. Includes Honors sections. Preq: GEOL 1010. Coreq: GEOL 2121.

GEOL 2140 Geologic Analysis I 1 (3) Students develop a working knowledge of statistical methods used to formulate and solve problems in the earth sciences. Emphasis is on sampling methods and experiment design for geologic settings and on formulating and evaluating hypotheses using statistical inference of data sets. Coreq: GEOL 2120.

GEOL 2141 Geologic Analysis I Laboratory 0 (3) Non-credit laboratory to accompany GEOL 2141. Coreq: GEOL 2121.

GEOL 2150 Geologic Analysis II 1 (3) Students develop a working knowledge of deterministic methods used to formulate and solve problems in the earth sciences. Emphasis is on developing conceptual models from geologic field observations, formulating idealized problems, and analyzing and interpreting solutions. Special focus is on using computer software to support analyses. Preq: GEOL 2110 and MTHS 1080. Coreq: GEOL 2151.

GEOL 2151 Geologic Analysis II Laboratory 0 (3) Non-credit laboratory to accompany GEOL 2151. Coreq: GEOL 2150.

GEOL 2160 Planetary Science 1 (1) Required group learning and research experience emphasizing the role of the student as a geologic agent. Emphasis is on problem-solving approaches in geology. Social and ethical contexts, communication skills, and professional development are incorporated. Preq: GEOL 2101.

GEOL 2700 Experiences in Sustainable Development: Water 3 (3) Integrates cross-disciplinary perspectives on sustainability through active student participation in real-world development projects. Focuses on identifying and overcoming environmental, technical, social/organizational, and economic barriers to the sustainability of water resources. Emphasizes small-scale international water resources development.

GEOL 2910 Introduction to Research I 1 (1) Required group learning and research experience for Geology majors (open to others with consent of instructor). Introduction to problem solving through case studies and interdisciplinary team approaches. Focus is on, but not limited to, research approaches in geology. Social and ethical contexts, communication skills, and professional development are incorporated.

GEOL 2920 Introduction to Research II 1 (1) Required group learning and research experience for Geology majors (open to others with consent of instructor). Introduction to problem solving through case studies and interdisciplinary team approaches. Focus is on, but not limited to, research approaches in geology. Social and ethical contexts, communication skills, and professional development are incorporated. Preq: GEOL 2910.

GEOL 3000 Environmental Geology 3 (3) Discussion-oriented introduction to relationships of man to his physical surroundings and problems resulting from upsetting the established equilibria of geologic systems; man's role as a geologic agent, social and ethical contexts, and analytical methods. Includes Honors sections. Preq: GEOL 1010.

GEOL 3020 Structural Geology 4 (3) Diverse geologic structures of the earth, their description, origin, and field recognition. Practical problems in interpreting geologic structures are utilized, in addition to theoretical considerations of the mechanics and causes of tectonism. Includes Honors sections. Preq: GEOL 1020. Coreq: GEOL 3021.

GEOL 3021 Structural Geology Laboratory 0 (3) Non-credit laboratory to accompany GEOL 3020. Coreq: GEOL 3021.

GEOL 3130 Sedimentology and Stratigraphy 4 (3) Topics include origin, composition, and texture of sediments and sedimentary rocks; sedimentation processes, depositional environments, facies relationships, and diagenesis; introduction to stratigraphic methods and geochronology. Laboratory involves description and classification of hand specimens and thin sections and analytical methods. Preq: GEOL 2050. Coreq: GEOL 3131.

GEOL 3131 Sedimentology and Stratigraphy Laboratory 0 (3) Non-credit laboratory to accompany GEOL 3130. Coreq: GEOL 3130.

GEOL 3140 Sedimentary Petrology 3 (2) Origin, composition, and texture of sediments and sedimentary rocks, including both siliciclastic and chemical varieties. Interpretation of tectonic settings, depositional systems, facies relationships, and diagenesis. Laboratory involves description and classification of hand specimens and thin sections and analytical methods. Includes Honors sections. Preq: GEOL 2050. Coreq: GEOL 3141.

GEOL 3141 Sedimentary Petrology Laboratory 0 (3) Non-credit laboratory to accompany GEOL 3140. Coreq: GEOL 3140.
GEOL 3160 Igneous and Metamorphic Petrology 3 (2) Classification, occurrence, and origin of igneous and metamorphic rocks. Discussion of the chemical and physical processes involved in magmatic crystallization and metamorphism. Laboratory study of igneous and metamorphic rocks in hand specimen and thin section. Includes Honors sections. Preq: GEOL 2050. Coreq: GEOL 3161.

GEOL 3161 Igneous and Metamorphic Petrology Laboratory 0 (3) Non-credit laboratory to accompany GEOL 3160. Coreq: GEOL 3160.

GEOL 3180 Introduction to Geochemistry 3 (3) Introduction to distribution of elements in the core, mantle, and crust of the earth. Control of rock type on trace element content in soils and sediments. Weathering; soil and regolith formation; water-sediment interrelations; solubility, mobility and bioavailability in relation to redox, pH and complexation; biogeochemical cycles of selected elements. Preq: GEOL 2050.

GEOL 3600 Geology and Castles of Scotland 3 (1) Students spend two weeks in Scotland exploring its diverse geology and visiting medieval castles and ancient stone mountains. Highlights include studying the unconformity at Siccar Point made famous by James Hutton, the father of modern geology; and travelling "The Rock Route" through the Scottish Highlands, where modern ideas about mountain building were birthed. Coreq: GEOL 3601.

GEOL 3601 Geology and Castles of Scotland Laboratory 0 (4) Non-credit laboratory to accompany GEOL 3600. Coreq: GEOL 3600.

GEOL 3700 Western United States Field Study 3 (1) Field excursion to a geologic region in the western United States. Students visit sites where the stratigraphy and structure are well exposed, studying a variety of landforms and the geologic processes responsible for their formation. Pre-trip sessions are held on campus. Additional fees are required. May be repeated for a maximum of six credits. Preq: GEOL 1010.

GEOL 3701 Western United States Field Study Laboratory 0 (4) Non-credit laboratory to accompany GEOL 3700. Coreq: GEOL 3700.

GEOL 3750 Bahamian Field Study 3 (1) Students develop an understanding of Bahamian geology, culture, and social structure (including the influences of historical context and natural environments). Students stay one week on Andros Island in the Bahamas, traveling by van and boat to various sites. Additional fees are required. Includes Honors sections. Preq: GEOL 1010. Coreq: GEOL 3751.

GEOL 3751 Bahamian Field Study Laboratory 0 (4) Non-credit laboratory to accompany GEOL 3750. Coreq: GEOL 3750.

GEOL 3910 Research Methods I 2 (2) Required group learning and research experience for Geology majors (open to others with consent of instructor). Introduction to problem solving through case studies and interdisciplinary team approaches. Focus is on, but not limited to, research methods in geology. Social and ethical contexts, communication skills, and professional development are incorporated. Preq or concurrent enrollment: GEOL 2910.

GEOL 3920 Research Methods II 2 (2) Required group learning and research experience for Geology majors (open to others with consent of instructor). Introduction to problem solving through case studies and interdisciplinary team approaches. Focus is on, but not limited to, research methods in geology. Social and ethical contexts, communication skills, and professional development are incorporated. Preq: GEOL 3910. Preq or concurrent enrollment: GEOL 2910.

GEOL 3930, 6030 Invertebrate Paleontology 3 (2) Study of life of past geologic ages as shown by fossilized remains of ancient animals, with emphasis on the invertebrates. Preq for GEOL 4030; GEOL 1020. Coreq: GEOL 4031, 6031.

GEOL 4031, 6031 Invertebrate Paleontology Laboratory 0 (3) Non-credit laboratory to accompany GEOL 4030, 6030. Coreq: GEOL 4030, 6030.

GEOL 4050, 6050 Surficial Geology 4 (3) Study of surface features of the earth and the processes that produce them. Analysis of landforms including their form, nature, origin, development, and rates and patterns of change. Laboratory studies emphasize terrain analysis and the mechanics of surficial geological processes. Preq for GEOL 4050; GEOL 1020 and GEOL 3000. Preq for GEOL 6050: GEOL 1020 and GEOL 3000 or consent of instructor. Coreq: GEOL 4051, 6051.

GEOL 4051, 6051 Surficial Geology Laboratory 0 (3) Non-credit laboratory to accompany GEOL 4050, 6050. Coreq: GEOL 4050, 6050.

GEOL 4080, 6080 Geohydrology (Honors) 3 (3) Study of the hydrologic cycle, aquifer characteristics, theory of ground water movement, mechanics of well flow, experimental methods and subsurface mapping. Preq for GEOL 4080: At least Junior standing.

GEOL 4090, 6090 Environmental and Exploration Geophysics 4 (3) Students develop an understanding of the principles and methods used to acquire, analyze, and interpret geophysical data. Emphasis on seismic, gravity, gravimetric and electromagnetics. Applications to hydrogeology, environmental engineering and science, soil science, contaminant transport and remediation, near surface geology, geotechnical problems, oil and gas exploration, and carbon sequestration. Includes Honors sections. Preq for GEOL 4090: At least Junior standing. Coreq: GEOL 4091, 6091.

GEOL 4091, 6091 Environmental and Exploration Geophysics Laboratory 0 (3) Non-credit laboratory to accompany GEOL 4090, 6090. Coreq: GEOL 4090, 6090.

GEOL 4110 Research Problems 1-3 (1-3) Field, laboratory, or library study of an approved topic in geology. Topic would be one not normally covered in formal courses, but may be an extension of a topic already covered in formal courses. May be repeated for a maximum of six credits. Includes Honors sections. Preq: Consent of instructor.

GEOL 4130, 6130 Stratigraphic Geology 3 (2) Analysis of stratified rocks as the repository of earth history and the conceptual framework used to synthesize the world geologic record as a coherent whole. Emphasizes not only traditional lithostratigraphy but also modern seismic stratigraphy, biostratigraphy, magnetostratigraphy, and current stratigraphic issues. Preq for GEOL 4130; GEOL 3140. Coreq: GEOL 4131, 6131.

GEOL 4131, 6131 Stratigraphic Laboratory 0 (2) Non-credit laboratory to accompany GEOL 4130, 6130. Coreq: GEOL 4130, 6130.


GEOL 4210, 6210 GIS Applications in Geology 3 (1) Introduction to geographic information systems with applications to current geological and hydrological problems. Topics include the use of global positioning systems, spatial analysis, and image analysis. Hands-on training with geographic information systems software and techniques is covered in lab. Preq: At least Junior standing. Coreq: GEOL 4211, 6211.

GEOL 4211, 6211 GIS Applications in Geology Laboratory 0 (4) Non-credit laboratory to accompany GEOL 4210, 6210. Coreq: GEOL 4210, 6210.

GEOL 4510, 6510 Selected Topics in Hydrogeology 3 (4) Selected topics in hydrogeology emphasizing recent developments in the field. May be repeated for a maximum of six credits, but only if different topics are covered. Preq for GEOL 4510: Consent of instructor. Coreq: GEOL 4511, 6511.

GEOL 4511, 6511 Selected Topics in Hydrogeology Laboratory 0 (99) Non-credit laboratory to accompany GEOL 4510, 6510. Coreq: GEOL 4510, 6510.

GEOL 4590, 6590 Biogeochemistry 3 (3) Examines how biology directs mass and energy transfer between the lithosphere, biosphere, hydrosphere, and atmosphere. Scale of examination ranges from molecular to global. Topics include element cycling, the mineral-microbe/plant interface, biominalization, and biogeochemical applications to bioremediation, ecology, environmental toxicology, and biotechnology. Preq for GEOL 4590: GEOL 3180; and CH 2010 or CH 2210.

GEOL 4750 Summer Geology Field Camp 6 (10) Introduction to field techniques emphasizing methods applied to hydrogeology. Includes description and mapping of hydrogeologic units and structures using outcrop data and lithologic and geophysical well logs. Also covers construction of potentiometric maps from water level data, performance of pumping tests on mapped aquifers, and analysis of data to determine aquifer characteristics. Preq: GEOL 2050 and GEOL 3020.

GEOL 4850, 6850 Environmental Soil Chemistry 3 (3) Study of soil chemical processes (sorption, desorption, ion exchange, precipitation, dissolution, and redox reactions) of nutrients and inorganic and organic contaminants in soils and organic matter. Chemical complex equilibria and adsorption phenomena at the solid (soil, sediment, and mineral) water interface are emphasized. Preq: CH 1020 or CSEN 2020.

GEOL 4910 Research Synthesis I 3 (3) Required capstone group learning and research experience for Geology majors (open to others with consent of instructor). Involves synthesis of applied geology and other approaches for problem solving through collaborative teams. Course is the culmination of a sequence of case studies incorporating social and ethical contexts, communication skills, and professional development. Preq: GEOL 3920. Coreq: GEOL 4911.
Courses of Instruction


GER 2600 Selected Topics in German Literature 3 (3) Study of significant aspects of German literature. Conducted in English.

GER 2970 Creative Inquiry—German 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Arrangements with faculty members must be established prior to registration. Preq: Consent of faculty member.

GER 3980 Directed Reading 1-3 (1-3) Directed study of selected topics in German literature, language, and culture. May be repeated for a maximum of six credits. Preq: Consent of department chair.

GER 4160 German for International Trade II 3 (3) Study of language and cultural environment of the German-speaking markets of the world, including linguistic and cultural idioms that support global marketing in general and the international marketing of textiles, agricultural products, and tourism in particular. Preq: GER 3160.

GER 4170 Topics in German for International Trade 3 (3) Examination and analysis of selected topics related to the business culture and economy of Germany, Austria, Switzerland, the European Union, or the European Free Trade Association. Topics may include the reconstruction of Eastern Germany’s economy, the expansion of the European Union, or current events of economic importance. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: One 3000-level German course.

GER 4500 Advanced Contemporary German Language 3 (3) Advanced study of spoken and written contemporary German based on modern autobiographical texts, eyewitness accounts of recent historical events, and media coverage of current events. Employs Internet, print and audio texts, TV programs, and photo series. Preq: One 3000-level German course.

GER 4550 German Film 3 (3) Study of a significant aspect of German cinema including the expressionist classics of the Weimar Republic, entertainment and documentary movies of the Nazi era, classics of the postwar New German Wave (West Germany), distinctive East German films, and vanguard contemporary films. Preq: GER 3050 or GER 3060. Coreq: GER 4551.

GER 4551 German Film Laboratory 0 (3) Non-credit laboratory to accompany GER 4550. Coreq: GER 4550.

GER 4600 Modernism in German Literature 3 (3) Study of major works of German literature and culture in the modernist era (1888–1933). May include drama, music, philosophy, and the plastic arts. Preq: GER 3050 or GER 3060.
HEALTH, EDUCATION AND HUMAN DEVELOPMENT

HEHD 1990 Creative Inquiry I 1-3 (1-3) In consultation with and under the direction of a faculty member, students pursue a first phase of scholarly activities in teams. These creative inquiry projects may be discipline-specific or interdisciplinary in nature. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of six credits. Preq: Consent of instructor.

HEHD 2990 Creative Inquiry II 1-3 (1-3) In consultation with and under the direction of a faculty member, students pursue a second phase of scholarly activities in teams. These creative inquiry projects may be discipline-specific or interdisciplinary in nature. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of six credits. Preq: Sophomore standing, consent of instructor.

HEHD 3990 Creative Inquiry III 1-3 (1-3) In consultation with and under the direction of a faculty member, students pursue a third phase of scholarly activities in teams. These creative inquiry projects may be discipline-specific or interdisciplinary in nature. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of six credits. Preq: Junior standing, consent of instructor.

HEHD 4000, 6000 Introduction to Leadership Theories and Concepts 1-2 (1-2) Interdisciplinary course introduces students to the nature of leadership. Students gain a broad understanding of the history and origins of leadership, theoretical approaches to leadership, and the essence of contemporary leadership. Students are encouraged to apply their ability to apply these concepts to life experiences. Preq for HEHD 4000: Junior standing. Preq for HEHD 6000: Junior standing or consent of instructor. Coreq: HEHD 4001, 6001.

HEHD 4000, 6001 Introduction to Leadership Theories and Concepts Laboratory 0 (1) Non-credit laboratory to accompany HEHD 4000, 6000. Coreq: HEHD 4000, 6000.

HEHD 4100, 6100 Leadership Behavior and Civic Engagement 3 (2) Students couple concepts of social justice and civic engagement with theoretical foundations from HEHD 4000 to complete a comprehensive theory to practice project. Students are introduced to a comprehensive leadership skill set to become active change agents for the common good. Preq: HEHD 4000. Coreq: HEHD 4100, 6100.

HEHD 4101, 6101 Leadership Behavior and Civic Engagement Laboratory 0 (1) Non-credit laboratory to accompany HEHD 4100, 6101. Coreq: HEHD 4100, 6100.

HEHD 4200, 6200 Leadership Application and Experience 3 (2) Students are immersed in a practical leadership experience utilizing knowledge and skills gained in HEHD 4000 and 4100. Students identify an issue or problem and practice leadership by developing and implementing a community project. Students are challenged to commit themselves to long-term engagement as agents of change. Preq: HEHD 4100. Coreq: HEHD 4201, 6201.

HEHD 4201, 6201 Leadership Application and Experience Laboratory 0 (3) Non-credit laboratory to accompany HEHD 4200, 6200. Coreq: HEHD 4200, 6200.

HEHD 4990 Creative Inquiry IV 1-3 (1-3) In consultation with and under the direction of a faculty member, students pursue a fourth phase of scholarly activities in teams. These creative inquiry projects may be discipline-specific or interdisciplinary in nature. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of six credits. Preq: Senior standing and consent of instructor.

HISTORY


HIST 1000 Higher Education and Clemson 1 (1) Introduction to higher education, its background and development in the western world, emphasizing land-grant institutions and Clemson University in particular.

HIST 1010 History of the United States 3 (3) Political, economic, and social development of the American people from the period of discovery to the end of Reconstruction. Includes Honors sections.

HIST 1020 History of the United States 3 (3) Political, economic, and social development of the American people from the end of Reconstruction to the present. Includes Honors sections.

HIST 1220 History, Technology, and Society 3 (3) Topics in the history of technology with emphasis on how technology affects society and how society shapes technology. Emphasis is on 19th and 20th century America, but some material from other periods of Western Civilization and other world regions may be discussed. Includes Honors sections.

HIST 1240 Environmental History Survey 3 (3) Introduction to environmental history, in the United States and globally, with emphasis on changing attitudes toward the environment and the interaction between science and public policy. Includes Honors sections.

HIST 1720 The West and the World I 3 (3) Examines the history of the West from early times until the 1648. After a comparative evaluation of the emergence of civilization around the globe, course concentrates on the history of the peoples of Europe up to the age of European exploration and overseas expansion. Includes Honors sections.

HIST 1730 The West and the World II 3 (3) Surveys the history of the West in modern times, from the late 17th century to the present. Particular emphasis is placed on European interaction with non-Western societies. Through cross-cultural comparisons, European history is placed in global context. Includes Honors

HIST 1930 Modern World History 3 (3) Political, economic, social, and cultural history of the modern world from the 19th century to the present.
Courses of Instruction

HIST 1980 Current History 1 (1) Examination of major events and problem areas in the news emphasizing their historical context and possible long-range significance. May be repeated for a maximum of three credits. Does not count toward the requirements of the major or minor in History.

HIST 2000 Fort Hill Internship 1-3 (1-3) Provides practical experience in public history museum work and/or historical preservation in the setting of Fort Hill. May be repeated for a maximum of three credits. To be taken Pass/No Pass only. Prereg: Consent of internship director.

HIST 2010 Prelaw Internship 1-3 (1-3) Faculty-supervised internship in a law firm or other legal setting. Introduces students to the workings of the legal system. To be taken Pass/No Pass only. Prereg: History major and sophomore standing.

HIST 2020 Internship 1-3 (1-3) Exposes History majors to hands-on experience in research, analysis, and public presentation of historical scholarship. May include working with faculty on research projects, in museums or historical organizations, or at sites. May be repeated for a maximum of three credits. To be taken Pass/No Pass only. Prereg: Sophomore standing.

HIST 2890 Creative Inquiry—History 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of nine credits. Prereg: Consent of faculty member/mentor.

HIST 2990 Seminar: The Historians Craft 4 (3) Writing and speaking intensive course to introduce History majors to study of what history is and what a historian does, including historiography, research techniques, ethics of the historical profession, and forms of presentation. Prereg: History major. Coreq: HIST 2991.

HIST 2991 Seminar: The Historians Craft Laboratory 0 (2) Non-credit laboratory to accompany HIST 2990. Coreq: HIST 2990.

HIST 3000 History of Colonial America 3 (3) Development of American institutions and customs in the period before 1776. Considerable emphasis is placed on the imperial relations between Great Britain and her colonies and upon the movement towards and the philosophy of the American Revolution.

HIST 3010 American Revolution and the New Nation 3 (3) Study of the various historical explanations leading to an understanding of the American Revolution, the establishment of the nation under the Constitution, and the first decade of the new nation. Special emphasis is on developing an understanding of individual motivation and ideological development present during the last four decades of the 18th century.

HIST 3020 Age of Jefferson, Jackson, and Calhoun 3 (3) Formation and growing pains of the new nation through the Federal and Middle periods of its history emphasizing economic and political development, the westward movement, and the conflicting forces of nationalism and sectionalism.

HIST 3030 Civil War and Reconstruction 3 (3) Study of the political, military, and social aspects of the sectional conflict and of the era of Reconstruction. Some emphasis is placed on the historical controversies inspired by the period.

HIST 3040 Industrialism and the Progressive Era 3 (3) Study of American society in the period between the 1880s and 1930s. Emphasizes the effects of industrialization and urbanization on the American people.

HIST 3050 The United States in the Jazz Age, Depression, and War 1918–1945 3 (3) Starting at Armistice Day, 1918, course analyzes the dawn of the age of mass consumption and mass communications, the Crash of 1929, Franklin Roosevelt and the New Deal, the gathering war clouds in Europe and Asia, and the Great Crusade of World War II. Prereg: Sophomore standing.

HIST 3060 The United States in the Postwar World: 1945–1975 3 (3) Examination of the American experience from the end of World War II through the period of the Korean and Vietnam wars, the Cold War, the Civil Rights movement, the counter-culture of the 1960s, assassinations, and Watergate.

HIST 3080 The United States in the Age of Reagan and Clinton 1975–Present 3 (3) The United States and the world in the recent era of economic and political upheaval, the end of the Cold War, the rise of the global economy and terrorism, social and cultural change, and emerging political and social divisions. Prereg: Sophomore standing.

HIST 3100 History of Religion in the United States 3 (3) Development of religion in the United States from the Colonial period to the 20th century. Attention is devoted to analyzing the broad currents in religious movements and various thought that have given shape to the American pluralistic experience.

HIST 3110 African Americans to 1877 3 (3) Study of the African-American experience in the United States from the African past through slavery to Reconstruction.

HIST 3120 African American History from 1877 to the Present 3 (3) Study of African American experience in the United States from 1877 to the present. Some emphasis is placed on urban, industrial, and social development in the 20th century.

HIST 3130 History of South Carolina 3 (3) Political, economic, and social development of South Carolina from 1670 to the present. Includes Honors sections.

HIST 3140 History of the South to 1865 3 (3) Origins and development of political, social, economic, and cultural institutions of the South from the Colonial period to the end of the Civil War and the role of the South in the nation’s development.

HIST 3160 American Social History 3 (3) Study of the social, cultural, economic, and political forces that have helped shape the law in the U.S. since 1890. Emphasizes the relationship between law and society, the way in which the practice of law changed American society, and the way in which social development affected both the theory and practice of the law.

HIST 3170 American Social History Since 1890 3 (3) Examination of the social, cultural, intellectual, economic, and political forces that have helped shape the law in the U.S. since 1890.

HIST 3190 Gender and Law in United States History 3 (3) Survey of how law has reflected and created distinctions on the basis of gender and sexuality throughout United States history. Emphasizes the relationship between legal rules and social conditions and the way in which groups have challenged these legal categories over time.

HIST 3200 History of United States Public Education 3 (3) Historical survey of the development of United States public schools. Prereg or concurrent enrollment: ED 1050 and a 2.0 minimum grade-point ratio.

HIST 3210 History of Science 3 (3) Survey of the development of science in the Western world, emphasizing the period from the Renaissance to the present.

HIST 3220 History of Technology 3 (3) History of the major developments in Western technology and their relationships to the societies and cultures in which they flourished.


HIST 3240 History of the South, 1865 to the Present 3 (3) Development of political, social, and cultural institutions of the South from the end of the Civil War to the present and the South’s relationship to the rest of the nation.

HIST 3250 American Economic Development 3 (3) Economic development of the United States from Colonial to recent times, emphasizing the institutional development of agriculture, banking, business and labor, and government regulations and policy.

HIST 3260 History of American Transportation 3 (3) Examine the principal forms of transportation in the United States from colonial times to the present, including water, road, canal, railroad, internal combustion, and air. Emphasizes technological developments and economic, geographic, and social impact of specific transport forms.

HIST 3270 American Business History 3 (3) Survey of the history of American business using a case-study approach. Focuses on the effects that policies and institutions have on individual businesses.

HIST 3280 United States Legal History to 1890 3 (3) Survey of the American legal system in its historical perspective from Colonial times to 1890. Emphasizes the relationship between law and society, the way in which the practice of law changed American society, and the way in which social development affected both the theory and practice of the law.

HIST 3290 United States Legal History Since 1890 3 (3) Examination of the social, cultural, intellectual, economic, and political forces that have helped shape the law in the U.S. since 1890.

HIST 3300 History of Modern China 3 (3) Growth and development of Chinese civilization from ancient times to the present. Emphasis is on 20th century China, particularly since the rise to power of the Communist regime.

HIST 3330 History of Modern Japan 3 (3) Origin and development of Japanese civilization with particular emphasis on modern Japan from mid-19th century to the present.
HIST 3340 Premodern East Asia 3 (3) Introduction to histories of China and Japan, from antiquity to approximately 1850. Political, religious, artistic, and other aspects of premodern society are examined and compared in order to gain significant insights regarding the premodern antecedents of these two dynamic and important nations.

HIST 3370 History of South Africa 3 (3) Examines the important trends in the history of South Africa from earliest times to the present. Topics include nature of precolonial society, European immigration, rise of industrial capitalism, advent of Apartheid, and the liberation struggle.

HIST 3380 African History to 1875 3 (3) Study of sub-Saharan Africa from antiquity to European colonial rule, exploring the development of Stone Age cultures; agricultural and pastoral societies; ancient civilizations; political, economic, and social systems; gradual shift of initiative from the interior to the coast; and various slave trades.

HIST 3390 Modern Africa, 1875 to the Present 3 (3) Study of sub-Saharan Africa from 1875 to the present, with focus on the development and decline of European imperialism, dilemmas of African independence, and ethnic struggles in Southern Africa.

HIST 3400 Latin America: From Conquest to Independence 3 (3) Examination of the encounters, collaborations, and clashes that characterized the conquest period and beyond in Latin America. Readings are assigned regarding the spiritual, biological, social, and political consequences of the meeting of Indians, Africans, and Europeans. Historical sources include images, artwork, letters, and memoirs.

HIST 3410 Modern Mexico 3 (3) Introduction to the geography of the region; origins and progress of the Independence movements; political, economic, and social developments after 1821; and current domestic and international problems.

HIST 3420 South America Since 1800 3 (3) Introduction to the geography of the region; origins and progress of the Independence movements; political, economic, and social developments after 1821; and current domestic and international problems.

HIST 3510 Ancient Near East 3 (3) History of the peoples and civilizations of the Near East from the Sumerians to the establishment of Roman power in this region. Includes geography, mythology, religious, and economic currents as well as the methods and discoveries of archaeology. May also be offered as REL 3510.

HIST 3520 Egypt in the Days of the Pharaohs 3 (3) Egyptian civilization from its beginning until the period of Roman conquest. Includes a survey of political history but also deals with daily life, making much use of archaeological evidence.

HIST 3530 Women in Antiquity 3 (3) Focuses on women in the ancient period in Mesopotamia, Israel, Egypt, Greece, Rome, and in the early Christian Church. Formation of gender roles and issues related to ancient sexuality also receive attention.

HIST 3540 The Greek World 3 (3) Study of Greek civilization from its beginning until the time of the Roman conquest, concentrating on the social institutions of the Greek city-states.

HIST 3550 The Roman World 3 (3) Considers the rise of Rome to world empire and the international civilization it dominated. Concentrates on the nature of the political change from Republic to monarchy with particular emphasis on city life and the causes of its decline.

HIST 3610 History of Britain to 1668 3 (3) Study of historical developments in the British Isles through the 17th century. Focus is on political institutions, warfare, social and economic trends, and cultural and legal developments.

HIST 3630 Britain Since 1668 3 (3) Study of political, cultural, social, economic, and imperial issues in the history of the British Isles from the late 17th century to the present. Includes Honors sections.

HIST 3650 British Cultural History 3 (3) Examination of topics in British cultural history from the 17th century to the present. Emphasizes the 19th and 20th centuries.

HIST 3670 Modern Irish History 3 (3) Examines Irish history over the past four centuries, with particular attention to the 19th and 20th centuries. Irish political, social, economic, and cultural history, Anglo-Irish relations, and the Irish diaspora are considered.

HIST 3700 Medieval History 3 (3) Survey of the period from the eclipse of Rome to the advent of the Renaissance, emphasizing human migrations, feudalism, rise of towns, and cultural life.

HIST 3720 The Renaissance 3 (3) Examination of the transitional period of European civilization (ca. 1300–1500) emphasizing institutional, cultural, and intellectual developments.

HIST 3730 Age of the Protestant Reformation 3 (3) Evolution of Modern Europe (ca. 1500–1660), as affected by the Reformation, wars of religion, and growth of nation-states. Study includes intellectual advances and the beginnings of European expansion overseas. May also be offered as REL 3730.

HIST 3740 Europe in the Age of Reason 3 (3) Study of the quest for order and the consolidation of the European state system between 1660 and 1789 with emphasis on the idea of absolutism, the question of French hegemony, and the synthesis of the 18th-century Enlightenment.

HIST 3750 Revolutionary Europe 3 (3) History of Europe from the outbreak of the French Revolution through the Revolutions of 1848 emphasizing the conflict between the forces of change and those of conservatism, within the states and in Europe in general.

HIST 3770 Europe, 1914–1945 3 (3) Focuses on Europe during two major wars and the peace time adjustments Europeans made, or failed to make, during the twenty-year internment between those wars.

HIST 3780 Europe Since 1945 3 (3) Focuses on how World War II completed the destruction of European global hegemony, creating a bipolar continent with the west dominated by the United States and the east by Soviet Russia, and how Europe adjusted to this situation.

HIST 3800 Imperial Germany 3 (3) German history from the beginning of the German Empire, 1870–71, through World War I. Emphasizes the influence of militarism, nationalism, anti-Semitism, and xenophobia on the German culture and political process.

HIST 3810 Germany Since 1918 3 (3) German history from the time of Germany’s defeat in World War I, through the Nazi period and World War II. Culminates with the study of a divided Germany.

HIST 3840 History of Modern France 3 (3) French history from mid-19th century to the present with particular emphasis on France since 1900.

HIST 3850 History of Imperial Russia 3 (3) Survey of the formative years of the Russian Empire from the time of accession of Peter the Great to the time of the Russian Revolution. Social, political, diplomatic, and intellectual developments are given equal treatment.

HIST 3860 History of the Soviet Union 3 (3) Soviet history from the revolution to 1991. Surveys the creation and subsequent development of the communist political and social system, with attention given to culture and diplomacy.

HIST 3870 The Russian Revolution 3 (3) History of one of the most formative series of events of the 20th century. Follows the crisis of Imperial Russia, its downfall during World War I, and subsequent revolutionary upheaval leading to the formation of the USSR.

HIST 3890 Creative Inquiry—History 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of nine credits. Preq: Consent of faculty member/mentor.

HIST 3900 Modern Military History 3 (3) Survey of the development of modern warfare and the influence of technological change on warfare. Particular attention is given to the major conflicts of the 20th and 21st centuries.

HIST 3910 Post World War II World 3 (3) Examines the world in the age of the Cold War; the breakdown of the colonial empires; and racial, religious, ethnic, national, and social tensions. The United States provides the central core to the class.

HIST 3920 History of the Environment of the United States 3 (3) Examination of the historical development of the attitudes, institutions, laws, people, and consequences that have affected the environment of the United States from pre-Columbian days until the present. Emphasizes the interaction of human beings within and with the environment.

HIST 3930 Sports in the Modern World 3 (3) Analysis of the global evolution and diffusion of sports in the industrial age emphasizing the linkage of sports structure and performance to the larger social context.

HIST 3940 Non-Western History 3 (3) Examines the important trends in world history since 1500— including capitalism, industrialization, nationalism, migration, and imperialism—with a focus on non-Western regions. Preq: 1730.

HIST 3950 Civil Rights History 3 (3) Examines the development of American civil rights from the creation of the Constitution through the present. Emphasis is on the legal struggle of African Americans for civil rights, but how other groups fought for rights in the courts is also considered.
HIST 3960 The Middle East to 1800 3 (3) Examines the histories, cultures, and societies of the Middle East from the rise of Islam in the seventh century to the eve of European colonial penetration.

HIST 3970 Modern Middle East 3 (3) Examines the histories, cultures, and societies of the Middle East from the 18th century to the present day with particular emphasis on contemporary issues.

HIST 4000, 6000 Studies in United States History 3 (3) Topics and problems in the history of the United States from the Colonial era to the present. May be repeated once for credit with departmental consent.

HIST 4090 Kennedy Assassination and Watergate 3 (3) Journey into the underbelly that examines the diverse elements of national security, divisive politics, the Cold War and Cuba, FBI, CIA, the mob, fanaticism, anomie, and threats to the stability of the republic that seem to have come together in Dallas in 1963 and in Watergate. Prereq: Junior standing.

HIST 4140 Introduction to the Study of History Museums 3 (3) An Introduction to the field of museology, covering the history, philosophy, and ethics of the profession; various types of museums, and different aspects of museum work; the museum’s role in the community; and the effects of philanthropy and government on museums. Prereq: Any 3000-level history course.

HIST 4150, 6150 Introduction to Digital History 3 (3) Introduces students to the philosophy and practice of the emerging field of History and New Media with a particular focus on how public historians can use technology to enhance their archival/museum center’s visibility with the general public. Prereq: Any 3000-level history course.

HIST 4170, 6170 History and Tourism 3 (3) Introduces students to important scholarship in the heritage tourism field. Examines the origins and objectives of heritage tourism, and case studies of how professionals employ heritage tourism. Prereq: Any 3000-level history course.

HIST 4180, 6180 Oral History and Local History 3 (3) Introduces students to the most recent work in oral history and methodology with a focus on the history of the Upstate and Appalachia from the colonial era to the present. Students engage in their own local oral history project and produce a research paper based on their findings. Prereq: Any 3000-level history course.

HIST 4200, 6200 History and Film 3 (2) Analyzes the role of the cinema in the construction and dissemination of history. May be repeated once for credit with departmental consent. Coreq: HIST 4201, 6201.

HIST 4201, 6201 History and Film Laboratory 0 (3) Non-credit laboratory to accompany HIST 4200, 6200. Coreq: HIST 4200, 6200.

HIST 4240, 6240 Topics in History of Medicine and Health 3 (3) Selected topics in the development of medicine and health care including public attitudes towards health and medicine.

HIST 4360, 6360 The Vietnam Wars 3 (3) Wars in Vietnam are seen in two phases. The First Indochina War, 1946–54, is covered briefly. Main body of the course covers the Second Indochina War, which began as a guerrilla conflict in 1959–60 and ended as a mostly conventional war in the Communist victory of 1975.

HIST 4380, 6380 Problems in African Historiography and Methodology 3 (3) Concentrates on major issues in the field of African history with an additional focus on methodological concerns. May be repeated once for credit with departmental consent.

HIST 4400, 6400 Studies in Latin American History 3 (3) Selected and varied topics in Latin American history are considered through readings, discussions, and individual or group projects. Special attention is given to the use of an inquiry or problem-solving method of historical analysis and to the cultivation of a comparative perspective. May be repeated once for credit with departmental consent.

HIST 4500, 6500 Studies in Ancient History 3 (3) Selected topics in ancient history ranging from pre-Biblical times to the fall of the Roman Empire. May be repeated once for credit with departmental consent.

HIST 4510, 6510 Alexander the Great 3 (3) Focuses on the career of Alexander the Great and deals with the history and archaeology of ancient Macedonia.

HIST 4520, 6520 History of Early Christianity 3 (3) Study of the history, social and doctrinal, of early Christianity up to 600 A.D. Prereq: Consent of instructor.

HIST 4600, 6600 Studies in British History 3 (3) Examination of selected themes, topics, or periods in British history from Anglo-Saxon times to the present. May be repeated once for credit with departmental consent. Includes Honors sections.

HIST 4700, 6700 Studies in Early European History 3 (3) Study of selected topics or themes in European history from the fall of the Roman Empire to the age of industrialization. May be repeated once for credit with departmental consent.

HIST 4710, 6710 Studies in Modern European History 3 (3) Study of selected topics or problems in European history from the end of the Old Regime to the present. May be repeated once for credit with departmental consent. Includes Honors sections.

HIST 4720, 6720 Medieval Conquests and Crusades 3 (3) Focuses on medieval conquests with particular emphasis on the era of the crusades. Investigates the origins and historical significance of the crusades from both Christian and Muslim perspectives, and examines crusader societies at home and abroad. Explores other medieval colonization movements and religious justifications for warfare outside the Holy Land.

HIST 4800 Museum Practicum 3 (3) Introduces critical issues and museum theoretical perspectives affecting museum curators and other museum professionals. Students will integrate theory with practical experience in the history realm as they work with museum professionals. Prereq: HIST 4140.

HIST 4870, 6870 World War II and the World 3 (3) World War II was a cataclysm of the twentieth century that touched every part of the globe and ushered in the atomic age. This course examines the war from its origins in the aftermath of World War I to the war crimes trials and the dawn of the Cold War.
HEALTH


HLTH 3050 Body Response to Health Behaviors 3 (3)
Positive benefits and the negative impact of certain behaviors at cellular, organ, and body-system levels are examined. The pathways of selected injury and disease are explored. Expected physiological changes are applied in identifying strategies for promoting health in the presence (or absence) of disease. Health majors will be given enrollment priority. Preq or concurrent enrollment: BIOL 2230.

HLTH 3100 Womens' Health Issues 3 (3)
Exploration of specific health needs of women, with emphasis on understanding and preventing problems of women's health. Health majors will be given enrollment priority. Preq: A two-semester sequence in science.

HLTH 3200 Health Maintenance for Men 3 (3)
Exploration of specific health maintenance needs of men, with emphasis on understanding and preventing problems of men's health. Health majors will be given enrollment priority. Preq: A two-semester sequence in science.

HLTH 3400 Health Promotion Program Planning 3 (3)
Students develop skills to conduct community health needs assessments and to plan and evaluate theoretically grounded health promotion intervention programs for diverse populations. Best practices for specific health behavior change interventions are identified. Preq: HLTH 2400 and HLTH 2980.

HLTH 3500 Medical Terminology and Communication 3 (3)
Skills in building, analyzing, defining, pronouncing, and spelling medical terms related to the human body are developed and applied through electronic communication. Preq: Junior standing.

HLTH 3610 Introduction to Health Care Economics 3 (3)
Introductory course in which students learn the basic economics of the institutions comprising the health-care industry. Topics include the underlying supply, demand, and institutional factors impacting health-care availability and cost of health care.

HLTH 3800 Epidemiology 3 (3)
Introduces epidemiological principles and methods used in the study of the origin, distribution, and control of disease. Health majors will be given enrollment priority. Preq: MATH 2030 and MTHS 3020 and MTHS 3120, and at least one 2000-level HLTH course.

HLTH 3950 Honors Research Seminar 3 (3)
Students review basic steps in the development of an honors research proposal and develop a draft of the proposal under the supervision of a faculty mentor. Students are also required to attend research presentations of senior departmental honors students. Preq: HLTH 3800 and Junior standing and a statistics course.

HLTH 3980 Health Appraisal Skills 1 (3)
Utilizes laboratory experiences to measure health risk, interpret laboratory health data, and design personal health programs. Restricted to Health Science majors. Preq: HLTH 2980.

HLTH 4000, 6000 Selected Topics in Health 1-3
Topics in health selected to meet special interests of students. May be repeated for a maximum of nine credits, but only if different topics are covered. Preq: Junior standing and consent of instructor.

HLTH 4010 Health Consumerism 3 (3)
Exploration of consumer decisions regarding health products and services emphasizing strategies for decision making. Health majors will be given enrollment priority. Preq: A two-semester sequence in science.

HLTH 4020 Principles of Health Fitness 4 (3)
Students apply current theories concerning physiological effects of exercise to select populations; understand the relationship between exercise and various chronic diseases; and design, execute, and evaluate exercise programs in terms of safety and effectiveness. Students must be certified in CPR to enroll in this course. Preq: HLTH 3980, Preq or concurrent enrollment: BIOL 2230. Coreq: HLTH 4021.

HLTH 4021 Principles of Health Fitness Laboratory 0 (1)
Non-credit laboratory to accompany HLTH 4020. Coreq: HLTH 4020.

HLTH 4100, 6100 Maternal and Child Health 3 (3)
Focuses on key issues concerning the health status and needs of mothers and children. Topics include primary health care, measurement and indicators of health status, health of minorities, role of families, and major programmatic interventions towards the health needs of these two groups.

HLTH 4110 Health Needs of High Risk Children 3 (3)
Analysis and evaluation of health needs of high-risk families and special needs children from the prenatal period to age six. Emphasizes health maintenance and early intervention strategies. Preq: HLTH 4100.

HLTH 4150, 6150 Public Health Issues in Obesity and Eating Disorders 3 (3)
In-depth review of prevalence, risk factors, consequences, and treatments of obesity and other eating disorders. Focuses on the public health importance of cultural norms, prevention, and early intervention related to obesity and eating disorders. Preq for HLTH 4150: Junior standing. Preq for HLTH 6150: Junior standing or consent of instructor.

HLTH 4190 Health Science Internship Preparation Seminar 1 (1)
Preparation for internship experience. Includes topics such as résumé development, interviewing skills, internship agency selection, and responsibilities of student, department, and agency. Preq: Junior standing in Health Science.

HLTH 4200, 6200 Health Science Internship 1-6 (1-6)
Under supervision in an approved agency, students have an opportunity for on-the-job experience. Students are placed in an agency and develop personal/professional goals and objectives appropriate to the setting, population, and health issues. Students create a comprehensive exit portfolio in a digital format. May be repeated for a maximum of six credits. Preq: HLTH 4190 and a minimum grade-point average of 2.0 and Junior standing in Health Science and consent of instructor.

HLTH 4300, 6300 Health Promotion of the Aged 3 (3)
Focuses on analysis and evaluation of health issues and health problems of the aged. Emphasizes concepts of positive health behaviors. Health majors will be given enrollment priority. Students are expected to have completed coursework in developmental psychology and a two-semester sequence in science.

HLTH 4310 Public and Environmental Health 3 (3)
Principles of environmental health emphasizing understanding various health concerns created by the interactions of people with their environment. Students evaluate the impact of environmental factors on public health policy decisions. Meets specific area of need in environmental health issues.

HLTH 4400 Managing Health Service Organizations 3 (3)
Provides the conceptual and theoretical foundation of management and organizational theory of health service organizations. Focuses on the role of health services managers and how they modify and maintain organizations.
Hlon Honors Research Colloquium 1 (1) Students enrolled in departmental honors present independent research conducted under the supervision of a faculty member in a public research forum to other honors students and public health professionals and/or submit a paper or presentation based on this research for publication. Preq: HLTH 4905 and Senior standing.

Hlon Creative Inquiry—Public Health 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of 12 credits.

Hlon Improving Population Health 3 (3) Critical examination of current and emerging issues in improving public health practice and population health. Covers examples in empirical and applied research, revealing future trends in population health. Health Science majors will be given enrollment priority. Preq for HLTH 4905: HLTH 2400 and HLTH 2980 and HLTH 3800; HLTH 4980; HLTH 2400 and HLTH 2980 and HLTH 3800; or consent of instructor.

Hlon Independent Study 1-3 (1-3) Study of selected problems in health under the direction of faculty member chosen by the student. Student and faculty member develop a course of study designed for the individual student and approved by the department chair prior to registration. May be repeated for a maximum of six credits. Preq: Junior standing.

HON Hlon Freshman Colloquium: Cross-Cultural Awareness (Honors) 3 (3) Intecllectually intensive seminar that engages freshman honors students in dialogue about the idea of the University. Explores traditions, customs, and value systems of peoples and cultures. Examines concepts and tools that organize scholarly inquiry into world cultures emphasizing non-Western societies. Topics vary. Preq: Membership in Calhoun Honors College.

Hlon Freshman Colloquium Science and Technology in Society (Honors) 3 (3) Intecllectually intensive seminar that engages honors students in dialogue about the idea of the University. Explores interactions of the sciences and technology with society. Examines how science and technology are social enterprises and the impact of science and technology on attitudes, behaviors, and choices. Topics vary. Preq: Membership in Calhoun Honors College.

Hlon Structures and Society (Honors) 3 (3) Interdisciplinary honors seminar that examines selected structures regarded as monuments to artistic creativity and technological genius and the ways that structures affect and are affected by the societies that produce them. Preq: Membership in Calhoun Honors College.

Hlon Science, Culture, and Human Values (Honors) 3 (3) Interdisciplinary honors seminar that unifies natural scientific, social scientific, and humanistic disciplines into a holistic view of the modern world and its future. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: Membership in Calhoun Honors College.

Hlon Society, Art, and Humanities (Honors) 3 (3) Combines readings and methodologies from the social sciences, arts, and humanities to study the interrelationships among the disciplines and their societal effects. Subjects vary. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: Membership in Calhoun Honors College.

Hlon Honors Study/Travel 1 (3) Study/travel experience related to a three-credit Calhoun Honors Seminar. May be repeated for a maximum of three credits, but only if different topics are covered. Preq: Membership in Calhoun Honors College.

Hlon Current Topics (Honors) 1 (1) Seminar to expose students to current topics in the interpretation of documents, works of art, structures and scholarly materials. May be repeated for a maximum of three credits, but only if different topics are covered. Preq: Membership in Calhoun Honors College.

Hlon Controversies in Science and Technology (Honors) 3 (3) Interdisciplinary honors seminar that examines social issues related to science and technology, using perspectives from science, the social sciences, and humanities. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: Membership in Calhoun Honors College.

Hlon Reasoning, Critical Thinking, and Problem Solving (Honors) 3 (3) Interdisciplinary honors seminar that teaches a particular set of tools for thinking and analysis, showing how these tools can be applied to different kinds of problems in different disciplines. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: Membership in Calhoun Honors College.
HON 2090 Border Crossings: Experiences in World Cultures (Honors) 1-3 (1-3) Readings and studies that heighten understanding of world cultures and societies. Taken in conjunction with international educational experiences approved by Calhoun Honors College. May be repeated for a maximum of six credits, with a maximum of three credit hours per study abroad experience. Preq: Membership in Calhoun Honors College.

HON 2100 Experiencing the Arts (Honors) 3 (2) Interdisciplinary exploration of the arts through seminar discussions and attendance at performing and visual arts events on campus. Exploration of arts and aesthetics leading to performance previews, reviews, and experiences of Brooks Center and Lee Gallery events. May be repeated for a maximum of nine credits. Preq: Membership in Calhoun Honors College. Coreq: HON 2101.

HON 2101 Experiencing the Arts (Honors) Laboratory 0 (3) Non-credit laboratory to accompany HON 2100. Coreq: HON 2100.

HON 200 Studies in Social Science (Honors) 3 (3) Discipline specific social science seminar including a disciplinary introduction (anthropology, economics, history, political science, psychology, or sociology) and a detailed examination of specific theories and methods within that discipline. May be repeated for a maximum of six credits, but only if different disciplines are covered. Preq: Membership in Calhoun Honors College.

HON 2210 Studies in Literature (Honors) 3 (3) Introduction to selected authors and literary works focused around a specific topic. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: Membership in Calhoun Honors College.

HON 2220 Studies in Arts and Humanities (Honors) 3 (3) Exploration of music, literature, film, philosophy or another area in humanities by examining a discipline specific topic. Focus may be on a particular scholar, era or culture that led to a concept specific to a particular arts/humanities discipline. May be repeated for a maximum of six credits, but only if different disciplines are covered. Preq: Membership in Calhoun Honors College.

HON 2230 Studies in Communications (Honors) 3 (3) Explores various topics in communications. Focus may be on a particular type of communication, medium or theory. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: Membership in Calhoun Honors College.

HON 4000 Honors Contract 0 (0) Advanced study and research taken in conjunction with any 3000-4000-level course. Contract requires prior approval by instructor and Honors Director. To be taken Pass/No Pass only. May be repeated once, but only if in conjunction with a different course. Preq: Membership in Calhoun Honors College.

HON 4990 Honors Research 1-12 (1-12) Honors directed research in an academic discipline. Topics include, but are not limited to, literature review, research design and execution, and reporting of results. May be repeated for a maximum of 12 credits. Preq: Membership in Calhoun Honors College.

HORTICULTURE

Professors: J.W. Adelberg, H. Liu, L.B. McCarty, T. Whitwell, G. Zehnder; Associate Professor: J.E. Faust; Assistant Professor: D. Park Extension Associates: R. Polomski, E. Vincent

HORT 1010 Horticulture 3 (3) Environmental factors and horticultural practices affecting optimum production of floral, fruit, ornamental, and vegetable crops. Includes a survey of the various areas of horticulture and their importance to society.

HORT 1020 Experience Horticulture 1 (2) Students experience the art, science, business, and diversity of horticulture through visits to greenhouses, nurseries, botanical gardens, athletic fields, golf courses, orchards, farms, and research fields and laboratories. Students learn about horticulture from a cross section of professionals sharing their work experiences. Preq: Freshman or sophomore standing in Horticulture or Turfgrass.

HORT 2020 Selected Topics 1-3 (1-3) Introduction to developing trends, concepts or technologies in horticulture and/or turfgrass. May be repeated for a maximum of three credits, but only if different topics are covered. Preq: Consent of instructor.

HORT 2830 Landscape Appreciation 3 (3) Deepens students appreciation of natural and built environments through a study of landscape elements, styles, and professions. Landscapes ranging in scale from residential to regional are critiqued, and design principles and landscape ethics are discussed.

HORT 2100 Growing Garden Plants in the Fall 3 (2) Focuses on growing techniques for the production of ornamental and edible horticultural crops during the fall growing season. Focuses on scheduling, fertilization, irrigation, integrated pest management and marketing. Labs focus on providing hands-on opportunities to identify and grow flowering crops and vegetables in greenhouses and in the field. Preq: HORT 1010. Coreq: HORT 2101.

HORT 2101 Growing Garden Plants in the Fall Laboratory 1 (3) Focuses on growing techniques for the production of ornamental and edible horticultural crops during the fall growing season. Includes scheduling, manipulation of vegetative growth and flowering, nutritional management and plant growth regulation. Labs focus on providing hands-on opportunities to grow flowering crops and vegetables in greenhouses and in the field. Preq: HORT 2110. Coreq: HORT 2111.

HORT 2102 Growing Garden Plants in the Spring 3 (2) Focuses on growing techniques for the production of ornamental and edible horticultural crops during the spring growing season. Includes scheduling, manipulation of vegetative growth and flowering, nutritional management and plant growth regulation. Labs focus on providing hands-on opportunities to grow flowering crops and vegetables in greenhouses and in the field. Preq: HORT 2110. Coreq: HORT 2111.

HORT 2111 Growing Garden Plants in the Spring Laboratory 0 (3) Non-credit laboratory to accompany HORT 2110. Coreq: HORT 2111.

HORT 2120 Introduction to Turfgrass Culture 3 (3) Studies of the introductory principles associated with the art and science of turfgrass culture. Develops an understanding of the history and evolution of turfgrasses and turfgrass culture. Explores career potentials in turfgrass management. Examines the basic scientific principles and techniques associated with the propagation and establishment of fine turfgrasses. Preq: BIOL 1030 and BIOL 1040.

HORT 2130 Turfgrass Culture Laboratory 1 (2) Provides hands-on activities and understanding of basic principles and techniques in turfgrass culture. Students learn all phases of turfgrass management including identification, turfgrass culture, common turfgrass pest identification and control. Preq or concurrent enrollment: HORT 2120.

HORT 2710 Internship 1-6 (1-6) Preplanned, practical, supervised work experience to give beginning students on-the-job learning opportunities that support classroom experience. Students submit monthly reports and present a departmental internship seminar. Undergraduates may accumulate a maximum of six credits for participation in HORT 2710 and/or 4710. Preq: Consent of instructor.

HORT 3030 Landscape Plants 3 (2) Woody, ornamental plants and their aesthetic and functional uses in landscape developments. Study covers habit of growth, ultimate size, texture effect, period of bloom, color, and cultural requirements. Coreq: HORT 3031.

HORT 3031 Landscape Plants Laboratory 0 (3) Non-credit laboratory to accompany HORT 3030. Coreq: HORT 3030.

HORT 3040 Annuals and Perennials 2 (3) Annual and perennial flowers aesthetic appeal and functional uses and needs. Color, texture, bloom time, form, size, and growth requirements as they relate to designing, planting, and maintaining colorful landscapes. Preq: HORT 2830 and HORT 3030. Coreq: HORT 3041.

HORT 3041 and 3042 1-2 (1-2) Prerequisites: HORT 2830. May be repeated for a maximum of three credits, but only if different disciplines are covered.

HORT 3040 Annuals and Perennials Laboratory 0 (3) Non-credit laboratory to accompany HORT 3040. Coreq: HORT 3040.

HORT 3080 Sustainable Landscape Garden Design 3 (3) Landscape planning of gardens using environmentally sensitive design, construction, and maintenance practices. Survey skills to obtain user perception and preference and environmental measurement skills are introduced. Offered fall semester only. Preq: HORT 1010.

HORT 3090 Sustainable Landscape Garden Design Laboratory 1 (3) Sustainable landscape garden design using sustainable environmentally sensitive concepts and practices. Techniques of sustainable landscape garden design including hand drawing, site assessment, client interview, user perception survey, plant selection, and professional presentation. Plant selection encourages establishing healthy ecosystems. Emphasis on interactions between design, installation, and maintenance phases. Preq or concurrent enrollment: HORT 3080.

HORT 3100 Growing Landscape Plants 3 (2) Principles, technologies, and techniques of landscape plant production and growth including environmental control and manipulation, water, nutrient and pest management, scheduling, propagation, and plant problem diagnostics. Emphasizes herbaaceous ornamentals along with significant woody landscape plants. Preq: HORT 1010. Coreq: HORT 3101.

HORT 3101 Growing Landscape Plants Laboratory 0 (3) Non-credit laboratory to accompany HORT 3100. Coreq: HORT 3100.
HORT 4000 Selected Topics 1-6 (1-6) Advanced study of any aspect of horticulture and/or turfgrass not addressed in other courses. May be repeated for a maximum of six credits, but only if different topics are covered.

HORT 4040 Plant Propagation 3 (3) Practices of plant propagation from seeds, bulbs, divisions, layers, cuttings, grafting, and tissue culture are introduced. Physiological principles of pollination and seed biology, plant growth, regulators, source-sink relations, life cycles and developmental phase transitions explain the practices. Environmental and economic contexts frame the preferred practices.

