College of Engineering, Computing and Applied Science

**Bioengineering**

Departmental Honors in Bioengineering requires the following courses totaling 7 credit hours:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOE 4150/6150</td>
<td>Research Principles and Concepts (1)</td>
<td></td>
</tr>
<tr>
<td>4910</td>
<td>Mentored Research in Bioengineering (1-4)</td>
<td></td>
</tr>
</tbody>
</table>

A total of six credit hours over a period of two semesters.

The Departmental Honors program in Bioengineering provides exceptional students training and practical experience in the conduct of experimental research under the supervision of a faculty advisor. BIOE 4150 provides academic training in research planning, ethical conduct, professional documentation, and dissemination in both oral and written formats. Students are strongly encouraged to co-enroll in BIOE 4150 (6150 if pursuing BS/MS degree) during their first semester of BIOE 4910.

In BIOE 4910, students will perform a review of relevant peer-reviewed literature, conduct a mentored research project, and present their findings in a poster or oral presentation (final semester) during the department’s research day near the end of each semester. During their final semester of BIOE 4910, students must prepare a senior thesis including the background, methods, results, and conclusions of the research project that must be approved by the faculty advisor and the department Honors Committee. Six credits of BIOE H 4910 may be used to satisfy the BIOE Technical Requirements within the Bioengineering curriculum.

**Biosystems Engineering**

Departmental Honors in Biosystems Engineering requires the following sequence of courses totaling 7 credit hours:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BE 3000</td>
<td>Biosystems Engineering Honors Seminar (0)</td>
<td></td>
</tr>
<tr>
<td>3010</td>
<td>Biosystems Engineering Thesis Research (3)</td>
<td></td>
</tr>
<tr>
<td>4000</td>
<td>Biosystems Engineering Honors Thesis (3)</td>
<td></td>
</tr>
<tr>
<td>4510</td>
<td>Newman Seminar &amp; Lecture Series in Natural Resources Engineering (1)</td>
<td></td>
</tr>
</tbody>
</table>

To be eligible for Departmental Honors in Biosystems Engineering you must have a minimum overall GPA of 3.5 and a written recommendation by two faculty members in the Biosystems Engineering (BE) program. One of the recommending faculty members must be willing to serve as the advisor for the thesis. The faculty advisor and student must provide a general topic area and statement of available and required resources to complete the thesis in the required time period.

In BE 3000, taken during the fall semester of the junior year, students are introduced to current faculty research. Project ideas are then developed to prepare students in choosing a research topic for the senior honors thesis. Students are required to attend senior honors thesis presentations. The research will begin during the spring semester of the junior year with BE 3010. In the first semester of your senior year, you will enroll in BE 4000 and take BE 4510 during your final semester.
During the research/thesis process you will review the literature pertinent to the research topic, conduct a research program, develop a portfolio, and present a summary of the background analysis and results of the project in the form of a senior thesis which must be approved by your faculty advisor. You are also required to make a presentation of your research program in a public seminar and to submit one copy of your thesis to the Honors Office. The final version of the thesis must be submitted to the advisor by the last day of finals week of the fall semester of the senior year.

**Chemical Engineering**

Departmental Honors in Chemical Engineering requires the following sequence of courses totaling 8 credit hours:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE 3000</td>
<td>Honors Seminar (1)</td>
<td></td>
</tr>
<tr>
<td>3950</td>
<td>Honors Research I (3)</td>
<td></td>
</tr>
<tr>
<td>4950</td>
<td>Honors Research II (3)</td>
<td></td>
</tr>
<tr>
<td>4970</td>
<td>Honors Thesis (1)</td>
<td></td>
</tr>
</tbody>
</table>

Students in the Chemical Engineering Departmental Honors program will conduct a major research project under the direction of a faculty member and write an honors thesis. In the first semester of the junior year honors students take CHE 3000. To earn this pass/fail credit honors students attend the department's CHE 8950 graduate seminar and meet individually with faculty members to learn about research opportunities in chemical engineering. By the end of the semester students select a research topic and faculty advisor. In the next two semesters honors students take CHE 3950 and CHE 4950. In these lab courses the students conduct research, write progress reports, and review their results periodically with their faculty advisor. In CHE 4950 each student presents a seminar before the faculty, graduate students and other honors students taking CHE 3000. In the last semester of the senior year the student registers for CHE 4970 and writes an honors thesis. With the approval of the faculty research advisor the exact timing of the honors sequence can be adjusted to accommodate students who are also involved in the cooperative education program.

