

SYLLABUS

ME 3030 – Thermodynamics – Section 001 – Spring 2024

Last Updated: January 6, 2024

1. General Information

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| Instructor: | Prof. John R. Saylor jsaylor@clemson.edu (864) 656-5621 |
| My Office: | 229 Fluor Daniel Building. |
| Student Hours: | <u>By appointment:</u> E-mail me and we'll schedule an in person or Zoom meeting. |
| Modality: | <u>In person:</u> Lectures/Quizzes/Exams will all be in-person at the lecture hall specified below. |
| Course Time/Location: | Tu/Th, 3:30PM - 4:45PM Dillard Building, Room 200. Location of lecture hall and my office can be found on this map: https://www.clemson.edu/campus-map/index.html |
| Textbook: | <u>Fundamentals of Engineering Thermodynamics</u> by Moran & Shapiro (any edition). Hardcopy only. |
| Catalog Course Description: | “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. Thermochemical equilibrium.” |
| Learning Objectives and Outcomes: | See departmental description at: http://cecas.clemson.edu/~jsaylor/ME3030Thermodynamics_ABET.pdf |
| Prerequisites: | ME 2030 with a C or better. |
| Required Materials: | Hard copy of textbook. Two calculators (more on calculators, below). |

2. Web Site:

Information relevant to this course will be posted on the **class web page**:

<http://cecas.clemson.edu/~jsaylor/teaching.html>

This syllabus is available on the class web page. Homework solutions, problem solving format, etc. will be located at this class web page as well. You should check it frequently.

3. E-mail:

E-mail communication is important. E-mails will be sent to your Clemson account only. It is your responsibility to be sure that this account is functioning properly. My response time to an e-mail is typically less than 24 hours.

4. Textbooks:

You will need a hard copy of the textbook. The quizzes will require a hard copy. You are required to bring your textbook to every lecture. Electronic copies will not be permitted.

A note on versions of the textbook. I will be teaching from the **6th** edition of the textbook for this course. Many of you have the 8th edition. Accordingly, I have compared the text in the relevant chapters for both editions and have compiled any differences here:

<http://cecas.clemson.edu/~jsaylor/DifferencesBetweenthe6thand8theditionsofTextbook.pdf>

These differences are very small. The homework problems do differ significantly between the 6th and 8th editions, and I will be assigning problems from the 6th edition. However, every problem that will be assigned can be found at:

http://cecas.clemson.edu/~jsaylor/ME3030ProbAssignments_6thEd.pdf

5. **Reading Assignments:**

A reading assignment will be given prior to each class. You will be expected to have read the assignment prior to each lecture and to participate in discussions and to solve problems related to the assignment during the lecture.

6. **Attendance:**

You are expected to attend all classes. Attendance will not be taken and there will be no attendance grade in this course. But if you miss a class, it is your responsibility to determine what you missed. You should obtain this material from another student. 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.

7. **Lateness:**

Because of the distraction caused by students entering during class, you are not permitted to enter the classroom once I have begun lecturing. Do not attempt to enter the classroom once I have begun lecturing even if the door to the classroom happens to be open. Your final grade may suffer if you fail to follow this rule (see “More on Grading”, below). If I am late to class, you are required to wait 20 minutes before you may assume that class has been canceled.

8. **Homework:**

Weekly homework assignments will be given. You are strongly encouraged to do these homework assignments, however they will not be graded or handed in. You will be quizzed on the material covered in each homework assignment (see below). Success on these quizzes will require proficiency on the homework. A list of homework assignments will be provided; these will also be posted on the class web page. The solutions to **most** of the assigned problems can be found on the class web page. **You are strongly encouraged to do these assignments as if the solutions did not exist, and then grade yourself using the solutions. Students who flip back and forth between their work and the posted solutions rarely do well in this course.**

9. **Quizzes:**

You will be given two types of quizzes in this course: Announced Quizzes and Surprise Quizzes. **All quizzes are weighted equally.**

Announced Quizzes will be given on the ‘due’ date for that week’s homework assignment. The subject of that quiz will be similar to the subject matter of the homework assignment. The purpose of these quizzes is to determine how well you have mastered the homework material. All quizzes will have equal weight.

Surprise quizzes will also be given. These will be based on the reading assignment for that class. The surprise quizzes will be designed to be easy if you have done the reading and difficult if you have not. Makeups will not be given for the surprise quizzes.