HORT 4050 Plant Propagation Techniques Laboratory 1 (3) Techniques of plant propagation, including sexual methods germination, scarification, and stratification. Asexual methods, including grafting, budding, cuttings, layering, tissue culture divisions, and separations. Students visit local nurseries. Prq or concurrent enrollment: HORT 4040.

HORT 4080 Horticulture Discovery and Inquiry 1-3 (1-3) Students learn about horticulture through research, service learning, and/or creative inquiry projects. They explore a topic of interest with faculty, organize a quality proposal, complete the project, and report results to appropriate professional audiences. May be repeated for a maximum of nine credits.

HORT 4090 Senior Capstone Course 3 (3) Student cognitive, affective and psychomotor learning (skills) in the field of environmental horticulture is assessed using real world professional situations requiring the command, analysis and synthesis of knowledge and skills acquired during the undergraduate experience. Prq: Senior standing in Horticulture.

HORT 4120, 6120 Advanced Turfgrass Management 3 (2) Advanced principles and practices associated with turfgrass management for golf courses, sports fields, sod production, and commercial landscape care. Topics include turfgrass physiology, plant growth and development, construction, turfgrass nutrition, irrigation, drainage, pesticide use and fate, and development of effective management systems. Prq: CSEN 2020 or HORT 2120. Coreq: HORT 4121, 6121.

HORT 4121, 6121 Advanced Turfgrass Management Laboratory 0 (3) Non-credit laboratory to accompany HORT 4120, 6120. Coreq: HORT 4120, 6120.

HORT 4200, 6200 Applied Turfgrass Physiology 3 (3) Advanced course in turfgrass science and management. Provides the current status and development of turfgrass stress physiology and research. Main topics include temperature, drought, traffic, edaphic stresses, new developments in the turf industry and environmental stewardship. Prq: HORT 2120, and HORT 2130.

HORT 4270, 6270 Urban Tree Care 3 (3) Principles, practices, and problems of protecting and maintaining trees in urban and recreational areas. Examines environmental and biological factors affecting trees in high-use areas, their management and cultural requirements, and the practices necessary for their protection and care as valuable assets in the landscape. Prq for HORT 4270: FOR 2050 or HORT 3030. Prq for HORT 6270: Consent of instructor.

HORT 4330, 6330 Landscape and Turf Weed Management 3 (2) Weed management strategies that include cultural, biological, and chemical methods are studied for landscape and turfgrass areas. Problem-solving skills and herbicide characteristics are emphasized. Coreq: HORT 4331, 6331.

HORT 4331, 6331 Landscape and Turf Weed Management Laboratory 0 (2) Non-credit laboratory to accompany HORT 4330, 6330. Coreq: HORT 4330, 6330.

HORT 4540, 6540 Just Fruits 3 (3) Students explore the origins, biology, culture, and production of major temperate zone fruit-apples, berries, and cherries to pawpaws, peaches, and pomegranates, the familiar to the forbidden. They discover principles, practices, and technologies employed to grow, protect, and harvest the fruits that feed us from commercial orchards, organic farms, and backyards. Prq: HORT 1010.

HORT 4560, 6560 Organic Vegetable Production 3 (1) Principles and practices of organic vegetable production, including site and variety selection, field and greenhouse production methods, and cultural practices to manage pests and weeds. Harvesting and post-harvest handling is also addressed. Emphasis is placed on sustainable practices, alternative methods, and reducing reliance on chemical inputs. Coreq: HORT 4561, 6561.

HORT 4561, 6561 Organic Vegetable Production Laboratory 0 (6) Non-credit laboratory to accompany HORT 4560, 6560. Coreq: HORT 4561, 6560.

HORT 4610, 6610 Advanced Landscape Garden Design 4 (3) Garden design for urban or other highly visible locations. A speciality garden with environmental education potential will be designed. Finished plans include detailed planting, installation and maintenance, and communication. Emphasis is on establishing healthy plant communities, habitat linkages, and healthy water and soil. Includes seniors sections. Prq: HORT 3080 and HORT 3090. Coreq: HORT 4611, 6611.

HORT 4640, 6640 Advanced Landscape Garden Design Laboratory 0 (3) Non-credit laboratory to accompany HORT 4610, 6610. Coreq: HORT 4610, 6610.

HORT 4650, 6650 Plant Molecular Biology 3 (3) Study of fundamental plant processes at both the cellular and molecular levels. Topics include genome structure and organization (both nuclear and organeleral); regulation of gene expression and its role in cellular and whole-plant processes; transposable genetic elements; applications for biotechnology. Prq: Junior standing; and GEN 3020; and either BIOL 3040 or BIOL 3050.

HORT 4710, 6710 Advanced Internship 1 (1-6) Preplanned work experience under competent supervision in approved agency dealing with horticultural endeavors. Gives advanced students on-the-job learning opportunities to apply acquired knowledge and skills. Monthly reports and final on-the-job learning opportunities to apply acquired knowledge and skills. Monthly reports and final reports required. Undergraduates may accumulate a maximum of six credits for participation in HORT 2710 and/or 4710. Prq: Junior standing.

HORT 4720, 6720 Landscapes + Health 3 (3) Explores the role of landscapes in human health and wellness. Historical healing places and contemporary urban environments are examined for evidence of psychological and physiological impacts. Readings include interdisciplinary research. Prq: Senior standing.

HISTORIC PRESERVATION

Professor: J. Burden

HP 4100, 6100 History and Theory of Historic Preservation 3 (3) Survey history of preservation that explores a variety of theoretical issues that impact the discipline. Provides a basis for critical evaluation of historic preservation. Prq: Three semesters of Art and Architectural History or equivalent or consent of instructor.

HP 4110, 6110 Archival Research and Oral History in Historic Preservation 3 (3) Introduction to historic buildings and landscapes research. Emphasizes researching the physical and social history of buildings and places. Charleston and its environs provide case study projects for archival research.

HP 4120, 6120 Materials and Methods of Historic Construction 3 (3) Survey of traditional materials and methods of construction in America from the 18th through the early 20th century. Scientific examination of historic construction provides case studies. Students are expected to have completed three semesters of Art and Architectural History.

HUMANITIES

Professor: S.K. Eisiminger; Associate Professor: A. Bennett

HUM 3010 Humanities 3 (3) Introduction to humanistic studies focusing on relationships among discipline—painting, sculpture, architecture, music, literature, philosophy, and drama—beginning with prehistory and continuing to the Renaissance.

HUM 3020 Humanities 3 (3) Introduction to humanistic studies focusing on relationships among discipline—painting, sculpture, architecture, music, literature, philosophy, and drama—beginning with the 17th century and continuing to the present.

HUM 3050 Creative Genius in Western Culture 3 (3) Investigation of creativity through study of great innovators in art, literature, music, and ideas. May be repeated once for credit.

HUM 3090 Studies in Humanities 3 (3) Interdisciplinary approach to the humanities. Special subject matter varies according to the instructor and as approved by the chair of the English Department. May be repeated once for credit.

HUM 4560, 6560 Literature and Arts of the Holocaust 3 (3) Addresses the Holocaust through literature, art, architecture, music, and film. Beginning with historical, political, and economic forces that contributed to the Holocaust, course then focuses on highly diverse creative responses to this event—responses that often reflect the difficulties and politics of these commemorative gestures. Prq for HUM 4560: ENGL 3100. Prq for HUM 4560: ENGL 3100 or consent of instructor.
INDUSTRIAL ENGINEERING


IE 2000 Sophomore Seminar in Industrial Engineering 1 (1) Addresses the industrial engineering program, best student practices, and career paths. Invited lecturers, as needed, and faculty provide lectures and demonstrations. Preq: ENGR 1020 or ENGR 1300 or ENGR 1410. Coreq: IE 2100. IE 2010 Systems Design I 4 (3) Introduction to the design of industrial engineering systems. Design methodologies are introduced in the context of a design process that includes identifying user needs; developing a design specification; generating, evaluating, refining, and selecting design concepts; detail design; constructing, testing, and refining prototypes; and delivering the product to the customer. Preq: ENGR 1020 and ENGR 1030. Coreq: IE 2111. IE 2101 Systems Design I Laboratory 0 (3) Non-credit laboratory to accompany IE 2100. Coreq: IE 2100. IE 2100 Design and Analysis of Work Systems 3 (2) Introduction to the tools and techniques used to design and analyze work systems for human use, including process improvement, workplace design and an introduction to the field of human factors and ergonomics. Preq: ENGR 1020; and either ENGR 1020 or ENGR 1030. Coreq: IE 2101. IE 2101 Design and Analysis of Work Systems Laboratory 0 (3) Non-credit laboratory to accompany IE 2100. Coreq: IE 2100. IE 2680 Creative Inquiry Seminar in Industrial Engineering 1 (1) Students are introduced to creative inquiry methods, resources, and current activities in a seminar format. To be taken Pass/No Pass only. Includes Honors sections. IE 2800 Deterministic Operations Research 3 (3) Introduction to operations research models including linear programming, integer linear programming, transportation and assignment problems, and network flows. Preq: MTHS 1060. IE 3000 Junior Honors Seminar 1 (1) Acquaints students enrolled in the Departmental Honors Program with current research issues in the profession. This assists students in preparing a research proposal for the senior thesis. Preq: Junior standing and admission to Departmental Honors Program. IE 3600 Industrial Applications of Probability and Statistics I 3 (3) Introduces central concept that overall system performance can be improved by taking uncertainty into account, especially through the reduction of variability. Specific industrial applications, such as decision analysis, reliability and probabilistic inventory models, are emphasized. Preq: MTHS 2060. IE 3610 Industrial Applications of Probability and Statistics II 3 (3) Introduces central concept that apparent conflict between productivity and quality can be resolved through improvements in processes by introducing statistical thinking. Specific industrial applications, such as (static) simulation, quality control and reliability models, are emphasized. Preq: IE 3600. IE 3680 Professional Practice in Industrial Engineering 1 (1) Seminar to orient students to issues of professional development and professional practice of industrial engineering. IE 3810 Probabilistic Operations Research 3 (3) Probabilistic modeling of engineering systems. Topics include calculus-based probability, Markov processes, Poisson processes, queueing, and other selected topics. Preq: IE 2800 and IE 3600. IE 3840 Engineering Economic Analysis 3 (3) Basic principles and techniques of economic analysis of engineering projects. Consideration of time, value of money, short- and long-term investments, replacement analysis, depreciation methods, cost allocation, and measures of cost effectiveness. Preq: MTHS 1080. IE 3860 Production Planning and Control 3 (3) Fundamentals of forecasting demand, scheduling production, and controlling the movement and storage of material associated with production are studied. State-of-the-art manufacturing techniques are discussed. Preq: IE 2800 or MTHS 4400. IE 4000, 6000 Honors Thesis 1-6 (1-6) Individual or joint research project performed with a faculty mentor or committee of faculty. May be repeated for a maximum of six credits. Preq: IE 2680 and consent of mentor. IE 4020 Creative Inquiry Research 1-6 (1-6) Research experience promoting reasoning, critical thinking, ethical judgment, communication skills, and an understanding of the scientific method and engineering design. These applied/research experiences are usually undertaken with a team under the mentorship of a faculty member or advanced graduate student. May be repeated for a maximum of six credits. Preq: Consent of mentor. IE 4030 Creative Inquiry Project 1-3 (1-3) Project-oriented experience promoting reasoning, critical thinking, ethical judgment, communication skills, and an understanding of the scientific method and engineering design. Typical experiences include cooperative education or sponsored student competitions undertaken with a team, under the mentorship of a faculty member or advanced graduate student. May be repeated for a maximum of three credits. Preq: IE 2680 and consent of mentor. IE 4180, 6180 Human Factors Accident Analysis and Expert Testimony 3 (3) This highly interactive course is divided into two components. Students gain an understanding of how the principles of human factors engineering are used in accident investigation and forensic analysis, and then learn the skills necessary to defend their opinions as an expert witness. Preq for IE 4180: One of IE 2100 or IE 4880 or PSY 3640 or PSYC 3660 or PSYC 4350. Preq for IE 6180: IE 6880 or IE 8000 or PSYC 8350. IE 4300, 6300 Human Factors Engineering in Healthcare 3 (3) Focuses on how industrial engineers help improve the quality and safety of patient care. Students learn how healthcare is different from traditional industrial engineering sectors. A substantial part of the course is focused on learning how to apply industrial engineering tools, specifically those grounded in human factors, to healthcare problems. Preq for IE 4300: IE 2100 or IE 4880 or PSYC 3640 or PSYC 3660 or PSYC 4350. Preq for IE 6300: IE 6880 or IE 8000. IE 4400, 6400 Decision Support Systems in Industrial Engineering 3 (2) Study of design of decision support systems for production and service systems based on operations research models. Includes use of spreadsheets, databases, and integrated software for implementation. Preq for IE 4400: ENGR 1410. Coreq: IE 4401, 6401. IE 4401, 6401 Decision Support Systems in Industrial Engineering Laboratory 0 (3) Non-credit laboratory to accompany IE 4400, 6400. Coreq: IE 4400, 6400. IE 4440 International Perspectives in Industrial Management 1-6 (1-6) Provides an international perspective to industrial management via organized plant visits to businesses in a foreign country and lectures by and discussions with senior operations managers. Cultural visits and lectures are also organized to provide a holistic perspective to cover cultural and economic environment of the host country. Students are responsible for travel costs. May be repeated for a maximum of six credits. Preq: Consent of instructor. IE 4520, 6520 Reliability Engineering 3 (3) Probabilistic approach to assessing system reliability. Methods for analyzing serial, parallel, and complex systems. Reliability life testing and its acceleration are covered. Essential elements of maintainability are identified and related to system availability. Preq for IE 4520: IE 3610; or MTHS 3020 and MTHS 4000. Preq for IE 6520: IE 8090; or (MTHS 6000 or MTHS 8000) and (MTHS 6050 or MTHS 8050). IE 4560, 6560 Supply Chain Design and Control 3 (3) Industrial engineering aspects of supply chains, including design and control of material and information systems. Preq for IE 4560: IE 3610 and IE 3860. Preq for IE 6560: IE 8040 or consent of instructor. IE 4570, 6570 Transportation and Logistics Engineering 3 (3) Introduces transportation and logistics systems analysis from both analytical and practical perspectives. Covers methods for identifying level-of-service metrics and measuring system performance. Discusses key aspects of modeling, simulation, and other techniques for economic and quantitative analysis of transportation and logistics planning issues. Preq for IE 4570: Senior standing in an engineering, science, or management program; and MTHS 1020 or MTHS 4600, 6600 Quality Improvement Methods 3 (3) Study of modern quality improvement techniques presented in an integrated, comprehensive context. Preq for IE 4600: MTHS 1020 or MTHS 1060; and junior standing. IE 4610, 6610 Quality Engineering 3 (3) Design aspects of quality and the engineers role in problems of quality in production systems. Preq: IE 3610. IE 4620, 6620 Six Sigma Quality 3 (3) Study of DMAIC (Define, Measure, Analyze, Improve, and Control) elements of Six Sigma, project management, process analysis, quality function deployment, hypothesis testing, gage R&R, data analysis, multi-var analysis, design of experiments, statistical process control, and process capability analysis. Preq for IE 4620: One of EXST 3010 or EXST 4110 or IE 3600 or MTHS 3010 or MTHS 3020 or MTHS 3090 or CHE 3070. Preq for IE 6620: EXST 8010 or IE 8090 or MTHS 6030 or MTHS 8040 or MTHS 8050.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Description</th>
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<tbody>
<tr>
<td>IE 4630, 6630</td>
<td>Quality in the Capital Projects</td>
<td>Covers topics in quality and lean principles relevant to the capital projects industry. Provides a broad overview on quality concepts and philosophies, quality management and inspection tools applicable to capital projects. Six Sigma Approach, lean concepts and value stream mapping. Preq for IE 4630: MTHS 1020 or MTHS 1060; and junior standing.</td>
</tr>
<tr>
<td>IE 4650, 6650</td>
<td>Facilities Planning and Design</td>
<td>Study of the principles and techniques of facility planning and design. Discusses economic selection of materials handling equipment and integration of this equipment into the layout plan to provide effective product flow in production, distribution, and service contexts. Includes quantitative techniques for evaluation of facility design. Preq for IE 4650: IE 2100 and IE 2800 and IE 3810. Preq for IE 6650: IE 8000 and IE 8030 and IE 8090.</td>
</tr>
<tr>
<td>IE 4670</td>
<td>Systems Design</td>
<td>Provides students with the challenge of integrating and synthesizing general engineering knowledge into creatively solving real-world, open-ended problems. This includes developing the problem statement, objectives, and criteria; data collection; technical analysis; developing and integrating recommendations; and presenting results. Preq: All of the following Industrial Engineering courses: IE 2010, 2100, 2800, 3600, 3610, 3680, 3810, 4400, 4610, 4650, and 4820. Coreq: IE 4671.</td>
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<tr>
<td>IE 4671</td>
<td>Systems Design II</td>
<td>Non-credit laboratory to accompany IE 4670. Coreq: IE 4670.</td>
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<tr>
<td>IE 4690</td>
<td>Creative Inquiry Symposium in Industrial Engineering</td>
<td>Provides a forum for exchange of results and ideas in creative inquiry student projects. To be taken Pass/No Pass only. Preq: IE 3680.</td>
</tr>
<tr>
<td>IE 4820, 6820</td>
<td>Systems Modeling</td>
<td>The purpose, theory, and techniques of modeling systems with dynamic events. Students learn a powerful analytical process to use in the analysis and improvement of systems in several industries, including transportation, logistics, manufacturing and service systems. Incorporates professional simulation software as a tool in evaluating the system performance. Preq for IE 4820: IE 3610 and 3810; or MTHS 4400 and MTHS 4410 and MTHS 3020. Preq for IE 6820: IE 8030 or (MTHS 6400 and 6410) or (MTHS 8030 and 8100); AND (IE 8090 or MTHS 6030 or MTHS 8040). Coreq: IE 4821, 6821.</td>
</tr>
<tr>
<td>IE 4821, 6821</td>
<td>Systems Modeling Laboratory</td>
<td>Non-credit laboratory to accompany IE 4820, 6820. Coreq: 4820, 6820.</td>
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<tr>
<td>IE 4850, 6850</td>
<td>Survey of Optimization Methods and Applications</td>
<td>Survey of deterministic and stochastic optimization methods, theory and algorithms. Modeling, analysis and applications of optimization to modern industrial engineering problems. Preq for IE 4850: One of IE 2800 or MTHS 4400; and one of IE 3810 or MTHS 4410. Preq for IE 6850: IE 8030; or MTHS 8030 and 8100; or MTHS 6400 and 6410.</td>
</tr>
<tr>
<td>IE 4870, 6870</td>
<td>Industrial Safety</td>
<td>Recognition and prevention of hazards; recognition and control of hazardous materials; developing and managing a safety program; designing inherently safe equipment and workplaces. Preq for IE 4870: MTHS 1020 or MTHS 1060; and junior standing.</td>
</tr>
<tr>
<td>IE 4880, 6880</td>
<td>Human Factors Engineering</td>
<td>Introduction to human performance and limitations in the design of effective and efficient systems. Covers issues related to changes in technology, impact of design on society, ethical issues in design of systems, and the cost benefits from designing systems and environments that often challenge perceived notions of benefits. Preq: Junior standing; and MTHS 1020 or 1060.</td>
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<tr>
<td>IE 4890, 6890</td>
<td>Industrial Ergonomics and Automation</td>
<td>Physical ergonomics and ergonomics in industrial settings, including work physiology, the physical environment, automated systems, and hybrid work systems. Preq for IE 4890: IE 2100. Preq for IE 6890: IE 8000. Coreq: IE 4891, 6891.</td>
</tr>
<tr>
<td>IE 4891, 6891</td>
<td>Industrial Ergonomics and Automation Laboratory</td>
<td>Non-credit laboratory to accompany IE 4890, 6890. Coreq: IE 4890, 6890.</td>
</tr>
<tr>
<td>IE 4910, 6910</td>
<td>Selected Topics in Industrial Engineering</td>
<td>Comprehensive study of any timely or special topic in industrial engineering not included in other courses. May be repeated for a maximum of six credits. Includes Honors sections. Preq: Consent of instructor.</td>
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<tr>
<td>ITAL 1010</td>
<td>Cross-Cultural Awareness</td>
<td>Experience 0 (0) Study of cross-cultural awareness as part of an international/study abroad experience. Minimum duration of the study abroad experience is four weeks. May be repeated. To be taken Pass/No Pass only.</td>
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<tr>
<td>ITAL 3010 Introduction to Italian Literature 3 (3)</td>
<td>Study of selected texts of Italian literature in their artistic, cultural, and social context. May include theme and genre studies. Preq: ITAL 2020.</td>
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<tr>
<td>ITAL 3020 Modern Italian Literature 3 (0) Study of selected works from major 19th- and 20th-century Italian authors, including Manzoni, Verga, Svevo, Moravia, Ginzburg. Preq or concurrent enrollment: ITAL 2020.</td>
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<tr>
<td>ITAL 3050 Intermediate Italian Conversation and Composition 3 (3)</td>
<td>Practice in the written and spoken language with emphasis on vocabulary, pronunciation, and comprehension. Preq: ITAL 2020.</td>
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<tr>
<td>ITAL 3070 Italian Civilization and Culture 3 (3)</td>
<td>Study of the significant aspects of Italian civilization and culture through analysis of literary texts, paintings, films, and magazine articles. Preq: ITAL 2020.</td>
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<tr>
<td>ITAL 3600 Italian Literature to 1600 3 (3)</td>
<td>Examines selected topics in Italian literature from the Middle Ages to 1600. Readings include works by Dante, Boccaccio, Petrarcha, Franco, Castiglione and Machiavelli. Preq or concurrent enrollment: ITAL 3020 or ITAL 3050.</td>
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<tr>
<td>ITAL 3970 Creative Inquiry—Italian 1-4</td>
<td>Students focus on a special research area under the guidance of a faculty member. After acquiring the requisite background, students formulate hypotheses for a group project, develop a critical framework, and initiate research on a specific topic.</td>
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<tr>
<td>ITAL 3980 Directed Reading 1-3 (1-3)</td>
<td>Directed study of selected topics in Italian literature, language, and culture. May be repeated for a maximum of six credits. Preq: Consent of department chair.</td>
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<tr>
<td>ITAL 4000 Image of an Italian City 3 (3)</td>
<td>Study of historical, social, and architectural images of Italian cities through analysis of literary texts and films. Preq: ITAL 2020.</td>
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</tbody>
</table>
ITAL 4050 Advanced Italian 3 (3) Advanced language study emphasizing fluency in oral and written expression through discussion and analysis of contemporary Italian media. Preq: One 3000-level Italian course.

ITAL 4550 Italian Film 3 (2) Overview of Italian cinema. Topics may include history, genres, and major directors. Preq: ITAL 3550. Coreq: ITAL 4551.

ITAL 4551 Italian Film Laboratory 0 (3) Non-credit laboratory to accompany ITAL 4550. Coreq: ITAL 4550.

ITAL 4750 Advanced Italian Seminar 3 (3) Concentrated research and discussion on advanced topics in Italian literature, film, art, or drama. May be repeated for a maximum of six credits. Preq: One 4000-level Italian course.

ITAL 4970 Creative Inquiry—Italian 1-4 (1-4) Continuation of research initiated in ITAL 3970. Students complete their project and disseminate their research results. Preq: ITAL 3970.

ITAL 4980 Selected Topics 3 (3) Study of selected topics in Italian literature, language, and culture. Taught in Italian. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: Consent of department chair.

JAPN 1020 Intermediate Japanese 3 (3) Course for beginners in which fundamentals are taught and a foundation is provided for further study and the eventual ability to read and speak the language. The Japanese writing system is introduced. Students learn how to recognize and write the two alphabets Hragana and Katakana. Three hours a week of classroom instruction and one hour a week in the language laboratory. Coreq: JAPN 1011.

JAPN 1011 Elementary Japanese Laboratory 0 (1) Non-credit laboratory to accompany JAPN 1020. Coreq: JAPN 1010.


JAPN 1021 Elementary Japanese Laboratory 0 (1) Non-credit laboratory to accompany JAPN 1020. Coreq: JAPN 1020.


JAPN 1011 Intermediate Japanese Laboratory 0 (1) Non-credit laboratory to accompany JAPN 2020. Coreq: JAPN 1010.


JAPN 2970 Creative Inquiry—Japanese 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Arrangements with faculty members must be established prior to registration. Preq: Consent of faculty member.


JAPN 3050 Japanese Conversation and Composition 3 (3) Practice in the spoken language with emphasis on vocabulary, Kanji, pronunciation, and comprehension; learning practical language skills and intercultural communication through various topics. Preq: JAPN 2020.

JAPN 3060 Japanese Conversation and Composition 3 (3) Continuation of JAPN 3050. More practice in the spoken language emphasizing vocabulary, Kanji, pronunciation, and comprehension. Learning practical language skills and intercultural communication through various topics. Preq: JAPN 3050.


JAPN 3970 Creative Inquiry—Japanese 1-4 (1-4) Students focus on a special research area under the guidance of a faculty member. After acquiring the requisite background, students formulate hypotheses for a group project, develop a critical framework, and initiate research on a specific topic.

JAPN 3980 Directed Reading 1-3 (1-3) Directed study of selected topics in Japanese literature, language, and culture. May be repeated for a maximum of six credits. Preq: Consent of department chair.

JAPN 4010 Japanese Literature in Translation 3 (3) Introduction to Japanese literature from 712 AD to the present. Cultivates an appreciation for Japanese literature and culture. All readings and discussions are in English. May not be used to satisfy general foreign language requirements.

JAPN 4030 Internship in Japan 3 (3) Minimum of one month of full-time work experience in Japan. All work activities with host companies are conducted in Japanese. May be repeated for a maximum of six credits. Preq: JAPN 2020.

JAPN 4040 Cultural Studies in Japan 3 (3) Study of Japanese cultural topics on site in Japan through lectures, field trips, small student group reconnaissances, and excursion sessions. All activities are conducted in Japanese. May be repeated for a maximum of six credits. Preq: JAPN 2020.

JAPN 4060 Introduction to Japanese Literature 3 (3) Students read contemporary Japanese narrative fiction, poetry, and drama in their historical and social context. Preq: 3000-level Japanese course.

JAPN 4110 Studies in the Japanese Language I 3 (3) Advanced training in the spoken and written language with emphasis on formal expressions. Preq: JAPN 3060.


JAPN 4160 Japanese for International Trade II 3 (3) Study of language and cultural environment of the Japanese-speaking market, including the linguistic and cultural idioms that support global marketing in general and the international marketing of textiles, agricultural products, and tourism in particular. Preq: JAPN 3160.

JAPN 4170 Japanese Culture and Society 3 (3) Focuses on the substantive areas of Japanese culture found in social interaction and ritual behavior. Japanese social organization, including marriage and family patterns, neighborhood and community organization, and gender roles receive extensive attention. All readings and discussions are in English. May not be used to satisfy general foreign language requirements.

JAPN 4900 Classical Japanese 3 (3) Examination and analysis of premodern Japanese texts. Special emphasis is on the grammar and syntax of the classical language, its divergence from and influence upon the modern idiom. All coursework is conducted in Japanese. Preq: JAPN 3060.

JAPN 4910 Senior Seminar in Japanese Literature 3 (3) Close readings of various works of premodern and modern Japanese literature. Includes study of important authors and their representative works in prose and poetry. Familiarizes students with the cultural and linguistic nuances of literature in the original language. All readings and activities are in Japanese. Preq: JAPN 3060.

JAPN 4970 Creative Inquiry—Japanese 1-4 (1-4) Continuation of research initiated in JAPN 3970. Students complete their project and disseminate their research results. Preq: JAPN 3970.

JAPN 4990 Selected Topics in Japanese Culture 3 (3) Topics generated examination of fundamental cultural themes in premodern and modern Japan, including, but not limited to, such topics as Japanese drama, poetry, prose, religious traditions, cinema, and folklore/mythology. May be repeated for a maximum of six credits, but only if different topics are covered. Readings and discussions are in English. May not be used to satisfy general foreign language requirements.

LANGUAGE

LANG 2500 Introduction to World Languages 3 (3) Introduction to fundamental questions concerning the nature and use of human language throughout the world. Emphasizes the definition, genesis and theoretical characterization of language, as well as its role in social and political discourse. All readings and discussions are in English.
LANG 2540 Introduction to World Cinemas 3 (2) Introduction to the development of cinemas outside the United States through an examination of representative works, genres and movements in their cultural contexts. Conducted in English. All films are subtitled.

LANG 2541 Introduction to World Cinemas Laboratory 0 (3) Non-credit laboratory to accompany LANG 2540.

LANG 2970 Creative Inquiry—Language 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Arrangements with faculty members must be established prior to registration.

LANG 3000 Introduction to Linguistics and Foreign Language Learning 3 (3) Introduction to the field of linguistics, including the study of phonetics, phonology, morphology, syntax, and semantics. Includes discussion of issues pertaining to foreign language acquisition.

LANG 3030 Study Abroad Transfer 0 (3-6) Course for credit transfer of any course taken abroad during a department-approved study. Requires a minimum of two contact hours per week for at least 15 weeks or equivalent. Students may take a course outside their concentration. May be repeated for a maximum of six credits. To be taken Pass/No Pass only. Preq: Consent of department chair.

LANG 3400 Cosmopolis: The Myth of the City 3 (3) Cross-cultural inquiry into the idea of the city through literary, political, and philosophical texts as well as film and architecture. Preq: Junior standing.

LANG 3420 Sacred and Profane Bodies 3 (3) Cross-cultural inquiry into the ambivalence surrounding female sexuality implicit in images of women and, in particular, the division of women into earthly and divine categories. Preq: Junior standing.

LANG 3560 Faces of Evil 3 (3) Cross-cultural inquiry into evil as an ineradicable challenge to representation disclosed by notions of the monster, the enemy, the infinite, and death in literature, cultural theory, and the arts. Preq: Junior standing.

LANG 3710 Language and Culture 3 (3) Surveys key topics, theories, and methodological approaches in linguistic anthropology. Examines the complex relationships among language, culture, and communication behavior and provides students with conceptual tools that inform the study of language in its cultural contexts.

LANG 3970 Creative Inquiry—Language 1-4 (1-4) Students focus on a special research area under the guidance of a faculty member. After acquiring the requisite background, students formulate hypotheses for a group project, develop a critical framework, and initiate research on a specific topic.

LANG 4000, 6000 Phonetics 3 (3) Study of basic phonetic concepts used in the study of sounds in language.

LANG 4200 France and the Francophone World 3 (3) Selected masterpieces of French and Francophone Culture are considered within their historical and cultural context. All readings and instruction are in English. No knowledge of the foreign language is required. May be repeated for a maximum of six credits. Includes Honors sections. Preq: Sophomore standing.

LANG 4500 Risk and Danger 3 (3) Cross-cultural inquiry into the meanings of risk and danger as they are articulated in various literary and philosophical texts and films about gambling, duels, stunts, bullfights, wilderness adventure, and smoking. Preq: Junior standing.

LANG 4540 Selected Topics in International Film 3 (2) Presents subtitled films of specific world cultures and basic film theory and discourse applicable to the selected areas. Taught in English. May be repeated for a maximum of six credits with consent of department chair. Preq: ENGL 3100. Coreq: LANG 4540.

LANG 4541 Selected Topics in International Film Laboratory 0 (3) Non-credit laboratory to accompany LANG 4540. Coreq: LANG 4540.

LANG 4550 Hispanic Film: Documentary and Feature 3 (3) Overview of theory and discourse on Hispanic film. Through lectures, discussions, and films, students become acquainted with film as a vehicle for understanding the Hispanic World. Taught in English. Films are in Spanish with English subtitles. Preq: Sophomore standing.

LANG 4600 Propaganda and the Totalitarian Recreation of the World 3 (3) Cross-cultural inquiry into the various languages (philosophical, political, literary, and filmic, among others) that form a crucial weapon in the striving for hegemony over desire that marks the modern totalitarian project. Preq: Junior standing.

LANG 4620 Borders 3 (3) Cross-cultural inquiry into representations of physical and non-physical borders. Provides a theoretical framework in which various forms of borders, limits, and boundaries can be studied through literature and other artistic media. Preq: Junior standing.

LANG 4850 Global Affairs andGovernments 3 (3) Designed for teachers and education students who wish to learn how to incorporate global affairs more fully into high school curricula. Overview of major topics involving foreign policies and world politics provided. Preq: Junior standing.

LANG 4970 Creative Inquiry—Language 1-4 (1-4) Continuation of research initiated in LANG 3970. Students complete a project and disseminate their research results. Preq: LANG 3970.

LANG 4990 Language Portfolio 2 (2) Students create a digital portfolio to demonstrate competencies in reasoning, critical thinking, problem solving skills, cross-cultural awareness, ethical judgment, and to document a study abroad or internship experience. Course also serves as a resource for academic and professional development. To be taken Pass/No Pass only.

LANDSCAPE ARCHITECTURE

Professors: T. Schurk, K. Schwennsen, Interim Chair; Associate Professors: R. Hewitt, H. Nassar, M. Powers; Assistant Professor: P. Russell; Visiting Assistant Professors: D. Lycke, D. Pearson. Senior Lecturer: M.E. McCubbin

LARC 1160 History of Landscape Architecture 3 (3) History of design on the land from prehistory to the present. Overview of the interface of aesthetics, science, technology, and natural features that influence cultures in shaping places.

LARC 1280 Technical Graphics 3 (2) Introduction to rendering techniques, plan graphics, 3-D projection drawings, drafting skills, perspective drawing, and overview of computer graphics. Preq: Landscape Architecture major. Coreq: LARC 1281.

LARC 1281 Technical Graphics Laboratory 0 (2) Non-credit laboratory to accompany LARC 1280. Coreq: LARC 1280.

LARC 1510 Basic Design I 3 (6) Non-credit laboratory to accompany LARC 1500. Coreq: LARC 1500.

LARC 1520 Basic Design II 3 (6) Cross-cultural inquiry into the idea of the enemy, the infinite, and death in literature, cultural inquiry into the ambivalence surrounding female sexuality implicit in images of women and, in particular, the division of women into earthly and divine categories. Preq: Junior standing.

LARC 2510 Landscape Architecture Design Fundamentals 6 (1) Compositional skills introduced in LARC 1510 and 1520 are applied to design in the landscape. Through research, design assignments and discussions, students derive and apply design principles to place, study the processes of design and develop an understanding of how design principles, plant materials and structures are used in the landscape. Preq: LARC 1520. Coreq: LARC 2511.

LARC 2511 Landscape Architecture Design Fundamentals Laboratory 0 (10) Non-credit laboratory to accompany LARC 2510. Coreq: LARC 2510.

LARC 2520 Site Design in Landscape Architecture 6 (1) Students apply lessons from LARC 2510 to site designs considering planting design, responsible land management strategies and appropriate use of materials. Also included are participatory and social behavioral aspects of design. Readings and seminar discussions are emphasized as integral to the design and decision making process. Preq: LARC 2510. Coreq: LARC 2521.

LARC 2521 Site Design in Landscape Architecture Laboratory 0 (10) Non-credit laboratory to accompany LARC 2520. Coreq: LARC 2520.

LARC 2620 Design Implementation I 3 (1) Basics of landscape architecture construction methods and construction documents, including site information gathering and analysis, basic site grading and drainage, cut and fill, principles of stormwater management, and sustainable land management related to implementation. Includes explorations in hand and computer graphic techniques used in construction drawings. Preq: Consent of instructor. Coreq: LARC 2621.

LARC 2621 Design Implementation I Laboratory 0 (3) Non-credit laboratory to accompany LARC 2620. Coreq: LARC 2620.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Corequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>LARC 3930</td>
<td>Field Studies Internship</td>
<td>1-3</td>
<td>1-3</td>
<td>Skill-based practical work experience to give beginning students on-the-job learning opportunities. Requires a minimum of five weeks of uninterrupted, supervised, practical experience with a preapproved commercial firm or public agency dealing with landscape architectural site issues. May be repeated for a maximum of six credits. To be taken Pass/No Pass only. Preq: Consent of instructor.</td>
</tr>
<tr>
<td>LARC 2990</td>
<td>Creative Inquiry—Landscape Architecture II</td>
<td>3</td>
<td>3</td>
<td>In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. Preq: LARC 1990 and consent of faculty member/mentor.</td>
</tr>
<tr>
<td>LARC 3510</td>
<td>Regional Design and Ecology</td>
<td>6</td>
<td>6</td>
<td>Study and analysis of natural and cultural landscapes at the regional scale. Introduction of landscape ecology as an informant to design. Basic overview of geographic information systems. Regional and ecological issues are applied in a final site design. Also includes relevant reading, discussion, and writing. Preq: LARC 2520. Coreq: LARC 3510.</td>
</tr>
<tr>
<td>LARC 3520</td>
<td>Urban Design Studio</td>
<td>6</td>
<td>6</td>
<td>Landscape architectural design in the urban context. Students study urban issues and offer design and sustainable management solutions for urban areas. Includes readings and theory component as well as an opportunity to collaborate with architecture students. Preq: LARC 3510. Coreq: LARC 3520.</td>
</tr>
<tr>
<td>LARC 3521</td>
<td>Urban Design Studio Laboratory</td>
<td>0</td>
<td>0</td>
<td>Non-credit laboratory to accompany LARC 3520. Coreq: LARC 3520.</td>
</tr>
<tr>
<td>LARC 3620</td>
<td>Design Implementation II</td>
<td>3</td>
<td>3</td>
<td>Advanced landscape architecture construction methods and construction documents, including site information gathering, analysis, site grading and drainage, cut and fill, principles of stormwater management, sustainable land management related to implementation, materials research and use, sustainable planting strategies, site demolition and construction management. Includes explorations in appropriate graphic communication techniques. Preq: Consent of instructor. Coreq: LARC 3621.</td>
</tr>
<tr>
<td>LARC 3621</td>
<td>Design Implementation II Laboratory</td>
<td>0</td>
<td>0</td>
<td>Non-credit laboratory to accompany LARC 3620. Coreq: LARC 3620.</td>
</tr>
<tr>
<td>LARC 3990</td>
<td>Creative Inquiry—Landscape Architecture III</td>
<td>3</td>
<td>3</td>
<td>In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. Preq: LARC 2990 and consent of faculty member/mentor.</td>
</tr>
<tr>
<td>LARC 4050</td>
<td>Urban Genesis and Form</td>
<td>3</td>
<td>3</td>
<td>Exploration of urban forms and developments within their historical context through off-campus, on-site lectures and exposure to historic cities and sites. Students visit historic and contemporary cities and analyze those places through readings and direct observations. Offered in the summer only. Preq for LARC 4050: LARC 2520. Preq for LARC 6050: LARC 220 or consent of instructor.</td>
</tr>
<tr>
<td>LARC 4180</td>
<td>Off-Campus Study Seminar</td>
<td>1</td>
<td>1</td>
<td>Students study various cultural and environmental factors to inform and enhance their off-campus experiences in Istanbul, Barcelona, Genoa, or Charleston. Preq: Landscape Architecture major.</td>
</tr>
<tr>
<td>LARC 4190</td>
<td>Off-Campus Field Study</td>
<td>3</td>
<td>3</td>
<td>Intensive study of place in an off-campus setting as context for design. Numerous class trips to significant sites in the area of the off-campus programs. Bus trips to distant sites are also planned. Preq: LARC 4510.</td>
</tr>
<tr>
<td>LARC 4210</td>
<td>Landscape Architectural Seminar</td>
<td>3</td>
<td>3</td>
<td>Lectures and seminars dealing with pertinent topics related to environmental, technological, and theoretical issues in landscape architecture, land planning, and urban design. May be repeated for a maximum of six credits. Preq: Senior standing.</td>
</tr>
<tr>
<td>LARC 4230</td>
<td>Environmental Issues in Landscape Architecture</td>
<td>3</td>
<td>3</td>
<td>Overview of environmental and ecological issues and their relationship to landscape architecture practice and design. Preq for LARC 4230: LARC 4520. Preq for LARC 6230: LARC 4520 or consent of instructor.</td>
</tr>
<tr>
<td>LARC 4280</td>
<td>Landscape Architecture Computer-Aided Design</td>
<td>3</td>
<td>2</td>
<td>Introduces students to the use of computer technology in the landscape architectural design process. Covers the basics of computer applications used in the industry for conceptualizing, drafting, modeling, and graphic communications. Preq: Landscape Architecture major. Coreq: LARC 4281.</td>
</tr>
<tr>
<td>LARC 4281</td>
<td>Landscape Architecture Computer-Aided Design Laboratory</td>
<td>0</td>
<td>0</td>
<td>Non-credit laboratory to accompany LARC 4280. Coreq: LARC 4280.</td>
</tr>
<tr>
<td>LARC 4330</td>
<td>Historic Preservation in Landscape Architecture</td>
<td>3</td>
<td>3</td>
<td>Study of historic landscape preservation in a number of contexts, including gardens, vernacular landscapes, parks, cemeteries, and battlefields. Preq for LARC 4330: LARC 4520. Preq for LARC 6330: LARC 4520 or consent of instructor.</td>
</tr>
<tr>
<td>LARC 4380</td>
<td>Advanced Computer-Aided Design</td>
<td>3</td>
<td>2</td>
<td>Advanced study in computer-aided design for students wishing to develop their skills beyond LARC 4280. Students develop advanced skills in illustrative drawings, construction drawings, desktop publishing, and other computer-based applications. Preq: LARC 4280. Coreq: 4381.</td>
</tr>
<tr>
<td>LARC 4381</td>
<td>Advanced Computer-Aided Design Laboratory</td>
<td>0</td>
<td>0</td>
<td>Non-credit laboratory to accompany LARC 4380. Coreq: LARC 4380.</td>
</tr>
<tr>
<td>LARC 4430</td>
<td>Community Issues in Landscape Architecture</td>
<td>3</td>
<td>3</td>
<td>In-depth study of issues relevant to community design. Overview of physical design and related social issues. Preq: LARC 4520.</td>
</tr>
<tr>
<td>LARC 4510</td>
<td>Community Design Studio</td>
<td>6</td>
<td>1</td>
<td>Studio focused on the study and design of communities and public spaces. Students explore multicultural, historical and ecological layers of community, as well as the role of landscape management and the creative design process to add new dimensions of meaning to these places. Preq: LARC 3520. Coreq: LARC 4511.</td>
</tr>
<tr>
<td>LARC 4511</td>
<td>Community Design Studio Laboratory</td>
<td>0</td>
<td>0</td>
<td>Non-credit laboratory to accompany LARC 4510. Coreq: LARC 4510.</td>
</tr>
<tr>
<td>LARC 4521</td>
<td>Off-Campus Studio Laboratory</td>
<td>0</td>
<td>0</td>
<td>Non-credit laboratory to accompany LARC 4520. Coreq: LARC 4520.</td>
</tr>
<tr>
<td>LARC 4530</td>
<td>Key Issues in Landscape Architecture</td>
<td>3</td>
<td>3</td>
<td>Overview of research in landscape architecture and study of relevant research methods. Students write proposals for their own projects positioned within the larger context of research in the profession. Preq for LARC 4530: Fifth-year Landscape Architecture student. Preq for LARC 6530: Fifth-year Landscape Architecture student or consent of instructor.</td>
</tr>
<tr>
<td>LARC 4620</td>
<td>Landscape Architectural Technology III</td>
<td>2</td>
<td>2</td>
<td>Advanced overview of construction materials and methods used in project implementation. Study characteristics, strengths, nominal sizes and uses of materials (asphalt, brick, concrete, stone, wood). Field trips, exercises, and preparation of construction documents develop understanding of how design ideas are realized in built form. Preq: LARC 3620. Coreq: LARC 4621.</td>
</tr>
<tr>
<td>LARC 4621</td>
<td>Landscape Architectural Technology III Laboratory</td>
<td>0</td>
<td>0</td>
<td>Non-credit laboratory to accompany LARC 4620. Coreq: LARC 4620.</td>
</tr>
<tr>
<td>LARC 4900</td>
<td>Directed Studies and Projects in Landscape Architecture</td>
<td>1-3</td>
<td>1-3</td>
<td>Comprehensive studies and/or research of special topics not covered in other landscape architecture courses. May be repeated for a maximum of ten credits. Preq: Consent of instructor.</td>
</tr>
<tr>
<td>LARC 4910</td>
<td>Honors Research Methods for Landscape Architecture</td>
<td>1-3</td>
<td>1-3</td>
<td>Students investigate various research methodologies in landscape architectural design or related areas and apply to student generated project(s). Students generate a proposal for Landscape Architecture Honors Research. Preq: Junior standing and membership in Calhoun Honors College and consent of Department Honors Program Advisor.</td>
</tr>
<tr>
<td>LARC 4930</td>
<td>Professional Office Internship</td>
<td>1-3</td>
<td>1-3</td>
<td>Office experience for advanced students. On-the-job learning requires a minimum of five uninterrupted sequential weeks of employment under the direct supervision of a preapproved registered landscape architect, architect, urban planner, or civil engineer. May be repeated for a maximum of six credits. To be taken Pass/No Pass only. Preq: LARC 3520 and LARC 3620 and consent of instructor.</td>
</tr>
</tbody>
</table>
LATIN

LATN 1010 Elementary Latin 4 (4) Course for beginners designed principally to teach the reading of the language.

LATN 1020 Elementary Latin 4 (4) Continuation of LATN 1010.

LATN 2010 Intermediate Latin 3 (3) Review of the fundamental principles of grammar in conjunction with readings from the Classical period. Preq: LATN 1020.


LIB 1900 Creative Inquiry--The Libraries 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits.

LIB 2900 Creative Inquiry--The Libraries 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits.

LIB 3010 Introduction to Patent Searching 1 (1) Introduction to patents with an emphasis on how patents fit into the research process. Students develop skills in creating effective patent search strategies, and evaluating and presenting their search results.

LIB 3990 Creative Inquiry--The Libraries 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits.

LIB 4990 Selected Topics 1-3 (1-3) In-depth examination of timely topics in legal studies. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: Senior standing and consent of instructor.

LIBRARY

Courses of Instruction

LIT 2970 Creative Inquiry—Language and International Health 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Arrangements with faculty members must be established prior to registration.

LIT 3970 Creative Inquiry—Language and International Health 1-4 (1-4) Students focus on a special research area under the guidance of a faculty member. After acquiring the requisite background, students formulate hypotheses for a group project, develop a critical framework, and initiate research on a specific topic.

LIT 4000 Internship Abroad 3 (3) One semester, full-time internship in a health care or a health administration setting abroad. To be taken Pass/No Pass only. Preq: Second semester Junior standing.

LIT 4970 Creative Inquiry—Language and International Health 1-4 (1-4) Continuation of research initiated in LIT 3970. Students complete their project and disseminate their research results. Preq: LIT 3970.

LEISURE SKILLS

LIT 4970 Creative Inquiry—Language and International Trade 1-4 (1-4) Continuation of research initiated in LIT 3970. Students complete their project and disseminate their research results. Preq: LIT 3970.

LANGUAGE AND INTERNATIONAL TRADE


LIT 1270 Introduction to Language and International Trade 1 (1) Survey of the nature of international trade and related career opportunities. Information and applications of specific relevance to tourism, agriculture, and textile industries are offered. To be taken Pass/No Pass only.

LIT 2970 Creative Inquiry—Language and International Trade 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Arrangements with faculty members must be established prior to registration. Preq: Consent of faculty member.

LIT 3970 Creative Inquiry—Language and International Trade 1-4 (1-4) Students focus on a special research area under the guidance of a faculty member. After acquiring the requisite background, students formulate hypotheses for a group project, develop a critical framework, and initiate research on a specific topic.

LIT 4000 Language and International Trade Internship 1-3 (1-3) Mandatory internship with an international company in the U.S. or abroad. May be part-time or full-time during the summer or academic semester for a minimum of 1400 hours. After completing the internship, students register for three credits of LIT 4000 and write a research paper in the target language. To be taken Pass/No Pass only. Preq: CHIN 3160 or FR 3160 or GER 3160 or JAP 3160 or SPAN 3160; and twelve credit hours in a Language and International Trade technical option.

LIT 4020 Language and International Trade Directed Study 3 (0) Directed study of an individual project in language and international trade. To be taken Pass/No Pass only.

LS 1000 Selected Topics 1 (3) Presentation of leisure skills not covered in other courses. May be repeated for a maximum of three credits, but only if different topics are covered.

LS 1010 Challenge Recreation Activities 1 (1) Encourages students to broaden their leisure skills and improve self-image through challenge activities. Classroom instruction stresses how to get started safely in flying, scuba, canoeing, skiing, windsurfing, mountaineering, hang gliding, ballooning, and other challenge activities.

LS 1110 Lapidary Arts 1 (3) Students learn the techniques used to transform raw materials such as gemstones, minerals, gold, and silver into objects of art—primarily jewelry.

LS 1130 Wood Carving 1 (3) Introduction to the art of wood carving. Students learn about types of wood, tools, carving, and shop safety.

LS 1250 Budget Travel 1 (3) Teaches the necessary skills to travel internationally on a budget. Students learn how to get the best airfares, research destinations, and build an itinerary. Topics include packing, security, local transportation, and culture/safety/culture shock are also discussed.

LS 1260 Group Initiatives 1 (2) Students learn to lead people in group initiatives, also called team building exercises, with the goal of developing trust, cooperation, problem solving, and leadership among participants. Students learn specific initiatives to lead, as well as how to bring groups to their intended destination.

LS 1330 Women’s Shotgun Shooting 1 (3) Introduces basic shotgun shooting skills and firearm safety. Topics include gun fitting, chokes, gauges, ammunition, and different shotgun disciplines such as skeet, trap shooting, and sporting clays.

LS 1470 Alpine Skiing 1 (3) Basic downhill snow skiing instruction including equipment selection, safety, and maintenance; parallel turns; edging; carved and linked turns; wedeling; and safety and etiquette. There is an additional fee for this course. Taught during Christmas recess. (Contact the Department of Parks, Recreation and Tourism Management in October.)

LS 1490 Snowboarding 1 (3) Basic snowboarding instruction including equipment selection; tech; conditioning; and skills such as stopping, techniques for turning, and riding lifts. There is an additional fee for this course. Taught during Christmas recess. (Contact the Department of Parks, Recreation and Tourism Management in October.) May not be taken concurrently with LS 1470 or 3470.

LS 1560 Riffley 1 (3) Introduces the basics of rifle shooting and firearm safety. Students progress from beginning rifle shooting to more advanced topics such as reloading, external ballistics, and longrange shooting.

LS 1570 Shotgun Shooting 1 (3) Introduces students to basic shotgun shooting skills and firearm safety. Topics include gun fitting, chokes, gauges, ammunition, and different shotgun disciplines such as skeet, trap shooting, and sporting clays.

LS 1580 Archery 1 (3) Introduces students to the basic principles and skills of archery and helps them develop proper shooting form and marksmanship.

LS 1590 Hunting Traditions 1 (3) Basic, hands-on instruction in the shooting sports (shotgun, rifle, and archery) and the sport of hunting. Designed to introduce students to the safe and responsible use of firearms and archery equipment and safe hunting practices. Students are required to complete the South Carolina Department of Natural Resources Hunter Education certification.

LS 1610 Turkey Hunting 1 (3) Exposes students to the skills, techniques, and history of turkey hunting. Students learn gun and hunting safety; shotgun, muzzleloading, and archery hunting techniques; tracking; and basic calling techniques.

LS 1640 Whitewater Kayaking 1 (3) Flat-water and whitewater skills, techniques, safety, rescue, equipment selection and maintenance, and selection of routes/trips to participate in basic whitewater kayaking. Students must possess basic swimming skills to enroll in this course.
Courses of Instruction

LS 1650 Inland Kayak Touring 1 (3) Introduction to basic skills necessary for safe enjoyment of flat-water (non-tidal waters: lakes, slow moving rivers) kayaking. Students learn equipment selection, strokes, safety, and rescue techniques. Students must demonstrate swimming competence to enroll in this course.

LS 1670 Canoeing 1 (3) Basic instruction in the nomenclature, strokes, and safety techniques in canoeing. Students must possess basic swimming skills to enroll in this course.

LS 1690 Sailing 1 (3) Basic instruction in the nomenclature, strokes, and safety techniques required to skipper sailing craft. Students must possess basic swimming skills to enroll in this course.

LS 1710 Windsurfing 1 (3) Basic windsurfing instruction including rigging, launching, tacking, jibbing, rig and foot steering, safety, maintenance, equipment selection, rules-of-the-road, and racing techniques are covered. Offered Fall Break and first summer session. There is an extra fee for this course. Students must have the ability to swim 3000 yards and tread water for five minutes to enroll in this course.

LS 1730 Bass Fishing 1 (3) Provides basic knowledge and skills necessary to participate successfully in bass fishing.

LS 1750 Fly Fishing 1 (3) Introductory course in the techniques of fly-fishing. Students learn casting, fly-tying, and equipment selection.

LS 1760 Beginning Fly Tying 1 (3) The art of fly tying. Students learn basic fly tying techniques and gain a knowledge of materials and tools used in fly tying.

LS 1770 Saltwater Fly Tying 1 (3) Introduction to fly tying flies for saltwater applications of fly fishing.

LS 1790 Scuba Diving 1 1 (3) Teaches basic open water diving techniques; prepares students to complete requirements for the open water diving certification. Certifications are granted by an internationally recognized and accepted certifying agency. Students are required to pass a swim test required by certifying agency.

LS 1830 Introduction to Rugby 1 (3) Introduces students to the sport of Rugby. Covers history of the game, rules, and skills such as passing, kicking, and decision making.

LS 1850 Bowling 1 (3) Basic instructional program on techniques of bowling.

LS 1870 Frisbee Sports 1 (3) Focuses on the rules, history, and skills necessary for participating in various frisbee sports. Heavy emphasis is placed on Ultimate Frisbee and Frisbee Golf.

LS 1880 Disc Golf 1 (3) Introduces students to basic disc golf skills and knowledge. Topics include development of basic throwing skills, rules of the game, game strategy and disc golf etiquette.

LS 1890 Tennis 1 (3) Fundamental course stressing rules, strokes, and strategy, with ample opportunity for practice.

LS 1940 Racquetball 1 (3) Basic skills, knowledge of rules, strategy, and basic strokes.

LS 1950 Intermediate Racquetball 1 (3) Builds on knowledge gained in LS 1940. Students learn advanced swing mechanics, game strategy, and other advanced skills. Preq: LS 1940. Students who have not taken LS 1940 may demonstrate that they possess equivalent skill and obtain a registration override.

LS 1960 Introduction to Billiards 1 (3) Introductory course in the history, rules, and skills necessary to participate in billiards. Students learn different types of games, proper shot techniques, and equipment selection.

LS 1980 Golf 1 (3) Fundamental course stressing rules, strategy, and basic strokes.

LS 1990 Intermediate Golf 1 (3) Builds on the knowledge gained in LS 1980. Students learn to apply rules to common golf situations, improve ball striking, and course management. The skills and strategies taught are designed to improve existing golf scores. Preq: LS 1980. Students who have not taken LS 1980 may demonstrate that they possess equivalent skill and obtain a registration override.

LS 2000 Traditional Sports 1 (3) Introductory course in the history, rules, and skills necessary to participate in traditional sports. Students learn about and participate in basketball, volleyball, football, and softball.

LS 2020 Field Hockey 1 (3) Introduces the fundamental skills, history, and rules of field hockey.

LS 2030 Lacrosse 1 (3) Introduces the fundamental skills, history, and rules of men’s and women’s lacrosse.