**Civil Engineering** (three options)

**Option one:** Honors Thesis Option for students in the BS Degree Program in Civil Engineering requires the following sequence of courses totaling 7-8 credit hours:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 3880</td>
<td>Honors Research Topics (1)</td>
<td></td>
</tr>
<tr>
<td>3890</td>
<td>Honors Research Skills (1)</td>
<td></td>
</tr>
<tr>
<td>4880</td>
<td>Honors Research I (2-3)</td>
<td></td>
</tr>
<tr>
<td>4890</td>
<td>Honors Research II (3)</td>
<td></td>
</tr>
</tbody>
</table>

Honors students in the Civil Engineering Departmental Honors program generally take CE 3880 and CE 3890 in the junior year. These courses are designed to prepare students for the senior-year thesis, which consists of CE 4880 and CE 4890. This sequence allows Civil Engineering honors students the opportunity to carry out a major research project under the direction of a selected faculty member. Students must complete an Honors Research Thesis and an oral defense of the thesis attended by the student’s faculty advisor, Civil Engineering Honors Coordinator and other interested faculty and students.
**Option two:** Research Option for students in the BS/MS Degree Program in Civil Engineering requires the following sequence of courses totaling 7-8 credit hours:

CE  
3880  Honors Research Topics (1)  
3890  Honors Research Skills (1)  
4880  Honors Research I (2-3)  
4890  Honors Research II (3)

Students must complete a research proposal including any preliminary research needed to reasonably define the scope and methodology of the proposed research. The research project will have the scope of activity normally associated with an MS thesis.

The expect outcome includes a research proposal, including an introduction of the problem statement, literature review, research methodology and sufficient preliminary results to validate the intended study. The student will also be required to give a proposal presentation attended by the student’s faculty advisor, Civil Engineering Honors Coordinator and other interested faculty and students.

**Option three (Portfolio Option):** Completion of four Honors Projects, typically one project completed each semester during a student’s junior and senior years (enroll in courses listed below for a total of 4-6 credit hours). If necessary, a student can complete multiple projects in a single semester to complete four projects in less than four semesters.

CE  
3870  Junior Honors Project (1-3) for a total of two-three credit hours over a period of two semesters  
4870  Senior Honors Project (1-3) for a total of two-three credit hours over a period of two semesters

The Honors portfolio, containing all completed honors projects, will be presented to the Civil Engineering Honors Program Coordinator and participating faculty for review and comment.

**Computer Science**
Departmental Honors in Computer Science requires the following sequence of courses totaling 7-8 credit hours:

CPSC  
3950  Honors Seminar (1) (up to two semesters – one is required)  
4950  Senior Honors Research for a total of six credit hours over a period of two semesters (1-3)

The Departmental Honors program in Computer Science consists of a junior-year honors seminar and a senior-year honors thesis. In each semester of the junior year honors students must take CPSC H3950, a one-credit course designed to introduce students to the research interests of the faculty and to suggest possible topics for the senior thesis. By the end of the second semester of CPSC H3950 the student is expected to have chosen a thesis topic and a research advisor.
After completing the junior honors seminar, the student will complete an honors thesis while enrolled in two semesters of CPSC H4950 for a total of six credits. Upon completion of the written thesis, the student is expected to make a presentation to an open seminar attended by Computer Science faculty and honors students.

