



ENGR 236 Thermodynamics section name section credit hours Credits Syllabus

Course Information

Meeting times and location: section meeting_times section location

Catalog description: This first course in thermodynamics is applicable to all engineering disciplines (and modern society in general) as it deals with energy, and an energy-balance" approach to problem solving. The first portion is devoted to energy, energy transfer, and physical properties. The first law of thermodynamics (which relates energy to heat and work) and the second law (specifies the direction of certain processes) are then covered in detail."

Prerequisites: PHYS-1310/PHYS-1310L(PHYS-215/PHYS-215L)

Terms offered: Spring Only

Section-specific Course Description:

Course Level Objectives

Course learning outcomes:

1. Determine the state of a pure substance and calculate energy values
2. Draw T-v and P-v diagrams for processes
3. Apply the first law of thermodynamics to both closed and open systems
4. Calculate efficiency or coefficient of performance for devices
5. Apply the second law of thermodynamics to both closed and open systems
6. Calculate entropy change values for substances and processes

This course covers:

1. Properties and units
2. Phase diagrams
3. Internal energy and enthalpy

4. Property table values and interpolation
5. Heat transfer mechanisms
6. Closed and open systems
7. Conservation of mass
8. First law of thermodynamics (conservation of energy)
9. Second law of thermodynamics (quality of energy)
10. Heat engines, refrigeration cycles and heat pumps
11. Efficiency and Coefficient of Performance of devices
12. Entropy
13. Reversible, irreversible, and isentropic processes

Required Texts and/or Materials

Thermodynamics; An Engineering Approach

9781260048667

Çengel and Boles

McGraw-Hill

9th edition

Required Technology and Software

- Canvas
- Chrome, Safari, or Firefox

Technical Support

Technical support is available through the San Juan College Help Desk 24/7/365. The help desk can be reached at 505-566-3266 or by creating a ticket at [San Juan College Help Desk](#).

For tickets and password reset: [San Juan College Help Desk](#)

For Canvas support information: [Canvas Support](#)

Accessibility/Privacy Policies for all Technology Tools Used

Course Requirements

TEXT MATERIAL: The full version of the textbook includes material for two semesters of classical thermodynamics, plus enough additional material on combustion for a third course. Chapters 1 - 7 will be covered in this class.

HOMEWORK: Homework will be assigned weekly from problems at the conclusion of each chapter and answers to all assigned numerical problems will be provided. It will be collected on the due date in class and assessed a grade as follows: the instructor will choose two or more problems to grade in detail, and will check the rest for completion. The score will be based on a ten (10) point total with eight (8) points dedicated to graded problems and two (2) points for completion of the other problems. Homework may be handed in during the next two days, but only for 70% quiz credit

Spending significant time and effort on homework problems is the key to doing well in this course. Practice is critical to good performance on the exams. Please organize your homework neatly and provide concise descriptions of your logic. Draw diagrams as necessary and label them. Use only 1 side of each sheet of paper.

In addition to solving problems from the textbook, you will be asked to listen to and summarize a number of radio episodes that deal specifically with thermodynamics. These submissions must be made through Canvas, and contribute to your homework grade. Four (4) homework grades will be dropped after mid-term.

EXAMS: Exams will be given in class and you will be allowed the entire period to finish. One week's notice (at least) will be given prior to each exam. You must inform the instructor (phone message, e-mail, etc.) prior to or during an exam if you are not able to make class. An extra credit assignment at the end of the course will be worth a 15 point addition to your lowest exam score.

The final exam will be given at the time listed in the semester schedule, unless negotiated and voted on by the students.

ADDITIONAL CREDIT: You are required to submit exam corrections for each in-class exam. No grades will be dropped, and the original exam must be handed in along with the corrections.

CANVAS: Web software (Canvas) will be used to track and submit assignments, provide an avenue for course announcements, and store a variety of useful websites and articles. If you are pre-registered for the course you should already have an account, which you can access through the college website or your student portal.