LS 2040 Soccer 1 (3) Introduces the history, rules, and fundamental skills of soccer.

LS 2100 Learn to Dance 1 (2) Introduces students to choreography, additional dance techniques, improvisation, and the use of finger cymbals. Students then improve their ability to improvise, add style, musicality, and many additional moves to their dance vocabulary. Preq: LS 2270.

LS 2110 Introduction to Belly Dance 1 (2) Introduces students to the Middle Eastern belly dance. In addition to learning choreography and belly dance skills, students are introduced to the traditions and origins of Middle Eastern belly dance.

LS 2120 Belly Dance I 1 (2) Designed to build on the dance and musicality skills developed during Introduction to Belly Dance, this course also introduces students to choreography, additional dance styles, improvisation, and the use of finger cymbals when they participate as a member of a percussion section. Preq: LS 2110.

LS 2130 Middle Eastern Dance 1 (2) Explores the various dance styles associated with middle eastern countries. Students learn dances, rhythms and traditions from Egypt, Libya, Morocco, Saudi Arabia, Lebanon and Turkey.

LS 2140 Modern Dance 1 (3) Introduction to modern dance techniques with an emphasis on developing the style of movement and understanding the dance art form.

LS 2160 Contra Dance 1 (2) Introduces students to the social dance of Contra. Students learn the origin and history of Contra along with the basic dance steps and styles.

LS 2180 Ballroom Dance 1 (2) Students develop an understanding of advanced dance methods, learn about dance at social and competitive levels, and increase knowledge of a variety of both smooth and Latin steps. Danes include tango, cha-cha, waltz, fox trot, and swing.

LS 2190 Country Western Dance 1 (2) Introduces traditional country western dance. Students learn traditional couples dances, line dances, and barn dances.

LS 2200 Shag 1 (2) Develops an understanding of the South Carolina state dance, its history and impact on the state. Students learn more advanced steps in shag, including bellyroll, sugarfoot, slide step, tiptoe up the ladder, pivot, and the thirteen steps.

LS 2210 Intermediate Shag Dance 1 (2) Builds on skills learned in LS 2200. Students improve their ability to improvise, add style, and add many different moves to their dance vocabulary. Preq: LS 2200.

LS 2220 Advanced Shag 1 (2) Explores students to a competition level of shag. Students learn to break down a dance routine and to choreograph short routines. Preq: LS 2210.

LS 2230 Introduction to Swing Dance 1 (2) Introduction to vintage swing dance created in the 1920s–1950s, including Charleston, Lindy Hop, Jitterbug, and optional acrobatic moves used in performance and competition.

LS 2280 Intermediate Swing Dance 1 (2) Builds on skills learned in LS 2270 by improving students ability to improvise, add style, musicality, and many additional moves to add to their dance vocabulary. Preq: LS 2270.

LS 2290 Advanced Swing Dance 1 (2) Focuses on competition level and style of swing dance. Students learn to break down and teach a routine to beginners. Students also learn the skills necessary to create and choreograph a short routine. Preq: LS 2280.

LS 2310 Bosu 1 (3) Introduces the group aerobic style of Bosu, which concentrates on physical stability, core strength, and general fitness.

LS 2320 Core Stability Training 1 (3) Teaches fundamentals of core training. Students learn basic anatomy, proper strength training, and how to design a program to fit their fitness goals.

LS 2330 Aerobic Dance 1 (3) Instruction in the development of skills for the safe improvement and maintenance of cardiovascular fitness, flexibility, and muscle tone utilizing dance movements and techniques.

LS 2350 Basic Yoga 1 (3) Develops flexibility, strength, sensitivity, energy, and a sense of relaxation through the study of basic yoga postures, conscious breathing, and meditation techniques.

LS 2360 Power/Ashtanga Yoga 1 (3) Power/Ashtanga Yoga is a comprehensive workout based on the Eastern philosophy of K. Pattabhi. Students learn the eight limbs of this philosophy and the rigorous series of postures that produce a high power, athletic workout with the purpose of detoxifying impurities in the body.

LS 2370 Kripalu Yoga 1 (3) Great emphasis is placed on learning breath work techniques to combine directly with the various kripalu yoga postures. The goal is to teach individuals the physiological reactions produced by this type of yoga in developing and restoring health.
LS 2380 Vinyasa Flow Yoga 1 (3) Explores the energetic, fluid movement of Yoga postures in sync with conscious breathing. Students study creative sequences using classical as well as innovative and advanced Yoga postures. Preq: LS 2350.

LS 2420 Meditation and Relaxation 1 (2) Exposes students to the benefits of relaxation and meditation techniques. Students learn different techniques used to relieve stress and promote relaxation.

LS 2450 Pilates 1 (3) Study of the history, philosophy, and fundamental movement concepts of Pilates.

LS 2460 Intermediate Pilates 1 (3) Course is designed to expand students' knowledge and practice of the principles, techniques and exercises learned in the basic Pilates course. Preq: LS 2450.

LS 2500 Marathon Training 1 (3) Provides students with the resources and knowledge to train for and successfully complete a marathon.

LS 2510 Running and Jogging 1 (3) Introduces the various components important to improving overall fitness level through a running or jogging activity. Topics include proper stretching exercises, nutrition, workout program design, and proper running techniques.

LS 2580 Self Defense 1 (3) Basic physical defense that incorporates risk avoidance and awareness techniques with basic physical defense options.

LS 2640 Aikido 1 (3) Introduces the modern Japanese martial art of Aikido.

LS 2660 Hapkido 1 (3) Introduces the fundamental skills and techniques of the self-defense based Korean martial art of Hapkido.

LS 2700 Sports Officiating 1 (3) Practical study of officiating for various sports. Includes studies and practical application of officiating rules and mechanics. Sports studied include football, basketball, softball, soccer, and introductions to a variety of other team sports.

LS 2750 Red Cross First Aid/CPR 1 (3) Gives students the knowledge and skills necessary to prevent, recognize, and provide basic care for infants, children, and adults with injuries and sudden illness.

LS 2760 First Aid/CPR for the Professional 1 (2) This American Red Cross CPR/AED for the Professional Rescue course teaches those with a duty to act the skills needed to respond appropriately to breathing cardiac emergencies, including the use of an Automated External Defibrillator (AED) to care for a victim of cardiac arrest.

LS 2770 Lifeguarding 1 (3) Students gain the knowledge and skills to prevent, recognize and respond to emergencies and to provide care for injuries and sudden illness. Upon course completion, students receive a lifeguarding certification from the American Red Cross.

LS 2780 Wilderness First Aid 1 (2) This American Red Cross Wilderness First Aid with Adult CPR course provides individuals involved with wilderness activities with the knowledge and skills to prevent, recognize and provide basic care for injuries and sudden illness when more advanced help is not available.

LS 2910 Outdoor Leadership 1 (3) Introduces the skills necessary to lead others in a backcountry environment. Focus is on wilderness travel skills, minimum impact, group dynamics, leadership skills and decision making. Course also includes certification in Wilderness First Aid.

LS 3470 Advanced Alpine Skiing 1 (3) Advanced downhill snow skiing instruction in such techniques as mogul skiing, check turns, free-style, and racing. There is an additional fee for course. Taught over Christmas break. Credit is awarded for spring semester. (Contact Department of Parks, Recreation and Tourism Management in October.) Preq: LS 1470.

LS 3560 Riffle II 1 (2) Students build upon skills previously learned in the basic riffler course, and learn advanced skills, such as using ballistic software and chronographs, precision long range shooting and advanced reloading. Preq: LS 1560.

LS 3580 Advanced Shotgun Skeet 1 (2) Introduces students who have taken the basic shotgun course to the shotgun game of Skeet. Students learn the rules and techniques necessary to competitively participate in Skeet. Preq: LS 1570.

LS 3890 Intermediate Tennis 1 (3) Develops skills necessary to play at a competitive level of tennis. Students learn mathematically sound tennis skills, court positioning, court movement, proper shot selection, and strategic insight into the game. Preq: LS 1890.

MECHANICAL ENGINEERING

ME 2010 Statics and Dynamics in Mechanical Engineering 1 (3) Emphasizes analytical and numerical solutions to problems. Principles and phenomena. Introduction to laboratory safety practices, instrumentation, calibration techniques, data analysis, and report writing. Introduction to basic manufacturing processes. Preq: PHYS 1220 and PHYS 1240, each with a C or better. Preq or concurrent enrollment: ME 2220, with a C or better.

ME 2020 Foundations of Mechanical Systems 3 (3) Introduction to basic physical elements of mechanical engineering systems. Problem solving, design, and resourceful application of mathematics and general principles from students science courses are emphasized throughout. Preq: ME 2010, with a C or better. Preq or concurrent enrollment: ME 2220, with a C or better.

ME 2030 Foundations of Thermal and Fluid Systems 3 (3) Introduction to control volumes, conservation laws of mass, momentum, and energy. Concepts of work and heat are introduced, including rate forms. Properties of pure substances. Preq: MTHS 2060 and PHYS 2210, each with a C or better. Preq or concurrent enrollment: ME 2220, with a C or better.

ME 2220 Mechanical Engineering Laboratory I 2 (6) Discovery of mechanical engineering principles and phenomena. Introduction to laboratory safety practices, instrumentation, calibration techniques, data analysis, and report writing. Introduction to basic manufacturing processes. Preq: PHYS 1220 and PHYS 1240, each with a C or better. Preq or concurrent enrollment: ME 2220, with a C or better.

ME 2900 Creative Inquiry in Mechanical Engineering 1, 1.5, 1.5 (1-3) Students work in extended teams (including sophomores, juniors, and graduate students) addressing research and development problems under the supervision of a faculty lead. Engineering principles and best practices will be employed. Team work, professionalism, and communication skills are emphasized. May be repeated for a maximum of nine credits. Preq: consent of instructor.

ME 3000 Junior Honors Seminar 0 (0) Acquaints students enrolled in Departmental Honors Program with current research activities in the Department of Mechanical Engineering. Faculty provide seminars in which research interests are summarized. These seminars are planned to prepare students in choosing a research topic for the senior thesis. Preq: Junior standing in departmental honors program.

ME 3020 Mechanics of Materials 3 (3) Relationships between external loads on solid bodies or members and the resulting internal effects and dimension changes, including the derivation of rational formulas for stresses and deformations and the identification and use of important mechanical properties of engineering materials. Includes Honors sections. Preq: ME 2010 and MTHS 2100 and MTHS 2100, each with a C or better. Preq or concurrent enrollment: MTHS 2080, with a C or better.

ME 3030 Thermodynamics 3 (3) Study of the second law and entropy. Includes applications to fixed mass systems and control volumes; vapor and gas power cycles; mixtures of gases; vapor psychrometrics; combustion and the third law. Thermochromical equilibrium. Preq: ME 2030, with a C or better.

ME 3040 Heat Transfer 3 (3) Study of steady and transient heat conduction, free and forced convection, radiation, and multi-mode heat transfer. Emphasizes analytical and numerical solutions to engineering heat transfer problems with a design orientation. Preq: MTHS 2080 and MTHS 3080, each with a C or better. Preq or concurrent enrollment: MTHS 3650, with a C or better.
ME 3050 Modeling and Analysis of Dynamic Systems 3 (3) Presents techniques for developing and analyzing models of mechanical, electrical, electromechanical, fluid and thermal systems. Transient, steady-state and frequency response are determined using analytical and numerical methods. Covers tools for stability analysis and state-space representation. Covers linear free- and forced-vibration in single- and multidegree-of-freedom systems with lumped-parameters representation, methods of vibration absorption and isolations. Preq: ECE 3070 and ECE 3090 and MTHS 2080 and MTHS 3650, each with a C or better. Preq or concurrent enrollment: ME 2020, with a C or better.

ME 3060 Fundamentals of Machine Design 3 (3) Introduction to failure theory, fatigue analysis, and energy methods for deflection analysis. Integration of these topics with selected portions of mechanics of materials and application of them to the design and analysis of machine elements. Preq: ME 2020 and ME 3020, each with a C or better.

ME 3080 Fluid Mechanics 3 (3) Behavior of fluids at rest or in motion, including the study of fluid properties. Emphasizes a rational, analytical approach from which are developed basic principles of broad applicability to all fields of engineering. Includes Honors sections. Preq: ME 2010 and ME 2030, each with a C or better. Preq or concurrent enrollment: MTHS 2080, with a C or better.

ME 3100 Thermodynamics and Heat Transfer 3 (3) Introduction to thermodynamics and heat transfer for nonmajors: properties of liquids and gases, first and second law analysis, introduction to cycles for power and refrigeration, heat flow by conduction and radiation, and convective heat flow and heat exchangers. Preq: Junior standing in an engineering curriculum.

ME 3120 Manufacturing Processes and Their Application 3 (3) Fundamental principles associated with production processes and their application to the manufacture of products from metals, polymers, ceramics, and composites. Emphasizes the physical and quantitative aspects of processing, the selection of processes to create products, and the identification processes used to manufacture existing products. Preq or concurrent enrollment: ME 3040 and ME 3060 and ME 3330, each with a C or better.

ME 3330 Mechanical Engineering Laboratory II 2 (6) Mechanical engineering principles and phenomena are reinforced through student conducted experiments. Presentation of fundamentals of instrumentation, calibration techniques, data analysis, and report writing in the context of laboratory experiments. Preq: MTHS 2080 and ME 3030 and ME 2220, each with a C or better.

ME 3090 Creative Inquiry in Mechanical Engineering II 1-3 (1-3) Students work in extended teams (including sophomores, juniors, seniors, and graduate students) addressing research and development problems under the supervision of a faculty lead. Engineering principles and best practices will be employed. Team work, professionalism, and communication skills are emphasized. May be repeated for a maximum of nine credits. Preq: Consent of instructor.

ME 4000 Senior Seminar I 1 (1) Seminars address the problems encountered by engineering graduates in professional practice. Invited lecturers as well as faculty provide the lectures and demonstrations. Students must have completed all required 3000-level ME courses before enrolling in this course.

ME 4010 Mechanical Engineering Design 3 (3) Project-oriented course in mechanical engineering emphasizing the role of analysis, synthesis, and evaluation in design and on written reporting of design solutions. Influence of economics and optimization, concurrent development, integration of design and manufacturing, and system creation are utilized for engineering design decisions. Preq: ENGL 3140 and ME 3030 and ME 3040 and ME 3050 and ME 3060, each with a C or better (concurrent enrollment in one of the preceding ME courses is permitted, but student must request a prerequisite override from the undergraduate coordinator). Preq or concurrent enrollment: ME 3120, with a C or better.

ME 4020 Internship in Engineering Design 3 (1) Creative application of general engineering knowledge in solving an open-ended design problem provided by a sponsor typically external to the University. Progress is evaluated by a faculty jury. Students present results to the jury and sponsor through written reports and oral presentations addressing University written/oral competency goals. Students must have completed all required 3000-level ME courses before enrolling in this course. Preq: ME 4010, with a C or better. Coreq: ME 4021.

ME 4021 Internship in Engineering Design Laboratory 1-6 (1-6) Non-credit laboratory to accompany ME 4020. Coreq: ME 4020.

ME 4030 Control and Integration of Multidomain Dynamic Systems 3 (3) Introduction of control theory with sensor, actuator, and dynamic plant integration to develop, model, control, and analyze mathematical models of dynamic systems, including mechanical, electrical, electromechanical, hydraulic and pneumatic systems. Transient dynamics are determined using analytical and numerical methods with feedback control systems. Strong emphasis is placed on system design using computer simulation tools. Preq: ME 3050, with a C or better.

ME 4050 Kinematics and Dynamics of Machinery I 3 (3) Graphical, analytical, and numerical techniques are used in the dynamic analysis and synthesis of machines. Emphasis is on the application of these analysis techniques to planar linkages. Preq: ME 2020 and ME 3020, each with a C or better.

ME 4070, 6070 Applied Heat Transfer 3 (3) Application oriented extension of ME 3040, considering topics in transient conduction, flow of fluids, energy exchange by radiation, and mass transfer. Applications in heat-exchanger design with emphasis on economics and variation of operating conditions from the design point. Preq for ME 4070: ME 3040, with a C or better. Preq for ME 6070: ME 3040 and consent of instructor.

ME 4150 Undergraduate Research 1-3 (1-3) Individual research projects conducted under the direct supervision and guidance of a faculty member. May be repeated for a maximum of six credits. Includes Honors sections. Preq: Consent of instructor.

ME 4160 Control of Mechanical Systems 3 (3) Physical modeling and feedback principles are presented for control of mechanical systems. Transient response, root locus, and frequency response principles are applied to the control of basic mechanical systems such as electric motors, fluid tanks, or thermal processes. PID control laws are emphasized. Preq: ME 3050, with a C or better.

ME 4170, 6170 Mechatronics System Design 3 (2) Mechatronics integrates control, sensors, actuators, and computers to create a variety of electromechanical products. Includes concepts of design, appropriate dynamic system modeling, analysis, sensors, actuating devices, and real-time microprocessor interfacing and control. Laboratory experiments, simulation, and design projects are used to exemplify the course concepts. Preq for ME 4170: ME 3050, with a C or better. Preq for ME 6170: ME 3050 or consent of instructor. Coreq: ME 4171, 6171.

ME 4171, 6171 Mechatronics System Design Laboratory 0 (0) Non-credit laboratory to accompany ME 4170, 6170. Coreq: ME 4170, 6170.

ME 4180 Finite Element Analysis in Mechanical Engineering Design 3 (2) Introduction to the finite element method and solid modeling, finite element modeling and analysis using commercial codes; analysis strategies using finite elements; applications to heat transfer, fluid flow, and structures. Preq: ME 3020 and ME 3040 and ME 3080, each with a C or better. Coreq: ME 4181.

ME 4181 Finite Element Analysis in Mechanical Engineering Design Laboratory 0 (1) Non-credit laboratory to accompany ME 4180. Coreq: ME 4180.

ME 4200, 6200 Energy Sources and Their Utilization 3 (3) Covers availability and use of energy sources such as fossil fuels, solar (direct and indirect), and nuclear; addresses energy density and constraints to use (technical and economic) for each source. Preq: ME 3030 and ME 3040, each with a C or better.

ME 4210, 6210 Introduction to Compressible Flow 3 (3) Introductory concepts to compressible flow; methods of treating one-dimensional gas dynamics including flow in nozzles and diffusers, normal shocks, moving and oblique shocks, Prandtl-Meyer Flow, Fanno Flow, Rayleigh Flow, and reaction propulsion systems. Preq: ME 3030 and ME 3080, each with a C or better.

ME 4220, 6220 Design of Gas Turbines 3 (3) Guiding principles in gas turbine cycles are reviewed. Turbine and compressor design procedures and performance prediction for both axial and radial flow machines are presented. Methods of design of rotary heat-exchangers and retrofitting gas turbine for regenerative operation are presented. Design projects are used to illustrate the procedures. Preq for ME 4220: ME 3080, each with a C or better. Preq for ME 6220: ME 3080, or consent of instructor.

ME 4230, 6230 Introduction to Aerodynamics 3 (3) Basic theories of aerodynamics are presented for the purpose of accurately predicting the aerodynamic forces and moments which act on a vehicle in flight. Preq for ME 4230: ME 3080, with a C or better. Preq for ME 6230: ME 3080 or consent of instructor.
ME 4260, 6260 Nuclear Energy 3 (3) Engineering methods and science principles are considered for the design of components to nuclear power stations. A systems level understanding is emphasized. Includes nuclear fuel cycle and regulatory considerations. Preq for ME 4260: ME 3030 and ME 3040, each with a C or better. Preq for ME 6260: ME 3030 and ME 3040, or consent of instructor.

ME 4290, 6290 Thermal Environmental Control 3 (3) Mechanical vapor compression refrigeration cycles, refrigerators, thermodoelectric cooling systems, cryogenics, thermodynamic properties of air, psychometric charts, heating and cooling coils, solar radiation, heating and cooling loads, insulation systems. Preq for ME 4290: ME 3030 and ME 3080, each with a C or better. Preq for ME 6290: ME 3030 and ME 3080, or consent of instructor.

ME 4300, 6300 Mechanics of Composite Materials 3 (3) Develops fundamental relationships for predicting the mechanical and thermal response of multi-layered materials and structures. Develops micromechanical and macromechanical relationships for laminated materials emphasizing continuous filament composites. Discusses the unique nature of composites and the advantages of designing with composites. Preq for ME 4300: ME 3020, with a C or better. Preq for ME 6300: ME 3020, or consent of instructor.

ME 4310 Applied Fluids Engineering 3 (3) Applications-oriented course in industrial fluids engineering, primarily directed toward the analysis and design of piping systems and components for liquid and gas flow. Topics include friction factors, head loss, flow capacities, piping networks, flow measurement, pumps, control valves, and hydraulic and pneumatic components. Preq: ME 3080 and ME 3330, each with a C or better.

ME 4320, 6320 Advanced Strength of Materials 3 (3) Topics in strength of materials not covered in ME 3020. Three-dimensional stress and strain transformations, theories of failure, shear center, unsymmetrical bending, curved beams, and energy methods. Other topics such as stress concentrations and fatigue concepts are treated to the extent permitted. Preq for ME 4320: ME 3020, with a C or better. Preq for ME 6320: ME 3020 or consent of instructor.

ME 4400 Materials for Aggressive Environments 3 (3) Emphasizes the engineering aspects of selecting materials for applications in aggressive environments. Various types of materials degradation are discussed as are methods for wastage prevention, including especially engineering design and materials selection approaches. Structural metallic alloys are emphasized; however, technically important ceramics and polymers are also discussed. Preq: ME 3060, with a C or better.

ME 4440 Mechanical Engineering Laboratory III 2 (6) Continuation of ME 3330. Mechanical engineering principles and phenomena are reinforced through student-conducted experiments. Presentation of fundamentals of instrumentation, calibration techniques, data analysis, and report writing in the context of laboratory experiments. Preq: ME 3330, with a C or better; and MTHS 3020 or EXST 4110, each with a C or better. Preq or concurrent enrollment: ME 3060, with a C or better.

ME 4530, 6530 Dynamic Performance of Vehicles 3 (3) Introduces techniques for analyzing the dynamic behavior of vehicles. Types of vehicles to be considered are chosen from aircraft, surface ships, automobiles and trucks, railway vehicles, and magnetically levitated vehicles. Preq for ME 4530: ME 3030, with a C or better. Preq for ME 6530: ME 3050 or consent of instructor.

ME 4540, 6540 Design of Machine Elements 3 (3) Design of common machine elements including clutches, brakes, bearings, springs, and gears. Optimization techniques and numerical methods are employed as appropriate. Preq for ME 4540: ME 3060, with a C or better. Preq for ME 6540: ME 3060 or consent of instructor.

ME 4550, 6550 Design for Manufacturing 3 (3) Concepts of product and process design for automated manufacturing are considered. Topics include product design for automated manufacturing, inspection and assembly, using automation, industrial robots, knowledge-based systems and concepts of flexible product manufacture. Preq for ME 4550: ME 3060, with a C or better. Preq or concurrent enrollment for ME 4550: ME 3120, with a C or better. Preq for ME 6550: ME 3060 or consent of instructor. Preq or concurrent enrollment for ME 6550: ME 3120 or consent of instructor.

ME 4570 Fundamentals of Wind Power 3 (3) Introduces wind turbine systems, including wind energy potential and application to power generation. Topics include wind energy principles, wind site assessment, wind turbine components, power generation machinery components, systems, connection to the electric grid, and maintenance. Preq: ECE 3070 or ECE 3200 with a C or better.

ME 4710, 6710 Computer-Aided Engineering Analysis and Design 3 (2) Students are exposed to geometric and solid modeling, finite elements, optimization, and rapid-prototyping. Students design an artifact, represent it on the computer, analyze it using FEA, then optimize before prototyping. Emphasizes the use of computer-based tools for engineering design. Preq for ME 4710: ENGR 1410 and ME 2020, each with a C or better. Preq for ME 6710: ENGR 1410 and ME 2020 or consent of instructor. Coreq: ME 4711, 6711.

ME 4711, 6711 Computer-Aided Engineering Analysis and Design Laboratory 0 (3) Noncredit laboratory to accompany ME 4710. Coreq: ME 4710, 6710.

ME 4900 Creative Inquiry in Mechanical Engineering III 1-3 (1-3) Students work in extended teams (including sophomores, juniors, seniors, and graduate students) addressing research and development problems under the supervision of a faculty lead. Engineering principles and best practices will be employed. Team work, professionalism, and communication skills are emphasized. May be repeated for a maximum of nine credits. Preq: Consent of instructor.

ME 4930, 6930 Selected Topics in Mechanical Engineering I-6 (I-6) Study of topics not found in other courses. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: Consent of instructor.
MGT 3120 Decision Models for Management 3 (3)
Exploration of ways in which management science decision models can help in making sound managerial decisions. Problem solving is Excel-based. Topics include linear programming, project scheduling, and simulation. Includes Honors sections. Preq: MTHS 3090 and MGT 2180 or equivalents which include: MTHS 3090; MTHS 3010, 3020, EXST 3010, PSYC 3090, IE 3600 and IE 3610 (must complete both IE courses) and for MGT 2180: CPSC 2200.

MGT 3150 New Venture Creation 3 (3) Through the development of a business plan, the course focuses on creating an organization capable of effectively exploiting a viable opportunity. Topics include organization strategy and design, startup capital, operations and sourcing issues, leadership, team building, and management of rapid growth. Preq: ELE 3010.

MGT 3170 Logistics Management 3 (3) Management of physical distribution and supply systems with emphasis on design concepts, cost determinants, and control. Preq: MGT 3120.

MGT 3180 Management of Information Systems 3 (3) Introduction to information systems concepts and applications in business. Topics include software, hardware, decision support and knowledge based systems, database, information systems design and implementation, and the management of information systems. Preq: MGT 2010.

MGT 3900 Operations Management 3 (3) Examines the role of operations management in both manufacturing and service organizations. Discusses the concepts, tools, and techniques for managing the operations function. Topics include operations strategy, design, planning, and control. Preq: MTHS 3090 or MGT 2180 or equivalents which include: MTHS 3090; MTHS 3010, 3020, EXST 3010, PSYC 3090, IE 3600 and IE 3610 (must complete both IE courses) and for MGT 2180: CPSC 2200.

MGT 3980 Internship in Management 3 (3-12) Faculty-supervised management internship to give students learning opportunities that support their classroom experiences. Requires at least 150 hours of internship work per credit hour received. Course enrollment and internship must occur in the same semester. May be repeated for a maximum of three credits. To be taken Pass/No Pass only. Preq: Junior standing and a 2.0 cumulative grade-point average and consent of instructor.

MGT 4000 Management of Organizational Behavior 3 (3) Provides management students with a framework for understanding how behavior within business organizations is managed. Particular emphasis is on integrating management theory with recent developments in the behavioral sciences with distinct management applications. Theory, research, and business applications are considered. Preq: MGT 2010.

MGT 4020 Operations Planning and Control 3 (3) Managing, planning, and controlling production and service operations emphasizing demand forecasting, aggregate planning, production scheduling, and inventory management. Includes Honors sections. Preq: MGT 3900.

MGT 4030 Special Problems 1-3 (1-3) Students plan, develop, and execute a research project related to the field of management and defense studies. May be repeated for a maximum of six credits. Preq: Senior standing in Management.

MGT 4040 Advanced Statistical Quality Control 3 (3) Statistical quality control techniques as applied to all areas of quality control: process control, process capability, acceptance sampling, and economic aspects of quality decisions. Preq: MGT 3900.

MGT 4080 Lean Operations 3 (3) Examines the use of scientific methods for the design of operating systems for both manufacturing and services. Special emphasis is on the development of the Toyota Production System for continuous improvement and the application of the relevant techniques to the design of facilities, jobs, and systems. Preq: MGT 3900.

MGT 4110 Project Management 3 (3) Examination and application of the project management body of knowledge. This consists of theory, tools, and techniques to organize, plan, and control individuals, teams, quality, and operations while conducting a project. Preq: MTHS 3090, or MTHS 3010, MTHS 3020.

MGT 4120 Sourcing and Supplier Management 3 (3) Provides an understanding of the key issues in selecting and developing suppliers. Provides a conceptual framework to understand purchasing’s function within the firm and its role in supply chain management. Preq: MGT 3900.

MGT 4150 Business Strategy 3 (3) Capstone course for seniors. Various methods are used in analyzing complex business problems, requiring students to integrate their knowledge of all areas of business. Student participation and written and oral communications are stressed. Includes Honors sections. Students must take this course at Clemson University. Preq: EN 3060 or 3110; and MGT 2010, and MGT 3100 and Senior standing.

MGT 4160 Special Topics in Human Resources 3 (3) In-depth examination of advanced topics in Human Resource Management based on the developments in the Human Resource profession and interests of faculty. Emphasizes the strategic formulation and application of these topics to support organizational leadership. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: MGT 3900 and MGT 4010.

MGT 4210 Small Business Management 3 (3) Study of management of the small independently owned and operated business. Emphasizes analyzing new business opportunities, planning and establishing a growing concern, and managing the contemporary small business. Field experience in consulting with small businesses enhances students understanding of the unique opportunities and problems of small business organizations. Preq: MGT 3100.

MGT 4230 International Business Management 3 (3) Survey of theoretical and institutional complexities of international business operations. Topics include exporting, importing, foreign investment, multinational corporations, and international payment system. Preq: Junior standing.

MGT 4240 Global Supply Chain Management 3 (3) Design, planning, control, and improvement of supply chains for competing effectively in the context of global operations. Topics include supply chain structure and configuration, approaches to intra-organizational and interfirm integration, and complexities of material, information, and cash flows across international borders. Preq: MGT 3900.

MGT 4250 Compensation Management 3 (3) Examination of compensation employees seek in exchange for their efforts and contributions. Topics include government and union influences; job content analysis, description, and evaluation; developing pay structures; measuring and paying for performance; employee benefits; administration of the compensation plan; executive, managerial, professional, and sales. Preq: MGT 3070 and MGT 4000.

MGT 4270 Managing Continuous Improvement 3 (3) Examination of issues related to continuous improvement, including a systematic approach to selecting improvement areas, determining how to improve, plan, and manage the improvement process. Topics include selecting performance measurements, using teams to achieve breakthrough change, identifying root causes of problems, and developing and implementing solutions to problems. Preq: MGT 3900.

MGT 4300 Senior Seminar in Management 3 (3) In-depth study of current business topics; allows senior Management students to relate their academic studies to real-world problems. Senior paper is required. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: Senior standing.

MGT 4310 Employee Diversity, Rights, and Responsibilities 3 (3) Focuses on employee and organizational rights and responsibilities. Topics include various types of discrimination (race, sex, religion, national origin, age, and disability status); drug and alcohol testing; AIDS in the workplace; employee discipline and termination issues; privacy and safety concerns; and union organizing campaigns. Preq: MGT 3070 or MGT 4000.

MGT 4350 Personnel Interviewing 3 (3) Helps students understand current interviewing theory, conduct an employment interview, and advise their future employers how to improve interviewing programs. Topics include job analysis, legal issues, types of interviews, and evaluating applicants. Preq: MGT 3070 or MGT 4000.

MGT 4360 White-Collar Crime 3 (3) White-collar crime and corruption are examined from a managerial perspective. Topics include financial crimes, crimes against consumers, environmental crimes, acts of institutional corruption, the impact of organized crime on legitimate businesses, and computer crime. Preq: Senior standing. Coreq: FIN 3060.

MGT 4400 Negotiations 3 (3) Includes negotiating concepts, strategies, situational applications, and practice in applied techniques. Situations include negotiation in sales, customer relations, global nuances in negotiation situations, employee management, and career development. Preq: Senior standing.
Courses of Instruction

MGT 4440 International Perspectives in Industrial Management 1-6 (1-6) Provides an international perspective to industrial management via organized plant visits to businesses in a foreign country and lectures by and discussions with senior operations managers. Cultural visits and lectures are also organized to provide a holistic perspective to cover cultural and economic environment of the host country. Students are responsible for travel costs. May be repeated for a maximum of six credits. Preq: Consent of instructor.

MGT 4520 Business Analysis 3 (3) Follows the traditional systems development life cycle (SDLC), although alternative methodologies are also discussed. Focuses on earlier phases of the SDLC, from IS planning through specification of structured requirements and on the methods, techniques, and tools used to determine information requirements and their unambiguous documentation. Preq: on IS planning through specification of structured requirements and on the methods, techniques, and tools used to determine information requirements and their unambiguous documentation. Preq: MGT 3180; or MGT 2010 and ACCT 3220; or MGT 2010 and CPSC 2150 and CPSC 2310.

MGT 4540 Systems Implementation 3 (3) Builds upon skills of programming, database, and systems analysis and design by involving students with the later phases of the systems development life cycle (SDLC). Students design and develop a system using various platforms. Focus is on the logical and physical system design. Preq: MGT 4520 or CPSC 4620 or equivalent.

MGT 4550 Emerging Information Technology Trends in Business 3 (3) In-depth study, through case studies, readings, and hands-on experience, of emerging information technologies in and across business organizations. Focuses on understanding, effective deployment, and impact of these technologies on business outcomes. Preq: MGT 3180; or MGT 2010 and ACCT 3220; or MGT 2010 and CPSC 2150 and CPSC 2310.

MGT 4560 Business Information Management 3 (3) In-depth study of business related data, information, and knowledge-based systems as well as business intelligence technologies and techniques, through readings, hands-on experience, and case studies. Emphasizes organizational decision-making and the ability to access data, information and knowledge-based assets where and when needed. Preq: MGT 3180; or MGT 2010 and ACCT 3220; or MGT 2010 and CPSC 2150 and CPSC 2310.

MGT 4900 Selected Topics in Industrial Management 3 (3) In-depth examination of advanced topics in Industrial Management. Topics may vary in keeping with developments in the management profession and interests of faculty. Emphasizes the application of these topics to the production and operations management environment. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: MGT 4020 or 4040 or 4080.

MGT 4970 Creative Inquiry—Management 1-3 (1-3) Students plan, develop, execute, and direct a research project related to the field of management and present their findings. The project includes lectures about research design, conduct, and data analysis. May be repeated for a maximum of six credits. Includes Honors sections.

MICROBIOLOGY

Professors: T.A. Hughes, X. Jiang, C.D. Rice, S.W. Scott; Associate Professors: J.M. Henson, Y. Wei; Assistant Professors: B.J. Campbell, M. Cao, H.D. Kurtz, T.L. McNealy, T.R. Tseng; Senior Lecturers: J.G. Abercrombie, K.B. Rudolph; Lecturer: K.J. Whitehead

MICR 1010 Microbes and Human Affairs 1 (1) Introduces Microbiology majors to University career and library services, evaluation of computer program proficiency, Web page development, Microbiology emphasis areas, and Microbiology faculty. Students initiate their own Web-based student portfolios, which showcase their skills and experiences (e.g., résumés, accomplishments, and work samples) during their undergraduate programs. Preq or concurrent enrollment: BIOL 1030 and BIOL 1050; or BIOL 1100.

MICR 2050 Introductory Microbiology 4 (3) Basic concepts of microbiology, introduced through class-room and laboratory experiences. Emphasizes practical applications in various areas of importance to man. Recommended for students not majoring in a biological science. Not open to Microbiology majors. Preq: CH 1010 and CH 1020 and BIOL 1030 and BIOL 1050. Coreq: MICR 2050.

MICR 2051 Introductory Microbiology Laboratory 0 (3) Non-credit laboratory to accompany MICR 2050. Coreq: MICR 2050.


MICR 3051 General Microbiology Laboratory 0 (3) Non-credit laboratory to accompany MICR 3050. Coreq: MICR 3050.

MICR 3050 Selected Topics in Creative Inquiry 1 2-3 (2-3) Disciplinary and multidisciplinary group research projects with the goal of developing the students' ability to discover, analyze, and evaluate data. Students are required to document their research activities in their portfolios. May be repeated for a maximum of six credits. Honors students must take at least six credits over a two-semester period with the same research advisor and write an honors thesis. These credits may include MICR 3940, MICR 4940 or both. Includes Honors sections. Preq: Consent of instructor. Coreq: MICR 3941.

MICR 3941 Selected Topics in Creative Inquiry I Laboratory 0 (99) Non-credit laboratory to accompany MICR 3940. Coreq: MICR 3940.

MICR 4000, 6000 Public Health Microbiology 3 (3) Epidemiology of transmissible diseases including pathogenic characteristics of the infectious organism, modes of transmission, mechanism of infection, diagnostic aids, effective treatments, immunizing procedures, and methods of preventing infection. Includes Honors sections. Preq: MICR 3050.

MICR 4010, 6010 Microbial Diversity and Ecology 3 (3) In-depth survey of microbial morphology, ecology, and diversity. Study of the interaction and adaptation of microbes in a wide range of environmental conditions, including consideration of their metabolism, nutrition, growth and the use of microbial biological assays. Preq: CH 2230 and/or CH 2270; and MICR 3050.

MICR 4020, 6020 Environmental Microbiology 3 (3) Discussion of microorganisms in air, terrestrial, and aquatic environments and how they are used for environmental restoration activities. Topics include the nature of biosols, interactions of microbes with inorganic and organic constituents, processes to implement bioremediation in surface/subsurface environments, and treatment of solid, liquid, and gaseous waste streams. Preq for MICR 4020: MICR 3050 and MICR 4010; and either CH 2230 or CH 2270. Preq for MICR 6020: MICR 3050 and MICR 4010; and either CH 2230 or CH 2270; or consent of instructor.

MICR 4030, 6030 Marine Microbiology 3 (2) Discussion of the microbes that inhabit the marine environment, their peculiar physiological traits, and contributions to the ecology of oceans. Preq: MICR 3050; and either CH 2230 or CH 2270. Coreq: MICR 4030, 6031.

MICR 4031, 6031 Marine Microbiology Laboratory 0 (3) Non-credit laboratory to accompany MICR 4030, 6030. Coreq: MICR 4030, 6030.

MICR 4070, 6070 Food and Dairy Microbiology 4 (3) Physical-chemical factors limiting survival and growth of microorganisms during processing and manufacturing of food and dairy products. Standard methods for enumerating and identifying indicator bacteria, yeasts, molds, and microbes producing food and food-borne illness. Statter cultures, fungal toxins, microbial cell injury and standards for food and dairy products. Includes Honors sections. Preq: MICR 3050; and one of BCHM 3050 or CH 2010 or CH 2230. Coreq: MICR 4071, 6071.

MICR 4071, 6071 Food and Dairy Microbiology Laboratory 0 (3) Non-credit laboratory to accompany MICR 4070, 6070. Coreq: MICR 4070, 6070.

MICR 4100, 6100 Soil Microbiology 3 (3) Role of microorganisms in the decomposition of organic substances, transformation of nitrogen and mineral substances in the soil; interrelationships between higher plants and microorganisms; importance of microorganisms in soil fertility. Includes Honors sections. Preq: MICR 4010.

MICR 4110, 6110 Pathogenic Bacteriology 3 (3) Study of pathogenic bacteria and their virulence mechanisms. Emphasizes host-microbe interactions, responses to infection and treatment, and research strategies for various topics of bacterial pathogenesis. Includes Honors sections. Preq: MICR 3050 and MICR 4120 and MICR 4140.

MICR 4120, 6120 Bacterial Physiology 3 (3) Consideration of the cytology, physiology, metabolism, and genetics of bacteria. Includes studies of growth and death, reproduction and mutation, nutrition and metabolic pathways, regulatory mechanisms, and effects of environment. Includes Honors sections. Preq: CH 2240 and MICR 3050; and either BCHM 3010 or BCHM 3050.
MICR 4140, 6140 Basic Immunology 3 (3) Laboratory topics corresponding to MICR 4120 lecture. The course will train students in the proper handling of bacteria and will teach techniques for growing and maintaining bacterial cultures while avoiding contamination. Coreq: MICR 4120.

MICR 4240, 6240 Immunology Laboratory 1 (3) This course is designed to apply the knowledge gained in MICR 4140, Immunology lecture, in an applied setting. The experiments in this beginning immunology laboratory are designed to study both the innate and acquired immune systems. Experimentation into the formation, function and detection of antibodies provides students with skills in basic immunologic techniques. Preq: MICR 3050. Preq or concurrent enrollment: MICR 4140.

MICR 4250, 6250 Microbial Genetics Laboratory 1 (3) Complements the genetics topics covered in the Microbial Genetics lecture. These topics are important at practical levels for molecular and genetics studies. The laboratory is used to teach basic cloning techniques, the basis of blue/white screening, isolation of mutants, calculation of mutation rate, as well as gene regulation. Preq or concurrent enrollment: MICR 4150.

MICR 4270, 6270 Molecular Mechanisms of Carcinogenesis and Aging Laboratory 1 (3) The laboratory is used to teach the basic molecular protocols for cancer and aging research, and will help students to understand the mechanisms of cancer and aging discussed in lecture. Preq or concurrent enrollment: MICR 4150.

MICR 4300, 6300 Soil Microbiology Laboratory 1 (3) Examines microbes residing in the soil and their effects on the soil substrate and resident plant communities. Topics include biogeochemistry, microbial composition and characterization of microbial communities. Preq or concurrent enrollment for MICR 4300: MICR 4100. Preq or concurrent enrollment for MICR 6300: MICR 4100 or consent of instructor.

MICR 4310 Microbial Diversity and Ecology Laboratory 1 (3) Provides a laboratory experience to complement topics covered in the Microbial Diversity and Ecology lecture. These topics are important at practical levels to better understand the diversity of microbes in various ecosystems. The laboratory will be used to learn sampling techniques, preparation of microbial media, basic identification techniques, and modern molecular protocols for microbe identification, such as PCR and 16S rDNA gene sequencing. Preq: MICR 3050. Coreq: MICR 4140.

MICR 4400 Advanced Microbiology Laboratory I 2 (1) Application of knowledge and techniques learned in the Introductory Microbiology Lab with new topics on microbial ecology, diversity and physiology. Experiments in soil, marine and environmental microbiology will be conducted. Preq: MICR 3050, 4100. Coreq: MICR 4501.

MICR 4501 Advanced Microbiology Laboratory I Laboratory 0 (2) Non-credit laboratory to accompany MICR 4500. Coreq: MICR 4500.

MICR 4510 Advanced Microbiology Laboratory I 2 (1) Application of knowledge and techniques learned in the Advanced Microbiology Lab I with new topics in microbial cell biology and microbial genetics. Preq: MICR 3050, 4010, 4120 and 4500. Coreq: 4511.

MICR 4511 Advanced Microbiology Laboratory II Laboratory 0 (2) Non-credit laboratory to accompany MICR 4510. Coreq: MICR 4510.

MICR 4520 Advanced Microbiology Laboratory III 2 (1) Application of knowledge and techniques learned in the Advanced Microbiology Labs I and II with new topics on pathogenic bacteriology, parasitology, virology and immunology. Preq:MICR 4510. Coreq: MICR 4521.

MICR 4521 Advanced Microbiology Laboratory III Laboratory 0 (2) Non-credit laboratory to accompany MICR 4520. Coreq: MICR 4520.

MICR 4560, 6560 Medical and Veterinary Parasitology 3 (3) Introduction to parasitism in the animal kingdom. Emphasizes basic and applied principles related to economically and medically important diseases. Classical and experimental approaches to the study of parasites are examined in reference to protozoa, helminths, and arthropods. Includes Honors sections. Preq: BIOL 1040 and BIOL 1060; or BIOL 1110. Coreq: MICR 4570, 6570.

MICR 4570, 6570 Medical and Veterinary Parasitology Laboratory 2 (1) Laboratory to reinforce material presented in BIOL 4560. Introduces students to both live and preserved human/animal parasites. Also introduces techniques used in collection, preservation, and examination of animal parasites. Includes Honors sections. Coreq: MICR 4560, 6560 and 4571, 6571.

MICR 4571, 6571 Medical and Veterinary Parasitology Laboratory 0 (2) Non-credit laboratory to accompany MICR 4570, 6570. Coreq: MICR 4570, 6570.

MICR 4910 Undergraduate Research in Microbiology 1-4 (1-4) Individually mentored research problems in various areas of microbiology that introduce undergraduate students to the planning and execution of research experimentation and the presentation of research findings. May be repeated for a maximum of eight credits with consent of instructor. Honors students must take at least six hours under a single research advisor over two semesters. Honors thesis is required. Includes Honors sections. Preq: Consent of instructor.

MICR 4920 Internship in Microbiology 1-4 (1-4) Preplanned internship at an advisor-approved facility to give students learning opportunities beyond their classroom experiences. Students submit a Student Internship Contract and a two-page study plan before the internship and a comprehensive report within one week of the end of the internship. May be repeated for a maximum of six credits. To be taken Pass/No Pass only. Preq: Consent of advisor.

MICR 4930 Senior Seminar 2 (2) Capstone course engaging students in analysis and discussion of publications from the technical and non-technical literature in biological sciences and from current topics of biology appearing in other media. Students complete their undergraduate on-line digital portfolios. Emphasis is placed on ethical issues that arise as a result of biological research. Preq: Senior standing; COMM 1500 or 2500 or ENGL 3150; or consent of instructor.
MICR 4940 Selected Topics in Creative Inquiry II 2-3 (1-3) Disciplinary and multidisciplinary group research projects with the goal of developing the students ability to discover, analyze, and evaluate data. Students are required to document their research activities in their portfolios. May be repeated for a maximum of six credits. Honors students must take at least six credits over a two-semester period with the same research advisor and write an honors thesis. These credits may include BIOL 3940, BIOL 4940 or both. Includes Honors sections. Preq: Consent of instructor. Coreq: MICR 4941.

MICR 4941 Selected Topics in Creative Inquiry II Laboratory 0 (3-6) Non-credit laboratory to accompany MICR 4940. MICR 4940.

MICR 4950 Service Learning in Biology 2-4 (2-4) Combines service and academic learning while helping pre-college or college students learn about the fundamental aspects of science. Provides lecture and laboratory experiences as students learn to prepare and participate in supervised laboratory teaching for pre-college or college students. May be repeated for a maximum of six credits. Preq: Consent of instructor. Coreq: MICR 4951.

MICR 4951 Service Learning in Biology Laboratory 0 (99) Non-credit laboratory to accompany MICR 4950. Coreq: MICR 4950.

**MARKETING**


**MKT 2980 Creative Inquiry—Marketing 1-4 (1-4)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of six credits. Preq: Consent of faculty member/mentor.

**MKT 3010 Principles of Marketing 3 (3)** Principles and concepts involved in planning, pricing, promoting, and distributing of goods and services. Includes Honors sections. Preq: ECON 2000 or ECON 2110 or ECON 2120; and sophomore standing.

**MKT 3020 Consumer Behavior 3 (3)** Examination of selected individual and group behavioral science concepts and their application to the understanding of consumer decision making. Preq: MKT 3010.

**MKT 3140 New Venture Creation 1 3 (3)** First in a two-part series that continues with MGT (ELE) 3150 assessing entrepreneurial opportunities. Focuses on creativity, idea generation, market opportunity analysis, strategy, and methods of entry. Opportunity analysis may be developed into a full new venture plan in ELE 3150 or MGT 3150. Preq: Junior standing.

**MKT 3150 Retail Management 3 (3)** Retailing is studied from a decision-making approach. Topics include target market analysis, location analysis, merchandising, human resources, pricing and promotion. Preq: MKT 3010 and MKT 4200. Preq: MKT 4200.

**MKT 3210 Sports Marketing 3 (3)** Exploration of the essentials of effective sports marketing. Topics include application of marketing principles in the sports area, licensing issues, sponsorships and endorsements, stadium and arena marketing, broadcasting and media considerations, public policy and sports, and unique marketing challenges for sport specific products (football, basketball, baseball, motorsports, etc). Preq: MKT 3010.

**MKT 3900 Junior Honors Research 1 (1)** Students select and complete a research project approved by a faculty advisor, in conjunction with an approved three-credit marketing course (other than MKT 3010 or 4310). Students are expected to display a command of marketing theory and an ability to apply theory to their research. Preq: MKT 3010 and membership in Calhoun Honors College and consent of faculty member supervising research.

**MKT 3980 Creative Inquiry—Marketing 1-4 (1-4)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of six credits. Preq: Consent of faculty member/mentor.

**MKT 3990 Marketing Internship 3 (3)** Credit will only be given for internships of at least ten full-time, consecutive weeks with the same internship provider. Restricted to students with a major in Marketing. To be taken Pass/No Pass only. Preq: MKT 3010 or consent of instructor.

**MKT 4200 Professional Selling 3 (3)** Emphasis on the selling of goods and services to organizational buyers in the context of long-term relationships. Role playing, video-taped presentations and other techniques are generally employed to enhance interpersonal communication skills. Preq: Junior standing and MKT 3010.

**MKT 4230, 6230 Promotional Strategy 3 (3)** Emphasizes the promotional function of sport. Attention is given to communication, promotion objective setting and promotion. Factors affecting promotional decision-making processes are explored, and promotion as a competitive tool is examined. Preq for MKT 4230: MKT 3010. Preq for MKT 6230: MKT 3010 or consent of instructor.

**MKT 4240 Sales Management 3 (3)** Comprehensive examination of the planning, implementation, and control of professional sales organizations. Preq: MKT 3010 and MKT 4200.

**MKT 4250 Retail Management 3 (3)** Retailing is studied from a decision-making approach. Topics include target market analysis, location analysis, merchandising, human resources, pricing and promotion. Preq: MKT 3010 and MKT 4200. Preq: MKT 4200.

**MKT 4260 Business-to-Business Marketing 3 (3)** Study and analysis of the unique aspects of marketing goods and services to organizational buyers rather than household consumers. Emphasis is on developing strategic responses to market opportunities given competitive behavior. Preq: MKT 3010.

**MKT 4270, 6270 International Marketing 3 (3)** Study of marketing from the international point of view. Emphasis is on the necessary modification of marketing thinking and practice for foreign markets due to individual environmental differences. Preq: MKT 3010.

**MKT 4280, 6280 Services Marketing 3 (3)** Exploration and study of the nature of service organizations and the principles that guide the marketing of their products. Emphasis is on a marketing mix that is fundamentally different than that found in traditional goods marketing. Preq for MKT 4280: MKT 3010. Preq for MKT 6280: MKT 3010 or consent of instructor.

**MKT 4290, 6290 Public and Nonprofit Marketing 3 (3)** Examines the role and application of marketing in public and nonprofit settings. Focuses on a conceptual understanding of the marketing discipline and marketing processes and shows how basic concepts and principles of marketing are applicable to public and nonprofit organizations. Preq for MKT 4290: MKT 3010. Preq for MKT 6290: MKT 3010 or consent of instructor.

**MKT 3000, 6300 Marketing Product Management 3 (3)** Management of the firms product or service offerings. Topics include new product screening, evaluation, and development; product line and mix analysis, abandonment decisions, brand managers role, new product development department, and others. Emphasis is on decision making. Preq for MKT 4300: MGT 3100 and MKT 3010. Preq for MKT 6300: MKT 3000 and MKT 3010; or consent of instructor.

**MKT 4310 Marketing Research 3 (3)** Research used in marketing decision making. Emphasizes methods and techniques used in planning, collection, processing, and utilizing information. Topics include research design, sources of information, questionnaire design, sampling, data collection, and data analysis. Preq: Marketing major and MKT 3010 and MTHS 3090. Preq or concurrent enrollment: MGT 3100.

**MKT 4330 Sport Marketing Strategy 3 (3)** Provides students with basic knowledge about brand management as it applies to sport. Addresses basic principles and guiding precepts of how sport-based organizations build strong brands. Preq: MKT 3210.

**MKT 4340 Sport Promotion 3 (3)** Emphasises the promotional function of sport. Topics include event sponsorship, developing media relationships, endorsements, promotion objective setting and budgeting, media planning and scheduling, and utilizing the tools of promotion within a sport context. Integrated Marketing Communication provides the theoretical and managerial framework for how these factors are utilized optimally. Preq: MKT 3210 and MKT 4230.

**MKT 4430 Advertising Strategy 3 (3)** Advertising strategy emphasizing knowledge of target audiences, along with the messages to communicate effectively with them. Foundations include knowing, motivating, and changing behavior of target audience. Issues include models for decisions, tools for promotion, and integrated advertising plans. Preq: MKT 3010.
Courses of Instruction

MKT 4450 Macromarketing 3 (3) Examines the relationship between marketing and society, focusing on the social impact of marketing practices. Topics include technology, ethics, materialism, globalization, environmental sustainability, and the political and economic philosophy underlying marketing. Course is multidisciplinary and uses a variety of readings to cover each topic area. Preq: MKT 3010 and junior standing.

MKT 4500 Strategic Marketing Management 3 (3) Application of marketing constructs in analyzing and solving marketing problems. Emphasizes infor-mation systems, data analysis, and creative-thinking skills in solving marketing problems in a wide range of managerial decision areas, including, but not limited to, new product development, pricing, advertising, personal selling, channels, and international marketing. Preq: Marketing major and MKT 3010 and six credits of 400-level marketing courses.

MKT 4900 Senior Honors Thesis Research 3 (3) Students, in consultation with a Marketing faculty member, choose a topic for the honors thesis and produce a research proposal that involves an imaginative approach to the subject, a sufficient literature review, a comprehensive introduction to the research topic, and a detailed research plan. Preq: MKT 3900.

MKT 4910 Senior Honors Thesis Writing and Presentation 3 (3) Students implement their research plans, write up their reports, and present and defend their Senior Honors Theses to an audience of Marketing faculty, Honors students, and invited others. Preq: MKT 4900.

MKT 4950, 6950 Selected Topics 3 (3) In-depth examination of timely topics in marketing. May be repeated for credit, but only if different topics are covered. Preq for MKT 4950: MKT 3010. Preq for MKT 6950: MKT 3010 or consent of instructor.

MKT 4980 Creative Inquiry—Marketing 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of six credits. Preq: Consent of faculty member/mentor.

MKT 4990 Independent Study 1-3 (1-3) Directed readings or independent research in selected marketing areas. Topics must be selected and proposed by student. Proposals must be approved by instructor. May be repeated for a maximum of three credits. Preq: MKT 3010 and consent of instructor.

MILITARY LEADERSHIP

Professor: J. Mullinax, Chair; Assistant Professors: P. Andrews, T. Bras, G. Hansel, K. Norris, R. Rozetar, C. Wells

ML 1010 Leadership Fundamentals I 2 (2) Study of leadership focused at the individual level. Students learn effective communicating skills, ethical decision making, small group management, and mental and physical conditioning. Skills are applied in a variety of challenging training events during laboratory, including rappelling, water survival, land navigation, and team athletics. Coreq: ML 1011.

ML 1011 Leadership Fundamentals I Laboratory 0 (1) Non-credit laboratory to accompany ML 1010. Coreq: ML 1010.

ML 1020 Leadership Fundamentals II 2 (2) Continued study of leadership focused at the individual and team levels. Topics include problem solving, critical thinking, leadership styles, and group cohesion. Leadership laboratory training includes small tactics and weapons firing. Coreq: ML 1021.

ML 1021 Leadership Fundamentals II Laboratory 0 (1) Non-credit laboratory to accompany ML 1020. Coreq: ML 1020.

ML 2010 Leadership Development I 2 (2) Study of leadership focused at the team level. Students develop leadership skills through public speaking, managing small groups, and mentoring first-year students. Skills are applied in a variety of challenging training events during leadership laboratory, including rappelling, water survival, land navigation, and team-building exercises. Coreq: ML 2011.

ML 2011 Leadership Development I Laboratory 0 (1) Non-credit laboratory to accompany ML 2010. Coreq: ML 2010.

