1. General Information:

Instructor: Dr. Richard S. Miller
Office: 210 Fluor Daniel Building
(864) 656-6248
rm@clemson.edu

Open door policy: Appointments by email

2. Course Time/Location:
M, W – 2:30PM – 3:45PM, Dillard 200

Prerequisites:
(Undergraduate level ME 2030 Minimum Grade of C).

Course web page:
http://cecas.clemson.edu/~rm/

Textbook:

E-mail:
I will communicate to the class via e-mail and email. Check your e-mail often. It is your responsibility to be sure that you regular email is functional.

4. Textbooks and Calculator:
You are required to bring a calculator to class each day. Bring laptop to class for computer projects. You may not use cellphone and your laptop during class unless instructed to do so. You will need hardcopy of the thermodynamic tables for the exams.

5. Attendance:
You are expected to attend all classes. Occasional surprise attendance/quizzesmay be taken, but there will be no attendance grade in this course. If you miss a class, it is your responsibility to determine what material you missed. You should obtain this material from another student; do not ask me to bring you up to speed if you have missed a class. Poor performance on an exam, quiz, or other assignment which results from missing a class will under no circumstances be accepted as a rationale for alteration of any grade. Even if you have a legitimate excuse for your absence (see Documentable Excuses, below), it is still your responsibility to learn what you missed.
Should I not be present at the beginning of class, you are required to wait fifteen minutes before presuming that class is canceled.

6. Lateness:
Because of the distraction caused by students entering during class, be considerate and be seated before the class starts.

7. Homework:
Homework assignments will be given. You need to do these homework Assignments. Detailed answers to homework will not be published. If you cannot understand how to get the results, consult the grader or instructor.

Any changes to the assignments and/or due dates will either be announced in class or e-mailed to you by Canvas (make sure you have the Canvas email updates set properly). The numeric answers to the assigned problems will be posted on the Canvas after the due dates. No detailed solutions will be provided.

You are strongly advised to do these assignments by yourself and to understand the underlying concepts.

Design Projects:

Design problems will be assigned as homework after in-class discussions and are related to the cumulative course coverage to date and content of pre-requisite and co-requisite courses to encourage concept integration. Students may work in groups for projects requiring greater effort. Methodology and the effectiveness of the design may be critiqued via class peer reviews.

8. Exams:
Quizzes will be closed book but open notes. Midterms and Final exam will be closed book and notes, but you can bring a double-sided A4 sized equation cheat sheet. Scientific calculator will be needed. Access to internet will not be allowed.

Final Exam: In class. You may confirm the date/time of the final at: https://www.clemson.edu/registrar/index.html

Note that there will be no exception to the attendance/lateness policy described above on days when an exam is given.

9. Inclement Weather and Power Outages:
It is possible that class may be canceled by the university due to inclement weather or power outages. Any quiz or exam that is scheduled at the time of a class cancellation due to inclement weather or power outages will be given at the next class meeting unless you are informed otherwise.

10. Honor Code:
The Clemson University statement on academic integrity applies to all students in this class and will be rigorously enforced. That statement can be found at: http://www.clemson.edu/academics/academic-integrity/
You are required to go to this URL and read this policy. Cheating includes giving or receiving assistance
of any kind on exam or quiz by any means. It is alright to discuss conceptually on homework, but your work needs to be done by you.

Cheating is grounds for failure in this course. This will be strictly enforced. Cheating is a violation of the university honor code and is also a violation of this syllabus.

11. Cell Phone/Laptops:
You may not use your laptop or your cell phone in this class unless instructed. All cell phones and laptops are to be turned off before class begins.

12. Documentable Excuses:
Missing an exam or quiz (surprise or announced) will result in zero credit, unless a valid, documented excuse is provided. A valid excuse is something which is truly beyond your control, such as a medical emergency, or an activity that is a valid part of your education and requires you to miss class. You must provide me with a Clemson approved official document in order for your absence to be excused. For school-related activities such as traveling with a university team, orchestra etc., you must provide me with an official letter indicating the necessity of this trip at least one week in advance. For all other excuses, you must provide me with an official document within one week of returning to class.

Examples of documentable excuses are: medical emergencies, travel with a university-recognized team, death in your immediate family, activity in a department- or university-recognized organization (e.g. ASME, SAE ...). Examples of invalid excuses are: vacations, family activities, an airline ticket booked prior to the start of this course, a cramped schedule due to other coursework, etc.

13. Grading:
The weighting of exams, quizzes and the final exam is as follows:

- HW and computer assignments 15%
- Project and class quizzes 15%
- Midterm exams 40% (2 of them, 20% each)
- Final Exam 30%

This course will not be graded on a curve. The letter-grade you obtain in this course will be determined by computing (out of 100%), your homework quiz grade, exam grade, and final exam grade. The weighted average of these grades will then be translated into a letter grade according to the following schedule:

- 90% < A <= 100%
- 80% < B <= 90%
- 70% < C <= 80%
- 60% < D <= 70%
- F <= 60%

More on Grading:
I may choose to decrease the grade for failing to follow procedures outlined in this syllabus (e.g. cell phone going off in class, entering class late, talking to your neighbor in class, etc.).
14. Questions Regarding Grading:
The following procedure is to be used if you have questions or concerns regarding a grade you have received.