Electrical and Computer Engineering

Departmental Honors in Electrical and Computer Engineering requires the following sequence of courses totaling 10 credit hours:

ECE 3000 Junior Honors Seminar (1)

At least 5 credits from the following ECE courses:
- 2010 Logic and Computing Devices (2 credits)
- 2020 Electric Circuits I (3 credits)
- 2620 Electric Circuits II (3 credits)
- 3170 Random Signal Analysis (3 credits)
- 3200 Electronics I (3 credits)
- 3300 Signals, Systems and Transforms (3 credits)

*At least three of these credits must be from ECE 3170 or ECE 3300

Four additional credits:
- 4910 Undergraduate Honors Research for a total of four credit hours over a period of two semesters (1-6)

Or a combination of the following (4 credits):
- 2990 Creative Inquiry in Electrical and Computer Engineering (1-4) up to 1 credit
- 3990 Creative Inquiry in Electrical and Computer Engineering (1-4) up to 1 credit
- 4990 Creative Inquiry in Electrical and Computer Engineering (1-4) 2-4 credits

The Departmental Honors Program in Electrical and Computer Engineering provides qualified students the opportunity to pursue a comprehensive research project under the supervision of a faculty advisor.

In your junior year you will take ECE 3300 and ECE 3000 a seminar designed to introduce you to research activities within the department.

Students may select either of the following options associated with the honors thesis:

Option 1 - Honors Thesis: This option includes four credits of ECE 4910 taken in the senior year. You will be required to do a literature survey of your chosen topic and to develop a research plan that will evolve into a senior thesis. Research will be performed under the direction of a faculty advisor. The honors thesis must meet the standards of the faculty advisor and the Calhoun Honors College, and you will be required the Honors Office with a copy of your thesis.

Option 2 - Creative Inquiry with Honors Thesis: This option includes four credits of one or a combination of the following courses: ECE 2990 (up to 1 credit) ECE 3990 (up to 1 credit); and ECE 4990 (2-4 credits)
Creative Inquiry (CI) courses may be taken in the sophomore, junior or senior year. You will work with a faculty advisor individually or as a member of a research team. The CI program has been designed to promote your reasoning and critical thinking skills, ethical judgment, and communication skills as well as a deep understanding of the methods of scientific research. This option may get you involved in research activities earlier, and well lead to an honors thesis. The honors thesis must meet the standards of the faculty advisor and the Calhoun Honors College, and you will be required the Honors Office with a copy of your thesis.

Note: The credit hours associated with ECE 4990 and ECE 4910 can be used to satisfy up to 3 credits of the technical elective requirements of the Electrical Engineering curriculum or the Computer Engineering curriculum.

**Geology**
Departmental Honors in Geology requires the following sequence of courses totaling 12 credit hours:

GEOL 4110 Research Problems for a total of six credit hours taken under a single research advisor over a period of two semesters (1-3)

Two courses selected from the following:

GEOL 3000 Environmental Geology (3)
GEOL 3020 Structural Geology (4)
GEOL 3140 Sedimentary Petrology (3)
GEOL 3160 Igneous and Metamorphic Petrology (3)
GEOL 3750 Bahamian Field Study (3)
GEOL 4080 Geohydrology (3)

**Industrial Engineering**
Departmental Honors in Industrial Engineering requires the following sequence of courses totaling 7 credit hours:

IE 2680 Creative Inquiry Seminar in Industrial Engineering (1)
IE 4000 Honors Thesis (1-6) for a total of six credit hours over a period of two or more semesters

The Departmental Honors Program in Industrial Engineering provides students with an opportunity to engage in research under the guidance of a faculty advisor. If the research ultimately proves fruitful, it is disseminated to the professional community via presentations, publications, or both. In addition, opportunities exist for students to participate in local and national research competitions.

A student receives academic credit for the research through a series of courses. The first in the series is IE 2680, a course in which honors students become familiar with current research in industrial engineering and begin groundwork for their own research; IE 268 is one credit hour. As the work progresses, students enroll in IE 4000. IE 4000 is a variable hour course that may be taken two or more times, in multiples of one hour, for a total of six credits. Since IE 4000 is a variable hour course, it affords students considerable flexibility. Moreover, the research hours may be substituted for six credits of the Department’s technical elective.
requirement. While enrolled in IE 4000, the research project is defined and developed, and ultimately culminates in the form of an honors thesis. Upon successful completion of the honors thesis, it must be submitted both to the Calhoun Honors College and the Department’s Honors Coordinator. In addition, the Department requires an abstract and a profile, examples of which may be found on the Department’s Honors Program Web site (theses of former honors students may be found there as well).