ML 2100 Leaders Training Course 3 (3) Five-week leadership camp conducted on an Army post. Students pay and expenses are provided by the U.S. Army. Environment is rigorous and focused on leadership development. Non-military obligation is incurred. Completion of this course qualifies students for entry into the Army ROTC. Coreq: ML 2100.

ML 2110 Leadership Development II Laboratory 0 (1) Non-credit laboratory to accompany ML 2020. Coreq: ML 2020.

ML 4010. Coreq: ML 4021.

ML 4021 Organizational Leadership I Laboratory 0 (2) Non-credit laboratory to accompany ML 4020. Coreq: 4020.

ML 4510 Organizational Leadership III 3 (2) Transitional leadership development and training for completion cadets and others designed to enhance practical experiences in managing organizational training programs, develop leadership skills by serving in cadet staff positions, develop small group decision making and conflict management skills, and reinforce physical fitness and lifestyle skills required of leaders. May be repeated for a maximum of six credits. Preq: ML 3020. Coreq: ML 4511.

ML 4511 Organizational Leadership III Laboratory 0 (3) Non-credit laboratory to accompany ML 4510. Coreq: ML 4510.

MATERIALS SCIENCE AND ENGINEERING

MSE 1010 Materials Technology in Everyday Life 3 (3) Introduces principles of materials science benefitting citizens. Students learn how to make intelligent choices about everyday materials and devices and present their informed opinions through class discussion and group projects involving controversial topics such as recycling, green manufacturing, and nanotechnology.

MSE 2010 Yarn Structures and Formation 4 (3) Study of fiber processing systems required to transform various fibrous materials into yarn. Involves the machine principles and theories, relationship of the fibers to the process and the resultant yarn structures, and subsequent analysis of the yarn structure to define quality and to determine suitable manufacturing practices. Preq: MSE 2500. Coreq: MSE 2011.
Courses of Instruction

MSE 2011 Yarn Structures and Formation Laboratory 0 (3) Non-credit laboratory to accompany MSE 2010. Coreq: MSE 2010.


MSE 2100 Introduction to Materials Science 3 (3) Introductory course in materials science designed primarily for engineering students. Studies the relation between the electrical, mechanical, and thermal properties of products and the structure and composition of these products. All levels of structure are considered from gross structures easily visible to the eye through electronic structure of atoms. Preq: CH 1010 and MTHS 1080.

MSE 2410 Metrics Laboratory 1 (3) Provides basic knowledge of statistical techniques and testing procedures used to evaluate materials. Includes sampling procedures, calculation of averages, confidence intervals, Weibull statistics, precision and accuracy to enable quality decision making. Preq or concurrent enrollment: MSE 2100.

MSE 2500 Polymer and Fiber Materials I 3 (3) Introduction to the broad fields of textile, fiber, and polymer science and engineering with emphasis on the scientific, technological, and business principles utilized in producing fibers, yarns, and fabrics; enhancing fabric functionality by dyeing, finishing, and printing; and establishing end-use products.

MSE 2510 Materials Science and Engineering Portfolio 1 1 (1) Introduces students to the concept of self-paced professional development throughout their plans of study. Each student is assigned a faculty member to act as mentor and advisor. Preq: Consent of instructor.

MSE 3000 Honors Seminar 1 (1) Acquires students enrolled in the Departmental Honors program with current research issues in the profession. This assists students in preparing a research proposal for the Senior Thesis. To be taken Pass/No Pass only. Preq: Junior standing and admission to departmental honors program.

MSE 3030 Textile Chemistry 3 (3) Study of the properties and reactions of aliphatic and aromatic organic compounds. Emphasizes mechanistic interpretations and the development of synthetic schemes leading to polyfunctional compounds of the types encountered in the textile industry. Preq: CH 1020. Preq or concurrent enrollment: MTHS 2060 or MTHS 2070.

MSE 3190 Materials Processing I 3 (3) Introduction into the principles underlying the processing/manufacturing of ceramic, polymeric, and metallic materials. Preq or concurrent enrollment: MSE 2100.

MSE 3240 Statistics for Materials Science and Engineering 3 (3) Introduction to statistics with particular application to the material industry. Covers measures of central value and variation, probability, the normal curve, tests of hypotheses, elementary correlation, and regression. Preq: Sophomore standing.

MSE 3260 Thermodynamics of Materials 3 (3) Introduction to physical laws that govern the equilibrium products of chemical and thermal reactions. Covers the three laws of thermodynamics, phase equilibria, energy requirements for reactions, material corrosion, and environmental stability. Preq: CH 1020 and MSE 2100 and MTHS 1080 and PHYS 2210.

MSE 3270 Transport Phenomena 3 (3) Kinetic aspects of mass, heat, and fluid transport as they relate to the processing and performance of materials. Preq or concurrent enrollment: MSE 2100 and MSE 3260 and MTHS 2080.

MSE 3280 Phase Diagrams for Materials Processing and Applications 3 (3) Teaches students to use single component, binary, and ternary phase diagrams to analyze material processing routes and utilization. Considers reaction pathways by which material microstructure evolves and the relationship of reaction pathway to equilibrium phase diagrams. Also considers material interactions/degradation during use. Preq: MSE 3260.

MSE 3420 Structure/Property Laboratory 2 (6) Provides a basic understanding of how microstructure interrelationships and processes affect the physical properties of materials and how environmental effects modify structure and mechanical behavior of materials. Preq: MSE 2410.

MSE 3610 Processing of Metals and Their Composites 3 (3) Examines the control of microstructure-property relationships in metallic materials and their composites through development and selection of innovative manufacturing methods. Preq or concurrent enrollment: MSE 3270.

MSE 3950 Honors Research I 3 (9) Individual research under the direction of a Ceramic and Materials Engineering faculty member. Preq or concurrent enrollment: MSE 3270 and SE 3280.

MSE 4020, 4020 Solid State Materials 3 (3) Discussion of the properties of solids as related to structure and bonding with emphasis on electronic materials. Emphasizes fundamental, electronic, and optical properties are treated. Preq: MSE 3260 and MTHS 2080 and PHYS 2210.

MSE 4070 Senior Capstone Design 1 (1) Work with industrial partners who have materials-related processes or product problems. Emphasizes interdisciplinary team approach and global perspective of products and problems. Incorporates critical thinking, group effectiveness, and problem solving with materials and processes. Collaborative efforts between industry and student academic teams are employed. Preq: IE 3840. Preq or concurrent enrollment: MSE 4410. Coreq: MSE 4071.

MSE 4070 Senior Capstone Design Laboratory 0 (6) Non-credit laboratory to accompany MSE 4070. Coreq: MSE 4070.

MSE 4130, 4130 Noncrystalline Materials 3 (3) Study of the fundamentals of the noncrystalline state. Includes cooling kinetics and effects on formation as well as physical properties of noncrystalline substances in metallic, polymeric, and ceramic systems. Preq for MSE 4130: MSE 3260. Preq or concurrent enrollment for MSE 4130: MSE 4020. Preq for MSE 6130: MSE 3260; Coreq: MSE 6020; or consent of instructor.

MSE 4150, 4150 Introduction to Polymer Science and Engineering 3 (3) Chemistry of monomers and polymers and the chemical and physical properties of polymers are discussed emphasizing fiber forming, synthetic polymers. Includes molecular characterization, structure, morphology, and mechanical properties as they relate to the design of polymer systems for end uses in textiles, geotextiles, plastics and fiber-reinforced composite materials. Includes Honors sections. Preq for MSE 4150: CH 2010; and CH 3300 or CH 2240. Preq for MSE 6150: CH 2010; and CH 3300 or CH 2240 or consent of instructor.

MSE 4160, 4160 Electrical Properties of Materials 3 (3) Covers a range of topics dealing with electrical and magnetic materials, including metal and polymer conductors, insulators, ceramic and polymer materials for dielectric applications, and ferroelectric, piezoelectric, pyroelectric, and electrooptic materials. Metal and ceramic magnetic materials are also discussed.

MSE 4220, 4220 Mechanical Behavior of Materials 3 (3) Covers the microstructural basis of deformation and fracture in ceramic, metallic, and polymeric systems. Preq: CE 2010 and MTHS 2080.

MSE 4240, 4240 Optical Materials and Their Applications 3 (3) Introduces the interaction of materials with light. Specific topics include fundamental optical properties, materials synthesis, optical fiber and planar waveguides, and the componentry and systems-level aspects of optical communication systems. Preq: MSE 4020 and MSE 4130.

MSE 4320 Manufacturing Processes and Systems 3 (3) Plant layout and design for manufacturing of ceramic products. Emphasizes process control and verification of processing results. Includes adaptation of computers in process simulation/robotics and the use of programmable logic controllers and robotics in processing.

MSE 4330 Combustion Systems and Environmental Emissions 3 (3) Study of the application of burners, burner controls, firing atmospheres, hydrocarbon fuels, and other energy resources to industrial kilns, furnaces, and firing operations. Topics include energy resources, fuel chemistry, combustion analysis, ratio control systems, flow and pressure measurement and control, kiln atmosphere controls, industrial burners, and flames. Preq: MSE 3260.

MSE 4410 Manufacturing Laboratory 1 (3) Provides students with the understanding of process optimization. Emphasizes the use of complex experimental design schemes to elucidate the interrelationships between processing, microstructural development, and resulting properties. Preq: MSE 4240.

MSE 4450 Practice of Materials Engineering 1 (1) Students working in groups present and discuss practical, ethical, safety, business, and selected technical topics. Invited speakers discuss various aspects of the engineering world. To be taken Pass/No Pass only. Preq: MSE 4320.

MSE 4500 Materials Science and Engineering Portfolio 2 (2) Students working in groups present and discuss practical, ethical, safety, and business topics in the polymer and textile industries. Students are required to complete their electronic portfolios. To be taken Pass/No Pass only.
MSE 4510 Materials Science and Engineering Portfolio II 1 (1) Student continues self-paced professional development throughout the rest of his/her plan of study by working with the faculty member assigned to act as mentor and advisor. Prev: MSE 2510 and consent of instructor.

MSE 4550 Polymer and Fiber Laboratory I 3 (3) High molecular weight polymers are prepared from monomers, and their chemical and physical properties are measured as functions of critical end use parameters using instrumental and physical methods. Prev or concurrent enrollment: MSE 4560.

MSE 4560, 6560 Polymer and Fiber Materials II 3 (2) Chemicals used in the preparation of fabric for dyeing and finishing. Oxidizing and reducing agents and their control and effect on various fibers. Colloidal and surface active properties of various compounds and the fundamental factors influencing these properties. Prev for MSE 4560: MSE 4150. Prev for MSE 6560: MSE 4150 or consent of instructor. Coreq: MSE 4561, 6561.

MSE 4561, 6561 Polymer and Fiber Science II Laboratory 0 (2) Non-credit laboratory to accompany MSE 4560, 6560. Coreq: MSE 4560, 6560.

MSE 4570, 6570 Color Science 3 (3) Understanding of physical, chemical, and mechanical principles behind the application of colors and finishes to textiles. Requires an appreciation of fiber chemistry and morphology, dye and finish structures and reactivity and mechanical principles behind equipment used to effect transfer of these chemicals onto the textile substrate. Includes Honors sections.

MSE 4580 Surface Phenomena in Materials Science and Engineering 3 (3) Introduction to surface phenomena focusing on fiber science. Fundamentals of interfacial phenomena embrace thermodynamics of surfaces, physics of adhesion, wetting, and finishing emphasizing specific features associated with interactions of liquids and chemicals with fibers and fibrous materials. Prev: Junior standing in engineering or science.

MSE 4590 Color Science Laboratory I 3 (3) Introduction to common dyeing and printing methods and to some of the machinery necessary to carry out dyeing operations. Prev or concurrent enrollment: MSE 4570.

MSE 4600 Surface Phenomena in Materials Science and Engineering Laboratory I 3 (3) Covers finishing in addition to dyeing operations and their instrumental control. Prev or concurrent enrollment: MSE 4580.

MSE 4610 Polymer and Fiber Materials III 3 (2) Familiarizes students with the physical properties of textile and high performance fibers and how these properties influence process and end-use performance; method of measuring those properties; and how those properties are related to structural features of the fiber. Includes Honors sections. Coreq: MSE 4611.

MSE 4611 Polymer and Fiber Materials III Laboratory 0 (2) Non-credit laboratory to accompany MSE 4610. Coreq: MSE 4610.

MSE 4620, 6620 Properties of Textile Structures 3 (2) Yarn and fabric properties, their scientific significance and analysis. Dimensional, structural, and mechanical interrelationships are established and evaluated. Coreq: MSE 4621, 6621.

MSE 4621, 6621 Properties of Textile Structures Laboratory 0 (2) Non-credit laboratory to accompany MSE 4620, 6620. Coreq: MSE 4620, 6620.

MSE 4640, 6640 Nonwoven Structures 3 (2) Nonwoven fabric structures, their manufacture, properties, and applications. Methods of nonwoven fabric formation, resultant material characteristics and end-use applications are examined. Prev: MSE 2010. Coreq: MSE 4641, 6641.

MSE 4641 Nonwoven Structures Laboratory 0 (2) Non-credit laboratory to accompany MSE 4640. Coreq: MSE 4640.

MSE 4900, 6900 Selected Topics in Materials Science and Engineering 1-3 (1-3) Study of topics not ordinarily covered in other courses. Taught as the need arises. Typical topics could include current research in a specific area or technological advances. May be repeated for a maximum of six credits, but only if different topics are covered. Includes Honors sections. Prev: Consent of instructor.

MSE 4910 Undergraduate Research 1-3 (2-6) Investigation of a typical materials science and engineering research problem under the direct supervision of a faculty member. After completing the research, students prepare a formal written and oral report. May be repeated for a maximum of six credits. Prev: Consent of instructor.


MATH 1010 Essential Mathematics for the Informed Society 3 (3) Topics include logic and computers, probability and statistics, and financial mathematics. Specific topics include Boolean algebra, digital data formats, randomness, graphical representation of data, inference and estimation; interest, annuities, and amortization. Not open to students who have received credit for MTHS 1010, 3010, 3020, 3090, or EXST 3010. Prev: Any EXST or MTHS course or a score of 2 or higher on the Clemson Mathematics Placement Test.

MTHS 1020 Introduction to Mathematical Analysis 3 (3) Intuitive approach to the concepts and applications of calculus. Topics include functions and graphing, differentiation, and integration. Applications from social, biological, and management sciences are presented. Not open to students who have received credit for MTHS 1060. Prev: Any MTHS or EXST course or a score of 2 or higher on the Clemson Mathematics Placement Test.

MTHS 1030 Elementary Functions 3 (3) Gateway course for MTHS 1060. Comprehensive treatment of functions and analytic geometry with applications including polynomial, rational, algebraic, exponential, logarithmic, and trigonometric functions. Not open to students who have received credit for MTHS 1050. To be taken Pass/No Pass only. Prev: Any MTHS or EXST course or a score of 3 or higher on the Clemson Mathematics Placement Test. Coreq: MTHS 1031.

MTHS 1031 Elementary Functions Laboratory 0 (2) Non-credit laboratory to accompany MTHS 1030. Coreq: MTHS 1030.

MTHS 1040 Precalculus and Introductory Differential Calculus 4 (4) Relevant precalculus and algebra review, limits, continuity and introduction to differential calculus. The combination of MTHS 1040 and MTHS 1070 covers the same calculus material as MTHS 1060. MTHS 1040 alone cannot be substituted for any calculus course. To be taken Pass/No Pass only. Not open to students who have received credit for MTHS 1060. Prev: Any MTHS or EXST course of a score of 3 or higher on Clemson Mathematics Placement Test.

MTHS 1050 Precalculus 5 (4) Extensive treatment of topics chosen to prepare students for the study of calculus. Special emphasis is given to polynomial, rational, exponential, logarithmic, and trigonometric functions and their graphs, as well as basic and analytic trigonometry. Students who have received credit for any other mathematical sciences course will not be allowed to enroll in or receive credit for MTHS 1050. To be taken Pass/No Pass only. Coreq: MTHS 1051.

MTHS 1051 Precalculus Laboratory 0 (2) Non-credit laboratory to accompany MTHS 1050. Coreq: MTHS 1050.

MTHS 1060 Calculus of One Variable I 4 (4) Topics include analytic geometry, introduction to derivatives, computation and application of derivatives, integrals, exponential and logarithm functions. Includes Honors sections. Prev: MTHS 1030 or MTHS 1040 or MTHS 1050 or a score of 5 or better on the Clemson Mathematics Placement Test.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTHS 1070</td>
<td>Differential and Integral Calculus</td>
<td>4 (4)</td>
<td>Continuation of MTHS 1040. Successful completion of MTHS 1040 and MTHS 1070 is equivalent to the completion of MTHS 1060. Continuation of differential calculus and an introduction to integral calculus. Not open to students who have received credit for MTHS 1060. Preq: MTHS 1040.</td>
</tr>
<tr>
<td>MTHS 1080</td>
<td>Calculus of One Variable I</td>
<td>4 (4)</td>
<td>Topics include transcendental functions, applications of integration, integration techniques, indeterminate forms, improper integrals, parametric equations, polar coordinates, and infinite series. Includes Honors sections. Preq: MTHS 1060 or MTHS 1070.</td>
</tr>
<tr>
<td>MTHS 1110</td>
<td>Calculus II for Biologists</td>
<td>4 (4)</td>
<td>MTHS 1110 Calculus II for Biologists 4 (4) Selected topics from integral calculus, eigenvalues and eigenvectors of matrices and differential equations are used to encourage the use of mathematics, computational tool and biological science in the study of relevant biological models. Credit toward a degree will be given for only one of MTHS 1080 and MTHS 1110. Preq: MTHS 1060 or MTHS 1070.</td>
</tr>
<tr>
<td>MTHS 1150</td>
<td>Contemporary Mathematics for Elementary School Teachers I</td>
<td>3 (3)</td>
<td>MTHS 1150 Cooperative learning groups, manipulatives, and concrete models are used to demonstrate logical reasoning, problem-solving strategies, sets and their operations, numeration systems, properties and operations of whole numbers, number theory, prime and composite numbers, divisibility, common factors and multiples. Open to Elementary, Early Childhood, and Special Education majors only. Preq: Any MTHS or EXST course or a score of 2 or higher on the Clemson Mathematics Placement Test.</td>
</tr>
<tr>
<td>MTHS 1160</td>
<td>Contemporary Mathematics for Elementary School Teachers II</td>
<td>3 (3)</td>
<td>MTHS 1160 Calculus II for Biologists 4 (4) Selected topics from integral calculus, eigenvalues and eigenvectors of matrices and differential equations are used to encourage the use of mathematics, computational tool and biological science in the study of relevant biological models. Credit toward a degree will be given for only one of MTHS 1080 and MTHS 1110. Preq: MTHS 1060 or MTHS 1070.</td>
</tr>
<tr>
<td>MTHS 1170</td>
<td>Mathematics for Elementary School Teachers I Laboratory</td>
<td>0 (2)</td>
<td>MTHS 1170 Mathematics for Elementary School Teachers I Laboratory 0 (2) Non-credit laboratory to accompany MTHS 1170. Coreq: MTHS 1170.</td>
</tr>
<tr>
<td>MTHS 1180</td>
<td>Mathematics for Elementary School Teachers II</td>
<td>2 (2)</td>
<td>MTHS 1180 Mathematics for Elementary School Teachers II 2 (2) Simple probability and descriptive statistics are reviewed. Two- and three-dimensional geometry including polygons, polyhedra and their properties; congruence, similarity, and constructions; coordinate system; standard measurement, area, surface area, volume; and motion geometry are explored. Content, according to state standards, is taught with appropriate methodology for teaching K-6. Preq: MTHS 1170. Coreq: MTHS 1181.</td>
</tr>
<tr>
<td>MTHS 1181</td>
<td>Mathematics for Elementary School Teachers II Laboratory</td>
<td>2 (2)</td>
<td>MTHS 1181 Mathematics for Elementary School Teachers II Laboratory 0 (2) Non-credit laboratory to accompany MTHS 1180. Coreq: MTHS 1180.</td>
</tr>
<tr>
<td>MTHS 1190</td>
<td>Introduction to Discrete Methods</td>
<td>3 (3)</td>
<td>MTHS 1190 Introduction to Discrete Methods 3 (3) Topics normally include elementary logic and methods of proof; sets, functions, and relations; graphs and trees; combinatorial circuits and Boolean algebra. Preq: Any MTHS or EXST course or a score of 2 or higher on the Clemson Mathematics Placement Test.</td>
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<tr>
<td>MTHS 1290</td>
<td>Problem Solving in Discrete Mathematics</td>
<td>3 (2)</td>
<td>MTHS 1290 Problem Solving in Discrete Mathematics 3 (2) Problem-solving approach to learning mathematics is applied to topics in modern discrete mathematics. Typical selection of topics includes logic and proof, sets, relations, functions, mathematical induction, graphs and trees, counting techniques, recurrence equations. For Bachelor of Science and Bachelor of Arts majors in Mathematics only. Credit may not be received for both MTHS 1190 and 1290. Preq: MTHS 1060 or MTHS 1070. Coreq: MTHS 1291.</td>
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<tr>
<td>MTHS 1291</td>
<td>Problem Solving in Discrete Mathematics Laboratory</td>
<td>0 (2)</td>
<td>MTHS 1291 Problem Solving in Discrete Mathematics Laboratory 0 (2) Non-credit laboratory to accompany MTHS 1290. Coreq: MTHS 1290.</td>
</tr>
<tr>
<td>MTHS 1990</td>
<td>Problem Solving in Mathematics</td>
<td>3 (2)</td>
<td>MTHS 1990 Problem Solving in Mathematics 3 (2) Functions and graphs, mathematical modeling, and applications. Applications from management and life and social sciences are presented. Specific topics include linear, quadratic, polynomial, exponential, and logarithmic functions with emphasis on problem solving. Students who have received credit for any other mathematical sciences course will not be allowed to enroll in or receive credit for MTHS 1990. To be taken Pass/No Pass only. Coreq: MTHS 1991.</td>
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<tr>
<td>MTHS 1990</td>
<td>Introductory Business Statistics</td>
<td>3 (3)</td>
<td>MTHS 1990 Introductory Business Statistics 3 (3) Basic statistical concepts more advanced than those of high school geometry. Treatment of the various properties of the triangle, including the notable points, lines, and circles associated with it. Preq: MTHS 1060 or MTHS 1070.</td>
</tr>
<tr>
<td>MTHS 2070</td>
<td>Multivariable Calculus</td>
<td>4 (4)</td>
<td>MTHS 2070 Multivariable Calculus 4 (4) Introduction to the calculus of several variables, differential calculus and optimization of several variables, multiple integrals. Topics from the management sciences are used to illustrate the above concepts. May not be taken by students who have passed MTHS 2060. Preq: MTHS 1020 or MTHS 1060 or MTHS 1070.</td>
</tr>
<tr>
<td>MTHS 2080</td>
<td>Introduction to Ordinary Differential Equations</td>
<td>4 (4)</td>
<td>MTHS 2080 Introduction to Ordinary Differential Equations 4 (4) Introduction to the study of differential equations and their application to physical problems. Topics include exact, series, and numerical solutions; solutions by means of Laplace transforms; and solutions of systems of differential equations. Includes Honors sections.</td>
</tr>
<tr>
<td>MTHS 2100</td>
<td>Applied Matrix Algebra</td>
<td>3 (3)</td>
<td>MTHS 2100 Applied Matrix Algebra 3 (3) Introduction to the basic principles of matrix algebra with applications to the behavioral and managerial sciences. Major areas of application include linear programming, directed graphs, and game theory. Preq: MTHS 1020 or MTHS 1060 or MTHS 1070.</td>
</tr>
<tr>
<td>MTHS 2160</td>
<td>Geometry for Elementary School Teachers</td>
<td>3 (3)</td>
<td>MTHS 2160 Geometry for Elementary School Teachers 3 (3) Informal treatment of the basic concepts of geometry. Open to Elementary, Early Childhood, and Special Education majors only. Preq: MTHS 1160.</td>
</tr>
<tr>
<td>MTHS 2500</td>
<td>Introduction to Mathematical Sciences</td>
<td>1 (1)</td>
<td>MTHS 2500 Introduction to Mathematical Sciences 1 (1) Introduction to areas of study, degree options, career choices, and professional development in mathematical sciences. Includes guidelines and requirements for portfolio development and an introduction to ethical issues.</td>
</tr>
<tr>
<td>MTHS 2990</td>
<td>Creative Inquiry--Mathematical Sciences</td>
<td>3 (3)</td>
<td>MTHS 2990 Creative Inquiry--Mathematical Sciences 3 (3) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of three credits. Preq: Consent of faculty member/mentor.</td>
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<tr>
<td>MTHS 3010</td>
<td>Statistical Methods I</td>
<td>3 (3)</td>
<td>MTHS 3010 Statistical Methods I 3 (3) Principal topics include collecting and summarizing data, probability distributions, inferences about central values and variation, analysis of categorical data, simple linear regression, basic experimental designs, and the analysis of variance. Credit toward a degree will be given for only one of MTHS 3010, 3020, 3090, EXST 3010. Includes Honors sections. Preq: MTHS 1060 or MTHS 1070 or MTHS 2070 or MTHS 2100.</td>
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<tr>
<td>MTHS 3020</td>
<td>Elementary Statistical Inference</td>
<td>3 (3)</td>
<td>MTHS 3020 Elementary Statistical Inference 3 (3) Data-based course in statistical methodology: descriptive and summarizing data, the normal distribution and two sample inference on means and proportions, simple linear regression, analysis of categorical data. May not be taken for credit by students who have passed MTHS 3010, 3020, 3090, or EXST 3010. Preq: Any MTHS or EXST course or a score of 3 or higher on the Clemson Mathematics Placement Test.</td>
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<tr>
<td>MTHS 3060</td>
<td>Calculus of Several Variables</td>
<td>4 (4)</td>
<td>MTHS 3060 Calculus of Several Variables 4 (4) Topics include real valued functions of several variables, multiple integration, differential calculus of functions of several variables, vector field theory. Includes Honors sections. Preq: MTHS 1080 or MTHS 1110.</td>
</tr>
<tr>
<td>MTHS 3080</td>
<td>Multivariable Calculus</td>
<td>3 (3)</td>
<td>MTHS 3080 Multivariable Calculus 3 (3) Introduction to the calculus of several variables, differential calculus and optimization of several variables, multiple integrals. Topics from the management sciences are used to illustrate the above concepts. May not be taken by students who have passed MTHS 2060. Preq: MTHS 1020 or MTHS 1060 or MTHS 1070.</td>
</tr>
<tr>
<td>MTHS 3090</td>
<td>Introductory Business Statistics</td>
<td>3 (3)</td>
<td>MTHS 3090 Introductory Business Statistics 3 (3) Introductory probability and statistics for business students, particularly those who will take MGT 3100. Topics include descriptive statistics, probability, expectations, binomial, normal, sampling distributions, one and two sample estimation and testing. Credit toward a degree will be given for only one of EXST 3010, MTHS 3010, 3020, 3090. Preq: MTHS 1060 or MTHS 1070 or MTHS 2070 or MTHS 2100.</td>
</tr>
</tbody>
</table>
MTHS 310 Linear Algebra 3 (3) Introduction to the algebra of matrices, vector spaces, polynomials, and linear transformations. Includes Honors sections. Preq: MTHS 1080 or MTHS 1110.

MTHS 3150 Advanced Topics in Mathematics for Elementary Teachers 3 (3) Course builds and expands upon content from previous elementary mathematics courses. Covers investigation of two- and three-dimensional shapes; scale and scale factor; ratio and proportional reasoning; relationships between perimeter, area, surface area and volume; relationships between fractions, decimals, and percents. Preq: MTHS 2160.

MTHS 3160 Problem Solving for Mathematics Teachers 3 (3) Course emphasizes problem solving and builds and expands upon previous mathematics content courses by examining connections between number and operations; algebra; data analysis and probability; geometry; and measurement. Preq: MTHS 2160.

MTHS 3600 Intermediate Mathematical Computing 3 (3) Intermediate-level introduction in using computers to solve problems in the mathematical sciences. Fundamental concepts of procedural programming including flow control, modular construction, primitive data structures, recursion, and graphics are applied to problems in applied mathematics, probability, statistics, discrete mathematics, and operations research. Preq: MTHS 1080 or MTHS 1110.

MTHS 3650 Numerical Methods for Engineers 3 (3) Application of undergraduate mathematics and basic engineering principles with emphasis on numerical methods, computer programming and the use of mathematical software packages in the solution of engineering problems. Preq: ENGR 1410. Preq or concurrent enrollment: MTHS 2080.

MTHS 3820 Honors Seminar 1 (1) Weekly seminar to prepare students in Departmental Honors Program for independent senior research. At the end of the second semester, each student must have identified a research topic and a faculty advisor. May be repeated for a maximum of two credits. Preq: Junior standing in departmental honors program.

MTHS 3990 Creative Inquiry—Mathematical Sciences 1-3 (1-3) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of three credits. Preq: Consent of faculty member/mentor.

MTHS 4000, 6000 Theory of Probability 3 (3) Principal topics include combinatorial theory, probability axioms, random variables, expected values; special discrete and continuous distributions, jointly distributed random variables, correlation, conditional expectation, law of large numbers, central limit theorem. Includes Honors sections. Preq for MTHS 4000: MTHS 2060. For MTHS 6000: Students are expected to have completed a Multivariable Calculus course before enrolling in this course.

MTHS 4030, 6030 Introduction to Statistical Theory 3 (3) Principal topics include sampling distributions, point and interval estimation, maximum likelihood estimators, method of moments, least squares estimators, tests of hypotheses, likelihood ratio methods, regression and correlation analysis, introduction to analysis of variance. Includes Honors sections. Preq for 4030: MTHS 4000. For MTHS 6030: Students are expected to have completed a Theory of Probability course before enrolling in this course.

MTHS 4050, 6050 Statistical Theory and Methods II 3 (3) Principal topics include simple linear regression, multiple regression and correlation analysis, one-way analysis of variance, multiple comparison, multifactor analysis of variance, experimental design. Computation and interpretation of results are facilitated through use of statistical computer packages. Preq for MTHS 4050: EXST 3010 or MTHS 3010 or MTHS 3020 or MTHS 3090. For MTHS 6050: Students are expected to have completed a Statistical Methods course before enrolling in this course.

MTHS 4060, 6060 Sampling Theory and Methods 3 (3) Probability-based treatment of sampling methodology. Theory and application of estimation techniques are treated using simple and stratified random sampling, cluster sampling, and systematic sampling. Preq for MTHS 4060: MTHS 4000 or one of EXST 3010 or MTHS 3010 or MTHS 3020 or MTHS 3090. For MTHS 6060: Students are expected to have completed a Statistical Methods course and a Theory of Probability course before enrolling in this course.

MTHS 4070, 6070 Regression and Time-Series Analysis 3 (3) Theory and application of the regression and time-series. Approaches to empirical model building and data analysis are treated. Computation and interpretation of results are facilitated through the use of interactive statistical packages. Preq for MTHS 4070: MTHS 3110 and MTHS 4000 or one of EXST 3010 or MTHS 3010 or MTHS 3020 or MTHS 3090. For MTHS 6070: Students are expected to have completed a Linear Algebra course, a Theory of Probability course, and one Statistics course before enrolling in this course.

MTHS 4080, 6080 Exploration and Analysis of Secondary Mathematics 3 (3) In-depth exploration and analysis of important underlying ideas in the secondary mathematics curriculum. An emphasis is placed on reasoning and proof as students investigate topics in geometry, probability, statistics and calculus. Preq for MTHS 4080: MTHS 2060. For MTHS 6080: Students are expected to have completed a Multivariable Calculus course before enrolling in this course.

MTHS 4100 Number Theory 3 (3) Introduction to theory of integers and related number systems. Topics include historical development, principle of mathematical induction, divisibility, primes, congruences, number-theoretic functions, primitive roots, quadratic residues, and diophantine equations. Preq: MTHS 1080 or MTHS 1110.

MTHS 4110 Introduction to Combinatorics 3 (3) Introductory course in combinatorial analysis. Topics include enumeration, graph theory, posets, and extremal combinatorics. Preq for MTHS 4110: MTHS 3110 and MTHS 1190. For MTHS 6110: Students are expected to have completed a Linear Algebra course and either a Discrete Mathematics course or a Introduction to Proofs course before enrolling in this course.

MTHS 4120, 6120 Introduction to Modern Algebra 3 (3) Introduction to the concepts of algebra. Topics include the number system and the elementary theory of groups, rings, and fields. Includes Honors sections. Preq for MTHS 4120: MTHS 3110. For MTHS 6120: Students are expected to have completed a Linear Algebra course before enrolling in this course.

MTHS 4190, 6190 Discrete Mathematical Structures I 3 (3) Applies theoretical concepts of sets, functions, binary relations, graphs, Boolean algebras, propositional logic, semigroups, groups, homomorphisms, and permutation groups to computer characteristics and design, words over a finite alphabet and translation, binary group codes, and other communication or computer problems. Includes Honors sections. Preq for MTHS 4190: MTHS 3110. For MTHS 6190: Students are expected to have completed a Linear Algebra course before enrolling in this course.

MTHS 4300 Actuarial Science Seminar I 1 (1) Problem-solving seminar to prepare students for the Society of Actuaries Exam P or the Casualty Actuarial Society’s Exam 1 (Probability). Preq: MTHS 4000.

MTHS 4310 Theory of Interest 3 (3) Comprehensive treatment of the theory of interest including from a calculus-based continuous viewpoint. Topics include simple and compound interest and discount, nominal and effective rates, force of interest, basic and general annuities, yield rates, amortization and sinking funds, and applications to bonds, mortgages, and other securities. Preq: MTHS 2060.


MTHS 4340, 6340 Advanced Engineering Mathematics 3 (3) Fourier series, Laplace and Fourier transform, and numerical methods for solving initial value and boundary-value problems in partial differential equations are developed. Applications to diffusion wave and Dirichlet problems are given. Matrix methods and special functions are utilized. Preq for MTHS 4340: MTHS 2080. For MTHS 6340: Students are expected to have completed a Differential Equations course before enrolling in this course.

MTHS 4350, 6350 Complex Variables 3 (3) Elementary functions; differentiation and integration of analytic functions; Taylor and Laurent series; contour integration and residue theory; conformal mapping; Schwartz-Christoffel transformation. Includes Honors sections. Preq for MTHS 4350: MTHS 2060. For MTHS 6350: Students are expected to have completed a Multivariable Calculus course before enrolling in this course.
MTHS 4400, 6400 Linear Programming 3 (3)
Introduction to linear programming covering the simplex algorithm, duality, sensitivity analysis, network models, formulation of models, and the use of simplex codes to solve, interpret, and analyze problems. Includes Honors sections. Preq for MTHS 4400: MTHS 2060 and MTHS 3110. For MTHS 6400: Students are expected to have completed a Multivariable Calculus course and a Linear Algebra course before enrolling in this course.

MTHS 4410, 6410 Introduction to Stochastic Models 3 (3) Introductory treatment of stochastic processes, finite-state Markov chains, queuing, dynamic programming, Markov decision processes, reliability, decision analysis, and simulation. Both theory and applications are stressed. Includes Honors sections. Preq for MTHS 4410: MTHS 4000. For MTHS 6410: Students are expected to have completed a Theory of Probability course before enrolling in this course.

MTHS 4420, 6420 Advanced Mathematical Programming 3 (3) Theory, methodology, and applications of integer and nonlinear programming. Topics include model development, computer solutions, branch and bound, unconstrained and constrained optimization algorithms, complexity and convergence analysis. Case studies are included. Preq for MTHS 4420: MTHS 4400. For MTHS 6420: Students are expected to have completed an Introduction to Stochastic Models course or a Mathematical Programming course before enrolling in this course.

MTHS 4500 Introduction to Mathematical Models 3 (3) Includes a study of the modeling process and examples of existing models chosen from physical, biological, social, and management sciences, depending on the instructor. Written and oral report is required for at least one of the models studied. May be repeated for a maximum of six credits. Preq: MTHS 4400; and one of MTHS 3600 or MTHS 3650; and one of EXST 3010 or MTHS 3010 or MTHS 3020 or MTHS 3090.

MTHS 4530, 6530 Advanced Calculus I 3 (3) Limits, continuity, and differentiation of functions of one and several variables, the Riemann integral, and vector analysis. Includes Honors sections. Preq for MTHS 4530: MTHS 2060. For MTHS 6530: Students are expected to have completed a Multivariable Calculus course before enrolling in this course.

MTHS 4540, 6540 Advanced Calculus II 3 (3) Continuation of MTHS 4530. Transformations, multiple integrals, line and surface integrals, infinite sequences and series, and improper integrals. Includes Honors sections. Preq for MTHS 4540: MTHS 4530. For MTHS 6540: Students are expected to have completed an Advanced Calculus course before enrolling in this course.

MTHS 4550, 6550 Topics in Geometry 3 (3) Covers a variety of geometries, such as Euclidean, hyperbolic, projective, and spherical. The intrinsic properties of these spaces, such as their geodesics and isometries, are studied. Other topics include differential geometry of curves and surfaces, Gaussian curvature, and the celebrated Gauss-Bonnet theory linking geometry with topology. Preq for MTHS 4550: MTHS 1190 and MTHS 2060 and MTHS 3110.

MTHS 4560, 6560 Topology 3 (3) Introduction to point-set topology. Topics include metric spaces, topological spaces, Hausdorff spaces, homeomorphisms, continuity, product and quotient spaces, compactness, and connectedness. Additional topics, such as homotopy equivalence of paths, the fundamental group, and basic knot theory, are introduced as time permits. Preq for MTHS 4560: MTHS 1190.

MTHS 4680, 6680 Introduction to Numerical Analysis I 3 (3) Introduction to the problems of numerical analysis emphasizing computational procedures and application. Topics include sources of error and conditioning, matrix methods, systems of linear equations, nonlinear equations, interpolation and approximation by splines, polynomials, and trigonometric functions. Preq for MTHS 4680: MTHS 2060 or MTHS 2070; and MTHS 3620 or MTHS 3650. For MTHS 6680: Students are expected to have completed a Multivariable Calculus course and a Mathematical Computing course before enrolling in this course.

MTHS 4690, 6690 Mathematical Analysis I 3 (3) Basic properties of the real number system, sequences and limits; continuous functions, uniform continuity and convergence. Integration, differentiation, functions of several real variables, implicit function theory. Includes Honors sections. Preq: MTHS 4680: MTHS 2060. For MTHS 6690: Students are expected to have completed a Multivariable Calculus course before enrolling in this course.

MTHS 4810 Seminar in Mathematics 1-3 (1-3) Topics include model development, computer applications of integer and nonlinear programming. Includes Honors sections. Preq: MTHS 4810. May be repeated for a maximum of six credits. Preq: Consent of instructor.

MTHS 4920 Professional Development 1 (1) Topics include the modeling process and materials of mathematics, including notation, key signatures, scales, and chord building, as well as discussions of the impact of various players and composers on the medium. Applied music fee is assessed. Preq: MTHS 4920.

MUSC 1010 Beginning Class Piano I 1 (2) Thorough introduction to basic keyboard skills including solo and ensemble repertoire, technique, applied keyboard theory, and performance. Applied music fee is assessed. Preq: Consent of instructor.

MUSC 1020 Beginning Class Piano II 1 (2) Continued work on keyboard skills, applied keyboard theory, solo and ensemble repertoire, and performance. Applied music fee is assessed. Preq: MUSC 1010.

MUSC 1100 Beginning Class Guitar I 1 (2) Introduction to basic guitar skills, including finger-style technique, strumming, and soloing. Includes learned theory for guitarists such as keys, scales, chord building, and discussions of the impact of various players and composers on the medium. Applied music fee is assessed. Preq: MUSC 1100.

MUSC 1120 Beginning Class Guitar II 1 (2) Continued work on guitar skills, including finger-style, strumming, pick playing, ensemble playing, and soloing. Includes students develop skills and appreciation of the discipline through teacher-led drills, ensemble playing, and the exploration of guitar history, style, and the impact of various players and composers on the medium. Applied music fee is assessed. Preq: Consent of instructor.

MUSC 1310 Beginning Instrumental Class I 2 (2) Introduction to basic instrumental skills in a class setting, including proper playing position, tone production, intonation, and ensemble playing. Includes all skills of the given instruments. Different instrumental groups are taught as separate course sections. May be repeated for a maximum of six credits, but only on other instruments. Applied music fee is assessed. Preq: Consent of instructor.

MUSC 1420 Music Theory I 3 (3) Introduces the materials of music theory, including notation, scales, keys, intervals, basic rhythms, and meter, triads and seventh chords, chord inversions, and non-chord tones. Coreq: MUSC 1430.

MUSC 1430 Aural Skills I 1 (2) Beginning aural skills, which include Solfege, singing and identifying intervals and scales, identifying triads and seventh chords, sight singing, and major and minor keys, and taking dictation of simple melodies in major and minor keys. Coreq: MUSC 1420.
MUSC 1440 Music Theory II 3 (3) Continuation of MUSC 1420 with added emphasis on part writing, small and larger formal structures, and secondary functions and modulation, in both classical and popular genres. Preq: MUSC 1420. Coreq: MUSC 1450.

MUSC 1450 Aural Skills II 1 (2) Continuation of MUSC 1430 with added emphasis on sight singing and taking direction with more complex intervals and in various modes. Preq: MUSC 1430. Coreq: MUSC 1440.

MUSC 1510 Applied Music I (1) Individual study in performance medium (piano, voice, strings, woodwinds, brass, percussion, guitar, organ, or carillon). One 30-minute lesson each week, for which a minimum of four hours practice is required. May be repeated for credit with departmental approval of differing performance media. Applied music fee is assessed. Preq: Consent of instructor, based upon a qualifying audition.

MUSC 1520 Applied Music I (1) Continuation of MUSC 1510. May be repeated for credit with departmental approval of differing performance media. Applied music fee is assessed. Preq: MUSC 1510.

MUSC 1530 Applied Music for Majors I (1) Individual study in vocal or instrumental performance (voice, woodwinds, brass, strings, percussion or keyboards). One 45-minute lesson each week. Jury required. May be repeated for credit with departmental approval of differing performance media. Applied music fee is assessed. Preq: Performing Arts major (Music Concentration) and consent of instructor, based upon qualifying audition.

MUSC 1540 Applied Music for Majors I (1) Continuation of MUSC 1530. Jury and performance on a recital are required. May be repeated for credit with departmental approval of differing performance media. Applied music fee is assessed. Preq: MUSC 1530 and consent of instructor.


MUSC 1801 Introduction to Music Technology Laboratory 0 (3) Non-credit laboratory to accompany MUSC 1800. Coreq: MUSC 1800.

MUSC 1950 Creative Inquiry—Music 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor.

MUSC 2100 Music Appreciation: Music in the Western World 3 (3) Deepens students appreciation of their musical heritage through study of the elements of the musical language and its development in Western culture. Includes Honors sections.


MUSC 2430 Aural Skills III 1 (2) Continuation of MUSC 1450, with the addition of harmonic dictation in inversions, melodic/harmonic dictation, and the identification of formal structures through listening. Preq: MUSC 1450. Coreq: MUSC 2420.

MUSC 2510 Applied Music I (1) Continuation of MUSC 1520. Applied music fee is assessed. Preq: MUSC 1520 and consent of instructor.

MUSC 2520 Applied Music I (1) Continuation of MUSC 2510. May be repeated for credit with departmental approval of differing performance media. Applied music fee is assessed. Preq: MUSC 2510 and consent of instructor.

MUSC 2530 Applied Music for Majors I (1) Continuation of MUSC 1540. May be repeated for credit on other performance media with departmental approval. Jury and performance on a recital are required. Applied music fee is assessed. Preq: MUSC 2530 and consent of instructor.

MUSC 2540 Applied Music for Majors I (1) Continuation of MUSC 2530. May be repeated on other performance media with departmental approval. Jury and performance on a recital are required. Applied music fee is assessed. Preq: MUSC 2530 and consent of instructor.

MUSC 2950 Creative Inquiry—Music 3 (3) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor.

MUSC 3050 Survey of Broadway Musicals I 3 (3) Introduction to Broadway musical repertoire from the Golden Age of Broadway: 1943–1964. Emphasizes the music with attention to production detail, historical perspective, and social milieu. May also be offered as THEA 3080.

MUSC 3060 Survey of Broadway Musicals II 3 (3) Survey of Broadway musical repertoire from new conceptual shows from 1965 to the present day. Emphasizes the music with attention to production detail, historical perspective, and social milieu. May also be offered as THEA 3090.

MUSC 3110 History of American Music I 3 (3) Music in America from 1620 to the present. Indigenous and borrowed influences are examined.

MUSC 3120 History of Jazz 3 (3) Comprehensive survey of jazz elements and styles. A historical perspective from Duxiedal to bebop to jazz/rock is included.

MUSC 3130 History of Rock and Roll 3 (3) Comprehensive survey of rock elements, styles, and artists. Emphasizes the evolution of rock and roll including a broad examination of musical influences. Course content examines how rock and roll both reflected and influenced social issues.

MUSC 3140 World Music 3 (3) Introduction to ethnomusicology and music of the worlds peoples. Emphasis is placed on music through culture.

MUSC 3170 History of Country Music 3 (3) Chronological study of country music origins, styles, and artists. Emphasizes the evolution of country music from a cultural expression of the South to a commercial art form of worldwide appeal.

MUSC 3180 History of Audio Technology 3 (3) Surveys the historical development of audio technology and its social impacts and consequences. Technologies include automatic instruments, recording devices, radio, amplification, consumer listening devices, and distribution formats.

MUSC 3210 Principles of Piano Performance 3 (3) In-depth study of the principles of piano performance focusing on how to interpret a musical score, develop technical skills and practice techniques, and use the body correctly at the keyboard. Preq: Consent of instructor by audition.

MUSC 3230 Piano Accompanying I 1 (3) Group study in piano accompanying. Focuses on sight-reading and choral, vocal, and instrumental accompanying. Students take group lessons and accompany choral groups and/or applied music students. Preq: Consent of instructor.

MUSC 3250 CU Carillonneurs I 1 (3) Group study in playing the 47-bell University carillon. One two-hour meeting each week for which a minimum of two hours of individual practice is required. Participation in a recital is required. Students are expected to have musical keyboard experience. Preq: Consent of instructor.

MUSC 3290 Musical Theatre Vocal Performance Laboratory 0 (2) Non-credit laboratory to accompany MUSC 3290. Coreq: MUSC 3290.

MUSC 3300 Small Ensemble 1 (3) Ensembles: devoted to the musical training of instrumental, vocal ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. Enrollment in simultaneous sections is allowed. Preq: Consent of director.

MUSC 3310 Pep Band 1 (3) Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given in addition to the minimum rehearsal time. Simultaneous enrollment in multiple sections is allowed. Preq: Consent of director.

MUSC 3320 Woodwind Quintet 1 (3) Ensembles: advanced study of woodwind chamber music media. One one-hour class meeting each week, for which a minimum of two hours of ensemble practice is required. Preq: Consent of instructor by audition only. Preq or concurrent enrollment: MUSC 3620.

MUSC 3330 String Quartet 1 (3) Ensembles: advanced study of string quartet repertoire. Two 90-minute meetings each week for which a minimum of two hours of practice is required. Preq: Consent of instructor by audition only. Preq or concurrent enrollment: MUSC 3690.

MUSC 3340 Flute Choir 1 (3) Ensembles: study of flute ensemble literature. One 60-minute meeting each week for which a minimum of two hours of practice is required. Preq: Consent of instructor by audition only.
Courses of Instruction

MUSC 3600 Percussion Ensemble 1 (2) Ensembles: study and performance of percussion ensemble literature. One two-hour class meeting each week, for which a minimum of two hours of individual practice is required. Preq or concurrent enrollment: MUSC 3310 or MUSC 3620 or MUSC 3630 or MUSC 3640 or MUSC 3690.

MUSC 3750 Steel Drum Band 1 (2) Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given in addition to the minimum rehearsal time. Rehearsals also include discussions of steel band history and performance practice. Preq: Consent of director.

MUSC 3410 Men’s Breakout Ensemble 1 (2) Small ensembles: study of a cappella/popular music on an advanced level. Preq or concurrent enrollment: MUSC 3700 or MUSC 3720.

MUSC 3420 Women’s Breakout Ensemble 1 (2) Small ensembles: study of women’s a cappella/popular vocal music on an advanced level. Enrollment is limited with priority given to students who are enrolled in a large choral ensemble. Preq or concurrent enrollment: MUSC 3700 or MUSC 3710.

MUSC 3430 Men’s Small Ensemble 1 (2) Small ensembles: study of male a cappella/popular, barbershop, and nostalgia music on an advanced level. Preq or concurrent enrollment: MUSC 3700 or MUSC 3720.

MUSC 3440 Vocal Jazz Ensemble 1 (3) Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. Preq or concurrent enrollment: MUSC 3700 or MUSC 3710 or MUSC 3720.

MUSC 3510 Applied Music 1 (1) Continuation of MUSC 2520. May be repeated for credit with departmental approval of differing performance media. Applied music fee is assessed. Preq: MUSC 2520 and consent of instructor.

MUSC 3520 Applied Music 1 (1) Continuation of MUSC 3510. Students are required to perform an appropriate solo in a student recital. May be repeated for credit with departmental approval of differing performance media. Applied music fee is assessed. Preq: MUSC 3510 and consent of instructor.

MUSC 3530 Applied Music for Majors 1 (1) Continuation of MUSC 2540. May be repeated on other performance media with departmental approval. Jury is required. Applied music fee is assessed. Preq: MUSC 2540 and consent of instructor.

MUSC 3540 Applied Music for Majors 1 (1) Continuation of MUSC 3530. May be repeated on other performance media with departmental approval. Juried half-recital performance is required. Applied music fee is assessed. Preq: MUSC 3530 and consent of instructor.

MUSC 3610 Marching Band 1 (3) Ensembles: devoted to musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. Offered fall semester only. Preq: Consent of director.

MUSC 3620 Symphonic Band 1 (3) Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. Preq: Consent of director.

MUSC 3630 Jazz Ensemble 1 (3) Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. Preq: Consent of director.

MUSC 3640 Concert Band 1 (2) Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. Preq: Consent of director.

MUSC 3650 Symphony Orchestra 1 (3) Mid-sized college-community orchestra devoted to performing works from standard repertoire. Weekly evening rehearsals with one or more performances per semester. Preq: Consent of director.

MUSC 3700 Clemson University Singers 1 (3) Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. Preq: Consent of director.

MUSC 3710 Women’s Glee 1 (3) Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. Preq: Consent of director.

MUSC 3720 Men’s Glee 1 (3) Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given in addition to the minimum rehearsal time. Preq: Consent of director.

MUSC 3730 University Chorus 1 (3) Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. Preq: Consent of director.

MUSC 3750 Creative Inquiry—Music 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor.

MUSC 3980 Special Topics in Music 3 (3) Consideration of select areas of study in music not addressed by other music courses. May be repeated once for credit. Preq: Consent of instructor.

MUSC 4000, 6000 Music in the Elementary Classroom 3 (3) Familiarizes teachers in the elementary classroom with traditional, Kodaly, Orff, and Kindermusik approaches in correlating music with language arts, mathematics, and social studies.

MUSC 4050 Instrumental and Vocal Arranging 3 (2) Advanced study of the properties of instruments and voices and their combination in various small and large ensembles. Emphasis is placed on applying this knowledge to the creation of instrumental and vocal arrangements. Preq: MUSC 1800 and MUSC 2420. Coreq: MUSC 4051.

MUSC 4051 Instrumental and Vocal Arranging Laboratory 0 (3) Non-credit laboratory to accompany MUSC 4050. Coreq: MUSC 4050.

MUSC 4150 Music History to 1750 3 (3) Development of Western music from antiquity to 1750, emphasizing representative literature from various styles and periods. Preq: MUSC 2100.

MUSC 4160 Music History Since 1750 3 (3) Continuation of MUSC 4150. Music from 1750 to the present. Preq: MUSC 2100.

MUSC 4300 Conducting 3 (3) Study of choral and instrumental conducting. Emphasis is on manual conducting techniques, attitudes, philosophies, and responsibilities necessary for the preparation, planning, and execution of artistic conducting. Preq: MUSC 2420.

MUSC 4510 Applied Music 1 (1) Continuation of MUSC 3540, guiding students in interpretation of advanced solo and ensemble literature. Students are required to perform an appropriate solo in a student recital. May be repeated for credit with departmental approval of differing performance media. Applied music fee is assessed. Preq: MUSC 3520 and consent of instructor.

MUSC 4520 Applied Music 1 (1) Continuation of MUSC 4510. Students are required to perform an appropriate solo in a student recital. Applied music fee is assessed. Preq: MUSC 4510 and consent of instructor.

MUSC 4530 Applied Music for Majors 1 (1) Continuation of MUSC 3540. May be repeated on other performance media with departmental approval. Jury is required. Applied music fee is assessed. Preq: MUSC 3540 and consent of instructor.

MUSC 4540 Applied Music for Majors 1 (1) Continuation of MUSC 4530. May be repeated on other performance media with departmental approval. Juried full-recital performance is required. Applied music fee is assessed. Preq: MUSC 4530 and consent of instructor.

MUSC 4950 Creative Inquiry—Music 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor.

MUSC 4990, 6990 Independent Studies 1-3 (1-3) Faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor.

MUSC 4990, 6990 Independent Studies 1-3 (1-3) Tutorial work for students with special interests in music study outside the scope of existing courses. May be repeated for a maximum of six credits. Preq: Consent of department chair.

This course may be repeated for credit with a maximum of 16 hours of ensemble credit allowable toward a degree.
NONPROFIT LEADERSHIP

NPL 3000 Foundations in Nonprofit Leadership 2 (2) Students develop an understanding of historical and philosophical aspects of nonprofit organizations, as well as special skills needed to develop boards, recruit volunteers, raise funds, and manage day-to-day operations. Career development opportunities are also explored.

NPL 3900 Practicum I 1 (3) Under agency supervision, students spend 60 hours observing and implementing activities, events, and programs in a nonprofit, faith-based, grass-roots, or organization approved by instructor. To be taken Pass/No Pass only. Preq: NPL 3000 and enrollment in Nonprofit Leadership minor and consent of instructor.

NPL 4900 Practicum II 2 (6) Under agency supervision, students spend 1000 hours planning, organizing, and implementing activities, events, and programs in a nonprofit, faith-based, grass-roots, or other organization approved by instructor. To be taken Pass/No Pass only. Preq: NPL 3000 and enrollment in Nonprofit Leadership minor and consent of instructor.

NURSING


NURS 1020 Nursing Success Skills 2 (2) Introduction to a variety of topics critical to a students success as a Nursing major and future professional. Topics include time management, goal setting, test taking, campus and nursing department resources and policies, critical thinking, and diversity. Students have the opportunity to discover and practice many procedures, techniques, and tips, as well as apply principles learned to their future career in nursing. Preq: Nursing major.

NURS 1400 Computer Applications in Nursing 3 (3) Introduces students to nursing and the application of computer technology in the delivery of health care. Covers existing computer health-care applications, emerging trends and forecast future needs. Social and ethical issues related to technology are discussed. Preq: Acceptance into the Nursing program.

NURS 1980 Creative Inquiry—Nursing 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor.

NURS 2980 Creative Inquiry—Nursing 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor.

NURS 3000 Seminar in Health Care Topics 1-4 (1-4) Individualized in-depth study in a selected health care area; may have a clinical component and/or special projects. Open to non-Nursing majors. May be repeated for a maximum of six credits. Preq: Consent of instructor.