- Exams: For exams, regardless of your question or concern, there is a 24 hour waiting period before you may discuss your grading concerns with me. Once this 24 hour waiting period has elapsed, you may do one of two things:

  (a) If you feel that a simple error has occurred in the grading of your exam (e.g. points added up incorrectly, work that was not graded, etc.), simply come and see me during office hours, make an appointment, see me after class, etc.

  (b) If you feel that your exam was graded unfairly, then submit it to me with a written statement (one paragraph maximum) of why you think the grade was unfair or inappropriate. Note that this must be done in writing. Also note that comparisons to grading on another student’s exam is not a rationale for a grade change. Once submitted I will consider your argument and regrade the problem. Note that the possible outcomes of this process are an increase in your grade, a decrease in your grade, or no change in your grade. You have one week from the day that the exam is returned to submit such a written statement.

- Quizzes and HomeWorks:
If you feel that a mistake was made in grading a quiz or homework, please see me after class or during office hours.

15. Course Objectives and Learning Outcomes:

1. Teach students the performance limitations of the second law.
2. Teach students to model entropy production, express reversible work.
3. Introduce power and refrigeration cycles.
4. Teach students to model properties and processes of mixtures.
5. Provide an introduction to combustion and thermochemical equilibrium.

See departmental description of this course at:

16. Students with Disabilities:
If you have a disability which requires special accommodations or testing procedures, please do the following. First contact the Office of Student Accessibility Services:
(http://www.clemson.edu/academics/studentaccess/)

Obtain a letter documenting any special needs you might have. You can make an appointment with Student Accessibility Services by calling 864-656-6848, by emailing studentaccess@lists.clemson.edu, or by visiting Suite 239 in the Academic Success Center building. Second, bring this letter to me during my office hours so that we may discuss any special accommodations which might be necessary. Note that if you need special testing procedures, you must initiate the online request for access to the Test Proctoring Center at least one week prior to EACH exam including the final exam.

17. Accessibility Statement:
18. Title IX:
The following is Clemson University’s Title IX (Sexual Harassment) statement:
“Clemson University is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender, pregnancy, national origin, age, disability, veteran’s status, genetic information or protected activity (e.g., opposition to prohibited discrimination or participation in any complaint process, etc.) in employment, educational programs and activities, admissions and financial aid. This includes a prohibition against sexual harassment and sexual violence as mandated by Title IX of the Education Amendments of 1972. This policy is located at:
http://www.clemson.edu/campus-life/campus-services/access/title-ix/

Mr. Jerry Knighton is the Clemson University Title IX Coordinator. He also is the Director of Access and Equity. His office is located at 110 Holtzendorff Hall, 864.656.3184 (voice) or 864.656.0899 (TDD).”
TENTATIVE SCHEDULE:  Final Exam: April 30, Thurs 7-9:30pm

## Academic Calendar

### Spring 2020

**January**
- Jan 6, Mon: Orientation
- Jan 6, Mon - Jan 7, Tue: Late enrollment
- Jan 8, Wed: Classes begin
- Jan 14, Tue: Last day to register or add a class or declare Audit
- Jan 20, Mon: Martin Luther King Jr. holiday
- Jan 22, Wed: Last day to drop a class or withdraw from the University without a W grade
- Jan 29, Wed: Last day to apply for May commencement

**February**
- Feb 28, Fri: Last day for instructors to issue midterm evaluations

**March**
- Mar 13, Fri: Last day to drop a class or withdraw from the University without final grades
- Mar 16, Mon - Mar 20, Fri: Spring break

**April**
- Apr 4, Sat - Apr 11, Sat: Honors and Awards Week
- Apr 6, Mon: Registration for fall term begins
- Apr 23, Thu - Apr 24, Fri: Classes meet; exams permitted in labs and one-hour courses only
- Apr 27, Mon – May 1, Fri: Examinations

**May**
- May 4, Mon: 9:00 A.M. – Deadline to submit candidate grades
- May 6, Wed: 9:00 A.M. – Deadline to submit other grades
- May 6, Wed: Candidates for commencement may access grades
- May 7, Thu - May 8, Fri: Commencement
- May 7, Thu: Doctoral Hooding at the Brooks Center

### Flow of the course: Chapters are from 9th Edition - Exclude Exergy

- Review - Chapters 2,3,4
- Second law cycles / Irreversibility - 5.1-5.2
- Using Entropy - 6.1-6.3
- Intro to Systems – 8.1, 9.1, 10.1
- Intro to Mixtures and Combustion – 13.1
- Second Law in Details – 5.3-5.11
- Entropy in Details – 6.2-6.13
- Vapor Power Systems – 8.2-8.5
- Refrigeration and Heat Pump Systems – 10.2-10.7
- Gas Power Systems – 9.2-9.14
- Ideal Gas Mixtures and Psychometry – 12.1-12.9
- Reacting Mixtures and Combustion – 13.1-13.4
- Chemical and Phase Equilibrium – 14.1-14.3