Finally, IE 600 is also an option for those students in the Combined Bachelor’s/Master’s Program in Industrial Engineering. In addition to the requirements for IE 4000, requirements for IE 6000 include first forming a thesis committee (consisting of your mentor, the Honors Coordinator and at least one other faculty member), and subsequently presenting both a preliminary proposal defense and final thesis defense to this committee. Thus the IE 6000 requirements more closely parallel those of a master’s thesis.

**Materials Science and Engineering**
Departmental Honors in Materials Science and Engineering requires the following sequence of courses totaling 8 credit hours:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSE 3000</td>
<td>Honors Seminar (1)</td>
<td></td>
</tr>
<tr>
<td>3950**</td>
<td>Honors Research I (3)</td>
<td></td>
</tr>
<tr>
<td>4950</td>
<td>Honors Research II (3)</td>
<td></td>
</tr>
<tr>
<td>4970</td>
<td>Honors Thesis (1)</td>
<td></td>
</tr>
</tbody>
</table>

**The following change was made on 12/15/2016: Beginning January 2017, MSE 4810/MSE 4910 should be taken instead of MSE 3950.**

Students wishing to participate in the Materials Science and Engineering Departmental Honors Program must have no grade lower than a C in any engineering course taken at Clemson University. Except for MSE 3000, which is offered pass/fail.

In MSE 3000, normally taken in the first semester of the junior year, students attend a weekly graduate seminar and are acquainted with current research in materials science and engineering. Attendance at each seminar is mandatory; students accumulating more than one unexcused absence will receive a grade of F and will be dismissed from the Departmental Honors program. No later than two weeks before the end of the semester, students in MSE 3000 will identify a research project and will submit a proposal to the honors program coordinator.

During the spring semester of the junior year and the fall semester of the senior year, the student completes six hours of honors research by enrolling in MSE 3950 and MSE 4950. With the approval of the department's Honors Program Committee, students participating in the Cooperative Education Program may substitute three hours of MSE 4060 (Summer Honors Project) earned over the course of a summer (two hours for one session, and one hour for the other) for MSE 3950.

During the spring semester of the senior year, the honors student will enroll in MSE 4970 and write a thesis based on the research done in MSE 3950 and MSE 4950.
The Materials Science and Engineering faculty intends for the Departmental Honors program to be an enriching experience beyond that normally provided to undergraduates. Therefore, Materials Science and Engineering honors courses may not be substituted for courses required for the B.S. degree.

**Mechanical Engineering**

Departmental Honors in Mechanical Engineering requires the following sequence of courses totaling 6 credit hours:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 3000</td>
<td>Junior Honors Seminar (0) taken both semesters of your junior year</td>
<td>0</td>
</tr>
<tr>
<td>ME 4150</td>
<td>Undergraduate Research (1-3) for a total of six credit hours over a period of two semesters</td>
<td>6</td>
</tr>
</tbody>
</table>

The Departmental Honors program in Mechanical Engineering provides outstanding students an opportunity to conduct in-depth research under the guidance of a faculty advisor. In your junior year you must participate in ME 3000 that introduces you to the spectrum of research activities in the department. By the end of your junior year you must have identified a specific research project, with the approval of your chosen faculty advisor.

During your senior year you must satisfactorily complete a senior research thesis while enrolled in two semesters of ME 4150. The six credits of ME 4150 are accepted for the technical electives required by the mechanical engineering curriculum. You will review the literature pertinent to the research topic, conduct a research program, and present a summary of the background analysis and results of the project in the form of a senior thesis which must be approved by your faculty advisor and the department Honors Committee. You are also required to make a presentation of your research program in a public seminar and to submit one copy of your thesis to the Honors Office.