NURS 3030 Medical-Surgical II: Nursing of Adults 7 (3) Incorporates theoretical and empirical knowledge from physical and social sciences. Uses critical thinking to provide holistic, safe, individualized nursing care to adults, including health promotion, maintenance, restoration, and health teaching. Preq: NURS 3040 and NURS 3100 and NURS 3120 and NURS 3400. Coreq: NURS 3031 and NURS 3050.

NURS 3031 Medical-Surgical II Laboratory 0 (12) Non-credit laboratory to accompany NURS 3030. Coreq: NURS 3030.

NURS 3040 Pathophysiology for Health Care Professionals 3 (3) Focuses on disease mechanisms and recognition of the manifestations of these mechanisms in body systems. Discussion also includes pharmacologic and medical interventions commonly associated with specific disease processes and application to patient-care situations. Preq: BIOS 2230 and junior standing in Nursing.

NURS 3050 Psychosocial Nursing 3 (3) Lifespan approach to examine psychosocial, developmental, family, and cultural factors that influence individuals from diverse populations and their families in health promotion, maintenance, and restoration of health. The use of the nursing process, critical thinking, therapeutic communication, and psychosocial nursing interventions is explored. Coreq: NURS 3050.

NURS 3070 Family Nursing in the Community 3 (3) Bridge course for registered nurse students that focuses on nursing care of families across the lifespan in the context of the community. Major emphasis is on practice activities to assist individuals in achieving or maintaining wellness in the family, home, and community environments. Coreq: NURS 3071 and NURS 4250.

NURS 3071 Family Nursing in the Community Laboratory 0 (3) Non-credit laboratory to accompany NURS 3070. Coreq: NURS 3070.

NURS 3100 Health Assessment 3 (2) Introduces concepts of health, wellness, and illness. Focuses on physical, psychosocial, and cultural assessment for the well adult client with variations across the lifespan. Includes interviewing techniques. Coreq: NURS 3101 and NURS 3120 and NURS 3400.

NURS 3101 Health Assessment Laboratory 0 (3) Non-credit laboratory to accompany NURS 3100. Coreq: NURS 3100.

NURS 3110 Health Promotion Across the Lifespan 2 (2) Focuses on health promotion and illness prevention activities across the lifespan for individuals and families in the community. Major emphasis is on nursing’s role in the acquisition and maintenance of health as well as the identification and modification of health risk factors. Preq: NURS 3100 and NURS 3120 and NURS 3200.

NURS 3120 Medical-Surgical I: Foundations of Nursing 4 (2) Focuses on therapeutic nursing interventions, including selected psychomotor skills, communication skills, and teaching/learning. Coreq: NURS 3100 and NURS 3120 and NURS 3400.

NURS 3121 Medical-Surgical I: Foundations of Nursing Laboratory 0 (6) Non-credit laboratory to accompany NURS 3120. Coreq: NURS 3120.

NURS 3180 Multidisciplinary Approach to End-of-Life Care 3 (3) Integrates principles of care to increase comfort at the end of life, presented within a framework that encompasses the physical, psychosocial, and spiritual dimensions of an individual. Coursework also includes ethical and legal issues related to advance directives, reimbursement, and post-mortem topics. Preq: PSYC 2010 or SOC 2100.

NURS 3190 Health Assessment for RNs 2 (2) Expands knowledge of health assessment techniques utilized with well or ill adult clients. Emphasizes data collection as a basis for critical thinking in professional nursing practice. Preq: Admission to RN/BS program.

NURS 3200 Professionalism in Nursing 3 (3) Application of critical thinking skills is the core of professional nursing roles in multidisciplinary approaches to health care. Analysis of the historical development of modern nursing. Examination of issues of providing nursing care to diverse populations within the context of professional standards. Includes medical nomenclature. Preq: BIOL 2220.

NURS 3230 Gerontology Nursing 2 (2) Introduction of theories of aging. Focuses on complex health-care issues of aging and chronic care, including promotion, maintenance, and restoration of health of the elderly. Scientific concepts address physiological, psychological, and sociological issues of aging and chronic illness. Preq: NURS 3100 and NURS 3120.

NURS 3280 Honors Seminar I 2 (2) Serves as the foundation for senior honors projects. Students identify a topic of interest, a faculty mentor, and team members for their honors project and begin to review the literature in their areas of interest. Preq: Admission to Nursing Department Honors program.

NURS 3300 Research in Nursing 3 (3) Introduction to conceptual frameworks, models, and theories related to nursing. Analysis of reported research in nursing and related disciplines. Ethical, moral, and legal issues are discussed in relation to nursing research. Includes Honors sections. Preq: NURS 3100 and NURS 3120 and NURS 3200. Students who do not meet the prerequisites, but who have been admitted to the RN/BS or accelerated Nursing program, may petition the instructor for a registration override.
NURS 3330 Health Care Genetics 3 (3) Focuses on the new genetics and the implications for health care professionals. Discussion includes applications of the evolving genetics technology and services to changing life stages. Issues of ethics relevant to various genetic disorders is also addressed. Preq: BIOL 2220.

NURS 3340 Integrative Healing: Complementary/Alternative Healthcare 3 (3) Introduction to healing practices that are complementary with/and alternative (C/A) for conventional Western medicine. Includes exploration of research, principles, techniques, and methods of C/A used in health and healing.

NURS 3400 Pharmacotherapeutic Nursing Interventions 3 (3) Focuses on the integration of nursing process with pharmacotherapeutics, administration, monitoring, and related client education. Includes major drug classifications, indications for use, side effects, interactions, routes of administration, usual dosages and contraindications. Preq: Junior standing in Nursing. Coreq: NURS 3100 and NURS 3120.

NURS 3980 Creative Inquiry—Nursing 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor.


NURS 4011 Mental Health Nursing Laboratory 0 (6) Non-credit laboratory to accompany NURS 4010. Coreq: NURS 4010.

NURS 4030 Medical-Surgical III: Complex Nursing of Adults 5 (3) Focuses on the biological, psychological, and sociocultural influences on complex health problems related to acute and traumatic conditions. Emphasizes the concepts of circulation, oxygenation, homeostasis, and compensation in acutely ill adults. Preq: NURS 4010 and NURS 4110 and NURS 4120. Coreq: NURS 4031.

NURS 4031 Medical-Surgical III: Complex Nursing of Adults Laboratory 0 (6) Non-credit laboratory to accompany NURS 4030. Coreq: NURS 4030.

NURS 4050 Leadership and Management in Nursing 3 (2) Focuses on the role of the professional nurse in managing nursing care. Theories and research related to leadership, power, management, organizations, regulation, and ethics are discussed. Directed laboratory experiences are provided. Preq: Admission to RN/BS program. Coreq: NURS 4051.

NURS 4051 Leadership and Management in Nursing Laboratory 0 (2) Non-credit laboratory to accompany NURS 4050. Coreq: NURS 4050.

NURS 4060 Issues in Professionalism 3 (3) Analysis of the development of professional nursing. Consideration of educational issues, legal and economic issues, health policy, leadership, cultural variations, and the influence of values in ethical decisions and nursing practice. Preq: Admission to RN/BS program.

NURS 4100 Leadership Management and Nursing Care Practicum 6 (3) Focuses on the role of the professional nurse in practicing and managing nursing care. Theories and research related to clinical practice, leadership, power, management, organizations, regulation, ethics, and licensure preparation are discussed. Directed lab experiences are provided under preceptor supervision. Coreq: NURS 4030 and NURS 4100.

NURS 4101 Leadership Management and Nursing Care Practicum Laboratory 0 (9) Non-credit laboratory to accompany NURS 4100. Coreq: NURS 4100.

NURS 4110 Nursing Care of Women and Children 5 (3) Focuses on child health problems and health maintenance. Emphasizes biological, pathophysiological, psychological, and sociocultural concepts related to nursing care of children with acute, critical, and chronic illnesses. Includes strategies for alleviation of illnesses, restoration of wellness, promotion and maintenance of health, growth, and development. Coreq: NURS 4010 and NURS 4111.

NURS 4111 Nursing Care of Children Laboratory 0 (6) Non-credit laboratory to accompany NURS 4110. Coreq: NURS 4110.

NURS 4120 Nursing Care of Women and Their Families 5 (3) Emphasizes biological, psychosocial, and sociocultural concepts; identification of appropriate nursing strategies to enhance individual capacity to achieve or maintain wellness in the family, home, community, and hospital environment. Coreq: NURS 4010 and NURS 4121.

NURS 4121 Nursing Care of Women and Their Families Laboratory 0 (6) Non-credit laboratory to accompany NURS 4120. Coreq: NURS 4120.

NURS 4140 Community Health Nursing and Health Promotion 5 (3) Focuses on community health nursing of families and community groups, including community assessment, screening, health promotion and health education, with emphasis on the health of clients and population groups in homes, schools, industries and other community agencies and organizations. Preq: NURS 4010 and NURS 4110 and NURS 4120 and admission to the accelerated Nursing program. Coreq: NURS 4141.

NURS 4141 Community Health Nursing and Health Promotion Laboratory 0 (6) Non-credit laboratory to accompany NURS 4140. Coreq: NURS 4140.

NURS 4150 Community Health Nursing 4 (3) Consideration of health promotion activities for family and community groups with emphasis on community assessment, screening, health teaching/counseling. Practice activities are related to health promotion in population groups and nursing care of homebound clients. Laboratory settings include homes, schools, industries, public health department, and other community agencies. Preq: Admission to RN/BS program. Coreq: NURS 3070 and NURS 4251.

NURS 4250 Community Nursing 4 (3) Consideration of health promotion activities for groups within the community with emphasis on community assessment, screening, and health teaching/counseling. Practice activities are related to health promotion in population groups and nursing care of homebound clients. Laboratory settings include homes, schools, industries, public health department, and other community agencies. Preq: Consent of instructor.

NURS 4251 Community Nursing Laboratory 0 (2) Non-credit laboratory to accompany NURS 4250. Coreq: NURS 4250.

NURS 4280 Senior Honors II 2 (2) Students implement a proposal for a major directed study project or research thesis under the guidance of a faculty preceptor. Preq: NURS 4200.

NURS 4980 Creative Inquiry—Nursing 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor.

NURS 4990 Independent Study 1-4 (1-4) In-depth study in an area of special interest in Nursing. Students develop specific objectives with a faculty member with expertise in the area of interest. May be repeated for a maximum of six credits. Preq: Consent of instructor.

NUTRITION
See also courses listed under Animal and Veterinary Sciences, Biochemistry, and Food Science.

Professors: A.B. Bodine II, K.L. Cason, T.C. Jenkins, D.V. Maurice; Associate Professors: M.D. Condralsky, A.M. Fraser, V.J. Haley-Zitlin; Assistant Professor: E.D. Jesch; Senior Lecturer: R.M. Haliensa; Adjunct Assistant Professor: S.S. Baker, M.A. Parisi

NUTR 2030 Introduction to Principles of Human Nutrition 3 (3) Study of nutrient functions and requirements, food choices, dietary adequacy, and role of nutrition in physical fitness. Deals with social and scientific issues; evaluation and interpretation of nutrition sources from government, private, academic, and the health care sectors.

NUTR 2040 Nutrition Across the Life Cycle 3 (3) Using current evidence, course examines nutrition issues and requirements across the life cycle, including pre-conception, pregnancy, lactation, infancy, childhood, adolescence, adulthood, and aging. Methods of nutritional assessment for each stage of life are explored.
NUTR 2050 Nutrition for Nursing Professionals 3 (3) Investigation of targeted general and clinical nutrition topics, including principles of nutrition, life-cycle nutrition, relationship of diet to health and disease, and the role of nursing professionals and nutrition. Credit toward a degree will be given for only one of NUTR 2030, 2050, 4510. Preq: Nursing major. Preq or concurrent enrollment: BIOL 2220.

NUTR 2100 Nutrition and Physical Activity 3 (3) Topics include role of carbohydrates, fats, and proteins on energy utilization during exercise; altering body composition and improving fitness with diet and physical activity; importance of fluid intake on performance; effectiveness of dietary supplements and ergogenic aids; and choosing a diet appropriate for individual physical activity levels. Preq: BIOL 1200; and one of BIOL 1210 or BIOL 1220 or BIOL 1230 or BIOL 1240.

NUTR 2160 Evidence-Based Nutrition 1 (1) Introduction to research methods, ethics in research, and evidence-based nutrition guidelines within the profession of nutrition and dietetics. Preq: Food Science major.

NUTR 4010, 6010 Fundamentals of Nutrition 3 (3) Biochemical and physiological fundamentals of nutrition applicable to man and domestic animals. Considers digestive processes and absorption and metabolism of carbohydrates, lipids, proteins, water, minerals, and vitamins. Discusses energy metabolism and comparative anatomy and physiology of digestive systems. Offered fall semester only. Includes Honors sections. Preq for NUTR 4010: BIOL 3050 or CH 2230. Preq for NUTR 6010: BIOL 3050 or CH 2230 or consent of instructor.

NUTR 4180 Professional Development in Dietetics 1 (1) Provides the steps for dietetic internship application process; career development in the dietetics field; and concepts of professional standards. Preq: Food Science major and Junior standing.

NUTR 4190 Professional Development in Nutrition 1 (1) Career development strategies to assist students pursuing professional or graduate degrees. The focus is on standards used for admission, application preparation, and what to do when admitted. Preq: Food Science major and Junior standing.

NUTR 4200 Selected Topics in Nutrition 1-3 (1-3) Comprehensive study of special topics in nutrition not covered in detail or contained in other courses. Current developments in each area are stressed. May be repeated for a maximum of three credits, but only if different topics are covered. Preq: Food Science major and Senior standing.

NUTR 4210 Special Problems in Nutrition 1-4 (1-4) Independent research investigation in nutrition. Special emphasis is on developing a research proposal, conducting the research, and reporting the findings. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: Food Science major and Senior standing.

NUTR 4240, 6240 Medical Nutrition Therapy I 4 (3) Principles of nutritional assessment, education, and counseling skills; development of medical nutrition therapy for individuals with obesity and eating disorders, gastrointestinal disorders, metabolic and renal disorders. Preq for NUTR 4240: Food Science major or minor; and BIOL 2220 and BIOL 2230 and NUTR 4510. Preq for NUTR 6240: BIOL 2220 and BIOL 2230 and NUTR 4510. Coreq: NUTR 4241, 6241.

NUTR 4241, 6241 Medical Nutrition Therapy I Laboratory 0 (3) Non-credit laboratory to accompany NUTR 4240, 6240. Coreq: NUTR 4240, 6240.

NUTR 4250, 6250 Medical Nutrition Therapy II 4 (3) Development of medical nutrition therapy for individuals with various disease states, including cardiovascular, hepatic, musculoskeletal, and neoplastic disorders. Also considers sociocultural and ethnic aspects of food consumption and alternative nutrition therapies. Includes Honors sections. Preq for NUTR 4250: Food Science major or minor; and BIOL 2220 and BIOL 2230 and NUTR 4240. Preq for NUTR 6250: BIOL 2220 and BIOL 2230 and NUTR 4240. Coreq: NUTR 4251, 6251.

NUTR 4251, 6251 Medical Nutrition Therapy II Laboratory 0 (3) Non-credit laboratory to accompany NUTR 4250, 6250. Coreq: NUTR 4250, 6250.

NUTR 4260, 6260 Community Nutrition 3 (3) Study of fundamentals of nutrition care delivery in community programs beginning with assessment and problem identification and continuing through the development, implementation, and evaluation of nutrition intervention programs. Preq for NUTR 4260: Food Science major or minor; and NUTR 4250. Preq for NUTR 6260: NUTR NUTR 4230 and NUTR 4510.

NUTR 4270 Nutrition Counseling 1 (1) Examination and application of nutrition counseling methods, theories and strategies needed to promote nutrition behavior change. Assessment and interpretation of client information, development of client goals, and evaluation of interventions are discussed. Preq: NUTR 4240.

NUTR 4510, 6510 Human Nutrition 3 (3) Advanced concepts of nutrition, including physiological handling of nutrients, nutrient-nutrient interactions, and principles of nutritional deficiency and over-nutrition. Factors affecting methods of determining nutritional status, development of nutrition standards, and recent advances in human nutrition. Preq for NUTR 4510: Food Science major or minor. Preq or concurrent enrollment for NUTR 4510: BIOL 3050. Preq or concurrent enrollment for NUTR 6510: BIOL 3050 or consent of instructor.

NUTR 4550, 6550 Nutrition and Metabolism 3 (3) Concepts of metabolism fundamental to understanding normal and therapeutic nutrition are examined. Bioenergetics as well as metabolism of carbohydrates, lipids, amino acids, vitamins, and minerals as they relate to nutrition are discussed. Preq for NUTR 4550: Food Science major or minor; and BIOL 3050 and BIOL 2220. Preq or concurrent enrollment of NUTR 4550: BIOL 2230. Preq for NUTR 6550: BCHM 3050 and BIOL 2220. Preq or concurrent enrollment for NUTR 6550: BIOL 2230.

PERFORMING ARTS

Professors: P.L. Buyer, L.U. Harder, D.J. Hartmann, Chair; Associate Professors: L. Duris, N.M. Hosler, A.M. Penna, B.A. Whisler; Lecturer: K.W. Moore.

PA 1010 Introduction to Performing Arts 3 (3) Overview of performing arts, including performance, careers, technology, production, management, community outreach, safety, sales, and marketing. Preq: Production Studies in Performing Arts major. Coreq: PA 1030.

PA 1030 Portfolio I 1 (3) Students develop discipline-specific portfolios that display creative design and contain samples of work that demonstrate integrated learning. Coreq: PA 1010.

PA 1950 Creative Inquiry—Performing Arts 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of 12 credits. Preq: Consent of faculty member/mentor.

PA 2010 Career Planning and Professional Development 3 (2) Study of selected performing arts topics. Includes seminars and masterclasses with faculty and visiting artists and concert and theatre attendance and evaluation. Emphasis is placed on written communication skills. Preq: PA 1010 and Sophomore standing. Coreq: PA 2011.

PA 2011 Career Planning and Professional Development Laboratory 0 (3) Non-credit laboratory to accompany PA 2010. Coreq: PA 2010.

PA 2790 Performing Arts Practicum I 1 (3) Practical work on performing arts presentations including backstage technical work, multimedia support, and arts management. Preq: PA 1010.

PA 2800 Performing Arts Practicum II 1 (3) Continuation of practical work on performing arts presentations, with more specialized opportunities for backstage technical work, multimedia support, and arts management training. Preq: PA 2790.

PA 2950 Creative Inquiry—Performing Arts 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor.

PA 3010 Principles of Arts Administration 3 (2) Continuation of PA 2010 with added focus on critical and ethical analysis of performing arts. Emphasis is placed on oral communication skills. Preq: PA 2010 and Junior standing. Coreq: PA 3011.

PA 3011 Principles of Arts Administration Laboratory 0 (3) Non-credit laboratory to accompany PA 3010. Coreq: PA 3010.

PA 3950 Creative Inquiry—Performing Arts 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor.
PA 3980 Special Topics in Performing Arts 1-3 (1-3) Select areas of study in performing arts not addressed by other performing arts course offerings. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: PA 1010 and consent of instructor.

PA 3990 Internship 1-3 (1-3) Provides performing Arts majors an opportunity to apply technical, managerial, and artistic concepts in a performing arts environment through preplanned, preapproved, faculty-supervised internships. Minimum of 45 hours of work per credit hour. May be repeated for a maximum of six credits. To be taken Pass/No Pass only. Preq: PA 2790 and consent of Internship chair.

PA 4010 Senior Capstone Project 4 (3) Capstone course for Performing Arts majors. Students research, prepare, execute and assess a substantial project for the community as approved by a faculty committee. Students, with faculty guidance, manage all aspects of the project. Preq: PA 3010 and Senior standing. Coreq: PA 4011 and PA 4030.

PA 4011 Senior Capstone Project Laboratory 0 (3) Non-credit laboratory to accompany PA 4010. Coreq: PA 4010.

PA 4030 Portfolio II 1 (3) Students revise discipline-specific portfolios through use of current technologies. Further demonstration of integrated learning is provided with the incorporation of senior project research content from PA 4010. Coreq: PA 4010.

PA 4910 Performing Arts Honors Research 3 (3) Research for the preparation of an honors project. Preq: PA 3010.

PA 4920 Performing Arts Honors Project 3 (3) Preparation and presentation of an honors project. Preq: PA 4910 and consent of department chair and project advisor.

PA 4950 Creative Inquiry—Performing Arts 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Assignments with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor.

PA 4990 Independent Studies 1-3 (1-3) Supervised study for students with special interests in performing arts outside the scope of existing courses. May be repeated for a maximum of six credits. Preq: Consent of department chair.

PAN AFRICAN STUDIES

Associate Professor: A. A. Bartley

PAS 1010 Africa and the African World 3 (3) Study of Africa and its impact on the culture and life of peoples in the New World. Traces the impact Africans have had on shaping the music, language, dress, art, religion, and culture of the Western world.

PAS 3010 Introduction to Pan African Studies 3 (3) Study of African American experience from an Afrocentric perspective from colonial America to the present.

PAS 4000 Studies in Pan African Studies 3 (3) Study of selected topics or themes in Pan African Studies. Allows for individualized study of specific topics related to Pan African Studies such as music, dance, religion, colonization, slavery, or economic development. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: PA 4010.

PAS 4100 Studies in Africana Experience 3 (3) Looks at the impact of Africans or African Americans on U.S. society. Interdisciplinary course that allows for the study of Africans and their descendants from a variety of perspectives. Focuses primarily on the United States. May be repeated for a maximum of six credits, but only if different topics are covered.

PAS 4300 Hip-Hop and African American Contemporary Culture 3 (3) Examines the controversial history and legacy of Hip-Hop culture, and explores how the artistic expression of the American underclass has evolved into worldwide cultural expression. Combines scholarship and theory with considerable audio and video exposure to various Hip-Hop songs and artists. Preq: Sophomore standing.

PAS 4680 Comparative Racism and Discrimination in the Atlantic World 3 (3) Seminar in the comparative history of racism and segregation in South Africa and the Americas. Preq: Sophomore standing.

PAS 4710 Directed Studies on the Black Experience in Education 1-3 (1-3) Students conduct research and produce scholarly papers on academic, social, and historical issues that impact the Black experience in educational settings. Students may also participate in service learning activities to broaden their understanding and apply their knowledge in the community. May be repeated for a maximum of nine credits.

PAS 4900, 4980 Seminar on Pan African Studies 3 (3) Research/writing seminar on the African American experience. Selected topics and themes from 1900 to present. Preq: PAS 3102 and one of HIST 3110 or HIST 3120 or HIST 3390.

PEARCE CENTER FOR PROFESSIONAL COMMUNICATION

PCPC 4990 Pearce Center Internship 1-3 (1-3) Students work in the Class of 1941 Studio for Student Communication on projects involving multimodal communications, public relations, graphic design, and publishing. Students edit copy, pitch stories, research and write articles for print, web, and/or video publication, create ePros, develop and execute social media strategies, design marketing material, develop public relations strategies, design websites, and other related tasks. Preq: Consent of instructor.

PHILOSOPHY


PHIL 1010 Introduction to Philosophic Problems 3 (3) Discussion of representative philosophical questions that arise from human thought and action. Characteristic topics are values, knowledge, human nature, and society. Includes Honors sections.

PHIL 1020 Introduction to Logic 3 (3) Introduction to methods of evaluating arguments. Gives simple valid argument forms, which can be joined together to produce the logical form of virtually any argument. Informal fallacies may also be considered. Includes Honors sections.

PHIL 1030 Introduction to Ethics 3 (3) Philosophical consideration of the nature of ethics, basic ethical issues, and problems and modes of ethical reasoning. Includes Honors sections.

PHIL 1050 Introductory Seminar in the Big Questions 3 (3) Introductory seminar dealing with a single important philosophical question such as Who are we? What is the meaning of life? Are we free or determined? Question is pursued throughout the semester with active student involvement. Questions may vary from semester to semester.

PHIL 1240 Technology and Its Discontents 3 (3) Philosophical introduction to issues arising from the development of technologies, their implementation, and their integration into society. Considers theoretical questions regarding the nature of technology and its evaluation, as well as issues related to specific technologies.

PHIL 2100 Evolution and Creation 3 (3) A critical comparison of evolution and creationism. Students examine the scientific, philosophical, and theological issues this clash brings to light, develop their ability to think through the various claims and counter claims critically, and then articulate a coherent position for themselves. Credit toward a degree will be given for only one of PHIL 2100 or BIOL 2100.

PHIL 3030 Philosophy of Religion 3 (3) Critical consideration of the meaning and justification of religious beliefs. Representative topics are the nature and existence of God, religious knowledge, religious language, the problem of evil.

PHIL 3040 Moral Philosophy 3 (3) Study of moral problems, their origin in conflicts between duty and desire, and alternative solutions proposed by classical and contemporary writers.

PHIL 3050 Existentialism 3 (3) Inquiry into the core themes of existentialism: freedom, meaningfulness or meaninglessness of life, the existence of God, etc. Representative thinkers from the existentialist tradition, such as Dostoievsky, Kierkegaard, Sartre, and de Beauvoir, are studied.

PHIL 3120 Philosophy in Ancient China 3 (3) Study of the history of Chinese philosophy from fifth century BCE, including Confucianism, Daoism, Moism, legalism, Buddhism, Neo-Daoism, and Neo-Confucianism. Examination of Chinese philosophers views and arguments on questions of life and death, history and society, education and personal cultivation. May not be used to satisfy general foreign language requirements.
PHIL 3130 Philosophy in Modern China 3 (3) Study of the history of Chinese philosophy from the 19th century BCE, including Confucianism, Daoism, Moism, legalism, Buddhism, Neo-Daoism, and Neo-Confucianism. Examination of Chinese philosophers' views and arguments on questions of life and death, history and society, education and personal cultivation. May not be used to satisfy general foreign language requirements.

PHIL 3140 Comparative Topics in Eastern and Western Philosophy 3 (3) Study of issues and areas of overlapping concern to Eastern and Western philosophical traditions (e.g., ontology, ethics) with emphasis on both contrasts and convergences in philosophical approaches. Topics may vary.

PHIL 3150 Ancient Philosophy 3 (3) Origins and development of rationality as found in the thought of selected philosophers such as Socrates, Plato, and Aristotle.

PHIL 3160 Modern Philosophy 3 (3) Development of the modern view as seen in major Western philosophers of the 16th, 17th, and 18th centuries. Thought of Berkeley, Descartes, Hume, Leibniz, Locke, and Spinoza may be considered to illustrate the development of rationalism and empiricism.

PHIL 3170 Nineteenth-Century Philosophy 3 (3) Development of 19th-century philosophy emphasizing selected works of philosophers such as Kant, Hegel, Marx, Nietzsche, and Kierkegaard.

PHIL 3180 Twentieth-Century Philosophy 3 (3) Historical overview of selected significant movements in 20th-century Western philosophy such as Continental and/or analytic philosophy.

PHIL 3200 Social and Political Philosophy 3 (3) Critical consideration of the views of some major philosophers on the nature of the individuals relation to society and the state in the context of their wider philosophical (logical, epistemological, metaphysical, and ethical) doctrines. Philosophers may include Plato, Aristotle, Augustine, Hobbes, Rousseau, Mill, Marx, Hegel, Rawls, and Nietzsche.

PHIL 3210 Crime and Punishment 3 (3) Investigates what sorts of conduct should be criminally punished and what society should do with those who engage in criminal activity. Specific topics may include the enforcement of morals, euthanasia, hate crimes, deterrence, retribution, and restitution.

PHIL 3230 Theory of Knowledge 3 (3) Examination of concepts, criteria, and decision procedures underlying rational belief and the justification of knowledge claims. Representative answers to the problem of skepticism are considered, with special attention to some leading theories of knowledge.

PHIL 3240 Philosophy of Technology 3 (3) Examines technology and representative philosophical assessments of it with a focus on understanding its impact on the human condition.

PHIL 3250 Philosophy of Science 3 (3) Philosophical study of problems generated by science, but that are not themselves scientific, such as what comprises a scientific theory; how scientists formulate theories and acquire knowledge; what, if anything, differentiates science from other ways of knowing; what role concepts play in scientific knowledge; whether scientific progress is rational.

PHIL 3260 Science and Values 3 (3) Examination of several features of the relation between science and values. Topics may include ethical and social obligations of scientists, role of value judgements in scientific practice, and influence of social and political values on science and scientists.

PHIL 3270 Philosophy of Social Science 3 (3) Inquiry into the philosophical foundations of social science, in particular questions of objectivity, explanatory structure, causality, agency, normativism and naturalism, and social determination of knowledge.

PHIL 3280 Philosophy and Technology of the Body 3 (3) Examines the interrelation of human bodies and emerging technologies in light of philosophical notions of human nature, personal identity, and the ethical dignity of the human. Emphasizes the influence of social values on scientific and technological developments and the reciprocal impact of these developments on understandings of the body.

PHIL 3300 Contemporary Issues in Philosophy 3 (3) Examination of a variety of issues of broad concern to philosophers today. Issues may vary. May be repeated once with departmental consent.

PHIL 3330 Metaphysics 3 (3) Examination of issues and problems concerning the ultimate nature of reality. Topics may include the appearance-reality distinction, the nature of existence, freedom and determinism, personal identity, idealism, and realism.

PHIL 3400 Technology, Environment, and Sustainability 3 (3) Philosophical examination of how technology contributes to significant environmental change. Considers role of science in justifying claims about for example global climate change, role of technology in responding to these changes, how technology affects relations between humans and the extra-human world, and ethical implications of various kinds of technology.

PHIL 3430 Philosophy of Law 3 (3) Explanation of the nature of legal theory and the law through an in-depth examination of the basic concepts and principles of these fields.

PHIL 3440 Business Ethics 3 (3) Study of ethical issues created by business activities, relating them to fundamental questions of ethics generally. Representative topics may include hiring, firing, promotions, business and minorities, organizational influence in private lives, consumer interests, economic justice, and reindustrialization.

PHIL 3450 Environmental Ethics 3 (3) Study of ethical problems in our dealings with the rest of nature and of how they relate to ethics in general. Representative topics include the basis of ethics, nature and intrinsic value, duties to future generations, economics and the environment, rare species, animal rights, ethics and agriculture, energy doctrine.

PHIL 3460 Medical Ethics 3 (3) Examines ethical dilemmas facing modern medicine. Topics may include controversies surrounding death, reproductive technologies, abortion, allocation of resources, the concept of disease, the doctor-patient relationship, and medical research.

PHIL 3470 Ethics in Architecture 3 (3) Interdisciplinary course focused on the architectural profession and the practices of design, building, and other processes in a social and business context. Consideration is given to both general moral principles and particular case studies.

PHIL 3480 Philosophies of Art 3 (3) Examines some of the predominant attempts to understand art in ancient and modern philosophy and also considers a variety of contemporary views and controversies about the nature, meaning, value, and future of art.

PHIL 3490 Theories of Gender and Sexuality 3 (3) Examines the philosophical dimensions of contemporary debates about the relation of sex, gender, and sexuality.

PHIL 3500 Technology and Philosophy in Nursing 3 (3) See NURS 3500.

PHIL 3510 Philosophy of Emotion 3 (3) Considers a range of classic and contemporary readings on the nature and function of emotion. Topics include cognitive, physiological, and constructionist approaches to understanding emotion, emotion and reason, emotion and morality, and select individual emotions.

PHIL 3550 Philosophy of Mind and Cognitive Science 3 (3) Critical examination of philosophical and scientific theories of mental phenomena and of the relationship between mental and material phenomena. Theories of Mind-Body Dualism, Monism, Functionalism, Eliminative and Reductive Materialism, Connectionism, and the status of folk psychology versus cognitive neuroscience are studied.

PHIL 3600 Symbolic Logic 3 (3) Introduction to the basic concepts of modern symbolic logic, including the symbolization of statements and arguments and the techniques of formal proof.

PHIL 3700 Philosophy of War 3 (3) Examines war from both ethical and strategic perspectives: the nature of a just war, the aims of war, and the kinds of general strategies appropriate for achieving those aims.

PHIL 3750 Minds and Machines 3 (3) Examines controversial questions in artificial intelligence and the Computational Theory of Mind. Topics may include Can machines think? What’s involved in being able to think? Can machines reason, understand, be conscious, be self-aware, learn, be creative, have emotions, and use natural language? Focus is on magmaked computers and the mind as computer.

PHIL 3990 Philosophy Portfolio 2 (2) Creation of a digital portfolio to demonstrate competence in reasoning, critical thinking, and problem solving skills as well as ethical judgment. Course also serves as a resource for academic and professional development. Prereq: Junior standing in Philosophy.

PHIL 4010, 6010 Studies in the History of Philosophy 3 (3) In-depth study of a selected philosopher, philosophical school, or movement. Topics vary. With departmental consent, may be repeated once for credit. Current topics and course descriptions are available in the departments course offering brochure.

PHIL 4020, 6020 Topics in Philosophy 3 (3) Thorough examination of a particular philosophical topic, issue, or problem. Topics vary. May be repeated once for credit with departmental consent. Current topics and course descriptions are available in the departments course offering brochure.
PHIL 4220 Anarchism 3 (3) Philosophical study of the roots of anarchist thought and its current articulations.

PHIL 4750 Philosophy of Film 3 (3) Pursues several issues at the center of recent debate in the philosophy of film. Questions investigated include whether film has an essence that distinguishes it from other art forms, whether films ought to be thought of as having authors or narrators, and whether films can themselves philosophize.

PHIL 4900 Law, Liberty and Justice Prelaw Internship 1-3 (1-3) Faculty-supervised internship designed for students in the Law, Liberty and Justice emphasis area of the Philosophy major. Interns are placed with law offices or with institutions and agencies in fields related to law and social policy. May be repeated for a maximum of six credits. To be taken Pass/No Pass only. Preq: Philosophy major and Junior standing and consent of intern¬ship coordinator.

PHIL 4920 Creative Inquiry—Philosophy 1-4 (1-4) Small group work on particular issues with emphasis on involving students in research. Content varies. May be repeated for a maximum of nine credits. Preq: Consent of instructor.

PHIL 4970 Philosophy Honors Research 3 (3) Students conduct research, clearly define the topic, and complete an annotated bibliography under the supervision of the thesis advisor. Preq: Consent of department chair and thesis advisor.

PHIL 4980 Philosophy Honors Thesis 3 (3) In consultation with the thesis advisor and committee, students write, revise, defend, and complete the thesis. Preq: PHIL 4970 and consent of department chair and thesis advisor.

PHIL 4990, 6990 Independent Study 1-3 (1-3) Course of study designed by the student in consultation with a faculty member who agrees to provide guidance, discussion, and evaluation of the project. Student must confer with the faculty member prior to registration. May be repeated for a maximum of six credits. Preq: Consent of instructor.

PHYSICS

PHSC 1070 Introduction to Earth Science 4 (3) Survey of topics in geology, meteorology, astronomy, and oceanography, emphasizing comprehension and practical application of earth science concepts to experiments. Credit toward a degree will be given for only one of PHSC 1070 or PHSC 1170. Coreq: PHSC 1071.

PHSC 1071 Introduction to Earth Science Laboratory 0 (3) Non-credit laboratory to accompany PHSC 1070. Coreq: PHSC 1070.

PHSC 1080 Introduction to Physical Science 4 (3) Survey of topics in chemistry and physics emphasizing comprehension and practical application of physical science concepts to experiments. Credit toward a degree will be given for only one of PHSC 1080 or PHSC 1081. Coreq: PHSC 1080.

PHSC 1081 Introduction to Physical Science Laboratory 0 (3) Non-credit laboratory to accompany PHSC 1080. Coreq: PHSC 1080.

PHSC 1170 Introduction to Chemistry and Earth Science for Elementary Education Majors 4 (3) Integrates topics in chemistry, earth science and environmental science. It emphasizes the interconnections among the various science disciplines and the practical application to experiments and activities appropriate for the elementary classroom. Credit toward a degree will be given for only one of PHSC 1170 or 1171. Preq: Elementary Education major. Coreq: PHSC 1171.

PHSC 1171 Introduction to Chemistry and Earth Science for Elementary Education Majors Laboratory 0 (3) Non-credit laboratory to accompany PHSC 1170. Coreq: PHSC 1170.

PHSC 1180 Introduction to Physics, Astronomy, and Earth Science for Elementary Education Majors 4 (3) Integrates topics in physics, astronomy, and earth science. It emphasizes the interconnections among the various science disciplines and the practical application to experiments and activities appropriate for the elementary classroom. Credit toward a degree will be given for only one of PHSC 1080 or 1180. Preq: PHSC 1170. Coreq: PHSC 1180.

PHSC 1181 Introduction to Physics, Astronomy, and Earth Science for Elementary Education Majors Laboratory 0 (3) Non-credit laboratory to accompany PHSC 1180. Coreq: PHSC 1180.

PHYS 1010 Current Topics in Modern Physics 1 (0) Demonstrations and lectures serving as an introduction to different areas of physics and astronomy presented by various members of the staff. May include such topics as astrophysics, energy, relativity, and weather, as well as visits to the planetarium.

PHYS 1220 Physics with Calculus I 3 (3) First of three courses in a calculus-based physics sequence. Topics include vectors, laws of motion, conservation principles, rotational motion, oscillations, and gravitation. Credit for a degree will be given for only one of PHYS 1220, 2000, or 2070. Includes Honors sections. Preq or concurrent enrollment: MTHS 1000 or MTHS 1070.

PHYS 1240 Physics Laboratory I 1 (3) Introduction to physical experimentation with emphasis on mechanical systems, including oscillatory motion and resonance. Computers are used in the experimental measurements and in the statistical treatment of data. Credit for a degree will be given for only one of PHYS 1240 or 2090. Preq or concurrent enrollment: PHYS 1220.

PHYS 1990 Creative Inquiry—Physics and Astronomy 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor.

PHYS 2000 Introductory Physics I 3 (3) Introduction to classical physics. Includes elements of mechanics, heat, electricity, and light. May not be substituted for PHYS 2200, but may be substituted for PHYS 2070, only with the approval of the Department of Physics and Astronomy. Credit for a degree will be given for only one of PHYS 1220, 2000, or 2070. Preq or concurrent enrollment: MTHS 1050. Coreq: PHYS 2001.


PHYS 2070 General Physics I 3 (3) Introductory course for students who are not majoring in physics, science or engineering. Covers such topics as mechanics, waves, fluids, and thermal physics. Credit for a degree will be given for only one of PHYS 1220, 2000, or 2070. Preq or concurrent enrollment: MTHS 1020 or MTHS 1040 or MTHS 1050.

PHYS 2080 General Physics II 3 (3) Continuation of PHYS 2070. Covers such topics as electricity, magnetism, electromagnetic waves, optics, and modern physics. Credit for a degree will be given for only one of PHYS 2080 or 2210. Preq or concurrent enrollment: PHYS 2100.

PHYS 2100 General Physics II Laboratory 1 (2) Introductory laboratory course for students who are not majoring in physical science or engineering. Covers such topics as mechanics, waves, fluids, and heat. Credit for a degree will be given for only one of PHYS 1240 or 2090. Preq or concurrent enrollment: PHYS 2070.

PHYS 2100 General Physics II Laboratory 1 (2) Covers such topics as electricity, magnetism, electromagnetic waves, optics, and modern physics. Credit for a degree will be given for only one of PHYS 2230 or 2100. Preq: PHYS 2070, 2090. Preq or concurrent enrollment: PHYS 2080.

PHYS 2210 Physics with Calculus II 3 (3) Continuation of PHYS 2200. Topics include thermodynamics, kinetic theory of gases, electric and magnetic fields, electric currents and circuits, and motions of charged particles in fields. Credit for a degree will be given for only one of PHYS 2080 or 2210. Includes Honors sections. Preq or concurrent enrollment: MTHS 1080 or MTHS 1110.

PHYS 2220 Physics with Calculus III 3 (3) Continuation of PHYS 2210. Topics include wave motion, electromagnetic waves, interference and diffraction, relativity, atomic particles, and atomic and nuclear structure. Includes Honors sections. Preq: PHYS 2210.

PHYS 2230 Physics Laboratory II 1 (3) Experiments in heat and thermodynamics, electrostatics, circuits, and magnetism. Computers are used in statistical treatment of data. Credit for a degree will be given for only one of PHYS 2230 or 2100. Preq or concurrent enrollment: MTHS 1080 or MTHS 1110.
PHYS 2240 Physics Laboratory III 1 (3) Experiments involve atomic, molecular, and nuclear systems. Wave particle duality of light and matter is emphasized. Calculators and computers are used in statistical treatment of data. Preq or concurrent enrollment: PHYS 2220.

PHYS 2400 Physics of the Weather 3 (3) Descriptive introduction to meteorology. Includes atmospheric thermodynamics, solar radiation, heat budget, atmospheric circulation, force laws governing air motion, fronts, precipitation, synoptic prediction. Special topics of current interest, such as the effect of environmental pollution on weather and the effect of weather on health, are included.

PHYS 2450 Physics of Global Climate Change 3 (3) Descriptive study of the heating and cooling balance of the Earth's atmosphere and surface and feedback mechanisms that regulate our climate. Past and future temperature trends, atmospheric greenhouse gas inventories, and solar radiative forcing. Evaluation of claims and news about climate change, and their interaction with public opinion.

PHYS 2800 Physics and Reality 3 (3) Non-technical study of the content and meaning of modern physics. Begins with first-principles of physics. Evaluates concepts of substance, matter, locomotion, atomization, fields, space, time, and randomness. Includes quantum mechanics, Bell's Theorem, theory of relativity, and Gödel's Theorem. Intended for a broad audience, including specialists and non-specialists.

PHYS 2900 Physics Research 1-3 (1-3) Individual research project in any area of experimental or theoretical physics or astronomy supervised by a physics or astronomy faculty member. Project need not be original but must add to students ability to carry out research. May be repeated for a maximum of six credits. Students must have a 3.0 minimum grade-point average to enroll in this course. Preq: Consent of instructor.

PHYS 2990 Creative Inquiry—Physics and Astronomy I 4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor.

PHYS 3000 Introduction to Research 1 (2) Acquaints students with current research in physics. Seminars are provided where research activities in various areas of physics and astronomy are summarized. Provides a basis for students to choose a suitable topic for a senior thesis. Includes Honors sections. Preq: Junior standing in Physics.

PHYS 3110 Introduction to the Methods of Theoretical Physics 3 (3) Survey of methods and techniques of problem-solving in physics. Emphasizes the application of mathematical techniques to the solution of problems of vectors, fields, and waves in mechanics, electromagnetism, and quantum physics. Preq: PHYS 2220.

PHYS 3120 Methods of Theoretical Physics II 3 (3) Continuation of PHYS 3110 focused on introducing various mathematical notions widely used in upper level physics courses, such as differential equations, special functions and complex numbers, and complex functions. Preq: PHYS 3110.
PHYS 4520, 6520 Nuclear and Particle Physics 3 (3) Study of our present knowledge concerning subatomic matter. Experimental results are stressed. Topics include particle spectra, detection techniques, Regge pole analysis, quark models, proton structure, nuclear structure, scattering and reactions. Includes Honors sections.

PHYS 4550, 6550 Quantum Physics I 3 (3) Discussion of solution of the Schroedinger equation for free particles, the hydrogen atom, and the harmonic oscillator. Includes Honors sections. Preq for PHYS 4550: PHYS 3220 and PHYS 4410. Preq for PHYS 6550: PHYS 3220 and PHYS 4410 or consent of instructor.

PHYS 4560, 6560 Quantum Physics II 3 (3) Continuation of PHYS 4550. Application of principles of quantum mechanics as developed in PHYS 4550 to atomic, molecular, solid state, and nuclear systems. Includes Honors sections. Preq: PHYS 4550.

PHYS 4650 Thermodynamics and Statistical Mechanics 3 (3) Study of temperature development of the laws of thermodynamics and their application to thermodynamic systems. Introduction to low temperature physics is given. Includes Honors sections. Preq: Six hours of physics beyond PHYS 2220.

PHYS 4750, 6750 Selected Topics I-3 (1-3) Comprehensive study of a topic of current interest in the field of physics. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: Consent of instructor. Coreq: PHYS 4750.

PHYS 4751 Selected Topics Laboratory 0 (99) Non-credit laboratory to accompany PHYS 4750. Coreq: PHYS 4750.

PHYS 4810 Physics of Surfaces 3 (3) Introduction for advanced undergraduates to the physics and chemical physics of solid surfaces and to the interaction of atoms and molecules with those surfaces. Preq: PHYS 3120 and PHYS 3220 and PHYS 3250 and PHYS 3260 and PHYS 4410.

PHYS 4820 Surface Experiments 3 (2) Instruction for advanced undergraduates to experimental methods of surface physics. Includes hands-on experience in advanced laboratory. Preq: PHYS 3120 and PHYS 3220 and PHYS 3250 and PHYS 3260 and PHYS 4410. Coreq: PHYS 4821.

PHYS 4821 Surface Experiments Laboratory 0 (3) Non-credit laboratory to accompany PHYS 4820. Coreq: PHYS 4820.

PHYS 4999 Creative Inquiry—Physics and Astronomy 1-4 (1-4) In consultation with and under the direction of a faculty mentor, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty mentor.

PACKAGING SCIENCE


PKSC 1010 Packaging Orientation I (1) Overview of the various principles and practices in packaging science, historical development, packaging as a career.

PKSC 1020 Introduction to Packaging Science I (2) Considers functions of a package; materials, processes, and technology used in package development; and the relationship of packaging to the consumer, environment, and society as a whole.

PKSC 1030 Packaging Science E-Portfolio I (1) Packaging Science majors initiate professional electronic portfolios that showcase their skills and experiences and lead to career e-portfolios. Students demonstrate proficiency in using important software tools; are introduced to Packaging Science faculty, emphasis areas, and target library services; and discuss academic integrity. Preq: PKSC 1010. Preq or concurrent enrollment: PKSC 2021.

PKSC 2010 Packaging Perishable Products I-3 (3) Covers fundamental characteristics and applications of various materials and systems used to package perishable products such as foods and pharmaceuticals. Discusses packaging issues regarding food, pharmaceuticals, and medical packaging. Includes product/package interactions and packaging requirements to address basic theory in food and pharmaceutical protection. Preq or concurrent enrollment: CH 1010 and PKSC 2020.


PKSC 2030 Packaging Research Fundamentals 2 (2) Principles, methods, and resources for organizing, researching, and reporting technical work in packaging science. Preq: PKSC 1020 and PKSC 1030 and ENGL 1030 and Packaging Science Major.

PKSC 2040 Container Systems (Rigid and Flexible) 3 (3) Examination of all the packages and container systems developed to use systems to distribute products. Compatibility of product and package, structural design, costs, and merchandising considerations are stressed. Preq: PKSC 2020. Coreq: PKSC 2060.

PKSC 2060 Container Systems Laboratory 1 (3) Laboratory practice in sample making, design and constructing various containers. Coreq: PKSC 2040.

PKSC 2200 Product/Package Design and Prototyping I-4 (4) Overview of structural and graphic development tools for product and packaging design. Focus on digital creation, photo rendering, wide-format plotting/proofing, rapid prototyping, visualization and real-time 2d/3d design. Course utilizes online lectures and hands-on laboratory experience at The Sonoco Institute. Coreq: PKSC 2201.

PKSC 2201 Product/Package Design and Prototyping Laboratory 0 (6) Non-credit laboratory to accompany PKSC 2200. Coreq: PKSC 2200.

PKSC 2990 Creative Inquiry—Packaging Science I-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. To be taken Pass/No Pass only. Preq: Consent of faculty member/mentor.

PKSC 3200 Packaging Design Theory I-3 (1-3) Study of human factors psychology as it relates to product and package development. Lecture topics center on advanced color theory, space, shape, texture, pattern, typography, branding, marketing, consumer studies, ergonomics, sustainability and applied packaging. Laboratory focuses on developing retail packaging through applying course theory, group development and peer critique. Preq: PKSC 2200 Coreq: PKSC 3201.

PKSC 3201 Packaging Design Theory Laboratory 0 (3) Non-credit laboratory to accompany PKSC 3200. Coreq: PKSC 3200.

PKSC 3680 Packaging and Society I-3 (1-3) Study of the role of packaging in society as it specifically relates to the responsibilities of the packaging scientist in protecting people and the environment. Includes study of packaging and environmental regulations and guidelines currently in place to achieve these goals. Ability to make informed decisions and ethical judgments is an encompassing goal. Includes Honors sections.

PKSC 3990 Creative Inquiry—Packaging Science I-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. To be taken Pass/No Pass only. Preq: Consent of faculty member/mentor.

PKSC 4010, 6010 Packaging Machinery 3 (3) Systematic study of types of machinery used to form, fill, seal, and handle various packaging, products, and packaging materials. Emphasizes basic mechanical, electrical, pneumatic, and hydraulic components of packaging machinery along with packaging machinery terminology. Discusses methods for machine line optimization and layout. Preq for PKSC 4010: Packaging Science major or minor and PKSC 2040; and one of PHYS 2080 or PHYS 2210. Preq for PKSC 6010: PKSC 2040 and PHYS 2080 or PHYS 2210.
Courses of Instruction

PKSC 4030 Packaging Career Preparation 1 (1) Preparation for a successful career in Packaging Science by completing the professional e-portfolio, and finalizing a résumé and career e-portfolio. Refines career skills through role playing. Topics include presentations, interviewing, effective collaboration and communication, business and foreign travel etiquette. Preq: Packaging Science major or minor. Coreq: PKSC 4200.

PKSC 4040, 6040 Mechanical Properties of Packages and Principles of Protective Packaging 3 (3) Study of the mechanical properties of products and packages and standard methods of determining these properties. Focuses on the functional properties of packages related to shock and vibration isolation and compression. Includes honors sections. Preq for PKSC 4040: Packaging Science major or minor and junior standing; and MTHS 1060 and PKSC 2040; and one of PHYS 1220 or PHYS 2070. Preq for PKSC 6040: MTHS 1060 and PKSC 2040; and one of PHYS 1220 or PHYS 2070; or consent of instructor.

PKSC 4090 Total Quality Management for the Packaging Career Preparation 1 (1) Course for packaging professionals needing to understand the fundamentals of modern quality management, focusing on the principles of total quality management. Preq for PKSC 4090: Packaging Science major or minor and junior standing; and MTHS 1060 and PKSC 2040; and one of CH 2010 or 2230; or consent of instructor. Non-credit laboratory to accompany PKSC 4090. Coreq: PKSC 4090.

PKSC 4160, 6160 Application of Polymers in Packaging 4 (3) Detailed study of polymer science and engineering as applied to packaging science. Includes polymer morphology, rheology, physical properties, processing methods, and polymerization. Emphasizes relationships among processing, structure, and properties. Preq for PKSC 4160: Packaging Science major or minor; and PKSC 2040 and PKSC 2060; and one of PHYS 1220 or PHYS 2070; and one of CH 2010 or 2230. Preq for PKSC 6160: PKSC 2040; and one of PHYS 1220 or PHYS 2070; and one of CH 2010 or 2230; or consent of instructor. Coreq: PKSC 4160, 6160.

PLPA 4111, 6111 Plant Disease Diagnosis I Laboratory 0 (3-1) Principles of disease diagnosis. The general nature of this course makes it beneficial to all students. Coreq: PLPA 4110, 6110. Non-credit laboratory to accompany PLPA 4110, 6110.

PKSC 4160, 6160 Application of Polymers in Packaging 4 (3) Detailed study of polymer science and engineering as applied to packaging science. Includes polymer morphology, rheology, physical properties, processing methods, and polymerization. Emphasizes relationships among processing, structure, and properties. Preq for PKSC 4160: Packaging Science major or minor; and PKSC 2040 and PKSC 2060; and one of PHYS 1220 or PHYS 2070; and one of CH 2010 or 2230. Preq for PKSC 6160: PKSC 2040; and one of PHYS 1220 or PHYS 2070; and one of CH 2010 or 2230; or consent of instructor. Coreq: PKSC 4160, 6160.

PKSC 4200, 6200 Package Design and Development 3 (2) Study of the principles and methods practiced in designing and developing packages and packaging systems and of methods used to coordinate and analyze package development activities including interfacing with product development, manufacturing, marketing, purchasing, and accounting. Preq: Packaging Science major or minor and second semester Senior standing; and PKSC 3200 and PKSC 3680 and PKSC 4400. Preq or concurrent enrollment for PKSC 4200: PKSC 4010, 4040, 4160, 4300, 4540, and 4640. Coreq: PKSC 4201/6201 and PKSC 4301.

PKSC 4201, 6201 Package Design and Development Laboratory 0 (3) Non-credit laboratory to accompany PKSC 4200, 6200. Coreq: PKSC 4200, 6200.

PKSC 4210 Special Problems in Packaging Science 1-4 (1-4) Independent research investigations in packaging science related to packaging materials, machinery, design, and applications. Special emphasis is placed on organizing a research proposal, conducting research, and reporting results. May be repeated for a maximum of 15 credits. Preq: Consent of Instructor.

PKSC 4220 Selected Topics in Packaging Science 1-3 (1-3) Comprehensive study of selected topics in packaging science not covered in detail or contained in other courses. Controversial developments in each area are stressed. May be repeated for a maximum of 15 credits, but only if different topics are covered. Preq: Consent of instructor.

PKSC 4300, 6300 Converting for Flexible Packaging 3 (1) Study of materials, methods, processes, and equipment used in converting web materials for flexible packaging. Laboratory provides hands-on experience preparing and operating pilot-scale converting equipment. Preq for PKSC 4300: Packaging Science major or minor; and PKSC 2040; and PKSC 6300; and PKSC 5040 or consent of instructor. Coreq: 4301, 6301.

PKSC 4301, 6301 Converting for Flexible Packaging Laboratory 0 (6) Non-credit laboratory to accompany PKSC 4300, 6300. Coreq: PKSC 4300, 6300. Non-credit laboratory to accompany PKSC 4300, 6300.

PKSC 4400, 6400 Packaging for Distribution 3 (3) Packages are exposed to various shipping methods and numerous hazards during distribution. To ensure adequate product protection, packaging professionals need to understand the fundamental principles of distribution packaging design. Topics include ASTM and ISTA packaging test methods, packaging design guidelines for distribution, terminology, transport modes, distribution hazards, and protective packaging materials. Preq for PKSC 4400: Packaging Science major or minor and PKSC 4040; Preq for PKSC 6400: and PKSC 4040 or consent of instructor.

PKSC 4540, 6540 Product and Package Evaluation Laboratory 1 (1) Laboratory experiments to determine properties of packaging materials and to evaluate the response of packages and products to shock, vibration, and compression. Students operate standard testing equipment and become familiar with industry recognized test methods and standards. Preq for PKSC 4540: Packaging Science major or minor. Preq or concurrent enrollment for PKSC 4540 and 6540; PKSC 4040.

PKSC 4640, 6640 Food and Health Care Packaging Systems 4 (3) Characteristics, engineering properties, and applications of various materials and systems used in the packaging of foods, pharmaceutical agents, and medical devices. Packaging systems for specific food and medical applications are considered. Laboratory and field exercises on food and medical packaging operations and packaging materials are included. Emphasis is on evaluation methods. Includes Honors sections. Preq for PKSC 4640: Packaging Science or Food Science major or minor; and one of PKSC 2010 and PKSC 2040 or FDS 2140. Preq for PKSC 6640: PKSC 2010 and PKSC 2040 or FDS 2140; or consent of instructor. Coreq: PKSC 4641, 6641.

PKSC 4641, 6641 Food and Health Care Packaging Systems Laboratory 0 (3) Non-credit laboratory to accompany PKSC 4640, 6640. Coreq: PKSC 4640, 6640.