10. **Cell Phones/Laptops:**

All cell phones, tablets, pda’s, laptops, etc. are to be turned off before the beginning of class. You may not text, e-mail, or use the internet during class.

11. Documentable Excuses:

Missing an exam or quiz 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 an 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**. Isolation and quarantine because of a Covid infection or exposure will be treated the same as any other illness.

Examples of valid, 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 course work, etc.

12. Inclement Weather/Power Outage:

Any exam or quiz scheduled during a university power outage will be given at the next class meeting unless you are contacted by me first. Class cancellation by the university due to inclement weather will result in cancellation of a quiz or exam.

13. Grading:

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

- Quizzes 15%
- Mid-Term Exams 60%
- Final Exam 25%

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 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:

- $90\% < A \leq 100\%$
- $80\% < B \leq 90\%$
- $70\% < C \leq 80\%$
- $60\% < D \leq 70\%$
- $F \leq 60\%$

Note that the lower bound of each grade bracket is a ‘greater-than’ sign, not a ‘greater-than-or-equal-to’ sign. Hence, a grade of 89.999% is not an A, it is a B. This policy is designed to reduce conflicts over roundoff in computing grades.

14. More on Grading:

If your final numerical grade is very close to a letter grade transition, I may, at my discretion, choose to increase your final letter grade for this course due to excellent class participation or decrease it for failing to follow procedures outlined in this syllabus (e.g. texting during class, cell phone going off in class, entering class late, talking to your neighbor in class, etc.).

15. Format for solving problems:

 See class web page:

http://cecas.clemson.edu/~jsaylor/problemSolvingFormat3030_2024s.pdf

16. Permitted calculators:

 Only a four-function calculator is permitted to be used on exams and quizzes. An image of the four-function calculator that you can use in this class can be found here:

http://cecas.clemson.edu/~jsaylor/FourFunction_1.jpg

If you have a calculator that is very similar to this one, e-mail me a photo of it and I will let you know if it is acceptable. If your calculator has a key with the word “Solve” on it, it is not acceptable. Any calculator that is capable of solving integrals, derivatives, equations, or is programmable in any way is not acceptable. Occasionally you will be permitted to use a scientific calculator, for example on a quiz where computing exponentials or trigonometric values is required.

17. 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 make an appointment to see me about the issue.
- (b) If you feel that your exam was graded unfairly, submit your exam to me along with a written statement (one paragraph maximum) describing 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:

If you feel that a mistake was made in grading a quiz, please set up an appointment to see me.

18. Academic Integrity Statement:

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.

All infractions of academic dishonesty by undergraduates must be reported to Undergraduate Studies for resolution through that office. In cases of plagiarism instructors may use the Plagiarism Resolution Form.

Additionally, for undergraduate classes:

Plagiarism, which includes the intentional or unintentional copying of language, structure, or ideas of another and attributing the work to one's own efforts. Graded works generated by artificial intelligence or ghostwritten (either paid or free) are expressly forbidden.

See the [Undergraduate Academic Integrity Policy](#) website for additional information and the [current catalogue](#) for the policy.

Cheating includes giving or receiving assistance of any kind on an exam or quiz by any means. **Cheating is grounds for failure in this course.** Note that texting your fellow students or communicating with any individual or any entity in any way during a quiz or an exam is cheating. Cheating, in addition to being a violation of the university honor code, is also a violation of this syllabus.

19. Accessibility Statement:

Clemson University values the diversity of our student body as a strength and a critical component of our dynamic community. Students with disabilities or temporary injuries/conditions may require accommodations due to barriers in the structure of facilities, course design, technology used for curricular purposes, or other campus resources. Students who experience a barrier to full access to this class should let the instructor know and are encouraged to [request accommodations](#) through SAS (Student Accessibility Services) as soon as possible. To request accommodations through SAS, please see this link: (<https://www.clemson.edu/academics/student-accessibility-services/how-to-register/index.html>). You can also reach out to SAS with questions by calling 864-656-6848, visiting SAS at the ASC Suite 239, or stopping by the office as a drop-in appointment.

20. Title IX 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 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 [Title IX](#) policy is located on the Access and Equity website. Ms. Alesia Smith is the Clemson University Title IX Coordinator, and the Assistant Vice President of Equity Compliance. Her office is located at 223 Brackett Hall, 864-656-3181 and her email address is alesias@clemson.edu. Remember, email is not a fully secured method of communication and should not be used to discuss Title IX issues.