COVID Safe Practices for Being on Campus

Masks / cloth face coverings must be worn while on campus in accordance with the New Mexico public health order. If you feel that you cannot wear a mask due to health complications, please contact Disabilities Services:

disabilityservices@sanjuancollege.edu or call (505) 566-3271. Hand sanitizer stations are at all building entrances, please “wash in, wash out”--clean your hands when you enter and before you leave. Classrooms and labs have been arranged to allow for social distancing; please respect your classmates and instructors by staying 6 feet away from everyone. You will be expected to disinfect your table or area prior to class and after class, cleaning products will be provided for this purpose. Check with your instructor for specific policies for their course. Please do not congregate in hallways or common areas, instead utilize our beautiful outside spaces and weather to visit with your friends and colleagues from a safe distance.

If you have been in contact with anyone who has tested positive for COVID-19, has symptoms, or is waiting on test results, contact your instructor and DO NOT come to class. If you have tested positive, have symptoms or are waiting on test results, contact your instructor and DO NOT come to class. Your health care provider or the assigned contact tracer will let you know when it is safe for you to be around others.

Student Support

Student Services and Support

The Student Support webpage provides information on counseling, tutoring, technical support, and many other support services available to San Juan College students.

[Student Support](#)

Academic Support

Academic Support webpage provides information on academic advising, the library, Testing Center, and the honors program.

[Academic Support](#)

Participation and Attendance Policy

Attendance will be taken. Absence and lateness will certainly have an effect on final grades to the extent that class work and discussions will be missed.

Canvas Participation and Expectations

Check in every week for announcements and assignments. All grades are available on Canvas and you should verify them often.

Instructor Response Time

Phone calls and emails will be returned within two (2) business days, and often sooner. Work will be graded and posted with a few days of the due date.

Course Time Commitment

Significant time will be required outside of class to complete homework assignments and study for the exams. Plan on at least six hours a week, more during exam weeks.

Grading

Category	Weight (%)
Exams (3)	50
Final Exam	20
Homework	20
Corrections	10

Key Dates to Remember

[Full Academic Calendar](#)

Course Schedule

This is a 16 week course and is not self-paced. You are expected to keep up with the assignment schedule in Canvas. The final project will be due on the last day of class.

College Policies

The following information also applies to your work in this class. If you have special needs for campus emergency situations, please inform me immediately.

1. Academic Accommodations - American with Disabilities Act (ADA)

If you believe you need academic accommodations due to physical or learning disabilities, you are encouraged to inform them as soon as possible. The coordinator can work with you in verifying your disabilities and developing accommodation strategies. Please go to [Disability Services Office](#), click the button for "Request for Services" and complete all the steps.

You can also contact the college's disability coordinator in the Advising/Counseling Center at 566-3271 or disabilityservices@sanjuancollege.edu. More information is available on the website listed above.

2. The Family Educational Rights and Privacy Act (FERPA)

Your personal information and grade are confidential. Aside from routine reporting to the college required for this course, I will not share such information with anyone unless I have your permission.

3. Academic Honesty Rules

San Juan College expects all students to adhere to the [Academic Honesty Rules](#) as posted online. These are the official guidelines for all classes at San Juan College (July 2006).

4. Student Conduct Statement

College is preparation for professional opportunities, and professional conduct is expected in courses, including online classes, as well as any written communications, and interactions with members of the college community. As part of our learning community, students are expected to interact and communicate in a mature, respectful, thoughtful, and supportive manner. Students who demonstrate disrespectful, hostile, belittling, bullying or other disruptive behavior will be subject to potential consequences and possible dismissal from the college. The college will take appropriate action when students demonstrate threatening behavior (to others or self). Students should refer to the Code of Conduct in the Student Handbook for additional information.

5. Student Safety

Keeping students safe is a priority, and part of that is ensuring that we have the ability to communicate emergency messages – whether for school closures due to weather or for more or urgent situations. Rave is San Juan College's emergency messaging system. Through your SJC student email, you will automatically receive email messages, however, it is also vital that you receive text messages. In order to receive the messages, you must register in a simple process with [Rave](#). When registering, please make sure that your mobile status is "confirmed."