PKSC 4990 Creative Inquiry—Packaging Science 2-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Coreq: PKSC 4991.

PLPA 4991 Creative Inquiry—Packaging Science Laboratory 0 (3-4) Non-credit laboratory to accompany PKSC 4990. Coreq: PKSC 4990.

PLANT PATHOLOGY

Professors: S.N. Jeffers, S.B. Martin, S.W. Scott; Assistant Professors: G. Agudelo, J. Kerrigan

PLPA 2140 Fungi and Civilization 3 (3) Overview of how fungi affect the lives of humans, both currently and historically. Addresses the diversity of fungi and the tremendous roles fungi play on the planet with respect to the biological, social and ethical consequences. The general nature of this course makes it beneficial to all students.

PLPA 3100 Principles of Plant Pathology 3 (2) Introduction to diseases caused by biotic and abiotic agents, symptom development, diagnosis, economics, control, and relationship of plant diseases to human welfare, including the uses of genetic engineering to develop disease resistant crops. Preq: BIOL 1110; or BIOL 1040 and BIOL 1060. Coreq: PLPA 3101.

PLPA 3101 Principles of Plant Pathology Laboratory 0 (3) Non-credit laboratory to accompany PLPA 3100. Coreq: PLPA 3100.

PLPA 4060, 6060 Diseases and Insects of Turfgrasses 2 (2) Host-parasite relationships, symptomatology, diagnosis, economics, and control of infectious diseases of turfgrasses and life histories, diagnosis, and control of important insect pests of turfgrasses. Preq: ENT 3010 and PLPA 3100.

PLPA 4080, 6080 Diseases and Insects of Turfgrasses Laboratory 1 (1) Laboratory to complement PLPA 4060 or ENT 4060 to learn symptomatology, diagnosis, and control of infectious diseases of turfgrasses and diagnosis of damage caused by important insect pests of turfgrasses. Preq: PLPA 4060 or ENT 4060.

PLPA 4110, 6110 Plant Disease Diagnosis I 3 (2) Methods and procedures used in the diagnosis of plant diseases, especially late spring and early summer diseases. Basic techniques of pure culture and identification of plant pathogens and Koch’s postulates are taught. Diagnosis of a wide variety of diseases of cultivated and wild plants is carried out. Offered summer session only. Preq: PLPA 3100. Coreq: PLPA 4111, 6111.

PLPA 4111, 6111 Plant Disease Diagnosis Laboratory 0 (3) Non-credit laboratory to accompany PLPA 4110, 6110. Coreq: PLPA 4110, 6110.
PLPA 4250, 6250 Introductory Mycology 3 (3) Introduction to the biology of all the groups of fungi and some related organisms, with considerations of the taxonomy, morphology, development, physiology, and ecology of representative forms. Prereq: BIOL 1040 and BIOL 1060; or BIOL 1110. Prereq or concurrent enrollment: BIOL 4260 or PLPA 4260.

PLPA 4260, 6260 Mycology Practicum 2 (1) Application of the principles of mycological techniques, microscopic study of fungi. Examples from all major groups of fungi are included. Prereq or concurrent enrollment: BIOL 4250 or PLPA 4250. Coreq: PLPA 4261, 6261.

PLPA 4261, 6261 Mycology Practicum Laboratory 0 (2) Non-credit laboratory to accompany PLPA 4260, 6260. Coreq: PLPA 4260, 6260.

PLPA 4540 Plant Virology 4 (3) Study of plant viruses; their morphology, biochemistry, purification, and transmission; symptoms resulting from virus infection; virus vector relationships. Serological and nucelar acid hybridization procedures. Diagnosis of viral diseases and the identification of causal agents. Replication of plant viruses, the interaction between viral host and plant genome. Control of plant viral diseases. Prereq: BCHM 3010 or BCHM 3050 or MICR 3050. Coreq: PLPA 4541.

PLPA 4541 Plant Virology Laboratory 0 (3) Non-credit laboratory to accompany PLPA 4540. Coreq: PLPA 4540.

PLPA 4590, 6590 Plant Nematology 3 (2) Introduction to nematodes emphasizing plant parasitic nematodes. Introduces morphology of nematodes as it relates to their taxonomic position and ability to cause diseases. Includes diagnosis and control of nematode diseases, along with use of nematodes in studies of molecular interaction and genetics. Involvement in developing resistance. Prereq: PLPA 3100. Coreq: 4591, 6591.

PLPA 4591, 6591 Plant Nematology Laboratory 0 (3) Non-credit laboratory to accompany PLPA 4590, 6590. Coreq: PLPA 4590, 6590.

PLPH 3400 Plant Medicine and Magic 3 (3) Study of use of compounds of plant and fungal origin as poisons, hallucinogens, and pharmaceuticals. Prereq: BIOL 1040 and BIOL 1060 and CH 1020.

PORTUGUESE

PORT 1010 Elementary Portuguese 4 (3) Introduction to speaking, listening, and writing. Attention is given to the sound system of Portuguese to develop basic communication skills. Coreq: PORT 1011.

PORT 1011 Elementary Portuguese Laboratory 0 (1) Non-credit laboratory to accompany PORT 1010. Coreq: PORT 1010.


PORT 1021 Elementary Portuguese Laboratory 0 (1) Non-credit laboratory to accompany PORT 1020. Coreq: PORT 1020.

PORT 2010 Intermediate Portuguese 3 (3) Intermediate course with more emphasis on communication skills and structure. Reading and writing practice in and outside the classroom, with special attention to idiomatic usage. Introduction to perspectives through readings and cultural activities. Prereq: PORT 1020.


POLITICAL SCIENCE


POSC 1010 American National Government 3 (3) Introduction to American national government and politics examining topics such as the Constitution, federalism, political institutions, political behavior, and political participation. Includes Honors sections.

POSC 1020 Introduction to International Relations 3 (3) Overview of both theory and practice in contemporary global politics. Topics include the structure of and primary actors in the international system, reasons conflict occurs, and roles of international institutions, law, and policy. Includes Honors sections.

POSC 1030 Introduction to Political Theory 3 (3) Introduction to major themes and thinkers in the Western tradition of political thought. Students examine classic primary texts of the ancient and modern periods, including Plato, Aristotle, Hobbes and Locke, to acquire a working conceptual vocabulary of normative and theoretical terms, political methodologies, and basic patterns of political organization. Includes Honors sections.

POSC 1040 Introduction to Comparative Politics 3 (3) Introduction to the study of comparative politics in the post-Cold War era, with emphasis on theories and applications. Topics include democratic and nondemocratic systems; ideology; political culture; party systems; and legislative, executive, and judicial structures. Includes Honors sections.

POSC 1990 Introduction to Political Science 1 (1) Introduction to political science as a discipline. Topics include an overview of the subfields within political science, core research methodologies and source materials, and ethical issues related to the study of political science.

POSC 3020 State and Local Government 3 (3) Introduction to American state and local governments, including examination of nature and scope of non-national governments and their interaction with the U.S. federal system. Emphasis is on structural features, functions, and policies of non-national governments.

POSC 3050 Creative Inquiry—Political Science I 3 (1) Engages students in faculty-led research projects. May be repeated for a maximum of six credits. No more than three hours from POSC 3050, 3100, 3110, 3120, 3130, 4090, 4100 may be applied toward a Political Science major, minor, or a Global Politics minor. Coreq: Consent of instructor.

POSC 3100 Political Science Internship 1-3 (1-3) Off-campus internship for at least one semester equivalent. May be repeated for a maximum of three credits. No more than three hours from POSC 3050, 3100, 3110, 3120, 4090, 4100 may be applied toward a Political Science major, minor, or a Global Politics minor. No more than six hours from POSC 3100, 3110, 3120, 3130 may be applied toward any other degree. Prereq: POSC 1010 and consent of instructor.

POSC 3110 Model United Nations 1 (1) United Nations simulation exercises. May be repeated for a maximum of six credits. No more than three hours from POSC 3050, 3100, 3110, 3120, 3130, 4090, 4100 may be applied toward a Political Science major, minor, or a Global Politics minor. No more than six hours from POSC 3100, 3110, 3120, 3130 may be applied toward any other degree. Prereq: Consent of instructor.

POSC 3120 State Student Legislature 1 (1) State student legislature simulation exercises. May be repeated for a maximum of six credits. No more than three hours from POSC 3050, 3100, 3110, 3120, 3130, 4090, 4100 may be applied toward a Political Science major, minor, or a Global Politics minor. No more than six hours from POSC 3100, 3110, 3120, 3130 may be applied toward any other degree. Coreq: PORT 2010.

POSC 3130 Clemson University Model United Nations Conference 1 (1) Facilitation of annual high school Model United Nations conference held on Clemson campus. No more three hours from POSC 3050, 3100, 3110, 3120, 3130, 4090, 4100 may be applied toward a Political Science major, minor, or a Global Politics minor. No more than six hours from POSC 3100, 3110, 3120, 3130 may be applied toward any other degree; consent of instructor.

POSC 3210 Public Administration 3 (3) Introduction to public administration, including the elements of organization, personnel and financial management, administrative law, and administrative responsibility. Prereq: POSC 1010.

POSC 3410 Quantitative Methods in Political Science 3 (3) Introduction to quantitative research methods in political science. Topics include research design, measurement, data collection, sampling procedures, and applications of statistical techniques to research problems in political science. Also stresses computer use for elementary data analysis. Coreq: POSC 3411.

POSC 3411 Quantitative Methods in Political Science Laboratory 0 (1) Non-credit laboratory to accompany POSC 3410. Coreq: POSC 3410.

PORT 3430 Mass Media in American Politics 3 (3) Role and impact of the mass media in the American political system, emphasizing the media’s role in shaping public opinion and in influencing government and public policy. Prereq: POSC 1010.
POSC 3560 Social Science of Entrepreneurship 3 (3) Examines those areas of the social sciences that have direct relevance for entrepreneurs. Topics include processes by which entrepreneurs are shaped by social institutions such as the family and community, public policy implications and influences on entrepreneurship, risk perception, decision making, motivation, leadership, and group dynamics. Preq: SOC 2010 or SOC 2020 or SOC 2350 or CRD 2350 or PSYC 2010 or POSC 1010 or POSC 1020 or POSC 1040. POSC 3610 International Politics in Crisis 3 (3) Factors contributing to the prevalence of tension and conflict in the contemporary global arena are identified and analyzed, with particular emphasis on political, economic, and military elements. Includes Honors sections. Preq: POSC 1020 or POSC 1040. POSC 3620 International Organizations 3 (3) Examines normative and institutional foundations of civil society. Explains the formal institutions, decision-making processes, and multilateral capacities of international governmental and non-governmental organizations. Preq: POSC 1020 or POSC 1040. POSC 3630 United States Foreign Policy 3 (3) American foreign policy in historical perspective, with particular emphasis on decision-making process, contemporary American capabilities and challenges, and analysis of key issues. Preq: POSC 1020 or POSC 1040. POSC 3670 Political Risk Assessment 3 (3) Risks associated with conducting business and other activities in different countries, especially in the frequently unstable setting of the developing world. Major commercial providers of country risk assessment are identified and critiqued. Preq: POSC 1020 or POSC 1040. POSC 3710 European Politics 3 (3) Major emphasis on European governments and issues of importance in the European context. Current methods of comparison are studied and applied to the formal and informal functioning of European governments. Preq: POSC 1020 or POSC 1040. POSC 3720 Political Culture of East Asia 3 (3) Introduction to political culture that characterizes East Asian countries, with emphasis on political subcultures of different nations, and on the analysis of the mutual influence between politics and culture. Preq: POSC 1020 or POSC 1040. POSC 3750 European Integration 3 (3) Survey course analyzing increasing institutional cooperation between European countries with a focus on the European Union. Includes Honors sections. Preq: POSC 1020 or POSC 1040. POSC 3810 African American Politics 3 (3) Examination of African American political thought, interests and agenda setting, and dynamics of African Americans participation in political and governmental decision making. Preq: POSC 1010. POSC 3820 Spanish-Language News 1 (1) Weekly discussions of Spanish-language news articles in the foreign press with an emphasis on politics and on the connections among political, social, economic, and cultural trends. Emphasizes Spanish vocabulary as well as cross-cultural contrasts with the United States. May be repeated for a maximum of three credits. Preq: SPAN 2020. POSC 3830 French-Language News 1 (1) Weekly discussions of French-language news articles in the foreign press with an emphasis on politics and the connections among political, social, economic, and cultural trends. Emphasizes French vocabulary as well as cross-cultural contrasts with the United States. May be repeated for a maximum of three credits. Preq: FR 2020. POSC 3890 Selected Topics 1-3 (1-3) Study of a selected area of political science. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: Junior standing. POSC 3950 Junior Honors Research Seminar 1 (1) Readings and discussion to prepare for the Junior Research Paper and the Senior Thesis. Preq: Junior standing and membership in Calhoun Honors College. POSC 3960 Junior Honors Research 1 (1) Readings and research in conjunction with an approved political science course at the 3000 or 4000 level. Preq: Junior standing and membership in Calhoun Honors College. POSC 4030 United States Congress 3 (3) Examination of the evolution of Congress, congressional elections, the organization of the legislative branch, congressional rules and procedures, decision making, styles of representation, and policymaking. Preq: POSC 1010. POSC 4050 The American Presidency 3 (3) Examines the evolution of the presidency, the powers of the chief executive, the public presidency, executive branch organization and staffing, decision making, and political relations with Congress and the federal judiciary. Preq: POSC 1010. POSC 4070 Religion and American Politics 3 (3) Examines the impact of religion on American politics, including an analysis of the role of religion in politics, political behavior of major religious groups, constitutional issues and voting behavior. Preq: POSC 1010. POSC 4090, 6090 Directed Study in American Politics 1-3 (1-3) Supervised reading/research in selected areas of American politics. May be repeated for a maximum of six credits. No more than three hours from POSC 3050, 3100, 3110, 3120, 3130, 4090, 4100 may be applied toward a Political Science major, minor, or a Global Politics minor. Preq: Consent of instructor. POSC 4100 Directed Study in International Politics 1-3 (1-3) Supervised reading/research in selected areas of international/comparative politics. May be repeated for a maximum of six credits. No more than three hours from POSC 3050, 3100, 3110, 3120, 3130, 4090, 4100 may be applied toward a Political Science major, minor, or a Global Politics minor. Preq: Consent of instructor. POSC 4160, 6160 Interest Groups and Social Movements 3 (3) Empirical and normative examination of the origins, role, and influence of interest groups and social movements in the United States and of the relationships among interest groups, social movements, and democratic theory. Preq for POSC 4160: POSC 1010. Preq for POSC 6160: Consent of instructor. POSC 4210, 6210 Public Policy 3 (3) Introduction to the major approaches to public policy making in American government. Topics include theories and models of policy making, the identification of policy problems, agenda setting, the formulation and adoption of policy, implementation, and program evaluation. Preq for POSC 4210: POSC 1010. Preq for POSC 6210: Consent of instructor. POSC 4230, 6230 Urban Politics 3 (3) Examines the nature and scope of politics in urban communities and offers an analysis of urban governance, especially in the interaction of public authority and private institutions in metropolitan areas. Emphasis is on the structure, processes, and problems challenging governments in urban America. Preq for POSC 4230: POSC 1010. Preq for POSC 6230: Consent of instructor. POSC 4240, 6240 Federalism and Intergovernmental Relations 3 (3) Introduction to the historical, theoretical, legal, and fiscal aspects of constitutionally divided government. Federal, state, and local division of responsibility for public services is emphasized, along with the emerging devolution of the responsibilities from the federal government to states and localities. Preq for POSC 4240: POSC 1010. Preq for POSC 6240: Consent of instructor. POSC 4270, 6270 Public Management 3 (3) Examination of emerging management problems and issues facing federal, state, and local government and the application of management principles, practices, and techniques of public administration. Preq for POSC 4270: POSC 1010. Preq for POSC 6270: Consent of instructor. POSC 4280, 6280 National Security Policy 3 (3) National security threats and policy decision making. Issues covered include weapons of mass destruction, terrorism, organized crime, narcotics, arms control, intelligence, and homeland security. Students deliberate and assess threat priorities and crisis management. Preq for POSC 4280: POSC 1020 or POSC 1040. Preq for POSC 6280: Consent of instructor. POSC 4290, 6290 Global Issues 3 (3) Analysis, assessment, and management of the principal threats facing global security today. Topics include rogue nations, regional superpowers, alliances, organized crime, illegal weapons proliferation, and corruption. Emphasis is on the strategies available to the international community for dealing with these threats. Preq for POSC 4290: POSC 1020 or POSC 1040. Preq for POSC 6290: Consent of instructor. POSC 4300 Public Policy Evaluation 3 (3) Discussion of the role of policy analysis in government. Applications of analytical and computer tools to substantive policy areas such as transportation, economic/community development, education, poverty, and health. Students focus on assessing a policy from a set of options based on analytic criteria as well as developing policy alternatives. Preq: MTHS 3010 or MTHS 3090 or EXST 3010 or POSC 3410. POSC 4360 Law, Courts, and Politics 3 (3) Introduces the principal features of the American legal system. Analyzes how and why legal actors and institutions operate as they do. Explores how the law functions as both a tool and an institution of government, as well as how the court system affects the formation and implementation of public policies. Preq: POSC 1010.
POSC 4370, 6370 American Constitutional Law: Rights and Liberties 3 (3) Examination and analysis of Supreme Court decisions and other legal materials in the areas of civil rights and civil liberties, with an emphasis on freedom of speech, freedom of religion, equal protection of the laws, and privacy rights. Preq for POSC 4370: Junior standing. Preq for POSC 6370: Consent of instructor.

POSC 4380, 6380 American Constitutional Law: Structures of Government 3 (3) Examination and analysis of Supreme Court decisions and other legal materials in the areas of national power, federalism, the separation of powers, and the role of the judiciary. Preq for POSC 4380: Junior standing. Preq for POSC 6380: Consent of instructor.

POSC 4420, 6420 Political Parties and Elections 3 (3) Study of the distinctive features of the American two-party system with emphasis on presidential elections. Parties are examined as formal organizations, coalitions of voters and interest groups, coordinators of nomination and election processes, and managers of policy-making institutions. Preq for POSC 4420: POSC 1010. Preq for POSC 6420: Consent of instructor.

POSC 4480, 6480 Studies in Political Economy 3 (3) Political economy describes the relationship between social and political order and the production, consumption and trading of goods. Course introduces special topics on political economy and familiarizes students with the work of Smith, Ricardo, Marx, Weber and Hayek. May be repeated for a maximum of six credits, but only if different topics are covered. Preq for POSC 4480: POSC 1010. Preq for POSC 6480: Consent of instructor.

POSC 4490 Political Theory of Capitalism 3 (3) Examines the ethical foundations of capitalism. Focuses primarily on the major ethical theories that have supported or criticized capitalism throughout history. Topics include justification of private property, role of corporations, the profit motive, and the source of wealth creation. Preq: POSC 1030.

POSC 4500 Special Topics in Political Theory 3 (3) Intensive examination of a selected political philosopher, conceptual area within political theory, or political thought of a particular era. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: POSC 1030.

POSC 4530 American Political Thought 3 (3) American political philosophy from the 17th century to the present with emphasis on political and social developments since the 1770s. Preq: POSC 1010 or POSC 1030.

POSC 4540, 6540 Southern Politics 3 (3) Examination of the unique political environment of the American South, with emphasis on the events and social forces that have shaped politics in the region since World War II. Course material is approached from a variety of perspectives, including history, literature, social themes, and political culture. Preq for POSC 4540: POSC 1010. Preq for POSC 6540: Consent of instructor.

POSC 4550 Political Thought of the American Founding 3 (3) Intensive seminar of the principles and practices of America’s founders (e.g., Washington, Adams, Jefferson, Madison, and Hamilton). Examines how American revolutions struggled between 1765 and 1788 to develop new ideas about rights, liberty, equality, constitutions, republicanism, separation of powers, representation, federalism, etc. Preq: POSC 1010 or POSC 1030.

POSC 4560 Diplomacy: The Art of Negotiation 3 (3) Examines the conduct of foreign policy in the historical and contemporary context. Explores theories and key concepts of international negotiation, offering a comparative look at the behavior and practice of major powers. Preq: POSC 1020 or POSC 1040.

POSC 4570, 6570 Political Terrorism 3 (3) Examination and analysis of the international phenomenon of terrorism in terms of origins, operations, philosophy, and objectives. Preq for POSC 4570: POSC 1020 or POSC 1040. Preq for POSC 6570: Consent of instructor.

POSC 4580, 6580 Political Leadership 3 (3) Comparative examination of political leaders, focusing particularly on types, methods, and consequences of leadership and on the relationships between leaders and followers. Preq for POSC 4580: POSC 1010. Preq for POSC 6580: Consent of instructor.

POSC 4590 Ethnic Violence 3 (3) Examination of both theories and case studies of ethnic violence in today’s world, with emphasis on understanding potential strategies of conflict resolution. Preq: POSC 1020 or POSC 1040.

POSC 4610, 6610 American Diplomacy and Politics 3 (3) Analyzes the process of making and implementing foreign policy, with special emphasis on the role of America in the world today. Preq: POSC 1020 or POSC 1040.

POSC 4620, 6620 American Politics 3 (3) Comprehensive survey of major political institutions and processes in the United States, with an emphasis on the role of women in electoral politics, issues of gender, women’s rights as human rights, and feminist theory. Preq for POSC 4620: POSC 1010 or POSC 1020 or POSC 1040 or POSC 6570. Preq for POSC 6620: Consent of instructor.

POSC 4650 African Politics 3 (3) Comprehensive survey of major regional blocks, as well as analysis of individual states and thematic concepts. Preq: POSC 1020 or POSC 1040.

POSC 4710 Russian Politics 3 (3) Comprehensive examination of the Russian Federation since the fall of the Soviet Union. The successes and failures of democratic transition are analyzed, with topics covering political participation, organized crime and corruption, center-periphery conflict, and ethnic-religious unrest. Preq: POSC 1020 or POSC 1040.

POSC 4720 Japanese Politics 3 (3) Concepts and operation of contemporary Japan’s political system. Emphasis is on institution building and political economy after World War II. Preq: POSC 1020 or POSC 1040.

POSC 4730 Eurasian Politics 3 (3) Examination of the areas of the Caucasus and Central Asia, covering themes that include democratization, globalization, terrorism, and stability. Preq: POSC 1020 or POSC 1040.

POSC 4740 Asian Politics 3 (3) Survey of prominent trends in Asian politics, with a focus on major countries in the region and major issues affecting the region. Relations between Latin America and the United States and other prominent countries are also considered. Preq: POSC 1020 or POSC 1040.

POSC 4770 Chinese Politics 3 (3) Concepts and operation of contemporary Chinas political system; emphasizes institutional innovation and political economy in recent reforms. Preq: POSC 1020 or POSC 1040.

POSC 4780 Latin American Politics 3 (3) Survey of prominent trends in Latin American politics, with a focus on major countries in the region and major issues affecting the region. Relations between Latin America and the United States and other prominent countries are also considered. Preq: POSC 1020 or POSC 1040.

POSC 4800, 6800 Gender and Politics 3 (3) Examination of the role of gender in politics in the United States and in other countries. Particular emphasis on the role of women in electoral politics, issues of gender, women’s rights as human rights, and feminist theory. Preq for POSC 4800: POSC 1010 or POSC 1020 or POSC 1040 or POSC 6800. Preq for POSC 6800: Consent of instructor.

POSC 4820 Political Novel and Film 3 (3) Examination of political novels and films. Emphasizes the development of these media as art forms; the relationship between political novels and films and politics at large; and the role of these media in shaping public opinion. Preq: POSC 1010.

POSC 4850, 6850 Global Affairs and Governments 3 (3) Designed for teachers and education students who wish to learn how to incorporate global affairs more fully into high school curricula. Overview of major topics involving foreign policies and world politics is provided.

POSC 4890, 6890 Selected Topics 1-3 (1-3) Intensive examination of a selected area of political science. May be repeated for a maximum of six credits, but only if different topics are covered. Preq for POSC 4890: Junior standing. Preq for POSC 6890: Consent of instructor.

POSC 4900 Senior Honors Thesis Research 3 (3) Reading and research related to the senior honors thesis. Preq: POSC 3960 and Senior standing and membership in Calhoun Honors College.

POSC 4910 Senior Honors Thesis 3 (3) Research and writing of the senior honors thesis. Preq: POSC 4900 and Senior standing and membership in Calhoun Honors College.

POSC 4990 Professional Development in Political Science 1 (1) Allows students to reflect on their experience as political science majors. Topics include understanding of cross-disciplinary issues, current research in political science, career options, and ethical issues related to the study of political science. To be taken Pass/No Pass only. Preq: Senior standing in Political Science.
PARKS, RECREATION AND TOURISM MANAGEMENT


PRTM 1010 Concepts of Leisure 3 (3) Introduces recreation professions and organizations: government, voluntary, and commercial; overviews professional preparation; outlines development of man's uses of leisure and evolution of recreation, city parks, natural resources conservation, and preservation movements as philosophical forces affecting leisure services. Restricted to Parks, Recreation and Tourism Management majors.

PRTM 1950 PGML Seminar I 1 (1) Covers career planning and professional development training needed in the golf industry with special emphasis on topics covered in the PGA/PGM Level I Training Program. Preq: PRTM 2810 and consent of instructor.

PRTM 1980 Creative Inquiry—Parks, Recreation and Tourism Management I 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor. Coreq: PRTM 1981.


PRTM 2000 The Profession and Practice in Parks, Recreation, and Tourism Management I 3 (3) Introduces students to the Parks, Recreation and Tourism Management field. Covers the history and development of the PRTM profession, including professional organizations, current issues and trends, ethical principles and professionalism, and professional competencies and development. To be taken Pass/No Pass only.

PRTM 2010 The Recreation/Leisure Environment 3 (3) Discusses the development characteristics of built and natural environmental resource settings for recreation, tourism development, and community expression. Examines human/environment interactions during leisure, including the impact of the recreation environment on people and the impact of people on the recreation environment. Surveys public agencies and private interests in these settings. Includes Honors sections.

PRTM 2050 Program and Event Planning 3 (2) Principles and methods of program development. Time and facility utilization for sports activities, social functions, arts and crafts, outdoor activities, hobbies or special-interest groups, and activities in the cultural and performing arts are pursued. Preq: PRTM 1010. Coreq: PRTM 2051.

PRTM 2051 Program and Event Planning Laboratory 0 (2) Non-credit laboratory to accompany PRTM 2050. Coreq: PRTM 2050.

PRTM 2060 Practicum I 1 (3) Students conduct a recreation program in a supervised setting. A minimum of 90 hours with a leisure agency approved by the University is required. To be taken Pass/No Pass only. Preq: PRTM 2050 and Sophomore standing in Parks, Recreation and Tourism Management.

PRTM 2070 Practicum II 1 (3) Continuation of PRTM 2060. Experience in a leisure situation different from the PRTM 2060 exposure. A minimum of 90 hours with a leisure agency approved by the University is required. To be taken Pass/No Pass only. Preq: PRTM 2050 and Sophomore standing in Parks, Recreation and Tourism Management.

PRTM 2100 Serving Diverse Populations in Parks, Recreation and Tourism Management 3 (3) Introduces students to the leisure patterns and constraints of diverse constituents, including members of ethnic and racial minorities, people of diverse socioeconomic status, women, older adults, people with disabilities, and people with alternative lifestyles. Preq: PRTM 1010.

PRTM 2110 Impacts of Technology and Science in the Context of Play, Recreation and Tourism 3 (3) Examines the relationship among society, technology, and tourism and recreation. Introduces theories of play, recreation and tourism as they relate to social concerns. Students learn how science and technology have impacted how people play, recreate and travel.

PRTM 2200 Conceptual Foundations of Parks, Recreation and Tourism 2 (2) Introduces students to the conceptual foundations of play, recreation, and leisure as they relate to contemporary society, the lifespan, and the natural environment. Preq: PRTM 2050 and Sophomore standing in Parks, Recreation and Tourism Management.

PRTM 2210 Delivery Systems for Parks, Recreation and Tourism 2 (2) Introduces students to the various roles, interactions, and importance of leisure service delivery systems in designing and operating programs and facilities to serve diverse populations. Also includes discussion of the role and impact of leisure services and community and economic development. Preq: PRTM 2000.

PRTM 2220 Program and Event Planning in Parks, Recreation and Tourism 3 (3) Introduces concepts, principles, and skills necessary to plan, implement, and evaluate leisure and recreation programs and events. Topics include assessing needs, developing goals and objectives, selecting programs, events, and resources, marketing, venues, implementation, evaluation, group dynamics and leadership techniques. Preq: PRTM 2000. Coreq: PRTM 2221.

PRTM 2221 Program and Event Planning in Parks, Recreation and Tourism Laboratory 0 (1) Non-credit laboratory to accompany PRTM 2220. Coreq: PRTM 2220.

PRTM 2230 Administration/Management in Parks, Recreation and Tourism 4 (3) Covers the concepts, principles, and skills of administration/management as they relate to leisure and recreation services. Topics include the fundamental principles of research and data analysis, management, human resource management, supervisory leadership, budgeting and financial management, marketing, professional communication, technology, and facility planning and operations. Preq: PRTM 2000. Coreq: PRTM 2001.

PRTM 2231 Administration/Management in Parks, Recreation and Tourism Laboratory 0 (0) Non-credit laboratory to accompany PRTM 2230. Coreq: PRTM 2230.

PRTM 2240 Legal Aspects of Parks, Recreation and Tourism 2 (2) Introduces legal foundations and legislative processes, contracts and tort law, regulatory agents and methods of compliance, safety, emergency, and risk management as they relate to recreation, park resources, and leisure services. Preq: PRTM 2000.

PRTM 2260 Foundations of Management and Administration in Parks, Recreation and Tourism Management 6 (5) Course covers the learning outcomes related to the management and administration of leisure services required for program accreditation by National Recreation and Parks Association. Topics include basic management history and functions, personnel and labor law, marketing, finance, and strategic management as they relate to the Parks, Recreation and Tourism Management field. Preq: PRTM 2000 and 2200; or PRTM 3010. Coreq: PRTM 2261 and PRTM 2262 and PRTM 2290.

PRTM 2261 Foundations of Management and Administration in Parks, Recreation and Tourism Management Laboratory 0 (2) Non-credit laboratory to accompany PRTM 2260. Coreq: PRTM 2260.

PRTM 2270 Provision of Leisure Service Experiences 5 (4) Course covers the learning outcomes related to the provision of leisure service experiences required for program accreditation by National Recreation and Parks Association. Topics include program design, facilitation, and evaluation as they relate to the Parks, Recreation and Tourism Management field. Preq: PRTM 2000 and 2200; or PRTM 3010. Coreq: PRTM 2260 and PRTM 2271 and PRTM 2290.

PRTM 2271 Provision of Leisure Service Experiences Laboratory 0 (2) Non-credit laboratory to accompany PRTM 2270. Coreq: PRTM 2270.

PRTM 2290 Distributed Competency Integration in Parks, Recreation and Tourism Management 3 (3) Covers and reinforces critical and creative thinking processes, ethical judgment, oral communication skills, and written communication skills as applied to the Parks, Recreation and Tourism Management field. In addition, students are given refresher/enhancement seminars on spreadsheets, presentation software and word processing software. Coreq: PRTM 2260 and PRTM 2270.

PRTM 2410 Introduction to Community Recreation, Sport and Camp Management 3 (3) Conceptual examination of community recreation, including the history and structure of public and private nonprofit recreation agencies with an emphasis on programs and services, career opportunities, funding mechanisms, the role of government, and current trends and issues impacting delivery of services. Preq: PRTM 1010.

PRTM 2540 Introduction to Sport Management 3 (3) Development of a conceptual understanding of sport management, career opportunities in sport management, and the necessary competencies for the different career fields.
PRTM 2700 Introduction to Recreation Resources Management 3 (3) Fundamentals of recreation resources management are presented to include the framework of management, management of specific resources, management of visitors, and management of services. Includes Honors sections.

PRTM 2810 Introduction to Golf Management 3 (2) Development of a conceptual understanding of the golf industry, career opportunities in professional golf management, and specific introductory competencies utilized within the field. Preq: Professional Golf Management concentration and consent of instructor. Coreq: PRTM 2810.

PRTM 2811 Introduction to Golf Management Laboratory 0 (3) Non-credit laboratory to accompany PRTM 2810. Coreq: PRTM 2810.

PRTM 2820 Principles of Golfer Development 3 (3) Introduction to golf instruction. Provides knowledge and skills necessary to develop successful golf programs. Preq: PRTM 2810.

PRTM 2830 Advanced Methods of Teaching Golf 3 (3) Provides students with the knowledge and skills necessary to succeed as golf instructors. Particular emphasis is on golf swing mechanics, learning styles and motivation theory, the business of teaching golf, and the use of advanced technology in golf instruction. Preq: PRTM 2820.

PRTM 2950 PGM Seminar II 1 (1) Introduction to the golf industry, professionalism, and current issues of interest in the industry with special emphasis on topics covered in the PGA/PGMED Training Program Level I. Preq: PRTM 1950.

PRTM 2980 Creative Inquiry—Parks, Recreation and Tourism Management II 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor. Coreq: PRTM 2980.

PRTM 2981 Creative Inquiry—Parks, Recreation and Tourism Management II Laboratories 0 (99) Non-credit laboratory to accompany PRTM 2980. Coreq: PRTM 2980.

PRTM 3010 Recreation and Society 3 (3) Investigation of the role of recreation in a technological and work-oriented society. Particular emphasis is on recreation behavior, resources, and programming in public and private organizations that serve the public wants. Not open to Parks, Recreation and Tourism Management majors; may not be substituted or otherwise used to meet Parks, Recreation and Tourism Management area requirements. Students must have a 2.0 cumulative grade-point average to enroll in this course.

PRTM 3040 Challenge Course Facilitation 3 (2) Develops knowledge and skills in planning, directing, and evaluating group performance in an adventure challenge course environment; emphasis is placed on low and high ropes elements, processing, assessment, safety, and course management. Students must have a 2.0 cumulative grade-point average to enroll in this course. Coreq: PRTM 3041.

PRTM 3041 Challenge Course Facilitation Laboratory 0 (2) Non-credit laboratory to accompany PRTM 3040. Coreq: PRTM 3040.

PRTM 3050 Safety and Risk Management in Parks, Recreation and Tourism Management 3 (3) Provisions of safe services, facilities, and activities in the parks, recreation, and tourism domain are studied through the application of germane concepts from the areas of safety, risk management, and liability. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: PRTM 3210 and Junior standing.

PRTM 3070 Facility Planning and Operations 3 (3) Introduction to facility planning and operations processes. Design, planning, financing, construction, budgeting, personnel, operating policies and procedures, maintenance, and equipment considerations are covered. Students must have a 2.0 cumulative grade-point average to enroll in this course.

PRTM 3080 Leadership and Group Processes in Recreation 3 (3) Leadership is analyzed through experience-based learning. Examines various styles of leadership and communication and their probable consequences. Considers techniques for planning large and small group meetings. Examines literature in the field of leadership and group processes. Includes Honors sections. Students must have a 2.0 cumulative grade-point average to enroll in this course.

PRTM 3090 Behavioral Concepts in Parks, Recreation and Tourism 3 (3) Studies social psychological concepts concerning leisure behavior in various park, recreation, and tourism settings. Students learn to apply these theories and behavioral concepts required to plan and manage leisure activities and environments. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: PRTM 1010 and consent of instructor.

PRTM 3110 Therapeutic Recreation 3 (3) Examination of the profession of therapeutic recreation by analyzing the history, philosophy, concepts, roles, and functions involved in the therapeutic recreation services. Includes Honors sections. Students must have a 2.0 cumulative grade-point average to enroll in this course.

PRTM 3170 Group Initiatives Laboratory 0 (2) Non-credit laboratory to accompany PRTM 3170. Coreq: PRTM 3170.

PRTM 3171 Group Initiatives Laboratory 0 (2) Non-credit laboratory to accompany PRTM 3171. Coreq: PRTM 3170.

PRTM 3180 Leisure Lifestyle Management 3 (3) Examines principles and techniques applicable to guiding disabled as well as nondisabled individuals in an exploration of leisure needs, barriers, consequences, and accessibility. Students must have a 2.0 cumulative grade-point average to enroll in this course.

PRTM 3200 Recreation Policy Making 3 (3) Structures and processes for public park and/or recreation policy formation in the United States. Includes Honors sections. Students must have a 2.0 cumulative grade-point average to enroll in this course.

PRTM 3210 Recreation Administration 3 (3) Analysis of the internal organization of a recreation department dealing with finances and accounting, records and reports, publicity and public relations, state and federal legislation, staff organization, coordination of community resources. Includes Honors sections. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: PRTM 3080 and Junior standing.

PRTM 3250 Global Perspectives in Leisure, Recreation and Tourism 4 (4) Advanced topics in serving diverse populations across the lifespan in Parks, Recreation and Tourism Management. Lifestage, cultural and global perspectives on recreation, and ways in which recreation serves as a tool for coping with issues of development, and appreciation of cultures. Preq: Consent of instructor.

PRTM 3300 Visitor Services and Interpretation 3 (3) Introduces the philosophy and principles of the art of environmental interpretation. Comprehensive survey of interpretive theory as it applies to the recreation and parks practitioner and the varying settings within the profession. Includes Honors sections. Students must have a 2.0 cumulative grade-point average to enroll in this course.

PRTM 3340 Introduction to Tourism 3 (3) Survey of travel and tourism in the United States with focus on terminology, demographics, financial significance, and trends. Includes Honors sections. Students must have a 2.0 cumulative grade-point average to enroll in this course.

PRTM 3341 Tourism Markets and Supply 3 (3) Acquaints students with the principles of matching tourism markets and supply. Students examine the strategies used in developing markets. Students must have a 2.0 cumulative grade-point average to enroll in this course.

PRTM 3345 Tourism Management 3 (3) Examines the management issues associated with offering tourism products and experiences to travelers by the private and public sectors for the purpose of enhancing visitor opportunities, making a profit and affecting change in a destination.

PRTM 3360 Heritage Tourism 3 (3) Heritage is an important part of tourism and can be the focal point of many journeys. Students are introduced to key concepts and issues in heritage tourism, including management of heritage tourism resources, politics of heritage tourism and the relationship between heritage tourism and authenticity.

PRTM 3370 Sport Tourism 3 (3) Sport tourism is one of the largest and most important segments of the travel and tourism industry. With a focus on the global sports environment, course introduces students to the fundamentals of sport tourism, including the creation, impacts and future trends of sport tourism development.
PRTM 3490 Survey of Tourism Sites 1 (3) On-site study of various exemplary components of the travel and tourism industry in the Southeast. There are additional costs to students to cover travel. To be taken Pass/No Pass only. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: PRTM 3420 and Junior standing in Parks, Recreation and Tourism Management and consent of instructor.

PRTM 3510 Risk Management and Certifications in Parks, Recreation and Tourism Management 3 (2) Reviews basics of risk management relative to the administration of recreation programs. Certifies students in Red Cross Wilderness First Aid, First Aid for Sports, and CPR for the Professional Rescuer. Coreq: PRTM 3511.

PRTM 3511 Risk Management and Certifications in Parks, Recreation and Tourism Management Laboratory 0 (2) Non-credit laboratory to accompany PRTM 3510. Coreq: PRTM 3510.

PRTM 3520 Camp Organization and Administration 3 (3) Surveys the development and trends of camping in America. Considers programming for the operations of agency and private camps. Enables students to master the techniques of group living. Laboratory offers practical experience in camp craft including trips and outdoor cooking. Students must have a 2.0 cumulative grade-point average to enroll in this course.

PRTM 3530 Foundations of Camp Counseling 3 (3) Introduces concepts, principles and skills essential to personnel working within a camp context. Topics include supervising campers, interacting with campers, understanding the developmental needs of campers, and dealing with camper behavior. Group dynamics, leadership techniques and issues such as abuse are also discussed.

PRTM 3540 Youth Development in Camp 3 (3) Provides camp professionals with an understanding of concepts and theories in youth development relative to camp settings. Topics include the developmental needs of campers through various ages and stages, activity planning and structure, programming for individuals with disabilities or special medical needs, and creating positive youth development outcomes.

PRTM 3550 Trends and Issues in Camp Management 3 (3) Advanced course designed for students to examine the most current principles and practices in the organized camp profession. Topics include evaluation of programs, professional development, fund development, social media and research within a camp context.

PRTM 3800 Community Recreation in South Carolina 1 (3) Students study indoor and outdoor recreation facilities, governmental jurisdiction, funding, programming, management, and staffing at community recreation agencies throughout South Carolina during a hands-on five-day field trip. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: PRTM 1010. Coreq: PRTM 3801.

PRTM 3801 Community Recreation in South Carolina Laboratory 0 (4) Non-credit laboratory to accompany PRTM 3800. Coreq: PRTM 3800.

PRTM 3830 Golf Shop Operations 3 (3) Provides students with the knowledge and skills necessary to succeed as managers of golf shops. Particular emphasis is on fundamental business planning, development of policies and procedures, merchandising, inventory control, pricing, and customer service. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: PRTM 2820.

PRTM 3900 Independent Study in Parks, Recreation and Tourism Management 1-6 (1-6) Comprehensive studies and investigation of special topics not covered in other courses. Emphasizes field studies, community service, and independent readings. May be repeated for a maximum of six credits. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: Junior standing and consent of instructor.

PRTM 3910 Selected Topics in Parks, Recreation and Tourism Management 2-3 (2-3) In-depth examination of developing trends in parks, recreation, and tourism that warrant timely study. May be repeated twice for a maximum of six credits, but only if different topics are covered. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: Junior standing.

PRTM 3920 Special Event Management 3 (3) Students acquire an in-depth knowledge about the field of special event management. Planning techniques, strategies, and requirements for planning, implementing, and evaluating community events are included. Emphasizes planning, funding, and marketing. Students must have a 2.0 cumulative grade-point average to enroll in this course.

PRTM 3950 PGMLSeminar III 1 (1) (Non-credit laboratory) to accompany PRTM 3950. Coreq: PRTM 3950.

PRTM 4020 Professional Golf Management Alternative Internship 3 (3) Under the guidance of a qualified professional supervisor, students gain practical experience and apply knowledge acquired in the classroom to the workplace. May be repeated for a maximum of six credits. Preq: PRTM 2060 and PRTM 2070 and PRTM 4040; and Parks, Recreation and Tourism Management major in the Professional Golf Management Concentration and approval of advisor.

PRTM 4030 Elements of Recreation and Park Planning 3 (3) Basic recreation and park planning principles, processes, and trends in area and facility development combine to form the basis for formulation of a relevant knowledge of planning. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: Senior standing.

PRTM 4040 Field Training I 1 (1) Preparation for field training experience, including topics such as résumé development, interviewing techniques, internship agency selections, and responsibilities of the student, department, and agency. To be taken Pass/No Pass only. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: PRTM 2060 and consent of instructor. Preq or concurrent enrollment: PRTM 2070.

PRTM 4050 Field Training II 6 (18) Minimum ten weeks (400 hours) of uninterrupted, supervised work in a park, recreation or tourism management agency. Under agency supervision, students observe, organize, and implement activities, events, and programs. To be taken Pass/No Pass only. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: PRTM 2060 and PRTM 2070 and PRTM 4040; and Senior standing in Parks, Recreation and Tourism Management; and consent of instructor.

PRTM 4070 Personnel Administration in Parks, Recreation and Tourism Management 3 (3) Study of personnel administration practices in recreation agencies, including employee selection, training, motivation, rewards, evaluation, and legal issues related to personnel and supervision. Students must have a 2.0 cumulative grade-point average to enroll in this course.

PRTM 4080 Honors Internship 6 (18) Minimum of 400 hours of uninterrupted, supervised work in a park, recreation, or tourism setting. Written report on observations, special project, or research is required in compliance with a contract between student and course instructor. Preq: PRTM 3990 and consent of instructor.

PRTM 4090 Methods of Recreation Research I 3 (3) Analysis of the principal methods of recreation research, the application of descriptive statistics to recreation research, and the development of a research proposal. Includes Descriptive statistics. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: EXST 3010 and Senior standing in Parks, Recreation and Tourism Management.

PRTM 4100 Methods of Recreation Research II 3 (3) Continuation of PRTM 4090; includes supervised execution and reporting of results of research proposal developed in PRTM 4090 and the application of inferential statistics to research. Includes Honors sections. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: PRTM 4090 and consent of instructor.
PRTM 4120 Therapeutic Recreation and Mental Health 3 (3) Therapeutic recreation services in mental health clinics, institutions, and outdoor settings. Review of disorders and current modes of treatment as they relate to therapeutic recreation. Includes Honors sections. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: PRTM 3110 and consent of instructor.

PRTM 4160 Leisure and Aging 3 (3) Examines the role of leisure services in later life, the needs of community-based and institutionalized elderly, and the development of services-delivery systems to meet those needs. Students must have a 2.0 cumulative grade-point average to enroll in this course.

PRTM 4170 Therapeutic Recreation Processes I 4 (3) Examination of models, principles, and procedures applicable to comprehensive program planning, specific program plans, individualized care plans, activity analysis, documentation, and evaluation. Students must have a 2.0 cumulative grade-point average and have completed three credit hours of human anatomy and physiology to enroll in this course. Preq: PRTM 3110. Coreq: PRTM 4171.

PRTM 4171 Therapeutic Recreation Processes I Laboratory 0 (2) Non-credit laboratory to accompany PRTM 4170. Coreq: PRTM 4170.

PRTM 4180 Therapeutic Recreation Processes II 4 (3) Examination of theories and concepts that guide therapeutic recreation interventions, including knowledge and use of communication skills, therapeutic relationships, counseling theories, and group processing techniques. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: PRTM 4170 and PRTM 4170. Coreq: PRTM 4181.

PRTM 4181 Therapeutic Recreation Processes II Laboratory 0 (2) Non-credit laboratory to accompany PRTM 4180. Coreq: PRTM 4180.

PRTM 4190 Therapeutic Recreation and Aspects of Disability Across the Lifespan 3 (3) Examination of characteristics and diagnoses of individuals with various disabilities (cognitive, affective, and/or psychomotor domains) across the lifespan. Application of theories and concepts that guide therapeutic recreation interventions as well as examination of disability theory and concepts. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: PRTM 3110 and BIOL 2220 and BIOL 2230.

PRTM 4200 Therapeutic Recreation Trends and Issues 3 (3) Advanced principles and practices of therapeutic recreation, including philosophy, ethics, professional development, standards of practice, certification, recreation inclusion, and marketing services. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: PRTM 4160 and PRTM 4180.

PRTM 4210, 6210 Recreation Financial Resources Management 3 (3) Analysis of recreation financial resources management. Deals with revenue sources and their allocation. Includes Honors sections. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: PRTM 3210 and Senior standing in Parks, Recreation and Tourism Management.

PRTM 4300, 6300 World Geography of Parks and Equivalent Reserves 3 (3) Major international patterns in the provision and use of urban and rural parks and recreation are examined. Preq: 2.0 cumulative grade-point ratio.

PRTM 4310, 6310 Methods of Environmental Interpretation 3 (2) Practice and instruction in the use of equipment and methods available to the interpreter in public contact work. Coaching in presentation and evaluation of live programs and in design, execution, and evaluation of mediated programs is the major emphasis. Programs are delivered to public audiences in the Clemson area. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: PRTM 3300 and Senior standing in Parks, Recreation and Tourism Management and consent of instructor. Coreq: PRTM 4311, 6311.

PRTM 4311, 6311 Methods of Environmental Interpretation Laboratory 0 (3) Non-credit laboratory to accompany PRTM 4310, 6310. Coreq: PRTM 4310, 6310.

PRTM 4410, 6410 Commercial Recreation 3 (3) Components of offering leisure services and products to the public by individuals, partnerships, and corporations for the purpose of making a profit. Students must have a 2.0 cumulative grade-point average to enroll in this course.

PRTM 4440, 6440 Tour Planning and Operations 3 (3) Provides the opportunity to understand the psychology of touring, with emphasis on packaged and group tours and how tours of different types and scale are planned, operated, marketed, and operated. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: PRTM 3420 and consent of instructor.

PRTM 4450, 6450 Conference/Convention Planning and Management 3 (3) Provides the opportunity to understand the problems of and solutions to conference and convention planning and management from both the sponsoring organizations and facility managers perspectives. Students must have a 2.0 cumulative grade-point average to enroll in this course.

PRTM 4460, 6460 Community Tourism Development 3 (3) Provides a community-based perspective of organizational, planning, development, and operational needs for a successful tourism economy at the local level. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: PRTM 3420 and consent of instructor.

PRTM 4470, 6470 Perspectives on International Travel 3 (3) Using the United States as a destination, international travel patterns and major attractions are presented. Factors which restrain foreign travel to the United States are analyzed. Students must have a 2.0 cumulative grade-point average to enroll in this course.

PRTM 4510 Seminar in Community Recreation, Sport and Camp Management 3 (3) Capstone course of case studies applied to management issues focused on community recreation, sport and camp management. Preq: PRTM 2060 and PRTM 2070 and PRTM 4050.

PRTM 4520 Campus Recreation 3 (3) Study of the basic components required for administration of successful college union and intramural-recreation sport programs. Students must have a 2.0 cumulative grade-point average to enroll in this course.

PRTM 4530 Sports Information and Event Management 3 (3) Introduction to basic techniques, tools, and procedures associated with sports information and event management activities. Focusses on the application of sports information and event management activities building upon knowledge from personal interviews, selected readings, event management brochures and field experience. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: PRTM 2540 and consent of instructor.

PRTM 4540 Trends in Sport Management 3 (3) Examination of trends in the sport management area that allows PRTM majors to obtain an updated knowledge base of the field. Students are able to relate their academic studies to the current trends, problems, and management strategies confronting and being used within the sport management industry. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: PRTM 2540 and consent of instructor.

PRTM 4550 Advanced Program Planning 3 (3) Advanced recreation programming techniques with an emphasis on funding, outcome measurement, customer service, program development, marketing, specialized populations, and current trends and issues impacting the delivery of recreation programs. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: PRTM 2050.

PRTM 4600 Leisure Across the Lifespan 3 (3) Introduces students to ways in which leisure affects human development and human development affects leisure behavior. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: PRTM 2050 and PRTM 3090.

PRTM 4740 Advanced Recreation Resources Management 3 (3) Advanced topics in recreation resource management focusing on management strategies and techniques for addressing common resource and social problems in recreation resource management. Case studies and problem analysis are emphasized. Includes Honors sections. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: PRTM 2700 and Senior standing.

PRTM 4830 Golf Club Management and Operations 3 (9) Focuses on activities related to merchandising, purchasing and selling, inventory management, vendor selection, pricing strategies, strategies for monitoring sales and inventory related to financial control and customer service. Students are exposed to the responsibilities of a golf professional at a full-service golf club facility. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq or concurrent enrollment: COOP 1040 and COOP 1050.
PRTM 4900 Senior Independent Study 1-6 (1-6)
In cooperation with and under supervision of a faculty member, students develop and execute a field study or community project. May be repeated for a maximum of six credits. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: Senior standing and consent of instructor.

PRTM 4950 PGM Seminar IV 1 (1) Covers golf shop merchandising and inventory management and supervising and delegating. Emphasizes topics covered in the PGA/PGMED Training Program Level III checkpoint. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: PRTM 3950.

PRTM 4980 Creative Inquiry—Parks, Recreation and Tourism Management IV 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor. Coreq: PRTM 4981.

PRTM 4981 Creative Inquiry—Parks, Recreation and Tourism Management IV Laboratory 0 (99) Non-credit laboratory to accompany PRTM 4980. Coreq: PRTM 4980.

PRTM 4990 Presentation of Honors Projects 1 (1) Non-credit laboratory to accompany PRTM 4980. Preq: PRTM 4070 or 4100; and consent of instructor.

PSYCHOLOGY


PSYC 2010 Introduction to Psychology 3 (3) Introduction to the study of behavior. Analysis of the biological bases of behavior, learning, thinking, motivation, perception, human development, social behavior, and the application of basic principles to more complex phenomena such as education, personal adjustment, and interpersonal relations. Includes Honors sections.

PSYC 2500 Pursuing Happiness 3 (3) Introduces psychological theories and principles used to study human behavior (methods, cognition, motivation, etc.). The concept of happiness is investigated as a psychological construct across cultures. Offered summer session only.

PSYC 2750 Applied Psychology and Transportation 3 (3) Introduces psychological principles used to study human behavior (methodological, cognitive, perceptual, etc.). These psychological principles, in addition to ethical, legal, and societal perspectives, are applied to transportation issues.

PSYC 3060 Human Sexual Behavior 3 (3) The subject of sexual behavior is approached from the psychophysiological, behavioral, and cultural points of view. Evolutionary, historical, and cross-cultural perspectives are considered.

PSYC 3090 Introductory Experimental Psychology 4 (3) Introduction to the analysis of data from experimental and correlational research in psychology. Emphasizes the application of logical nature of statistical reasoning. Laboratory periods stress the techniques of data analysis using microcomputers. Preq: PSYC 2010 with C or better. Coreq: PSYC 3091.

PSYC 3091 Introductory Experimental Psychology Laboratory 0 (2) Non-credit laboratory to accompany PSYC 3090. Coreq: PSYC 3090.

PSYC 3100 Advanced Experimental Psychology 4 (3) Continuation of PSYC 3090. Focus is on techniques of experimental research (experiments, quasi-experiments, survey research, etc.) that are widely used in psychology. Students design and carry out their own empirical research projects. Extensive practice in the writing of reports is included. Preq: PSYC 2010 with C or better and PSYC 3090. Coreq: PSYC 3101.

PSYC 3101 Advanced Experimental Psychology Laboratory 0 (2) Non-credit laboratory to accompany PSYC 3100. Coreq: PSYC 3100.

PSYC 3240 Physiological Psychology 3 (3) Study of human nervous system with emphasis on the function of the nervous and endocrine systems. Discusses the biological basis of behavior in its normal and abnormal dimensions. Preq: PSYC 2010 with C or better.

PSYC 3250 Physiological Psychology Laboratory 1 (3) Demonstrations and techniques of selected physiological procedures are presented to explain the principles discussed in PSYC 3240. Preq: PSYC 2010 with C or better. Preq or concurrent enrollment: PSYC 3240.

PSYC 3300 Motivation 3 (3) Various aspects of motivation are considered by studying physiological, emotional, and environmental influences on behavior. Orientation is empirical rather than theoretical with emphasis on pertinent research, applications, and measurement of motives. Preq: PSYC 2010 with C or better.

PSYC 3330 Cognitive Psychology 3 (3) Study of higher-order mental processes in humans. Topics include memory, learning of concepts, problem solving, and the psychology of language. Preq: PSYC 2010 with C or better.

PSYC 3340 Laboratory in Cognitive Psychology 1 (2) Selected experiments and demonstrations are conducted to reveal phenomena related to human perception, memory, reasoning, problem solving, and high-level mental processes. Preq: PSYC 2010 with C or better and PSYC 3090. Preq or concurrent enrollment: PSYC 3330.

PSYC 3400 Lifespan Developmental Psychology 3 (3) Survey of current theory and research concerned with the psychological aspects of human growth and development across the entire lifespan. Major topics include developmental methods, physiological maturation, cognition, socialization, personality, psycholinguistics, intelligence, learning, behavior problems, and exceptionality. Includes Honors sections. Preq: PSYC 2010 with C or better.