Clemson University aspires to create a diverse community that welcomes people of different races, cultures, ages, genders, sexual orientation, religions, socioeconomic levels, political perspectives, abilities, opinions, values and experiences.

21. Emergency Preparation Statement

Emergency procedures have been posted in all buildings and on all elevators. Students should be reminded to review these procedures for their own safety. All students and employees should be familiar with guidelines from [Clemson University Public Safety](#).

Clemson University is committed to providing a safe campus environment for students, faculty, staff, and visitors. As members of the community, we encourage you to take the following actions to be better prepared in case of an emergency:

1. Familiarize yourself with all possible exits, safer locations, and other key information on the emergency evacuation maps in this building, and those that you visit regularly.
2. Make a plan for how you would Run, Hide, and Fight in case of an [active threat](#) in this building, and those that you visit regularly. For example:
 - a Run - what are all the possible exits in this building, and the routes to them?
 - b Hide - what are the potential hiding locations in this room and building that are out of sight of doors and windows, how do you lock the door(s), how would you barricade the door(s) and windows, where do you turn off the lights?
 - c Fight - What tools are available in this room and building, should you have to fight?
3. Ensure you are signed up for [emergency alerts](#). Alerts are only sent when there is a potential threat to safety, a major disruption to campus services, and once-monthly tests.
4. Download the [Rave Guardian](#) app to your phone.
(<https://www.clemson.edu/cusafety/cupd/rave-guardian/>)
5. Learn what you can do to [prepare yourself](#) for the hazards that affect our locations.
(<http://www.clemson.edu/cusafety/EmergencyManagement/>)

22. Final Exam:

The final exam for this course is on:

Friday, May 3, 2024, 11:30AM - 2:00PM

You may confirm the date/time of the final at:

<https://www.clemson.edu/registrar/student-menu/exam-spring.html>

COURSE OUTLINE & TENTATIVE SCHEDULE

| <u>Lecture</u> | <u>Date</u> | <u>Topic (Chapter Sections)</u> |
|----------------|-------------|--|
| 1 | Jan. 11, | Thurs. ME 2030 Review via online lecture |
| 2 | Jan. 16, | Tues. Syllabus Review, 5.1 - 5.3 |
| 3 | Jan. 18, | Thurs. 5.4 - 5.5 |
| 4 | Jan. 23, | Tues. 5.6 - 5.9 |
| 5 | Jan. 25, | Thurs. 5.10 |
| 6 | Jan. 30, | Tues. 5.11, 6.1 |
| 7 | Feb. 1, | Thurs. 6.2 - 6.4 |
| 8 | Feb. 6, | Tues. 6.5 - 6.8 |
| 9 | Feb. 8, | Thurs. 6.9 - 6.11 |
| 10 | Feb. 13, | Tues. 6.12 - 6.13, 8.1 |
| 11 | Feb. 15, | Thurs. 8.2 - 8.4 |
| 12 | Feb. 20, | Tues. 8.4, 9.1 - 9.2 |
| 13 | Feb. 22, | Thurs. EXAM #1 |
| 14 | Feb. 27, | Tues. 9.2 - 9.5 |
| 15 | Feb, 29, | Thurs. 9.6 - 9.7 |
| 16 | Mar. 5, | Tues. 9.8 - 9.9, 9.11, 10.1 |
| 17 | Mar. 7, | Thurs. 10.2, 10.6 - 10.7, 11.1 |
| 18 | Mar. 12, | Tues. 11.4 - 11.5, 11.7 |
| 19 | Mar. 14, | Thurs. 12.1 - 12.3 |
| | Mar. 19, | Tues. Spring Break |
| | Mar. 21, | Thurs. Spring Break |
| 20 | Mar. 26, | Tues. 12.4 - 12.6 |
| 21 | Mar. 28, | Thurs. 12.7 - 12.9 |
| 22 | Apr. 2, | Tues. 13.1 - 13.3 |
| 23 | Apr. 4, | Thurs. 13.3 - 13.5 |
| 24 | Apr. 9, | Tues. EXAM #2 |
| 25 | Apr. 11, | Thurs. 14.1 - 14.2 |
| 26 | Apr. 16, | Tues. 14.3 - 14.4 |
| 27 | Apr. 18, | Thurs. 14.4 - 14.6 |
| 28 | Apr. 23, | Tues. Review |
| 29 | Apr. 25, | Thurs. Review |