

Thermodynamics – Physics 530  
Fall 2014  
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.)

**Required Texts**

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

**Instructor Information**

Instructor: Douglas Armstead  
Office: 127 Bowers (607) 753-2919  
Office Hours: TBA and by appointment.  
Email: douglas.armstead@cortland.edu  
Lecture meets: TR 6:25pm-7:40pm in Bowers 1119.

**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:

$$score = \frac{3 * H + E_1 + E_2 + E_3 + 1.5 * F}{7.5} \quad (1)$$

where  $H$  =homework average,  $E_i = i$ th in semester exam, and  $F$  =final exam. Each term is out of 100.

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 plagerism.

## 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.

Week of	Chapter(s)	Topic
8/26	1 & 2	Introduction and Energy Balance
9/2	2 & 3	1 <sup>st</sup> Law and Phases
9/9	3 & 4	Equations of State and Closed System Energy Analysis
9/16	4 & 5	Closed and Open System Energy Analysis
9/23	6	2 <sup>nd</sup> Law Exam 1 on 9/23.
9/30	6 & 7	Reversible vs Irreversible Process and Entropy
10/7	7 & 8	Change in Entropy and Exergy
10/14	8	Energy Degradation Exam2 on 10/23.
10/21	9	Gas Power Cycles Fall break 10/21, no class.
10/28	9 & 10	Gas Power Cycles and Vapor Cycles
11/4	10 & 11	Vapor Cycles and Refrigeration
11/11	11 & 12	Refrigeration and Differential Relationships
11/18	12	Differential Relationships Exam 3 on 11/20.
11/25	Supplemental	Statistical Physics Thanksgiving break, no class on 11/27.
12/2	Supplemental	Statistical Physics

**Final Exam at 7-9pm on Tuesday December 9, 2014**