PSYC 3440 Psychology of Adolescence 3 (3) Study of the psychosocial processes of adolescence. Major emphasis is on personality development, growth of thinking, social and sexual maturation, and variations in adolescence. Preq: PSYC 2010 with C or better.

PSYC 3450 Adulthood and Aging 3 (3) Special consideration of the major psychological processes of aging as they relate to individual behavior and adaptation. Includes the influences of aging on the body, learning and psychomotor skills, thinking and intelligence, employment and productivity, personality, and psychopathology. Opportunity for contact with institutionalized and noninstitutionalized elderly persons is provided. Preq: PSYC 2010 with C or better.

PSYC 3520 Social Psychology 3 (3) Survey course analyzing human social behavior from the perspective of the individual as a participant in social relationships. Major emphasis is on the study of such contemporary social processes as attitude formation and change, interpersonal relations, conformity, conflict resolution, aggression and violence, social communication, and group phenomena. Includes Honors sections. Preq: PSYC 2010 with C or better.

PSYC 3560 Social Science of Entrepreneurship 3 (3) Examines those areas of the social sciences that have direct relevance for entrepreneurs. Topics include processes by which entrepreneurs are shaped by social institutions such as the family and community, public policy implications and influences on entrepreneurship, risk perception, decision making, motivation, leadership, and group dynamics. Preq: SOC 2010 or SOC 2020 or SOC 2350 or CRD 2350 or PSYC 2010 or POSC 1010 or POSC 1020 or POSC 1040.

PSYC 3640 Industrial Psychology 3 (3) Reviews perception of work from the pre-industrial revolution to the present. Comparative approaches to motivation, development, maintenance, and attraction of successful work behaviors are discussed. Topics include the organizations responsibilities to the community, implementing a disease- and accident-free workplace, and the effects of consumerism. Preq: PSYC 2010 with C or better.

PSYC 3680 Organizational Psychology 3 (3) Analysis of individual behavior for the purpose of investigating problems in organizations and increasing organization effectiveness. Topics include psychological factors affecting communication, decision making, conflict, leadership, work stress, power, and organizational change. Preq: PSYC 2010 with C or better.
PSYC 3690 Leadership in Organizational Settings
3 (3) Broad survey of theory and research on leadership in formal organizations. A detailed explanation and critical evaluation of major theories (including participative and charismatic leadership) are bridged with helpful remedies and prescriptions for effective leadership in organizations. Preq: PSYC 2010.

PSYC 3700 Personality 3 (3) Historical and contemporary views of individual differences in behavior, affect, health, coping, and motivation. Covers topics such as personality development and structure, personality assessment, cross-cultural issues, and applications of personality psychology. Preq: PSYC 2010 with a C or better.

PSYC 3830 Abnormal Psychology 3 (3) Introduction to the diagnosis and treatment of mental illnesses. Uses current diagnostic standards for mental disorders as a framework for understanding the symptoms, causes, and treatments of the most commonly observed maladaptive behaviors. Includes Honors sections. Preq: PSYC 2010 with a C or better.

PSYC 3900 Honors Seminar in Psychology 3 (3) Variable topic seminar for Honors students from all majors. Topics are announced prior to registration for each semester. May be repeated once for credit, but only if different topics are covered. Preq: PSYC 2010 with a C or better.

PSYC 4080 Women and Psychology 3 (3) Explores the wide variety of psychological issues that concern women. Emphasizes empirical research on topics such as motherhood, sex differentiation, motivation, and psychological disorders. Preq: PSYC 2010 with a C or better.

PSYC 4150 Systems and Theories of Psychology 3 (3) Study of the development of psychology, particularly during the past 100 years. Emphasis is on giving students a better perspective of present-day psychology. Focus is on the various approaches taken by influential psychologists and the conflicts among these approaches. Preq: PSYC 2010 with a C or better and one 3000-level PSYC course.

PSYC 4220 Sensation and Perception 3 (3) Study of psychophysical techniques of measurement and sensory and perceptual processes related to vision, hearing, and the other senses. Includes Honors sections. Preq: PSYC 2010 with a C or better and one 3000-level PSYC course.

PSYC 4230 Sensation and Perception Laboratory 1 (2) Selected experiments are conducted to demonstrate the phenomena involved in sensation and perception. Preq: PSYC 3090. Preq or concurrent enrollment: PSYC 4220.

PSYC 4260 Advanced Physiological Psychology 3 (3) Advanced studies of the biological basis of behavior with emphasis on functional neuroanatomy and endocrinology. Topics may vary. May not be repeated for credit. Preq: PSYC 3240.

PSYC 4350 Human Factors Psychology 3 (3) Analyses of theoretical issues and research methods related to the interaction between people and machines and human performance. Topics include information processing theory, human control systems and displays, task simulation, perceptual and motor factors limiting human performance. Preq: PSYC 2010 with a C or better and one 3000-level PSYC course.

PSYC 4430 Infant and Child Development 3 (3) Cognitive, emotional, and social development from conception through childhood (up to age 12). Major theories and research findings are covered. Preq: PSYC 2010 with a C or better and PSYC 3400.

PSYC 4470 Moral Development 3 (3) Explores the development of moral reasoning, judgment, and character from a descriptive psychological point of view. Examines the theoretical and empirical work of Jean Piaget, Lawrence Kohlberg, and Elliot Turiel as well as prosocial, eudaemonistic, and cross-cultural alternatives to these ideas. Preq: PSYC 2010 with a C or better, and one of PSYC 3400 or PSYC 3440 or PSYC 3450.

PSYC 4560 Applied Psychophysiology 3 (3) Explores the various measures used in psychophysiology to study mind-body interactions. Exposes students to the practice of psychophysiology through an integrated hands-on laboratory experience in which students learn about psychophysiological measures by applying them. Preq: PSYC 2010.

PSYC 4710 Psychological Testing 3 (3) Introduction to the theory of psychological testing, emphasizing the principles of measurement and psychometric characteristics of a good psychological test. Issues in test development, administration, and interpretation are reviewed. Educational, industrial, and clinical uses of tests are examined. Preq: PSYC 2010 and 3090.

PSYC 4750 Brain and Behavior: An Evolutionary Approach 3 (3) Examines the interactions between the human brain and behavior from an evolutionary perspective. Topics include hunger, stress, sleep, sexual attraction, memory, decision making, in-group and out-group interaction, and maladaptive behavior. Includes Honors sections. Preq: PSYC 2010 with a C or better, and one 3000-level psychology course, and Junior or Senior standing.

PSYC 4800, 6800 Health Psychology 3 (3) Study of the role of health-related behaviors in the prevention, development and/or exacerbation of health problems. Emphasis on the biopsychosocial model and its application in the assessment, treatment, and prevention of health problems. Preq for PSYC 4800: PSYC 2010 with a C or better and one 3000-level PSYC course.

PSYC 4820 Positive Psychology 3 (3) Examines the research, theories, and applications of the psychology of human strengths and well-being. Fundamental research into the cultural, emotional, personality, cognitive/motivational, and developmental correlates of strengths and well-being is examined, as well as the application of these principles to a variety of organizational settings. Preq: PSYC 2010 with a C or better and one 3000-level PSYC course.

PSYC 4880 Theories of Psychotherapy 3 (3) Survey of alternative theories of psychological treatment for behavioral and emotional disorders. Various theoretical assumptions, techniques, and applications of each approach are examined and compared, and case examples are considered. Preq: PSYC 3700 or PSYC 3830.

PSYC 4890, 6890 Selected Topics 3 (3) Seminar in current topics in psychology. Topics change from semester to semester and are announced prior to each semester registration. May be repeated once for credit, but only if different topics are covered. Preq for PSYC 4890: PSYC 2010 with a C or better and one 3000-level PSYC course.

PSYC 4900 Senior Division Honors Research 1-4 (2-4) Preparation and defense of a research proposal. Proposed project should be empirical, historical, or theoretical in nature. Preq: Junior standing and consent of instructor.

PSYC 4910 Senior Division Honors Research II 2-4 (2-4) Completion of the proposed research project resulting in a written thesis. Preq: PSYC 4900.

PSYC 4920 Senior Laboratory in Psychology 1 (2) Students complete an integrative review of topics in psychology in the context of producing a reflective portfolio. Preq: Senior standing.

PSYC 4930 Practicum in Clinical Psychology 3 (1) Students apply classroom theory in solving individual and community problems through interaction with community agencies and other professional groups in the mental health area. Students have limited but well-controlled contact with actual clinical problems as they occur in the community environment. Preq: PSYC 3830. Coreq: PSYC 4931.

PSYC 4931 Practicum in Clinical Psychology Laboratory 0 (5) Non-credit laboratory to accompany PSYC 4930. Coreq: PSYC 4930.

PSYC 4950 Practicum in Applied Psychology 3 (1) Students are provided practical experience in the area of applied psychology. Students usually are involved in a project designed to help solve an industrial problem through a direct application of industrial or social psychology. Preq: PSYC 3520 or 3640 or 4540; consent of instructor. Coreq: PSYC 4951.

PSYC 4951 Practicum in Applied Psychology Laboratory 0 (5) Non-credit laboratory to accompany PSYC 4950. Coreq: PSYC 4950.

PSYC 4970 Directed Studies in Psychology 1-4 (1-4) Study under the direction of a faculty member of a particular topic agreed upon by the student and faculty member. May be repeated for a maximum of 12 credits. Includes Honors sections. Preq: Consent of instructor.

PSYC 4980 Team-Based Research 1-4 (1-4) Students conduct psychological research and learn about phases of the research process with a team of their peers under the direction of a faculty member. The collaborative nature of psychological research is emphasized. May be repeated for a maximum of 18 credits. Includes Honors sections. Preq: Consent of instructor.

RELIGION

Professor: S.E. Grosby; Assistant Professor: B.L. White; Lecturers: P.A. Cohen, R. Stephens

REL 1010 Introduction to Religion 3 (3) Study of the variety of religious experience and expression in human life.

REL 1020 World Religions 3 (3) Survey of major religious traditions of the world. Includes Honors sections.
REL 3000 Studying Religion: Theories and Methods 3 (3) Discussion- and presentation-based seminar in which students read the writings of the great theorists of religion since the eighteenth century. Socioscientific, phenomenological, and cultural approaches to the study of religion are explored. Basic methodologies and tools for studying religion are also introduced. Preq: Sophomore standing.

REL 3010 The Old Testament 3 (3) Survey of the books of the Old Testament with special consideration given to the development of the concepts, institutions, and theology of the ancient Hebrews.


REL 3030 The Quran 3 (3) Survey of Islamic Scripture, its origins, content, and interpretation, with attention to the development of Hadith and Sunna as well.

REL 3050 Constructing Scripture 3 (3) Historical exploration of the development of Jewish and Christian scriptures. Emphasis is given to reading texts that were excluded from the Hebrew Bible and the New Testament and the role the canonical played in constructing “orthodoxy.”

REL 3060 Judaism 3 (3) Examines the development of Judaism from biblical to modern times.

REL 3070 The Christian Tradition 3 (3) Examination of the development of Christianity in Western civilization from the post-New Testament period to the present, stressing institutional growth and changes, theological currents, and interaction of Christianity with culture.

REL 3080 Religions of the Ancient World 3 (3) Selected religious movements in ancient Mesopotamia, Egypt, Canaan, and the Greco-Roman world with emphasis on movements outside the Judeo-Christian tradition.

REL 3100 History of Religion in the United States 3 (3) Development of religion in the U.S. from the Colonial period to the 20th century. Attention is devoted to analyzing the broad currents in religious movements and religious thought that have given shape to the American pluralistic experience.

REL 3110 African American Religion 3 (3) Study of the religious milieu in the U.S. rooted in the African heritage. Background on African tribal religion is included, along with Christian denominations and new religions such as Nation of Islam, Rastafarianism, Voudun, Santeria, and Candomble.

REL 3140 Buddhism in China 3 (3) Study of Buddhism in Chinese history since the second century. Examination of the translation and interpretation of the texts, major Chinese Buddhist schools, monastic life, and the comprehensive influence of Buddhism on Chinese culture and society. All readings and discussions are in English.

REL 3150 Islam 3 (3) A study of the origins, development, and history of the religion of Islam and Islamic cultures from the time of the Prophet to the present.

REL 3300 Contemporary Issues in Religion 3 (3) Examination of a variety of issues of broad concern to scholars of religion today. Issues may vary. May be repeated for a maximum of six credits with departmental consent.

REL 3510 Ancient Near East 3 (3) History of the peoples and civilizations of the Near East from the Sumerians to the establishment of Roman power in this region. Includes geography, mythology, religious, and economic currents as well as the methods and discoveries of archaeology. May also be offered as HIST 3510.

REL 3730 Age of the Protestant Reformation 3 (3) Evolution of Modern Europe (ca. 1500–1660), as affected by the Reformation, wars of religion, and growth of nation-states. Study includes intellectual advances and the beginnings of European expansion overseas. May also be offered as HIST 3730.

REL 3990 Junior Research Colloquium 3 (3) Colloquium offered each spring for junior Religious Studies majors. Students enroll individually with a faculty member of their choice and develop, in consultation with him or her, a research project suited to the student’s interests. All students meet four times as a group to present and discuss their research. Preq: Junior Religious Studies major.

REL 4010, 6010 Studies in Biblical Literature and Religion 3 (3) Critical examination of a selected topic in biblical studies. Topics vary from year to year. May be repeated once for credit.

REL 4020, 6020 Studies in Religion 3 (3) Thorough examination of a selected topic in one or more of the religious traditions of the world or of religious life in a particular region. Topics vary from year to year. May be repeated once for credit.

REL 4520, 6520 History of Early Christianity 3 (3) Study of the history, social and doctrinal, of early Christianity up to 600 A.D. Preq: Consent of instructor.

REL 4900 Senior Seminar 3 (3) Capstone-style seminar offered each fall for senior year Religious Studies majors. Students conduct research, make presentations, and engage in weekly discussions on a topic chosen by the faculty member organizing the seminar. Course represents the final synthesis of skills developed throughout the major. Preq: Senior Religious Studies major.

REL 4970 Religion Honors Research 3 (3) Students conduct research, clearly define the topic, and complete an annotated bibliography under the supervision of thesis advisor. Preq: Consent of department chair and thesis advisor.

REL 4980 Religion Honors Thesis 3 (3) In consultation with thesis advisor and departmental thesis committee, students work, write, revise, and complete their theses. Preq: REL H497 and consent of department chair and thesis advisor.

REL 4990, 6990 Independent Study 1-3 (1-3) Study of selected problems, issues, or movements in religion under the direction of a faculty member chosen by the student. Student and faculty member develop an individualized course of study approved by the department chair prior to registration. May be repeated for a maximum of six credits. Preq: Consent of instructor.

RURAL SOCIOLOGY
Associate Professor: K.L. Robinson

RS 3010 Rural Sociology 3 (3) Study of human social relationships as influenced by life in the open country and in small towns and villages, including considerations of the rural population, rural social institutions, processes of change in agricultural technology, and community area planning and development. Offered spring semester only.

RS 3030 Methods of Social Research 1 4 (3) Introduction to methods of social research: research design, sampling, measurement, reliability, and validity; the relationship between theory and research. Coordinating laboratory introduces students to computer literacy through research. Required of all Sociology majors. Includes Honors sections. Preq: SOC 2010; and one of MTHS 2030 or MTHS 3010 or EXST 3010. Coreq: RS 3031.

RS 3031 Methods of Social Research I Laboratory 0 (3) Noncredit laboratory to accompany RS 3030. Coreq: RS 3305.

RS 4010, 6010 Human Ecology 3 (3) Analysis of the interrelationships between the physical world, institutions, and cultural, social, economic, and environmental currents as well as the social, economic, and cultural determinants of human behavior. Emphasizes conditions whereby natural resources become public policy concerns. Offered spring semester only. Preq: Junior standing.

RS 4510, 6540 The Community 3 (3) Close analysis of the development of contemporary communities and their place in society. Continuing effects of industrialization, migration, and technological change on community location and structure are examined. Structural relations of social class, status, and the associations among institutions are explored. Preq: Junior standing.

RS 4950 Field Experience 3 (1) Students participate in selected field placements under supervision for eight hours weekly and in a one-hour seminar per week. May be repeated once for credit. Preq: SOC 2010 or SOC 2020; and Junior standing; and consent of instructor. Coreq: RS 4951.

RS 4951 Field Experience Laboratory 0 (8) Noncredit laboratory to accompany RS 4950. Coreq: RS 4950.

RS 4980 Independent Study 1-3 (1-3) Individual readings or projects in sociological areas not covered in other courses. A written proposal must be approved by the instructor directing the work and by the department chair prior to registration. May be repeated for a maximum of six credits. Preq: Consent of instructor.

RUSSIAN
Professor: G.L. Love; Lecturer: J. Bridgwood

RUSS 1010 Elementary Russian 4 (3) Training in pronunciation, grammatical forms, and syntax with a view to giving the student the fundamentals necessary to hold simple conversations and to read simple Russian texts. Coreq: RUSS 1011.

RUSS 1011 Elementary Russian Laboratory 0 (1) Noncredit laboratory to accompany RUSS 1010. Coreq: RUSS 1010.

RUSS 1021 Elementary Russian Laboratory 0 (1) Non-credit laboratory to accompany RUSS 1020. Coreq: RUSS 1020.


RUSS 2970 Creative Inquiry—Russian 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Arrangements with faculty members must be established prior to registration. Preq: Consent of faculty member.


RUSS 3070 Russian Civilization 3 (3) Introduction to significant elements of Russian civilization. Emphasis is on social, geographical, political, and artistic aspects of modern Russia. Taught in Russian. Preq: RUSS 2020.

RUSS 3400 Russian Culture of the Nineteenth Century 3 (3) Study of achievements in art, science, music, and literature in Russia during the 19th century. Taught in English.

RUSS 3600 Russian Literature to 1910 3 (3) Study of key texts in the modern literary tradition in Imperial Russia from Pushkin to Chekhov. Readings and lectures are in English.

RUSS 3610 Russian Literature Since 1910 3 (3) Study of key texts in modern Russian and Soviet literature with particular focus on Russian modernist movements and Socialist Realism. Readings and lectures are in English.

RUSS 3970 Creative Inquiry—Russian 1-4 (1-4) Students focus on a special research area under the guidance of a faculty member. After acquiring the requisite background, students formulate hypotheses for a group project, develop a critical framework, and initiate research on a specific topic. Preq: RUSS 2020.

RUSS 3980 Directed Reading 1-3 (1-3) Directed study of selected works in Russian. May be repeated for a maximum of six credits. Preq: RUSS 2020.

RUSS 4600 Tolstoy and Dostoevsky 3 (3) Examines a selection of major works by Leo Tolstoy and Fyodor Dostoevsky with particular focus on their literary, political, and philosophical aspects as well as their importance within the modern European literary tradition. Readings and lectures are in English. Preq: Junior standing.

RUSS 4970 Creative Inquiry—Russian 1-4 (1-4) Continuation of research initiated in RUSS 3970. Students complete their project and disseminate their research results. Preq: RUSS 3970.

SOCIOLGY
Professors: M.T. Britz, D.K. Sturkie, B.J. Vander Mey, F.C. Molley, W.M. Wentworth; Associate Professors: E.M. Granberg, Interim Chair; W.H. Haller, S.E. Winslow; Assistant Professor: Y. Luo; Senior Lecturer: J.L. Holland; Lecturers: M. Barr, J. Edwards, S. Southworth, W.C. White

SOC 2010 Introduction to Sociology 3 (3) Sociological perspective: the study of contemporary groups, organizations, and societies in terms of human social behavior, social change, social structure, and social institutions. Includes Honors sections. Preq: RUSS 2020.

SOC 2020 Social Problems 3 (3) Social problems involving the family, education, health care, political and legal systems, economy, population, environment, community; and special problems associated with age, economics, racial status, and gender inequality.

SOC 2050 Introductory Sociology Laboratory 1 (3) Overview of major sociological fields. Examines core competencies and the Sociology major. Relevant career and academic development issues are investigated. E-portfolios are established and expanded. Preq: Sociology major. Preg or concurrent enrollment: SOC 2010 or SOC 2020.

SOC 2350 Introduction to Leadership 3 (3) Introduction to leadership with various organizational settings from a sociological perspective. Examines the concept of leadership, leadership traits, types of leadership, and the evolution of leadership behaviour in the 19th and 20th centuries.

SOC 2020 Social Research Methods 1 3 (3) This course is the first in a two-semester methods sequence, and focuses on conceptual issues related to research design, and on examples of an array of data collection and analysis techniques. Topics include the research process, linking theory and methods, conceptualization and measurement, sampling, research design, and research ethics. Preq: SOC 2010 or SOC 2020. Preg or concurrent enrollment: SOC 2050.

SOC 3030 Methods of Social Research 1 4 (3) Introduction to methods of social research: research design, sampling, measurement, reliability, and validity; the relationship between theory and research. Coordinating laboratory introduces students to computer literacy through research. Required of all Sociology majors. Includes Honors sections. Preq: SOC 2010; and one of MTHS 3200 or MTHS 3210 or EXST 3010. Coreq: SOC 3031.

SOC 3011 Methods of Social Research I Laboratory 0 (3) Non-credit laboratory to accompany RS 3030. Coreq: SOC 3030.

SOC 3040 Social Research Methods II Laboratory 0 (3) Non-credit laboratory to accompany SOC 3040. Coreq: SOC 3040.

SOC 3100 Marriage and Intimacy 3 (3) Examination of mate selection, living together, marital relations, family planning, conflict resolution, divorce and remarriage, later life adjustments, and单身hood as a lifestyle in the U.S. Includes Honors sections.

SOC 3110 The Family 3 (3) Introduction to the family as a social institution. Primary focus is on families in the U.S. with comparisons to other cultures. Topics include history of the family, trends in family formation and dissolution, division of labor, intragenerational relationships, family violence, and policy. Analyses of race, class, and gender are incorporated. Includes Honors sections. Preq: SOC 2010 or SOC 2020.

SOC 3300 Work and Occupations 3 (3) Introduces changes in the structure of work from preindustrial to postindustrial periods. Topics include the effects of stratification on career decisions, career paths and implications for life changes, social effects of scientific management of work, unionization, globalization, the rise of multinational corporations, and cross-cultural comparisons of management styles. Preq: SOC 2010 or SOC 2020.

SOC 3310 Urban Sociology 3 (3) Urbanization as a social process and related conditions of work, family structure, social mobility, crime, lifestyle, technology, and development of urban areas in the Third World. Preq: SOC 2010 or SOC 2020 and sophomore standing.

SOC 3500 Self and Society 3 (3) Social psychology from the sociological viewpoint. Examines interpersonal and group influences on such individual conditions as childhood and life-course development, language, emotions, motives, sexuality, deviance, and self-concept. Preq: SOC 2010 or SOC 2020 or PSYC 2010.


SOC 3560 Social Science of Entrepreneurship 3 (3) Examines those areas of the social sciences that have direct relevance for entrepreneurs. Topics include processes by which entrepreneurs are shaped by social institutions such as the family and community, public policy implications and influences on entrepreneurship, risk perception, decision making, motivation, leadership, and group dynamics. Preq: SOC 2010 or SOC 2020 or SOC 2350 or CRD 2350 or PSYC 2010 or POSC 1010 or POSC 1020 or POSC 1040.
SO 3600 Social Class and Poverty 3 (3) Overview of economic stratification and inequality. Topics include measuring and explaining inequality, how inequality is reproduced in society, and the consequences for life outcomes. Course also focuses on poverty, including its nature, causes, demographics and consequences. Prereq: SOC 2010 or SOC 2020.

SO 3800 Introduction to Social Services 3 (3) Fundamentals of casework practice, including philosophy and values, models of group work, and ethics in social services work. Prereq: SOC 2010 or SOC 2020.

SO 3880 The Criminal Justice System 3 (3) Social systems analysis of criminal justice agencies. Primary focus is on law enforcement and corrections and their interagency relationship with courts and prosecution.

SO 3890 Criminology 3 (3) Study of nature and causes of criminal behavior, societal attempts to control crime, social responses to crime, criminals, and the criminal justice system.


SO 3920 Juvenile Delinquency 3 (3) Study of nature, extent, and causes of juvenile delinquency; societal attempts to control delinquent conduct and gang violence; emergence of the juvenile justice system. Prereq: SOC 2010 or SOC 2020.

SO 3930 Sociology of Mental Illness 3 (3) Mental illness as a social phenomenon, including cultural and social influence, organizational settings of mental health-care delivery, legal issues, patient-therapist relationships, and mental illness intervention as social control. Includes Honors sections.

SO 3970 Substance Abuse: Social Causes, Consequences and Treatment 3 (3) Examination of the history and impact of substance use in our culture, from a sociological perspective. Topics include the various reasons individuals and groups partake of drugs and alcohol, our cultural obsession with substances, theories regarding addiction, drug and alcohol control policy and benefits and costs of substance use. Prereq: SOC 2010 or SOC 2020.

SO 3980 Computer Crime 3 (3) Traces the history of technological crime and evaluates forensic practices in light of legislation with an analysis of emerging case law. Addresses guidelines for the development of forensic laboratories, the creation of computer crime task forces, search/seizure of electronic equipment, and the evaluation of criminal subcultures. Prereq: SOC 3880.

SO 4010, 6010 Human Ecology 3 (3) Analysis of the interrelationships between the physical world, modifications in natural environments, human settlement patterns, and institutions that both encourage and regulate environmental modification. Emphasizes conditions whereby natural resources become public policy concerns. Offered spring semester only. Prereq: Junior standing.


SO 4040, 6040 Sociological Theory 3 (3) Survey of the development of sociological theory. Required of all Sociology majors. Prereq: SOC 2010 or SOC 2020; and Junior standing.

SO 4080 Honors Thesis Research I 3 (3) Reading and research related to senior honors thesis. Completion of junior honors requirements and approval of department chair and thesis advisor required. Prereq: Honors status and SOC 3020.

SO 4090 Honors Thesis Research II 3 (3) Research and writing related to the senior honors thesis. Prereq: Honors status and honors section of SOC 3040; and SOC 4080.

SO 4140, 4140 Policy and Social Change 3 (3) Uses the sociological perspective to examine policy development, implementation, and evaluation in the public and private sectors. Specifically, focuses on values and ethics and effects of social change efforts on the outcomes of policy formation and social planning, and implementation. Prereq: SOC 2010 or SOC 2020; and Junior standing.

SO 4300 Sociology of Organizations 3 (3) Analysis of administrative organizations and voluntary associations; applied analysis of their formal and informal group relations, communications, and effectiveness. Prereq: SOC 2010 or SOC 2020 and Junior standing.

SO 4320 Sociology of Religion 3 (3) Sociological analysis of religious systems and movements and their influence on other social institutions. Prereq: SOC 2010 or SOC 2020 and Junior standing.

SO 4330, 6330 Globalization and Social Change 3 (3) Examination of the social and historical causes of development and underdevelopment. Various sociological theories of development are reviewed. Selected countries are examined in an international context. Prereq: SOC 2010 or SOC 2020; and Junior standing.

SO 4440 Sociology of Education 3 (3) Examines the relationship between education and society. Topics include theoretical perspectives, school organization, social mobility and stratification in schools, race and gender, tracking and school reform. Prereq: SOC 2010 or SOC 2020 and Junior standing.

SO 4590, 6590 The Community 3 (3) Close analysis of the development of contemporary communities and their place in society. Continuing effects of industrialization, migration, and technological change on community location and structure are examined. Structural relations of social class, status, and the associations among institutions are explored. Prereq: Junior standing.

SO 4600, 6600 Race and Ethnicity 3 (3) Investigation of sociological perspectives on race, ethnic relations, and social stratification. Includes analysis of the impact of social class on minority movements. Prereq: SOC 2010 or SOC 2020 and Junior standing.

SO 4610 Sociology of Sex and Gender 3 (3) Examination of theoretical and empirical approaches to the sociology of sex and gender, focusing primarily on contemporary American society. Focuses on how gender intersects with race, ethnicity, social class and sexuality, and how major institutions in society are sites for the maintenance and reproduction of gender roles, expectations and differentiations. Includes Honors section. Prereq: SOC 2010 or SOC 2020 and Junior standing.

SO 4620 Men, Masculinity, and Society 3 (3) Consideration of masculinity and social order: norms, roles, relationships, and activities; identity and socialization: work, family, sexuality, war, sports, including subcultural comparisons. Prereq: SOC 2010 or SOC 2020 and Junior standing.

SO 4680 Sociology of Criminal Evidence 3 (3) Introduction to the types of evidence, collection of evidence, chain of custody, and procedures relating to the introduction of evidence into judicial proceedings. Attention is given to Fourth Amendment constitutional issues, the development of law within American boundaries, and the cross-cultural development of law. Prereq: SOC 3880.

SO 4710 Population Issues and Methods 3 (3) Study of demographic concepts, theory, and research methods for vital statistics, migration, and population distribution and projections. Considers collection and processing of demographic data and organization of demographic data systems. Offered fall semester only. Includes Honors sections. Prereq: ANTH 2010 or RS 3010 or SOC 2010 or SOC 2020.

SO 4800, 6800 Medical Sociology 3 (3) Study of sociocultural factors in the etiology and treatment of physical illness, medical occupations and professions, and the organization of health care delivery systems. Prereq: SOC 2010 or SOC 2020 and Junior standing.

SO 4810, 6810 Aging and Death 3 (3) Sociological orientation to aging populations focusing on the impact of health care, welfare, and retirement systems. Includes dying as a social phenomenon, suicide, euthanasia, and funerals. Prereq: SOC 2010 or SOC 2020 and Junior standing.

SO 4840, 6840 Child Abuse and Treatment 3 (3) Comprehensive examination of child abuse, neglect, and exploitation as major social problems; causes, effects, and prevalence of physical, sexual, and emotional maltreatment; definitional controversies; social policy and legal considerations; therapeutic approaches for children and their caretakers; child maltreatment and the judicial system. Prereq: Junior standing.

SO 4860 Creative Inquiry—Sociology 1-3 (1-3) Investigates topics and engages in action research projects selected by faculty and students. Goals, research, activities, and outcomes vary from semester to semester and project to project. May be repeated for a maximum of 12 credits. Prereq: Consent of instructor.

SO 4910, 6910 The Sociology of Policing 3 (3) Introduction to the major issues of contemporary policing in the U.S. from a sociological perspective. Topics include the changing functions and structure of policing, the police subculture, and the role of the police in a liberal democracy. Prereq: SOC 3880.
SPAN 4930, 6930 Sociology of Corrections 3 (3) Analysis of correctional alternatives. Topics include sentencing strategies and their impact, prison populations (male, female, and juvenile), inmate social structures, treatment and custody issues, community-based alternatives (probation, parole, electronic monitoring, and work release), and correctional management issues. Preq: SOC 3880.

SOC 4940, 6940 Sociology of Organized Crimes 3 (3) Examines the multifarious aspects of criminal organizations, namely their structure, methods, and networks. Specific topics may include white-collar crime and traditional, nontraditional, and transnational organized crime. Preq: SOC 3880.

SOC 4950 Field Experience 3 (1) Students participate in selected field placements under supervision for eight hours weekly and in a one-hour seminar per week. May be repeated once for credit. Preq: SOC 2010 or SOC 2020; and Junior standing; and consent of instructor. Coreq: SOC 4951.

SOC 4951 Field Experience Laboratory 0 (8) Non-credit laboratory to accompany SOC 4950. Coreq: SOC 4950.

SOC 4970 Sociology Senior Laboratory 1 (3) Concludes overview of theory, research, methodology, and fields of sociology. Students add to and finalize complete portfolio, and prepare for post-degree careers and major field test. Students must have a 2.0 cumulative grade-point average to enroll in this course. Preq: SOC 2050 with a passing grade and Senior standing.

SOC 4980 Independent Study 1-3 (1-3) Individual readings or projects in sociological areas not covered in other courses. A written proposal must be approved by the instructor directing the work and by the department chair prior to registration. May be repeated for a maximum of six credits. Preq: Consent of instructor.

SOC 4990 Seminar in Selected Topics in Contemporary Sociology 3 (3) Sociological areas of current interest are explored. May be repeated by special arrangement for a maximum of six credits. Preq: SOC 2010 or SOC 2020.

SPANISH


SPAN 1010 Elementary Spanish 4 (3) Course for students with no previous experience in Spanish study. The fundamentals of grammar and vocabulary are taught, and a foundation is provided for building oral and written proficiency. Three hours a week of classroom instruction and one hour a week in the language laboratory. Coreq: SPAN 1011.

SPAN 1011 Elementary Spanish Laboratory 0 (1) Non-credit laboratory to accompany SPAN 1010. Coreq: SPAN 1010.

SPAN 1020 Elementary Spanish 4 (3) Continuation of SPAN 1010. Coreq: SPAN 1021.

SPAN 1021 Elementary Spanish Laboratory 0 (1) Non-credit laboratory to accompany SPAN 1020. Coreq: SPAN 1020.

SPAN 1040 Basic Spanish 4 (3) Condensed first-year course for students who have previously studied Spanish. Upon completion, students are prepared to enter Intermediate Spanish. Coreq: SPAN 1041.

SPAN 1041 Basic Spanish Laboratory 0 (1) Non-credit laboratory to accompany SPAN 1040. Coreq: SPAN 1040.

SPAN 1510 Spanish for Graduate Students 3 (3) Intensive program only for graduate students preparing for the reading examination in Spanish. A minimum grade of B on a final examination will satisfy graduate school foreign language requirement. May be repeated once. To be taken Pass/No Pass only. Preq: Graduate standing.


SPAN 2011 Intermediate Spanish Laboratory 0 (1) Non-credit laboratory to accompany SPAN 2010. Coreq: SPAN 2010.


SPAN 2210 Accelerated Intermediate Spanish I 3 (3) Accelerated intermediate course that may be taken in lieu of SPAN 2010 and 2020. Through conversation, composition, dictation, and intensive grammar review, proficiency is stressed. Includes literary readings and cultural perspectives. May not be taken by students who have completed SPAN 2010 or 2020. Preq: SPAN 1020.

SPAN 2050 Creative Inquiry—Spanish 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Arrangements with faculty members must be established prior to registration. Preq: Consent of faculty member.


SPAN 3040 Introduction to Hispanic Literary Forms 3 (3) Introduction to the basic structures and elements of fiction, poetry, drama, and essay, including literary and critical theory, with readings in 19th- and 20th-century Spanish and Spanish-American literature. Preq: SPAN 3020 or SPAN 3050.

SPAN 3050 Intermediate Spanish Conversation and Composition 1 3 (3) Practice in spoken Spanish with emphasis on vocabulary, pronunciation, intonation, and comprehension. Includes written work to increase accuracy and assignments in the language laboratory. Preq: SPAN 2020.


SPAN 3070 The Hispanic World: Spain 3 (3) Introduction to the significant aspects of the culture of Spain from its origins to the present. Emphasizes the artistic, social, historical, political, and contemporary issues of the Iberian Peninsula. Preq: SPAN 2020.

SPAN 3080 The Hispanic World: Latin America 3 (3) Introduction to the significant aspects of the culture of Spanish-American countries. Emphasis is placed on the development of the political, economic, geographical, social, and artistic aspects of Spanish America from the indigenous period to the present. Preq: SPAN 2020.


SPAN 3100 CLIP Summer Immersion Program 6 (6) Conducted entirely in Spanish for eight hours daily. Consists of activities that combine interrelating cultural topics with language skill practice. Frequent opportunities to converse with native speakers during meals and on excursions. Students receive six credits, three of which may be taken in lieu of SPAN 2020. Preq: SPAN 2010.

SPAN 3110 Survey of Spanish-American Literature 3 (3) Literary movements, influences, authors, and works from the Colonial period to the present. Preq: Six credits in Spanish at the 3000 level, including at least one course in literature or culture.

SPAN 3130 Survey of Spanish Literature I 3 (3) Literary movements, influences, and authors from the beginning to the end of the 17th century; representative works, discussions. Preq: Six credits in Spanish at the 3000 level, including three credits in literature or culture.

SPAN 3140 Hispanic Linguistics 3 (3) Familiarizes students with the theory and practice of linguistics applied to Spanish, in order to deepen their knowledge of phonetics, morphology, syntax, semantics and linguistic change. Preq: SPAN 3020.

SPAN 3160 Spanish for International Trade 1 3 (3) Introduction to commercial Spanish; study of the spoken and written language, protocol, and cultural environment of the Spanish-speaking business world. Business vocabulary, basic business and cultural concepts, and situational practice. Reading and analysis of commercial texts. Preq: Two 3000-level Spanish language, literature, or culture courses.

SPAN 3180 Spanish Through Culture 3 (3) Topic-generated conversation course in Spanish through a broad array of artistic manifestations in the Hispanic World emphasizing conversation and short written exercises. Focuses on one Hispanic culture topic which provides a basis for class discussion and short written compositions in Spanish. Preq: One 3000-level course in Spanish.

SPAN 3910 Honors Introduction to Hispanic Literary Forms 1 (1) One-hour independent study to allow honors students to pursue supervised research on some aspect of Hispanic literature. Preq: Membership in Calhoun Honors College.

SPAN 3920 Survey of Spanish Literature (Honors) 1 (1) Independent study allowing honors students to pursue supervised research on a topic related to Hispanic American history, politics, geography, economics, social institutions, or artistic movements. Preq: Membership in Calhoun Honors College. Preq or concurrent enrollment: SPAN 3130.

SPAN 3930 The Hispanic World: Latin America (Honors) 1 (1) One-hour independent study to allow honors students to pursue supervised research on a topic related to Hispanic American history, politics, geography, economics, social institutions, or artistic movements. Preq: Membership in Calhoun Honors College. Preq or concurrent enrollment: SPAN 3080.

SPAN 3970 Creative Inquiry—Spanish 1-4 (1-4) Students focus on a special research area under the guidance of a faculty member. After acquiring the requisite background, students formulate hypotheses for a project group, develop a critical framework, and initiate research on a specific topic.

SPAN 3980 Directed Reading 1-3 (1-3) Directed study of selected topics in Spanish literature, language, and culture. May be repeated for a maximum of six credits. Preq: Consent of department chair.

SPAN 4010 New Spanish Fiction 3 (3) Study of selected readings by popular emerging and established authors of Spain, with emphasis on current cultural trends. Readings include, but are not limited to, detective novels, regional fiction, and fiction from marginalized groups in Spain. Preq: SPAN 3000-level literature course.

SPAN 4030 Spanish American Women Writers 3 (3) In-depth study of selected literary works by Spanish American women. Representative authors are studied within their philosophical and sociopolitical contexts. Preq: Spanish 3000-level literature course.

SPAN 4040 Nineteenth and Twentieth Century Spanish Literature 3 (3) Selected readings from major authors in Spain. Emphasis is on readings in poetry, theatre, short story, and novels from the 19th to the early 20th century. Preq: Spanish 3000-level literature course.

SPAN 4050 International Trade, Film, and Literature 3 (3) Readings and films on the social, economic, and political changes of the Hispanic world. Preq: Spanish 3000-level literature or culture course.

SPAN 4060 Hispanic Narrative Fiction 3 (3) Topics generated from Spanish America and/or Spain. Readings consider gender issues, the family, ethnicity, religion, politics, history, or socio-economic issues in the Hispanic world. Preq: Spanish 3000-level literature or culture course.

SPAN 4070 Hispanic Film 3 (3) Films are read as texts that mirror Hispanic society. Besides learning about cinematographic techniques in Spanish, topics include comparative analysis of film and literature, film as propaganda, film as blockbuster, and the cinematic depiction of social, cultural, and historical realities of Hispanic nations. Preq: Spanish 3000-level language, literature or culture course.

SPAN 4090 Comprehensive Writing in Spanish 3 (3) Study of stylistics in addition to grammar review; writing paragraphs, short compositions, and creative papers in Spanish on both fiction and non-fiction topics. Preq: Any 3000-level Spanish course.

SPAN 4110 Advanced Spanish Conversation and Composition 3 (3) Continuation of SPAN 3050 with emphasis on greater fluency and sophistication in oral and written expression. Preq: SPAN 3050.

SPAN 4150 Spanish for Health Professionals 3 (3) Medical concepts and terminology in Spanish; designed for students who plan to work in professions related to public health care. Preq: Six credits in Spanish at the 3000 or 4000 level.

SPAN 4160 Spanish for International Trade II 3 (3) Study of more complex business vocabulary, cultural concepts, and environment of Hispanic markets. Social, political, and economic issues related to Spanish-speaking countries and their current economies in global marketing. Economic geography of Hispanic countries, company organization, management, banking, investment, goods and services, and marketing. Preq: SPAN 3160.

SPAN 4170 Professional Communication 3 (3) Skill-oriented course, taught in a seminar format. Students learn established protocols for addressing various Spanish-speaking audiences and learn to give professional presentations in Spanish. Preq: Spanish 3000-level course.

SPAN 4180 Technical Spanish for Health Management Professionals 3 (3) Technical health communication course in Spanish with emphasis on managerial and business aspects of the international health industry. Preq: SPAN 4150 and six additional credits in Spanish at the 3000 or 4000 level.

SPAN 4190 Health and the Hispanic Community 3 (3) Study of cultural aspects of health and health services in Hispanic populations. Taught in Spanish. Preq: Six credits in Spanish at the 3000 or 4000 level.

SPAN 4200 Hispanic Drama 3 (3) Exploration of contemporary Hispanic theatre. The production and reception of the plays are analyzed paying particular attention to notions of dramatic genre. Focuses on the change and continuity of the plays as well as their historical, cultural, and ideological backgrounds. Preq: Two 3000-level Spanish literature or culture classes.

SPAN 4210 Spanish-American Modernism and Postmodernism 3 (3) In-depth study of Spanish-American modernism and postmodernism with focus on narrative and poetry. Preq: Any 3000-level Spanish literature course.

SPAN 4220 The Contemporary Spanish-American Novel 3 (3) New trends in the development of the Spanish-American novel from the 1940s to the present. Preq: Spanish 3000-level literature course.

SPAN 4230 Advanced Topics in Hispanic Linguistics 3 (3) Continuation of SPAN 3140 with advanced topics. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: SPAN 3140.

SPAN 4350 Contemporary Hispanic Culture 3 (3) Study of social, political, economic, and artistic manifestations of contemporary Hispanic culture. Preq: Spanish 3000-level civilization or culture course.

SPAN 4380 Spanish Honors Research 3 (3) Individual honors research conducted under the direction of Language Department faculty. May not be used to satisfy requirements for the major in Modern Languages–Spanish or Language and International Trade or the minor in Modern Languages. Preq: Junior standing and membership in Calhoun Honors College.

SPAN 4390 Spanish Honors Thesis 3 (3) Individual honors research conducted and thesis completed under the direction of Language Department faculty. May not be used to satisfy requirements for the major in Modern Languages–Spanish or Language and International Trade or the minor in Modern Languages. Preq: Junior standing and SPAN 4380 and membership in Calhoun Honors College.

SPAN 4490 Spanish Narrative Fiction (Honors) 1 (1) One-hour independent study to allow honors students to pursue supervised research on the socio-political climate under Franchos dictatorship, with emphasis on contemporary literary theory. Preq: Membership in Calhoun Honors College. Preq or concurrent enrollment: SPAN 4060.

SPAN 4492 Contemporary Latin American Novel (Honors) 1 (1) One-hour independent study to allow honors students to pursue supervised research in the literary and cinematographic images of magic realism. Preq: Membership in Calhoun Honors College. Preq or concurrent enrollment: SPAN 4220.

SPAN 4497 Creative Inquiry—Spanish 1-4 (1-4) Continuation of research initiated in SPAN 3970. Students complete their project and disseminate their research results. Preq: SPAN 3970.

SPAN 4498 Independent Study 1-3 (1-3) Directed study of selected topics in Spanish language, literature, and culture. May be repeated for a maximum of six credits. Preq: Consent of department chair.

SPAN 4499, 6990 Special Topics 3 (3) Study of timely or special topics in Spanish. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: Consent of department chair.

SOILS AND SUSTAINABLE CROP SYSTEMS


SSCS 1010 Survey of Soils and Sustainable Crop Systems 1 (1) Introduces majors to Soils and Sustainable Crop Systems concentrations, career paths, faculty, and University resources. Discusses academic and professional development skills. Preq: Soils and Sustainable Crop Systems field of study.
SSCS 3330 Agricultural Genetics 3 (3) Broad study of genetics as it applies to agricultural species and interacting organisms: weeds, pests, pathogens, beneficial organisms. Topics include genetic centers of origin, mutations and chromosomes in species domestication, transmission genetics and reproduction, genetics of qualitative and quantitative traits, genetics of development, and stress responses, agricultural omics. Preq: BIOL 1040 and BIOL 1060; or BIOL 1110.

SSCS 3350 Agricultural Biotechnology 3 (2) Strategies for the best use of biotechnology and genetic resources to alleviate constraints in global hunger, environmental sustainability, and health. Includes genetic enhancement and chromosome engineering of plant, animal, and microbial systems; issues related to commercial implementation; the impact on developing countries, environmental impact, and governmental policies. Preq: GEN 3000. Coreq: SSCS 3351.

SSCS 3351 Agricultural Biotechnology Laboratory 0 (2) Non-credit laboratory to accompany SSCS 3350. Coreq: SSCS 3350.

SSCS 3500 Practicum 1-6 (1-6) Preplanned practical or research experience related to student-selected Soils and Sustainable Crop Systems concentration. Practicum is undertaken with an approved advisor or agency. May be repeated for a maximum of six credits. Preq: Soils and Sustainable Crop Systems field of study.

SSCS 4010 Academic and Professional Development 1 (1) Soils and Sustainable Crop Systems majors evaluate, critique, and update portfolios for presentation to future employers. Students work with Career Center and instructor to develop interviewing skills and resumes, access professional goals, and identify skills necessary for reaching goals to be competitive. The importance of ethics in soils and sustainable crop systems careers is discussed.

SSCS 4450, 6450 Regulatory Issues and Policies 1 (1) Introduction to regulations of agricultural practices and implementation of novel technologies and products. Emphasizes patenting biotechnology inventions and ethical issues. Includes survey of state and governmental agencies with responsibilities to avoid risk to humans, non-target organisms, and preservation of food safety, agricultural resources, and natural ecosystems.

SSCS 4500, 6500 Agricultural Biosystems and Risk Assessment 1 (1) In-depth discussion of recent articles on agricultural biotechnology and related issues. Independent and comprehensive literature survey and critical discussions on introduction of modified organisms into biological systems, agricultural adoption, and bio-risk assessment. Discussions relate to scientific discovery, application, and regulatory issues of agricultural biotechnology.

SSCS 4510, 6510 Agricultural Biotechnology and Global Society 1 (1) In-depth discussion of recent articles on agricultural biotechnology and related global issues. Includes independent and comprehensive literature survey and critical discussions on implementation of biotechnology products in the context of world agricultural production systems and economics. Discusses the role of international agencies and social and ethical issues.

SSCS 4960 Selected Topics in Creative Inquiry 1-2 (1-2) Disciplinary and multidisciplinary projects with the goal of developing the student’s ability to discover, analyze, evaluate, and present data. Students are required to document their activities in their ePortfolios. May be repeated for a maximum of six credits. Preq: Consent of instructor.

SSCS 4970 Selected Topics in Creative Inquiry Laboratory 1-2 (1-2) Disciplinary and multidisciplinary research project with the goal of developing the student’s ability to conduct research along with analysis, evaluation and presentation of results. Students are required to document their research activities in their ePortfolios. May be repeated for a maximum of six credits. Preq: Consent of instructor.

SCIENCE AND TECHNOLOGY IN SOCIETY

STS 1010 Survey of Science and Technology in Society 3 (3) Surveys historical, philosophical, and social studies of science; introduces the basic requisites for scientific and technological literacy and considers the problems of responsible participation in a scientifically and technologically advanced society.

STS 1020 Ideas, Machinery, and Society 3 (3) Interdisciplinary discussion course introducing the fundamental themes of STS: the influence of social groups on the development of science and technology and the effects of science and technology on society.

STS 1200 Topics in Science and Technology in Society 3 (3) Explores ethical, policy and social issues raised by the complex interactions among science, technology and society. Topics vary depending on the instructor.

STS 1410 Scientific Skepticism 3 (3) Investigation of unusual phenomena using scientific methodology. Explores the interplay of science, pseudoscience, and society through development of critical thinking skills. Discussion-oriented course that focuses on case studies of extraordinary claims.

STS 2150 A Critical Approach to the Global Challenge of Technological Revolutions 3(3) Takes a broad, humanistic perspective for understanding the challenges posed by scientific and technological revolutions, including innovations like nanotechnology, environmental preservation, biotechnology, digital technology, and nuclear fusion. Students learn skills and strategies for thinking critically about the nature of radical change in science and technology as it affects society.

STS 2160 Critical Analysis of a Current STS Issue 3(3) Critical analysis of a current science and technology issue with significant controversial and societal consequences (e.g., global warming, methods of energy production). Students retrieve, analyze, evaluate, present, and discuss relevant information to develop basic competence in science and mathematics and in the evaluation of scientific and technological issues. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: Sophomore standing.

STS 3010 Science in Context 3 (3) Develops an understanding of the social character of scientific activity. Through the study of current work by leading historians, sociologists, and philosophers of science, students develop a comprehensive grasp of the social foundations of modern scientific inquiry.

STS 3030 Technology, Culture and Society 3 (3) Addresses issues that arise from the interaction of technology with its social and cultural context. To better understand how technologies relate to societies and cultures, students learn to use the analytic tools required to evaluate the significance of technology, as well as its relations to social endeavors and cultural endeavors.

STS 4980 Creative Inquiry 1-3 (1-3) Students conduct research into Science and Technology in Society with a team of their peers under the direction of a faculty member. The collaborative character of research in science and technology in society is emphasized. Includes Honors sections. May be repeated for a maximum of 12 credits.

STS 4990 Independent Study 1-3 (1-3) Study of selected topics under direction of a faculty member selected by the student. Student and faculty together develop a course of study designed for the individual student and approved by the STS program coordinator prior to registration. May be repeated for a maximum of six credits. Students are expected to have completed their General Education Science and Technology in Society Requirement before enrolling in this course. Preq: Consent of instructor.

THEATRE

Theatre Professors: D.J. Hartmann, Chair; Associate Professors: K.L. Johnson, A.M. Penna, S. Robert; Assistant Professor: K. Seymour; Lecturers: J. Adkins, C. Collins

THEA 1950 Creative Inquiry—Theatre 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor.

THEA 2100 Theatre Appreciation 3 (3) Examination of the theatre event approached through historical context, play reading, analysis of production practices, and field trips to live dramatic performances. Includes Honors sections.

THEA 2670 Stage Makeup Techniques 3 (2) Practical study of basic stage makeup techniques for the acting student including corrective makeup, modeling with paint, three-dimensional makeup, prosthesis with latex, and makeup for other media. Preq: THEA 2671. Coreq: THEA 2671.

THEA 2671 Stage Makeup Techniques Laboratory 0 (1) Non-credit laboratory to accompany THEA 2670. Coreq: THEA 2670.

THEA 2770 Production Studies in Theatre 3 (3) Study of technical production and design including scenery, costume, and lighting through the examination of plays in production.

THEA 2780 Acting I 3 (2) Fundamentals of acting; basic stage techniques; exercises in interpretation, improvisation, characterization; experience in supervised scene study, Coreq: THEA 2781.
THEA 2880 Introduction to Computer-Aided Drafting 3 (2) Introduction to the basics of computer-aided drafting. Software applications include AutoCAD, Vectorworks, and WYSIWYG. Coreq: THEA 2881.

THEA 2881 Introduction to Computer-Aided Drafting Laboratory 0 (2) Non-credit laboratory to accompany THEA 2880. Coreq: THEA 2880.

THEA 3150 Theatre History I 3 (3) Historical survey of Western theatre. Emphasizes the music with attention to production detail, historical perspective, and social milieu. May also be offered as MUSC 3080.

THEA 3160 Theatre History II 3 (3) Historical survey of Western theatre. Emphasis is placed on the changing roles of the playwright, director, actor, technician, and spectator from antiquity to the Renaissance. Coreq: Sophomore standing.

THEA 3740 Stage Movement for Actors Laboratory 0 (3) Non-credit laboratory to accompany THEA 3740. Coreq: THEA 3740.

THEA 3770 Stagecraft 3 (2) Theory and practice of stage design and technology. Coreq: THEA 3771.

THEA 3950 Creative Inquiry—Theatre 1 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor.

THEA 4760 Stage Directing II 3 (2) Continued study in the art of stage directing emphasizing leading contemporary theory and methodology. Cumulates in the production of a one-act play for public presentation. Preq for THEA 4760: Coreq: THEA 4760.

THEA 4770 Stage Design 3 (2) Study and practice in stage design, including drafting, graphics, drawing, rendering, scene painting, and lighting. Coreq: THEA 4770.

THEA 4780 Stage Design Laboratory 0 (3) Non-credit laboratory to accompany THEA 4780.

THEA 4790 Acting Ensemble 1 (3) Performance opportunities in the area of theatre for young audiences. Students are members of a theatrical touring troupe and perform in a variety of spaces and locations. May be repeated for a maximum of four credits. Preq: Consent of instructor by way of audition only.

THEA 4800 Stage Management 3 (3) Examines the vital part stage managers play in every theatrical production including organizing rehearsals, facilitating communication between director and designers, and calling cues during performances. Introduces the art and craft of stage management by incorporating Performance Arts Department and Brooks Center productions.
Courses of Instruction

THEA 4800 Advanced Scene Study for Actors (3) Students interpret and perform characters in complex plays written in heightened styles and integrating period movement into the various genres and styles of plays throughout major periods of theatre history. Styles include Elizabethan, Comedy of Manners, Farce, Chekhov Realism, Absurdism, Mamet, and various contemporary approaches. Preq: THEA 4790 or consent of instructor. Coreq: THEA 4801.

THEA 4801 Advanced Scene Study for Actors Laboratory (3) Non-credit laboratory to accompany THEA 4800. Coreq: THEA 4801.

THEA 4870, 6870 Stage Lighting I (3) Theory and practice of stage lighting through an understanding of various lighting instruments, lighting control systems, and execution of lighting designs. Coreq: THEA 4871, 6871.

THEA 4871, 6871 Stage Lighting Laboratory (1) Non-credit laboratory to accompany THEA 4870, 6870. Coreq: THEA 4870, 6870.

THEA 4880 Stage Lighting II (3) Study of advanced stage lighting theories and practices including script analysis, technology, software and execution of lighting designs. Other topics include unions and contracts, shop orders, and assisting the lighting designer. Preq: THEA 4870. Coreq: THEA 4881.

THEA 4881 Stage Lighting II Laboratory (3) Non-credit laboratory to accompany THEA 4880. Coreq: THEA 4880.

THEA 4950 Creative Inquiry—Theatre 1 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Preq: Consent of faculty member/mentor.

THEA 4970, 6970 Scene Painting (3) Practical study of basic painting techniques for the theatre including layout, proper use of materials, painting styles, and texturing techniques. Coreq: THEA 4971, 6971.

THEA 4971, 6971 Scene Painting Laboratory (1) Non-credit laboratory to accompany THEA 4970, 6970. Coreq: THEA 4970, 6970.

THEA 4990, 6990 Independent Studies (1-3) Tutorial work for students with special interests outside the scope of existing courses. May be repeated for a maximum of six credits. Preq: Consent of department chair.

WILDLIFE AND FISHERIES BIOLOGY


WFB 1020 Methods of Wildlife and Fisheries Biology (1) Introduction to methodology used in aquaculture, fisheries science, and wildlife management. Students are introduced to terminology, techniques, laws, and legislation. Skills with dimensions, units, computations, and technical communications as applied to aquaculture, fisheries, and wildlife. Preq: Wildlife and Fisheries Biology field of study. Preq or concurrent enrollment: WFB 1020.

