

Thermodynamics – Physics 530
Fall 2018
SUNY College at Cortland
Physics Department

Catalog Description

Study of the thermal properties of matter from macroscopic and microscopic points of view. Topics include heat, temperature, entropy, classical and quantum statistical mechanics, and the laws and applications of thermodynamics to such systems as heat pumps, engines, and refrigerators.

Prerequisites: PHY 410 and MAT(122 or 237). PHY 410 may be taken concurrently (3cr. hr.)

Textbooks

Required

- *Thermodynamics an Engineering Approach* (8th Ed.) by Yunus Cengel and Michael Boles ISBN:0073398179.

Recommended

- *A Modern Course in Statistical Physics* (3rd Ed.) by Linda Reichl ISBN: 9783527407828.

Instructor Information

Instructor: Douglas Armstead

Office: 127 Bowers (607) 753-2919

Office Hours: MW 11-noon, T 1-2pm and by appointment.

Email: douglas.armstead@cortland.edu

Lecture meets: MW 3pm-4:15pm in Bowers 139.

Course Website: <http://facultyweb.cortland.edu/douglas.armstead/F18/Thermodynamics.html>

Expectations

What you should expect from me:

- Explanations of physical concepts that include concrete examples and, where reasonable, demonstrations.
- In-class examples that help you to develop the level of reasoning that is necessary to do the problems you will encounter in the homework and on exams.
- Careful and respectful consideration of your questions.
- An open door policy—if my office door is open you should feel free to come in and talk about physics. This is in addition to my regularly scheduled office hours listed above.

What I expect of you:

- Your presence in class, both physical and mental, for the entire class period.
- To prepare for class. This includes doing the reading at a level that you arrive with questions in hand about the material.
- When you have a question, ask it. Your fellow classmates will thank you—if you are unclear on something, chances are the person next to you is, too.
- Submit work for grading that is your own. If you copy from another student or source and submit it for a grade, then you risk receiving an F in the course.

Grades

The final score for the class is found in the following way:

$$score = \frac{H + E_1 + E_2 + F}{4} \quad (1)$$

where H =homework average, E_i = i th in semester exam, and F =final exam.

The homework is a vehicle for your mastering the concepts, techniques, and thought processes relevant to Thermodynamics and for communicating this in a way that leads from beginning to end using a clear, methodical plan. There are a number of aids at your disposal: the book, the instructor, in and out of class; and your classmates. But in the end nothing beats quiet concentration and gradually sorting things out for yourself.

Homework will typically be assigned on Thursday and due on the following Thursday, when solutions will be provided. Allowing late homework is not really in your best interest and will generally not be accepted.

Make-up exams will only be administered for “Excused Absences” (see University Catalog for details). Supporting documentation to excuse your absence will be required.

The score is mapped into a grade roughly as:

Final %	Grade
90-100	As
80-89	Bs
70-79	Cs etc.

Improvement and class participation may be used raise a border line grade.

Academic Integrity

You are expected to observe the University's statements and procedures on Academic Integrity in the college handbook, Chapter 340. Ask me if you have any uncertainty about what it means to cheat or the distinction between proper collaboration and plagiarism.

Students with a Disability

If you are a student with a disability and wish to request accommodations, please contact the office of Student Disability Services located in VanHoesen B-1 or call (607) 753-2066 for an appointment. Information regarding your disability will be treated in a confidential manner. Because requests for accommodation take time to review and many accommodations require early planning, requests for accommodations should be made as early as possible.

Class Schedule

All dates are tentative. Note that some weeks will have a single extended class session that starts early.

Week of	Chapter(s)	Topic
8/27	1 & 2	Introduction and Energy Balance
9/3	2 & 3	1 st Law and Phases
		No class on Labor Day
9/10	3 & 4	Equations of State
9/17	4	Closed System Energy Analysis
9/24	5	Open System Energy Analysis
10/1	5 & 6	Steady Flow Devices and 2 nd Law
10/8	6	Reversible vs Irreversible Process
		Exam 1 on 10/10 (Chapters 1-5).
10/15	7	Entropy
		No class during fall break.
10/22	7	Entropy and Devices
10/29	8 & 9	Energy Degradation and Gas Power Cycles
11/5	10 & 11	Vapor Power Cycles and Refrigeration
11/12	11 & 12	Refrigeration and Differential Relationships
11/19		Exam 2 on 11/19. (Chapters 6-11)
		Thanksgiving break, no class on Wed.
11/26	12 & Reichl Chapters 1& 2	Differential Relationships and Statistical Physics
12/3	Reichl Chapter 2 & 3	Statistical Physics

Final Exam at 1:30-3:30pm on Tuesday December 11, 2018