The Department of Public Safety is available 24 hours per day. In an emergency, they can be accessed by calling 215-3091 or 566-3333.

In the event of an emergency, a Rave message will be sent, and depending on the situation, you will be instructed to do one of the following:

- Evacuate the building
- Shelter in place (Campus doors are locked, and operations continue as normal. During this situation, no one other than law enforcement is allowed in or out of the campus.)
- Lockdown (Campus doors are locked. All operations cease, and you should take cover in your immediate area. No one other than law enforcement is allowed in or out of the campus.)

6. Non-Discrimination, Sexual Harassment, and Retaliation.

San Juan College does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender identity, national origin, disability, age, genetic, veteran's status, or on the basis of any other category protected under federal, state and local laws. If you have experienced sexual harassment, sexual assault, or any other form of protected class discrimination, we encourage you to make a report. If you report to a faculty member, she/he/they are obligated by policy to share knowledge, notice, and/or reports of harassment, discrimination, and/or retaliation with the Title IX Coordinator. These disclosures include but are not limited to reports of sexual assault, dating/domestic violence, and stalking. You may also make a confidential report to a SJC Counselor. Please refer to San Juan College's [Title IX](#) site for further details.

San Juan College's Title IX Coordinator is Stacey Allen, Assistant Director of Human Resources/Equity, Diversity, and Inclusion Officer. The office is located at the Educational Services Center Building, 2nd Floor, Human Resources, Room 4243 at (505) 566-3515 or allens@sanjuancollege.edu.

7. Drop for Non-Attendance and/or Non-Participation

Class Attendance and Participation Expectation:

Face-to-Face -- Students are expected to attend and participate in class regularly. Any student missing more than 10% of consecutive class time, (For example, in a regular 15-week class that meets twice a week, this equates to the student missing 3 consecutive classes) without consultation with the instructor may be considered as having abandoned the course.

On-line -- Students are expected to participate regularly and submit all course assignments, based on the course guide definition. A student who does not submit any assignments during a consecutive 10% of the course (1.5 weeks of a 15-week

semester) without consulting the instructor, may be considered as having abandoned the course. Logging in does not meet the attendance standard.

Competency-Based Education Classes -- Students are expected to have regular and substantive interactions with their instructor and to actively work on course content. A student who has not submitted coursework, nor had substantive interactions with the instructor over a consecutive 10% of the term, without the instructor's prior approval, will be considered to have abandoned the competency progression. Last date of attendance will be recorded as the last date that coursework was submitted or that the student met with the instructor. For on-line learners, logging in does not meet the attendance standard.

8. Failure to Meet Class Participation Expectation:

Students who fail to meet participation expectations will have their last date of attendance recorded. This date will be used to recalculate any financial aid received/veteran's benefits received, and the student may be required to repay the institution/government. If the student does not drop the course, an 'X' grade will be recorded. An 'X' grade impacts the grade point average the same as an 'F'.

9. Grading Policies

Incomplete: Incomplete Grade Assignment ([Incomplete Grades Information](#))

The grade of I (Incomplete) is given for passing work that could not be completed during the semester because of circumstances beyond the student's control. Ordinarily, the assignment of an I is given by the course instructor at the time final grades are due

In no case is an I grade to be used to avoid assignment of D or F grades for marginal or failing work or to require a student to enroll in the class the next semester because work was not completed on time. Circumstances warranting the issuance of an I grade must be beyond the student's control and must be documented on the appropriate form prior to approval.

I grades can be removed only during the subsequent 16 weeks from the end of term, or within the time limit set by the instructor. Removal of an I is accomplished by completing the work in a manner acceptable to the instructor. Re-enrollment in the course under the repeat option does not remove the prior grade of I. Students should not re-enroll for the course. An I not made up within 16 weeks or within the time limit set by the instructor will change to an F grade thereafter and cannot be

changed by work completion.

10. **Grade Appeals**

The policy for grade appeals is in the Academic Catalog.([Grade Appeal Policy](#))

Student Handbook

The Student Handbook provides information on Student support, student organizations, and San Juan College policies.

[Student Handbook](#)