WFB 3000 Wildlife Biology I (3) Natural history, biology, and conservation of wildlife managed by natural resource agencies. Attention is given to those factors important in the management and conservation including species distribution and abundance, habitat requirements, and life-history characteristics. Principles and problems associated with conservation of selected wildlife species are covered. Preq: One of the following combinations: Biol 1030 and Biol 1050 and Biol 1040 and Biol 1060; OR Biol 1100 and Biol 1110.

WFB 3010 Wildlife Biology Laboratory I (3) Identification of wildlife species with emphasis on game and non-game wildlife species managed or protected by state and federal agencies. One or more required weekend field trips will be scheduled. Preq: Wildlife and Fisheries Biology field of study. Preq or concurrent enrollment: WFB 3000.

WFB 3060 Introduction to Wildlife Conservation (2) Examines the fundamental thinking upon which modern conservation programs have been built.

WFB 3070 Hunting and Wildlife Management (1) Hunting techniques used to harvest renewable wildlife resources are examined with respect to their sound management practices. The effects of selected hunting regulations on wildlife populations, safety, and ethics are discussed. Preq: Junior standing.

WFB 3130 Conservation Biology I (3) Study of the biological bases for the conservation of flora, fauna, and habitats. Biological factors that influence the decision-making process are also addressed. Preq: Biol 1030 and Biol 1050 and Biol 1040 and Biol 1060; or Biol 1100 and Biol 1110.

WFB 3500 Principles of Fish and Wildlife Biology I (3) Introduction to principles of fisheries and wildlife biology on which sound management practices are based. Interrelationships of vertebrate and invertebrate biology, habitat, and population dynamics are covered. Preq: One of the following combinations: Biol 1030 and Biol 1050 and Biol 1040 and Biol 1060; OR Biol 1100 and Biol 1110.

WFB 4100, 6100 Wildlife Management Techniques I (3) Covers field and laboratory methods commonly used in wildlife management and research. Students interact with wildlife professionals. Topics include research methodology, estimating wildlife population characteristics, condition measures, and food habits; species determination, sex, and age; capture; population monitoring methods; GIS and mapping techniques, habitat evaluation and improvement. Preq: WFB 3000 and WFB 3500. Coreq: WFB 4101, 6101.

WFB 4101, 6101 Wildlife Management Techniques Laboratory (0) Non-credit laboratory to accompany WFB 4100, 6100. Coreq: WFB 4101, 6101.

WFB 4120, 6120 Wildlife Management I (3) Basic principles and general practices of wildlife management and conservation are covered. Major problems concerning the management of wildlife resources, with emphasis on upland game species. Laboratory work includes practical work on the Clemson University woodlands and field trips to several areas where wildlife management is being practiced. Includes Honors sections. Preq: WFB 3000 and WFB 3500. Coreq: WFB 4121, 6121.

WFB 4121, 6121 Wildlife Management Laboratory I (3) Non-credit laboratory to accompany WFB 4120. Coreq: WFB 4120, 6121.

WFB 4140, 6140 Wildlife Nutritional Ecology I (3) Concepts of how terrestrial wildlife obtains and utilizes energy and nutrients in wild ecosystems are taught. Energy and nutrient availability are discussed in the ecological context of distribution, flow, and cycling in natural and modified foraging areas. Physiology of digestion is discussed for major homeotherms. Preq: WFB 3000 and WFB 3500.

WFB 4150, 6150 Quality Deer Management 3 (3) Quality Deer Management (QDM) is a stewardship philosophy that provides desirable hunting experiences by producing white-tailed deer herds with a natural age and sex structure and population size appropriate for habitat conditions. The course will emphasize herd management, habitat management, hunter management and herd monitoring. Online course. Preq: Junior standing.

WFB 4160, 6160 Fishery Biology I (3) Principles underlying freshwater fish production. Introduction to major groups of freshwater fishes and their habitats. Topics include identification, age and growth, fecundity, food habits, populations estimation, environmental evaluation, management practices, and fish culture. Preq: WFB 3000 and WFB 3500. Coreq: WFB 4161, 6161.

WFB 4161, 6161 Fishery Biology Laboratory I (3) Non-credit laboratory to accompany WFB 4160, 6160. Coreq: WFB 4160, 6160.

WFB 4180 Fishery Conservation 3 (3) Survey of conservation efforts directed toward freshwater and marine fisheries resources. Topics include threatened, endangered, and over-exploited species and introductions of exotic species. Preq: WFB 3000 and WFB 3500.

WFB 4300, 6300 Wildlife Conservation Policy I (3) Deals with the ecological rationale and management implications of public policy designed for the conservation of American wildlife resources. Emphasis is on managed-land issues. Preq: WFB 3000 and WFB 3500.

WFB 4400 Non-Game Wildlife Management I (3) Basic principles and general practices of non-game wildlife management are covered. Emphasis is placed on those principles and practices most appropriately used by state agencies in their management programs for non-game species, along with real-world problems associated with implementation of such programs. Preq: WFB 3000 and WFB 3500.
WFB 4440, 6440 Wildlife Damage Management 3 (2) Covers the philosophical, sociological, ecological, and economical basis for controlling damage caused by animals problem wildlife populations. Emphasis is placed on fundamentals of prevention and control of damage caused by vertebrate species, especially mammals and birds. Includes interaction with federal and state agencies and private consultants. Preq: WFB 3000 and WFB 3500. Coreq: WFB 4444, 6444.

WFB 4441, 6441 Wildlife Damage Management Laboratory 0 (3) Non-credit laboratory to accompany WFB 4440, 6440. Coreq: WFB 4444, 6444.

WFB 4450 Urban Wildlife Management 3 (3) Focuses primarily on social, scientific, and ecological aspects of managing wildlife in the urban setting. Basic wildlife management techniques as well as urban planning for wildlife are covered. Preq: WFB 3000 and WFB 3500.

WFB 4500, 6500 Aquaculture 3 (3) Basic aquacultural techniques applied to freshwater and marine organisms; past and present culture of finfishes and shellfishes around the world; principles underlying fish production; water quality, feeding, and nutrition as they influence production of cultured aquatic organisms. Preq: WFB 3000 and WFB 3500.

WFB 4600, 6600 Warmwater Fish Diseases 2 (2) Study of diseases in warmwater fish including infectious and noninfectious processes. Preq: WFB 3000 and WFB 3500.

WFB 4620, 6620 Wetland Wildlife Biology 3 (3) Study of wetland wildlife habitats, emphasizing classification by physical, chemical, and biological characteristics; importance of wetland habitat for management and production of wetland wildlife species. Offered fall semester only. Includes Honors sections. Preq: WFB 3000 and WFB 3500.

WFB 4630 Directed Research in Aquaculture, Fisheries, and Wildlife Biology 1 (3) Research problems in selected areas of aquacultural biology, or wildlife sciences to introduce students to experimental design, research techniques, and presentation of research results. May be repeated for a maximum of three credits. Preq: Junior standing and consent of instructor.

WFB 4680, 6680 Herpetology 4 (3) Physiology, functional morphology, ecology, evolution, biomechanics and current literature of amphibians and reptiles. Laboratory study examines morphology and identification of world families and United States genera, as well as southeastern species. Field trips are required. Preq: BIOL 1040 and BIOL 1060; or BIOL 1110. Coreq: WFB 4681, 6681.

WFB 4681, 6681 Herpetology Laboratory 0 (3) Non-credit laboratory to accompany WFB 4680, 6680. Coreq: WFB 4680, 6680.

WFB 4690, 6690 Aquatic Insects 3 (1) Identification, life history, habitats, and interrelationships of aquatic insects; techniques of qualitative field collecting; important literature and research workers. Includes Honors sections. Preq: ENT 3010. Coreq: WFB 4691, 6691.

WFB 4691, 6691 Aquatic Insects Laboratory 0 (6) Non-credit laboratory to accompany WFB 4690. Coreq: WFB 4690, 6690.

WFB 4750, 6750 Economics of Wildlife Management and Policy 3 (3) Integrated approach to the study of the economics of wildlife. Topics include determination of market and nonmarket value, single and multiple species management, enterprise cost and returns, marketing wildlife, leasing methods, complementarity and competitiveness with agricultural and forestry enterprises, and timber and crop damage cost estimates and control. Preq: APEC 2020 or ECON 2000 or ECON 2110 or FOR 3040 or WFB 3060.

WFB 4760, 6760 Field Methods in Avian Monitoring and Conservation 3 (1) Field-intensive introduction to the identification, ecology, and conservation of North American birds and their habitats with an emphasis on southeastern species. Includes avian survey and census techniques. Two or three weekend (Friday-Sunday) field trips are required. Preq: BIOL 1040 and BIOL 1060; or BIOL 1110. Coreq: WFB 4761, 6761.

WFB 4761, 6761 Field Methods in Avian Monitoring and Conservation Laboratory 0 (4) Non-credit laboratory to accompany WFB 4760, 6760. Coreq: WFB 4760, 6760.

WFB 4930 Selected Topics 1-4 (1-4) Specialized topics which explore current areas of research and management in aquaculture, fisheries science, or wildlife management are examined in lecture/seminar format. May be repeated for a maximum of ten credits, but only if different topics are covered. Preq: Junior standing and consent of instructor. Coreq: WFB 4931, 6931.

WFB 4931 Selected Topics Laboratory 0 (99) Non-credit laboratory to accompany WFB 4930. Coreq: WFB 4930.

WFB 4950 Senior Portfolio 1 (1) Collection of Web-based materials representing the creative and critical work on particular issues with emphasis on in-depth exploration of special topics which explore current areas of research and management in aquaculture, fisheries science, or wildlife management. May be repeated for a maximum of ten credits, but only if different topics are covered. Preq: Senior standing and consent of instructor. Coreq: WFB 4951, 6951.

WS 2300 Women's Lives 3 (3) Comparative anthropological study of women and their status in developing countries around the world. A survey of women's daily lives in a global context, emphasizing education, economics, and the environment. Case studies include microfinance, literacy, reproductive rights and practices, and the impact of religious fundamentalism on women. Preq: Sophomore standing.

WS 3490 Theories of Gender and Sexuality 3 (3) Examines the philosophical dimensions of contemporary debates about the relation of sex, gender, and sexuality.

WS 3900 Women's Studies Internship 3 (8) Faculty-supervised internship provides Women's Studies minors with relevant work experience, mentoring, and networking opportunities with local leaders in business, government, and nonprofit organizations. Preq: Women's Studies minor, Junior standing, and consent of internship coordinator.

WS 4010 Senior Seminar 3 (3) In-depth exploration and analysis of a special topic in the areas of women's and leadership studies, culminating in a senior project documented in written, oral, visual and/or multimedia presentations. Topics vary based on student research interests. Preq: Senior standing in Women's Leadership.

WS 4230, 6230 Women in the Developing World 3 (3) Comparative anthropological study of women and their status in developing countries around the world. A survey of women's daily lives in a global context, emphasizing education, economics, and the environment. Case studies include microfinance, literacy, reproductive rights and practices, and the impact of religious fundamentalism on women. Preq: Sophomore standing.

WS 4360, 6360 Feminist Literary Criticism 3 (3) Introduces the germinal works of feminist literary theory and criticism. Outlines the development of modern literary criticism by studying feminist versions of the major critical methodologies. Preq: ENGL 3100.

WS 4590 Selected Topics in Women's Studies 1-3 (1-3) Topics change from semester to semester and are announced prior to registration. May be repeated for a maximum of six credits, but only if different topics are covered.

WS 4900 Creative Inquiry 1-3 (1-3) Small group work on particular issues with emphasis on involving students in research. Content varies. May be repeated for a maximum of six credits. Preq: Consent of instructor.

WS 4950 Independent Study 1-3 (1-3) Course of study designed by the student in consultation with a faculty member who agrees to provide guidance, discussion, and evaluation of the project. Student must confer with faculty member prior to registration. May be repeated for a maximum of six credits. Preq: Consent of instructor.
Faculty

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Abdellatif, Ahmed, Adjunct Assistant Professor, Bioengineering.
MBBCH, 1991, MS, 1997, Alexandria University (Egypt);
MS, 2007, PhD, 2007, University of Louisville
Abercrombie, John G., Senior Lecturer, Biological Sciences. BS,
Furman University, 1995; MS, Clemson University, 2001
Abernathy, James H., III, Adjunct Associate Professor, Industrial
Engineering. BS, University of the South, 1995; MPH, 1996,
MD, 2001, University of Alabama-Birmingham
Abou-Samra, Sulafa, Lecturer, Languages. MA, University of
Texas, 2002
Abu-Farha, Fadi K., Assistant Professor, Automotive Engineering.
BSc, University of Jordan (Jordan), 2001; PhD, University
of Kentucky, 2007
Adams, Clementina R., Professor, Languages. BA, University of
Atlántico (Colombia), 1969; MS, 1974, PhD, 1984, Florida
State University
Adams, Tim O., Adjunct Assistant Professor, School of
Agricultural, Forest, & Environmental Sciences. BS, 1977, MS,
1979, North Carolina State University; PhD, Clemson
University, 1992
Adams, Warren P., Professor, Mathematical Sciences. BS, Lewis
University, 1979; MS, 1981, PhD, 1984, Virginia Tech
Adelberg, Jeffrey W., Professor, School of Agricultural, Forest,
& Environmental Sciences. BS, 1982, MS, 1987, Rutgers
University; PhD, Clemson University, 1993
Adler, Peter H., Professor, School of Agricultural, Forest, &
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1976; MS, 1979, PhD, 1983, Pennsylvania State University
Agudelo, Paula, Associate Professor, School of Agricultural,
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Colombia (Colombia), 1996; MSc, University of Caldas
(Colombia), 2000; PhD, University of Arkansas, 2004
Albright, Dustin G., Lecturer, School of Architecture. BS,
Washington and Lee University, 2003; MS, 2006, MArch,
2008, Virginia Tech
Alexander, John C., Jr., Breazeale Professor of Financial Planning,
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1985, Stetson University; PhD, Florida State University,
1991
Alexander, Kim E., Executive Director, Automotive Safety
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Clemson University
Alexis, Frank, Assistant Professor, Bioengineering. BSc, 1999,
MSc, 2000, University of Montpellier II (France); PhD,
Nanyang Technological University (Singapore), 2006
Alexov, Emil G., Professor, Physics & Astronomy. MS, 1984, PhD,
1990, Sofia University (Bulgaria)
Allard, Cora M., Lecturer, Biological Sciences. BS, Millikin
University, 2000; MS, University of Kentucky, 2003
Allen, Craig R., Adjunct Associate Professor, School of Agricultural,
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University of Wisconsin, 1989; MS, Texas Tech University,
1993; PhD, University of Florida, 1997
Allen, Dennis M., Adjunct Professor, School of Agricultural, Forest,
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1974, PhD, 1978, Lehigh University
Allen, Jeffery S., Adjunct Assistant Professor, School of
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State University, 1983; MS, University of South Carolina,
1986; PhD, Clemson University, 2005
Allen, Lawrence R., Dean, College of Health, Education &
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Management. BS, West Chester State University, 1970; MS,
1974, PhD, 1979, University of Maryland
Alley, Pamela R., Senior Lecturer, Psychology. BA, 1975, MA,
1978, PhD, 1983, University of Connecticut
Alley, Thomas R., Professor, Psychology. BA, 1975, BS, 1975,
Pennsylvania State University; MA, 1979, PhD, 1981,
University of Connecticut
Allison, David J., Alumni Professor, School of Architecture. BS,
1978, MArch, 1982, Clemson University; FAIA
Allred, Sherri T., Lecturer, English. BA, University of North
Carolina-Charlotte, 1991; MA, Clemson University, 2007
Altstatt, Hamilton S., Assistant Professor, Performing Arts. BS,
Drexel University, 1983
Amerson, Roxanne, Assistant Professor, School of Nursing. BS,
Regents College, 1995; MSN, Clarkson College, 1999; PhD,
Clemson University, 2009

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Fudan University (China); PhD, University of Michigan,
1997
An, Yuehuei, Adjunct Associate Professor, Bioengineering. MD,
Harbin Medical University (China), 1983; MM, Beijing
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Anctil, Annick, Assistant Professor, Environmental Engineering
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(Canada), 2005; MS, 2007, PhD, 2011, Rochester Institute
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Anderson, Daniel M., Lecturer, PRTM Leisure Skills. BS,
Western Illinois University, 1997; MPRTM, Clemson
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Anderson, David P., Adjunct Professor, Chemical & Biomolecular
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1981, University of Massachusetts
Anderson, Denise M., Associate Professor, Parks, Recreation &
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MS, Eastern Illinois University, 1993; PhD, University of
Illinois, 2000
Anderson, Henry K., Lecturer, School of Accountancy and
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University, 1984; CPA (Georgia and South Carolina), CMA
Anderson, Paul C., Associate Professor, History. BA, University
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Andrae, John G., Associate Professor, School of Agricultural, Forest,
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MS, Oklahoma State University, 1995; PhD, University
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Andrew, John R., Jr., Professor, History. BA, University of
North Carolina, 1987; MA, Clemson University, 1993;
PhD, University of Georgia, 1997
Andrews, Phillip A., Assistant Professor, Military Leadership;
Major, U.S. Army. BA, University of South Carolina, 1999
Andrus, Ronald D., Professor, Civil Engineering. BS, 1983,
MS, 1986, Brigham Young University; PhD, University
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Anido, Raquel, Assistant Professor, Languages. Licenciatura en
Derecho, University of Barcelona (Spain), 2003; PhD, Johns
Hopkins University, 2010
Anker, Jeffrey N., Assistant Professor, Chemistry. BS, Yale
University, 1998; PhD, University of Michigan, 2005
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BS, Medical University of South Carolina, 1995; MS, 2000,
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Apon, Amy W., Division Chair and Professor, School of Computing.
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1996; PhD, University of Delaware, 2002
Argraves, William S., Adjunct Professor, Bioengineering. BS,
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College, 1976; MS, Abilene Christian University, 1978;
PhD, Virginia Tech, 1989
Arthur-Banning, Skye G., Associate Professor, Parks, Recreation
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1997; MS, Oregon State University, 1999; PhD, University
of Utah, 2005
Arya, Dev P., Professor, Chemistry. BS, University of Delhi
(India), 1996; PhD, Northeastern University, 1996
Ashley-Ross, Miriam A., Adjunct Associate Professor, Biological
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University of California-Irvine, 1994
Ashton, Susanna M., Professor, English. BA, Vassar College,
1989; MA, 1993, PhD, 1998, University of Iowa
Askew, George R., Associate Director, Clemson University Public
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Ault, Nicholas W., Lecturer, School of Architecture. BS, Bowling
Green State University, 2003; MArch, University of North
Carolina-Charlotte, 2006
Axelrod, Ysaaca D., Assistant Professor, Teacher Education. BA,
Haverford College, 1999; MA, University of California,
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University of Mississippi
Baatz, John E., Adjunct Professor, Bioengineering. BS, 1983, PhD,
1988, University of Cincinnati
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Baicu, Catalin F., Adjunct Assistant Professor, Bioengineering.
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Baier, Scott L., Associate Professor, Economics. BS, 1988, MA,
1991, Bowling Green State University; PhD, Michigan State
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Bailey, Beatrice N., Professor, Teacher Education. BA, Longwood
College, 1978; MA, Bethany Theological Seminary, 1981;
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Bain, Lisa J., Professor, Biological Sciences. BS, University of
Georgia, 1992; PhD, North Carolina State University, 1997
Baker, Caitlin E., Lecturer, Communication Studies. BA,
Clemson University, 2010; MS, North Carolina State
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Baker, George H., Adjunct Professor, Bioengineering. BS,
University of Michigan, 1996; MD, Albany Medical
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Baker, Susan S., Adjunct Assistant Professor, Food, Nutrition, &
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Baker, Thomas L., Associate Professor, Marketing. BBA, 1984,
MPA, 1986, University of Kentucky; PhD, Florida State
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Baldwin, Elizabeth D., Associate Professor, Parks, Recreation
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Miami University, 1992; PhD, University of Maine, 2006
Baldwin, Robert F., Associate Professor, School of Agricultural,
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MS, George Mason University, 1992; PhD, University of
Maine, 2005
Baldwin, William S., Professor, Biological Sciences. BS, Central
Michigan University, 1989; PhD, North Carolina State
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Ballato, Arthur D., Adjunct Professor, Electrical & Computer
Engineering. BS, Massachusetts Institute of Technology,
1958; MS, Rutgers University, 1962; PhD, Polytechnic
Institute of New York, 1972
Ballato, John M., Professor, School of Materials Science &
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University
Bandara, Damitha, Visiting Assistant Professor, Mathematical
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MS, 2010, PhD, 2012, Clemson University
Bao, Hua, Adjunct Professor, School of Materials Science &
Engineering. BS, 1984, MS, 1989, Tianjin University (China);
PhD, East China University of Science and Technology
(China), 1995
Barattoni, Luca, Assistant Professor, Languages. BA, University
of Bologna (Italy), 1996; MA, University of North Carolina,
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Holt, Albert Hamilton, PhD, Professor Emeritus of English
Horn, David N. S., PhD, Professor Emeritus of Forest Resources
Hood, Clarence Elam, Jr., PhD, Professor Emeritus of Agricultural and Biological Engineering
Hood, William Michael, PhD, Professor Emeritus of Entomology
Hook, Donal Delose, PhD, Professor Emeritus of Forestry
Horton, Paul Mackey, PhD, Professor and Assistant Director of Extension Emeritus
House, Verne Wadson, PhD, Professor Emeritus of Agricultural and Applied Economics
Howard, Gordon Edward, PhD, Professor Emeritus of Parks, Recreation and Tourism Management
Howe, Linda A., PhD, Associate Professor Emerita of Nursing
Howell, Nelda Kay, MEd, Professor Emerita of Home Economics
Hovle, Elizabeth H., Professor Emerita, Packaging Science
Hubbard, Julius Clifford, Jr., MS, Alumni Professor Emeritus of Textiles
Hudson, Larry Wilson, PhD, Professor Emeritus of Animal and Veterinary Sciences
Hudson, Mark Richards, MFA, Professor Emeritus of Art
Huey, Cecil O., Jr., PhD, Professor Emeritus of Mechanical Engineering
Huffman, John W., PhD, Professor Emeritus of Chemistry
Hughes, Buddy Lee, PhD, Professor Emeritus of Animal and Veterinary Sciences
Hughes, Robbie Blankenship, EdD, Professor Emerita, School of Nursing
Hunter, Jannis Gerrard, Distinguished County Agent Emeritus
Hunter, Oren Franklin, Sr., MS, Professor Emeritus of Textiles, Fiber, and Polymer Science
Hunter, Robert Howard, MFA, Professor Emeritus of Visual Arts
Hupp, Harold D., PhD, Professor Emeritus of Animal and Veterinary Sciences
Hurt, N. Jane, Ph.D., Associate Professor Emeritus of Architecture
Hutton, Dale Jovan, MArch, Professor Emeritus of Architecture
Idol, John Lane, Jr., PhD, Alumni Professor Emeritus of English
Irwin, John Waltrip, MAEd, Extension Animal Sciences Emeritus
Isebill, Clinton H., EdD, Professor Emeritus of Leadership, Technology, and Counselor Education
Jacobs, David P., PhD, Professor Emeritus of School of Computing
Jacques, John David, MPhil, Professor Emeritus of Architecture
James, Ann E., PhD, Professor Emeritus of Parks, Recreation, and Tourism Management
James, Willie Romando, PhD, Professor Emeritus of Family and Youth Development
James, Zoe Seabrook, MAEd, Distinguished County Extension Agent Emerita
Jamison, Robert E., PhD, Professor Emeritus Mathematical Sciences
Jarvis, James P., PhD, Professor Emeritus of Mathematical Sciences
Jenkins, Gloria, MS, County Extension Agent Emerita
Jenkins, Thomas C., PhD, Professor Emeritus of Animal & Veterinary Sciences
Jensen, Arthur Kenneth, PhD, Professor Emeritus of Vocational-Technical Education
Johnson, Albert W., PhD, Professor Emeritus of Entomology, Soils, and Plant Sciences
Johnson, Bruce C., MS, County Extension Agent Emeritus
Johnson, Ronnie J., PhD, Professor Emeritus of Agricultural, Forest and Environmental Sciences
Johnson, Ruby Carolyn, MS, County Extension Agent Emerita
Johnson, Steven D., MS, Librarian Emeritus
Jones, Emory Valentine, MS, County Extension Director Emeritus
Jones, Jack Endfield, PhD, Professor Emeritus of Poultry Science
Jones, Joe Kenneth, BS, State Leader Emeritus of 4-H and Youth Development Programs, Professor Emeritus of Animal Science
Jones, John, MS, County Extension Director Emeritus
Jordan, Johnny Wayne, PhD, Professor Emeritus of Agricultural and Applied Economics
Josey, James Larry, PhD, Professor Emeritus of Civil Engineering
Kahl, Kandise H., PhD, Professor Emeritus of Agricultural and Applied Economics
Kanst, John Joseph, PhD, Professor Emeritus of Management
Kearney, John S., JR., County Extension Agent Emeritus
Keese, Lee Shirley, BS, County Extension Agent Emeritus
Keinath, Thomas M., PhD, Dean, College of Engineering and Science and Professor Emeritus of Environmental Engineering
Keller, Deloris Olivia, Distinguished County Agent Emerita
Keller, Don F., PhD, Professor Emeritus of Leadership, Technology, and Counselor Education
Keller, Frederick Jacob, PhD, Professor Emeritus of Physics
Kelly, Mary Ann, EdD, Professor Emerita of Nursing Science
Kennedy, John Willis, PhD, Alumni Emeritus of Mathematical Sciences
Kennedy, John M., Professor Emeritus, Mechanical Engineering
Kennedy, William Joseph, PhD, Professor Emeritus of Industrial Engineering
Kessler, George D., PhD, Professor Emeritus of Forest and Natural Resources
Kew, Jennifer D., PhD, Professor Emerita of Mathematical Sciences
Kilbourne, William E., PhD, Professor Emeritus of Marketing
Kimbler, Delbert L., Jr., PhD, Professor Emeritus of Industrial Engineering
Kinder, Andrew Jackson, BA, County Extension Agent Emeritus
King, Donnie R., PhD, Professor Emeritus of Biostereoscopy Engineering
King, Grady Ansel, PhD, Professor Emeritus of Horticulture
King, Samuel C., PhD, Professor Emeritus of Languages
Kingman, Alan Randall, PhD, Professor Emeritus of Horticulture
Kingsland, Gribble Chapman, PhD, Professor Emeritus of Plant Pathology and Physiology
Kishimoto, Yuji, PhD, Professor Emeritus of Architecture
Kissam, John Benjamin, PhD, Alumni Professor Emeritus of Forest Resources
Klase, John Benjamin, PhD, Professor Emeritus of Entomology, Soils, and Plant Sciences
Kline, Ellis, PhD, Professor Emeritus of Microbiology and Immunology
Kline, Judith Myers, MS, Professor Emerita of Family and Youth Development
Kline, Priscilla Mackenzie, EdD, Professor Emerita of Nursing Science
Knap, Halina T., PhD, Professor Emerita of Crop and Soil Environmental Sciences
Knapp, Ronald James, PhD, Alumni Professor Emeritus of Sociology
Knox, Sarah Stewart, BS, Associate District Extension Leader Emerita, Professor Emerita of Home Economics
Kohl, Michael F., MLS, Librarian Emeritus
Komo, John, PhD, Professor Emeritus of Electrical and Computer Engineering
Koon, George W., PhD, Professor Emeritus of English
Kostreva, Robert M., PhD, Professor Emeritus of Mathematical Sciences
Kozma, Ernest Joseph, EdD, Professor Emeritus of Education
Kunkel, Mary E., Ph.D., Professor Emerita of Food Science and Human Nutrition
Kurfess, Thomas D., PhD, Professor Emeritus of Mechanical Engineering
Labecki, Geraldine, EdD, Dean Emerita, College of Nursing
Lafarge, Mary C., PhD, Professor Emerita of Marketing
Laforce, Robert L., PhD, Alumni Distinguished Professor Emeritus of Management
Lambert, Barbara Sherrill, BS, County Extension Agent Emerita
Lambert, Jerry Roy, PhD, Professor Emeritus of Agricultural and Biological Engineering
Lambert, Robert Stansbury, PhD, Professor Emeritus of History
Lander, Ernest McPherson, Jr., PhD, Alumni Professor Emeritus of History
Lane, Carl Leaton, PhD, Professor Emeritus of Forestry
Lane, Samuel, County Extension Agent Emeritus
Larcom, Lyndon L., PhD, Professor Emeritus of Physics and Astronomy
Laskar, Remo C., PhD, Professor Emerita of Mathematical Sciences
Lathrop, Jay Wallace, PhD, Professor Emeritus of Computer Engineering
LaTorre, Jeuel Gilliam, MA, Professor Emeritus of Mathematical Sciences
Law, E. Harry, PhD, Professor Emeritus of Mechanical Engineering
Lawson, John W., PhD, Professor Emeritus of Biological Sciences
Layne, Desmond R., PhD, Professor Emeritus of Pomology
Leap, Terry L., PhD, Professor Emeritus of Management
Leathrum, James Frederick, PhD, Professor Emeritus of Electrical and Computer Engineering
LeBlanc, Janet B., Ph.D., Associate Professor Emerita of Art
Lee, Andy W., PhD, Professor Emeritus of Forestry
Lee, Burtrand L., PhD, Professor Emeritus of Materials Science and Engineering
Lee, Daniel Dixon, Jr., PhD, Professor Emeritus of Animal and Veterinary Sciences
Lee, Evelyn J., Professor Emerita of Nursing
Lee, Peter Roald, MArch, Alumni Professor Emeritus of Architecture
Lefcourt, Herbert D., III, PhD, Professor Emeritus of Materials Science and Engineering
Leonard, Michael S., PhD, Professor Emeritus of Industrial Engineering
Leonard, William H., PhD, Professor Emeritus of Teacher Education
Lester, Clarence Martin, BS, County Extension Agent Emeritus
Leuschner, William Albert, PhD, Professor Emeritus of Forest Resources
Lew, William W., PhD, Emeritus Professor of Art
Lewis, Gordon, PhD, Professor Emeritus of Ceramic and Materials Engineering
Lewis, Stephen A., PhD, Professor Emeritus of Entomology, Soils, and Plant Sciences
Ligon, James Teddie, PhD, Professor Emeritus of Agricultural and Biological Engineering
Lindsay, Cotton M., PhD, Professor Emeritus of Economics
Linville, Dale Edward, PhD, Professor Emeritus of Agriculture and Bioengineering
Locke, Ernest Lytle, County Extension Agent Emeritus
Logan, Barbara N., Professor Emerita of Nursing
Loudenback, Joseph Girard, PhD, Professor Emeritus of Accounting
Lovedahl, Gerald Gery, PhD, Professor Emeritus of Technology and Human Resource Development
Lloyd, Max Ira, PhD, Professor Emeritus of Agricultural and Applied Economics
Lukawicki, Stanley Michael, PhD, Professor Emeritus of Mathematical Sciences
Lumpkin, Oliver Reese, PhD, Professor Emeritus of Education
Lupo, Barbara H., MS, County Extension Agent Emerita
Macy, Jacques Bert, MAT, Professor Emeritus of French
Madison, Alan Wayne, PhD, Assoc Prf Emeritus of School of Computing
Maloney, Michael T., PhD, Professor Emeritus of Economics
Manley, Donald G., Professor Emeritus, Entomology
Manson, Joseph R., PhD, Professor Emeritus of Physics and Astronomy
Marbut, Samuel Alexander, BS, Professor Emeritus of Forestry
Marsiscko, Allan, Professor Emeritus, Forestry and Natural Resources
Martin, John Campbell, PhD, Professor Emeritus of Electrical and Computer Engineering
Martin, Mary Virginia, MA, Extension Associate Emerita
Martin Jr, Joseph A., BS, County Extension Agent Emeritus
Martini, Joseph Albert, PhD, Professor Emeritus of Agronomy and Soils
Marvin, John Henry, Jr., MS, Professor Emeritus of Textiles
Mathews, Andrew Clark, PhD, Professor Emeritus of Botany
Mathis, Lee Terrell, J., Distinguished County Agent Emeritus
Matthews, James Edward, EdD, Dean Emeritus, College of Education; Professor Emeritus of Education
Matthewson, Charles, PhD, Chair and Professor Emeritus of Construction Science and Management
Maurer, Donald Edwin, EdD, Professor Emeritus of Industrial Education
Maurice, Dencil V., Ph.D., Professor Emeritus of Animal and Veterinary Sciences
Mazzur, Anthony Robert, Ph.D, Professor Emeritus of Crop and Soil Environmental Science
McCullough, Joe Lawrence, Ph.D, Professor Emeritus of Philosophy
McConnell, James Calvin, Jr., PhD, Professor Emeritus of Animal and Veterinary Sciences
McCormac, Jack Clark, LL.D., Alumni Professor Emeritus of Civil Engineering
McCormick, Robert M., PhD, Professor Emeritus of Economics
McCutcheon, Gloria S., Ph.D, Professor Emerita of Entomology, Soils, and Plant Sciences
McDaniel, Martha Huggins, Area County Extension Agent Emerita
McDowell, Helen Camp, BA, County Extension Agent Emerita
McElrath, Robert B., PhD, Emeritus of Finance
McGregor, William Henry Davis, PhD, Dean Emeritus, College of Forest and Recreation Resources; Professor Emeritus of Forestry
McGuire, Francis A., PhD, Alumni Distinguished Professor Emeritus of Parks, Recreation, and Tourism Management
McInnis, Thomas McLeod, Jr., PhD, Professor Emeritus of Biological Sciences
McKale, Donald M., PhD, Class of 1941 Memorial and Professor Emeritus of History
McLaughlin, John Joseph, PhD, Professor Emeritus of English
McLean, Edward Lee, PhD, Professor Emeritus of Agricultural and Applied Economics
McLellan, Margaret K., PhD, Associate Professor Emerita of Parks, Recreation, and Tourism Management
McLellan, Robert Wesley, PhD, Chair and Professor Emeritus of Parks, Recreation, and Tourism Management
McNatt, Jo Ann, PhD, Professor Emerita of French
McNulty, Peter J., PhD, Professor Emeritus of Physics and Astronomy
Melsheimer, Stephen S., PhD, Professor Emeritus of Chemical Engineering
Melton, Judith M., PhD, Associate Dean and Professor Emerita of Languages
Melton, Tony, BS, County Extension Agent Emeritus
Menke, Warren Wells, PhD, Professor Emeritus of Management
Merce, Robert Jack, EdD, Professor Emeritus of Agricultural Education
Miller, Ansel Eldon, PhD, Professor Emeritus of Forest Resources
Miller, Donald Piguet, PhD, Professor Emeritus of Physics
Miller, James A., PhD, Associate Professor Emeritus of History
Miller, James Cies, Jr., PhD, State Extension Leader Emeritus
Miller, Robert Walker, Jr., PhD, Professor Emeritus of Plant Pathology and Physiology
Miller, Stephen E., Professor Emeritus, Applied Economics and Statistics
Miller, Yvonne Holliday, MS, Staff Development Specialist Emerita
Mixon, Robert Floyd, MA, Professor Emeritus of Spanish
Molz, Fred J., III, Distinguished Scientist and Professor Emeritus, Environmental Engineering and Earth Sciences
Montanucci, Richard R., PhD, Associate Professor Emeritus of Biological Sciences
Moran, Ronald Wesson, PhD, Associate Dean Emeritus, College of Architecture, Arts, and Humanities; Professor Emeritus of English
Moore, Charles Vernon, PhD, Stender Professor Emeritus of Food Science
Morse, John C., PhD, Professor Emeritus of Entomology, Soils and Plant Sciences
Movbe, David D., PhD, Associate Professor Emeritus of Bioengineering and Physics
Mullins, Joseph Chester, PhD, Professor Emeritus of Chemical Engineering
Munson, Priscilla G., MLS, Librarian Emeritus
Murr, Kenneth R., Librarian Emeritus
Murrow, Elizabeth Jean, PhD, Professor Emerita of Nursing
Nance, John William, BA, County Extension Agent Emeritus
Newton, Alfred Franklin, EdD, Head and Professor Emeritus of Industrial Education
Nicholas, David M., Jr., PhD, Kathryn and Calhoun Lemon Professor Emeritus of History
Nix, Larry Edward, Professor Emeritus, Forestry and Natural Resources
Noble, Gayle P., PhD, Professor Emerita of Biological Sciences
Nocks, Barry C., Ph.D, Professor Emeritus of Planning, Development, and Preservation Landscape Architecture
Norman, Richard B., PhD, Professor Emeritus of Architecture
Nowack, Robert E., LL.D, Alumni Professor Emeritus of Civil Engineering
Nunery, Henry Grady, III, MA, County Extension Agent Emeritus
Nyvolk, James C., PhD, Professor Emeritus of Agriculture Economics
Odom, Stephen J., MS, County Extension Director Emeritus
Ogle, Wayne Leroy, PhD, Professor Emeritus of Horticulture
Oglesby, Frances Madelyn, PhD, Professor Emerita of Nursing
Olafson, Chinyelu B., Assistant Professor Emerita, Public Health Sciences
Olson, Loan W., Ph.D, Associate Professor Emeritus of Animal and Veterinary Sciences
Owens, Emma M., PhD, Professor Emeritus of Curriculum and Instruction
Owens, Rameth Richard, PhD, Professor Emeritus of History
Owens, Walton Harrison, Jr., PhD, Professor Emeritus of Political Science
Owings, Marvin Alpheus, PhD, Head and Professor Emeritus of English
Oxendine, Lavel, MS, County Extension Agent Emeritus
Oxner, John W., MS, County Extension Agent Emeritus
Paddock, Adrian Lewis, MS, Professor Emeritus of Agricultural Economics and Rural Sociology, Pee Dee Research and Education Center
Page, Edward W., PhD, Professor Emeritus of Computer Science
Palmer, James Howell, PhD, Professor Emeritus of Agronomy and Pardue, Paul Eugene, PhD, Professor Emeritus of Animal, Dairy, and Veterinary Sciences
Paulie, John Cecile, Jr., BS, Area County Extension Agent Emeritus
Park, Laura Irene, PhD, Professor Emerita of Psychology
Parker, David Andrew, MS, County Extension Agent Emeritus
Parks, Clyde Leonard, PhD, Professor Emeritus of Agronomy and Soils
Parks, Thomas Ilon, PhD, Professor Emeritus of Educational Leadership
Pate, Dow Henry, Jr., EdD, Professor Emeritus of Technology and Human Resource Development
Pearson, L. Wilson, PhD, Professor Emeritus of Electrical & Computer Eng.
Peck, John Charles, PhD, Professor Emeritus of Computer Science
Pennscoott, William Walter, EdD, Professor Emeritus of Education
Peppers, Larry G., PhD, Professor Emeritus of Sociology
Perr, Philip Rodney, MA, County Extension Agent Emeritus
Perr, Robert Lindsay, MME, Professor Emeritus of Engineering Technology
Peruitt, Alton Joseph, Jr., PhD, Professor Emeritus of Horticulture
Peterson, Chris L., PhD, Associate Professor Emeritus of Teacher Education
Pinkerton, Bruce W., PhD, Professor Emeritus of Entomology, Soils, and Plant Sciences
Pippin, Toni Scott, BS, Extension Associate Emerita
Pivorn, Edward B., PhD, Professor Emeritus of Biological Sciences
Placonn, Dennis L., Ph.D, Professor Emeritus of Economics
Platts, Rebecca Gaines, BA, County Extension Director Emerita
Polk, George Merriet, Jr., MArch, Professor Emeritus of Architecture
Porter, Nancy M., PhD, Professor Emerita of Family Outreach
Potts, Thomas D., PhD, Professor Emeritus of Parks, Recreation, and Tourism Management
Powell, Gary L., PhD, Professor Emeritus of Genetics and Biochemistry
Price, Dawn Louise, BS, County Extension Agent Emerita
Privett, Charles Victor, Jr., MS, Professor Emeritus of Agricultural and Biological Engineering
Proctor, Thomas Gilmer, PhD, Professor Emeritus of Mathematical Sciences
Quisenberry, Virgil L., Ph.D., Professor Emeritus of Agronomy and Soils
Rajapakse, Nihal C., Ph.D., Professor Emeritus of Environmental Horticulture
Ransom, Rosa Mitchell, MS, County Extension Agent Emerita
Rathwell, P. James, PhD, Professor Emeritus of Applied Economics and Statistics
Ray, John Robert, PhD, Professor Emeritus of Physics and Astronomy
Reamer, Larry Donald, MS, Professor Emeritus of Forestry
Redmann, Linda Louise, PhD, Professor Emerita of Family and Youth Development
Reel, Jerome V., Jr., PhD, Senior Vice Provost, University Historian and Professor Emeritus of History
Reese, Richard M., PhD, Professor Emeritus of Marketing
Regnier, Ireland Goldsmith, MFA, Professor Emeritus of Visual Arts
Reid, James A., PhD, Professor Emeritus of Mathematical Sciences
Rumfager, Kenyon C., PhD, Professor Emeritus of Biological Sciences
Rhodes, Billy Beryl, PhD, Professor Emeritus of Horticulture
Rice, Richard W., PhD, Associate Professor Emeritus of Chemical and Biomolecular Engineering
Richards, Eleanor Joyce, MS, Professor Emerita of Family and Youth Development
Richardson, John Coakley, EdD, Professor Emeritus of Special Education
Ridley, John Davis, MS, Professor Emeritus of Horticulture
Rife, Lawrence Albert, MA, Professor Emeritus of Mathematical Sciences
Riley, Barbara Brunson, County Extension Agent Emerita
Riley, Helene M., PhD, Alumni Distinguished Professor and Professor Emeritus of Languages
Riley, Melissa B., PhD, Professor Emerita of Entomology, Soils, and Plant Sciences
Risher, Charles Franklin, BS, Professor Emeritus of Poultry Science
Roberson, Georgia Taylor, MEd, State 4-H and Youth Development Coordinator Emerita; Professor Emeritus of Home Economics
Roberts, William Russell, MS, Professor Emeritus of 4-H and Youth Development
Robinet, David Lamar, PhD, Professor Emeritus of Forest Resources
Robinson, Lou Johnson, BA, County Extension Agent Emerita
Robinson, Vernon Lee, PhD, Professor Emeritus of Forest Resources
Rogers, Clarence D., PhD, Sussenberg Professor Emeritus of School of Materials Science and Engineering
Rogers, Ernest Brasington, Jr., MS, Professor Emeritus of Forestry
Rollin, Lucy Waddie, PhD, Professor Emeritus of English
Rollin, Roger Best, PhD, Lemon Professor Emeritus of Literature
Rowal, Leon, MS, Director and Professor Emeritus of Nursing
Ruckle, William Henry, PhD, Professor Emeritus of Mathematical Sciences
Rudolf, Carl Sidney, PhD, Professor Emeritus of Mechanical Engineering
Rudowski, Victor Anthony, PhD, Professor Emeritus of English
Ruff, William James, BS, County Extension Agent Emeritus
Russells, Janice Camlin, County Extension Agent Emerita
Ruppert, Edward Ernst, PhD, Professor Emeritus of Biological Sciences
Russell, C. Bradley, PhD, Professor Emeritus of Mathematical Sciences
Russell, Linda Latimer, ME2, Extension Regional Director Emerita
Webb, Carol Johnson, Associate Dean of Extension Emerita
Webster, Henry Wise, PhD, Professor Emeritus of Animal, Dairy, and Veterinary Science
Weir, Eldon Lee, EdD, Professor Emeritus of Graphic Communications
Weir, Julia K., MEd, Professor Emerita of Teacher Education
Wells, Amos, Jr., BS, County Extension Agent Emeritus
Wells, Mae Edwards, MEd, County Extension Agent Emerita
Welter, John Finlay, MS, Professor Emeritus of Poultry Science
West, William Elmer, PhD, Chair and Professor Emeritus of Industrial Education and Graphic Communications
Westall, James M., PhD, Professor Emeritus of Computer Science
Wheeler, Alfred P., PhD, Professor Emeritus of Biological Sciences
Wheeler, Richard Ferman, PhD, Head and Professor Emeritus of Animal Science
Whetstone, Jack M., Master’s, Associate Professor Emeritus of Forestry and Natural Resources
White, Charlie R., Jr., MS, Associate Professor Emeritus of Parks, Recreation, and Tourism Management
White, Donald, BS, County Extension Agent Emeritus
White, Mervin Forrest, PhD, Professor Emeritus of Sociology
White, Richard Kenneth, PhD, Newman Professor Emeritus of Natural Resources Engineering in Agricultural and Biological Engineering and Environmental Engineering and Science
White, Sr., Curtis D., Ph.D., Professor Emeritus of Biosystems Engineering
Whitehurst, Clinton Howard, Jr., PhD, Professor Emeritus of Management and Economics
Whitmire, Jerry Morris, MA, Professor Emeritus of Spanish
Wiggins, Emily Sutherland, EdD, Professor Emerita of Home Economics
Willey, Edward Parker, PhD, Professor Emeritus of English
Williams, Frankie K., PhD, Associate Professor Emeritus of Leadership, Counselor Education, and Human Organizational Development
Williams, Gloriaistine Fowler, County Extension Agent Emerita
Williams, John Newton, II, PhD, Professor Emeritus of Animal Science
Williams, Patricia Miller, Interim County Extension Director Emerita
Williams, Thomas M., PhD, Professor Emeritus of Forestry and Natural Resources
Williams, Woodie Prentiss, Jr., PhD, Professor Emeritus of Food Science
Williamson, Robert Elmore, PhD, Professor Emeritus of Agricultural and Biological Engineering
Willingham, Russell, MA, Professor Emeritus of Languages
Willis, Samuel Marsh, PhD, Professor Emeritus of Industrial Management
Wilson, Martha Craft, County Extension Agent Emerita
Wilson, Thomas Virgil, PhD, Alumni Professor Emeritus of Agricultural and Biological Engineering
Winchell, Donna H., PhD, Professor Emerita of English
Wither, Wesley, PhD, Professor Emeritus of Plant Pathology and Physiology
Witherspoon, Gayland Brooks, MArch, Associate Dean Emeritus, College of Architecture; Professor Emeritus of Architecture
Withington, Marian Hull, MS, Librarian Emerita
Wixon, Bobby Guinn, PhD, Dean Emeritus, College of Sciences; Professor Emeritus of Biological Sciences
Wolak, Francis J., PhD, Professor Emeritus of Agricultural and Biological Engineering
Wood, Gene W., Professor Emeritus, Forestry and Natural Resources
Wood, Wallace Blackwell, Jr., Distinguished County Agent Emeritus
Woodell, Charles Harold, PhD, Professor Emeritus of English
Woodruff, James Raymond, PhD, Professor Emeritus of Agronomy and Soils
Wooten, Thomas E., PhD, Alumni Distinguished Professor Emeritus of Forestry and Natural Resources
Wynn, Eddie Dowell, MCRP, Professor Emeritus of Agricultural and Applied Economics
Wynn, Mable Hill, MS, Professor Emerita of Parks, Recreation, and Tourism Management
Yandle, Thomas Bruce, Jr., PhD, Dean Emeritus, College of Business and Behavioral Science; Alumni Distinguished Professor Emeritus of Economics
Yang, Teh-Teh, PhD, Professor Emeritus of Mechanical Engineering
Yardley, Darrell Gene, PhD, Professor Emeritus of Zoology
Yates, William Pierce, MS, Extension Program Coordinator Emeritus
Young, Arthur P., PhD, Campbell Endowed Chair and Professor Emeritus of English
Zehr, Eldon Irvin, PhD, Professor Emeritus of Plant Pathology and Physiology
Zielinski, Paul Bernard, PhD, Director Emeritus, Water Resource Research Institute; Professor Emeritus of Civil Engineering
Zimmerman, James Kenneth, PhD, Professor Emeritus of Biochemistry
APPENDIX

ENGLISH FLUENCY
Clemson University has established a policy to assure that all instructional activities are conducted by individuals possessing appropriate proficiency in written and oral use of the English language. Instructional activities include lectures, recitation or discussion sessions, and laboratories. The individuals to be certified include full-time and part-time faculty, graduate teachers of record, graduate teaching assistants, and graduate laboratory assistants for whom English is not the first language.

A student who experiences difficulty with an instructor’s written or oral English and who wishes to seek relief must do so prior to the seventh meeting of a 50-minute class and prior to the fifth meeting of a 90-minute class in regular semesters. In summer sessions, relief must be sought prior to the third class meeting.

The procedure is summarized as follows:

a. The student must quickly bring the problem to the attention of the instructor’s department chair either directly or through a faculty member such as the student’s advisor. That department chair will assess the complaint and, if deemed valid, offer an appropriate remedy within two days.

b. A student who is not satisfied with the department chair’s decision or the relief suggested, may appeal within two days to a five-member hearing panel comprised of three faculty members and two students appointed by the Senior Vice Provost and Dean of Undergraduate Studies.

Students with questions should contact the Associate Dean of Undergraduate Studies, E-103 Martin Hall.

EQUAL OPPORTUNITY AFFIRMATIVE ACTION
Clemson University, in compliance with Titles VI and VII of the Civil Rights Act of 1964, as amended, Title IX of the Education Amendments of 1972, and Sections 503 and 504 of the Rehabilitation Act of 1973, does not discriminate on the basis of race, color, national origin, religion, sex, or disability in any of its policies, procedures, or practices; nor does the University, in compliance with the Age Discrimination in Employment Act of 1967, as amended, Section 402 of the Vietnam Era Veterans Readjustment Act of 1974, or Title II of the Genetic Information Nondiscrimination Act of 2008, discriminate against any employees or applicants for employment on the basis of their age, status as a disabled veteran or veteran of the Vietnam era, or their genetic information. Clemson University conducts its programs and activities involving admission, access, treatment, employment, teaching, research, and public service in a nondiscriminatory manner as prescribed by Federal laws and regulations.

In conformance with University policy and pursuant to Executive Order 11246, as amended, Section 503 of the Rehabilitation Act of 1973, and Section 402 of the Vietnam Era Veterans Readjustment Act of 1974, Clemson University is an Affirmative Action/Equal Opportunity Employer.

Inquiries concerning the above may be addressed to the following:

Director, Office for Access and Equity
110 Holtzendorff Hall
Clemson University
Clemson, SC 29634

Director, Office for Civil Rights
Department of Education
Washington, DC 20201

FAMILY PRIVACY PROTECTION ACT
The South Carolina Family Privacy Protection Act (SC Code 30-2-10 et. seq.) defines personal information as "...information that identifies or describes an individual including, but not limited to, an individual’s photograph or digitized image, social security number, date of birth, driver’s identification number, name, home address, home telephone number, medical or disability information, education level, financial status, bank account(s) number(s), account or identification number issued by and/or used by any federal or state governmental agency or private financial institution, employment history, height, weight, race or other physical details, signature, biometric identifiers, and credit records or reports.

Some of the information in documents which students provide to Clemson University may be personal information as defined above. Pursuant to Section 30-2-40, students are advised that this information may be subject to public scrutiny or release. They are also advised that personally-identifiable information contained in these educational records falls under the federal Family Educational Rights and Privacy Act of 1974, as amended (FERPA). If students elect to opt out of the release of directory information under FERPA, the University will not release any personal information except as otherwise required or authorized by law.

Visit http://www.clemson.edu/privacy.html for additional information.

HARASSMENT
In general, harassment is unwelcome verbal or physical contact, based upon race, color, religion, sexual orientation, gender, national origin, age, disability, status as a military veteran, or protected activity (i.e., opposition to prohibited discrimination or participation in the statutory complaint process), that unreasonably interferes with the person’s work or educational performance or creates an intimidating or hostile work or educational environment.

Examples may include, but are not limited to, epithets, slurs, jokes, or other verbal, graphic, or physical contact.

The entire text of the University’s policy on harassment can be obtained from the Office of Access and Equity, 110 Holtzendorff, (864) 656-3181 or at www.clemson.edu/access/policies.html.

INFORMATION RESOURCES FOR STUDENTS
Clemson University computing resources are the property of Clemson University, to be used for university-related business. Students have no expectation of privacy when utilizing university computing resources, even if the use is for personal purposes. The university reserves the right to inspect, without notice, the contents of computer files regardless of medium, the contents of electronic mailboxes and computer conferencing systems, systems output such as printouts, and to monitor network communications when:

1. It is considered reasonably necessary to maintain or protect the integrity, security or functionality of university or other computer resources or to protect the university from liability;
2. There is reasonable cause to believe that the user has violated this policy or otherwise misused computing resources;
3. An account appears to be engaged in unusual or unusually excessive activity;
4. It is otherwise required or permitted by law.

Any suspected violations of this policy or any other misuse of computer resources by students normally should be referred to the Office of Student Conduct. That office will investigate the allegations and take appropriate disciplinary action. Violations of law related to misuse of computing resources may be referred to the appropriate law enforcement agency.

Notwithstanding the above, Clemson Computing and Information Technology may temporarily suspend, block or restrict access to an account, independent of university disciplinary procedures, when it appears reasonably necessary to do so in order to protect the integrity, security or functionality of university or other computer resources, to protect the university from liability, or where the emotional or physical well-being of any person is immediately threatened. When CCIT unilaterally takes such action, it will immediately notify the account holder of its actions and the reason for them in writing. The account holder may appeal the action taken by CCIT in writing to the Chief Information Officer.

Access will be restored to the account holder whenever the appropriate investigatory unit of the university determines that the protection of the integrity, security or functionality of university or other computing resources has been restored and the safety and well being of all individuals can reasonably be assured, unless access is to remain suspended as a result of formal disciplinary action imposed through the Office of Student Conduct or as a result of legal action.
Use of University computing resources, including network facilities, account numbers, data storage media, printers, plotters, microcomputer systems, and software for computing activities other than those authorized by the University is strictly prohibited. Unauthorized use of such resources is regarded as a criminal act in the nature of theft, and violators are subject to suspension, expulsion, and civil and criminal prosecution.

Use of university computing resources, including network facilities, account numbers, data storage media, printers, plotters, microcomputer systems, and software for computing activities other than those authorized by the university is strictly prohibited. Unauthorized use of such resources is regarded as a criminal act in the nature of theft, and violators are subject to suspension, expulsion, and civil and criminal prosecution.

The following are examples of misuse of computing resources:

1. Unauthorized duplication, distribution or alteration of any licensed software. This includes software licensed by the university and licensed software accessed using the computing networks.

2. Attempting to gain unauthorized access to any computing resource or data, or attempting to disrupt the normal operation of any computing resource or network – at Clemson or anywhere on the Internet.

3. Attempting to use another student’s or employee’s computer account or data, without their permission.

4. Using the university electronic mail system to attack other computer systems, falsify the identity of the source of electronic mail messages, Sending harassing, obscene or other threatening electronic mail. Attempting to read, delete, copy or modify the electronic mail of others without their authorization. Sending, without official university authorization, “for-profit” messages, chain letters or other unsolicited “junk” mail.

5. Knowingly infecting any computing resource with a software virus.

6. Tampering with the university computer network or building wiring or installing any type of electronic equipment or software that could be used to capture or change information intended for someone else.

7. Participating in a “denial of service” attack on any other computer, whether on or off campus.

8. Using university computing or network resources for personal gain or illegal activities such as theft, fraud, copyright infringement, piracy (e.g., sound or video recording), or distribution of child pornography or obscenities.

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