

Physics 436 - Statistical Thermodynamics (Spring 2024)

Instructor: John Eric Goff

Instructor Information:

- *Office:* Hobbs 412
- *e-mail:* goff@lynchburg.edu
- *Phone:* 434.544.8856
- *Course Web Page:* <http://goff-j.web.lynchburg.edu/P436.html>
- *Office Hours:*
 - * Monday and Tuesday, 2:00 pm - 6:00 pm
 - * Tuesday and Thursday, 10:00 am - 11:00 am
 - * Appointments are welcome.

Course Meeting Times: 11:00 am - 11:50 am Mondays, Wednesdays, and Fridays in Hobbs 316

Textbook: *An Introduction to Thermal Physics* by Daniel V Schroeder (Addison Wesley Longman, 2000, ISBN: 0-201-38027-7)

Prerequisites: PHYS 302 (Physics IV)

Course Purpose: *Statistical Thermodynamics* is to be used as four hours toward the “Physics Major.” It may also be used as four hours toward the “Physics Minor.”

Course Description: Classical thermodynamics and its elegant basis in microscopic systems described by statistical mechanics are the big course topics. The course will cover most of Chapters 1-7 (only about half of Chapter 5). The course should prepare you for a graduate course in statistical mechanics, if such a course resides in your future. Future engineers will benefit from the thermodynamic concepts developed in this course. You should also be equipped with the tools needed to begin investigating complex systems, such as those seen in biophysics, condensed matter physics, astrophysics, etc.

Course Grade: Your course grade will be determined in the following manner:

- 2 Mid-Term Exams \Rightarrow 15% each \Rightarrow 30% of total grade
- Homework \Rightarrow 40% of total grade
- Mini Project \Rightarrow 10% of total grade
- Final Exam \Rightarrow 20% of total grade

Exams: Each of the two mid-term exams will be passed out in class on a Friday and collected at the start of the next class. More details about the format will be given before each exam. Exam #1 is to be handed out on Friday, 23 February 2024. Exam #2 is to be handed out on Friday, 29 March 2024. The Final Exam is scheduled to be on Friday, 10 May 2024, 12:00 pm - 3:00 pm in Hobbs 316.

Homework: Except for the first assignment, homework will be assigned each Friday and collected the following Friday. Solutions will be handed out once homework has been collected. Working homework problems is a *very* important part of learning the material.

Homework and Exam Solutions: You accept homework and exam solutions under the University of Lynchburg Honor Code that they will *never* be used by any person other than yourself. One aspect of your participation in this course under the University of Lynchburg Honor Code is that you will *never* make use of any other student's materials from past courses. Those materials include student solutions to homework assignments and student copies of past exams, as well as my past solutions to homework assignments and exams. Failure to adhere to this policy will result in *severe* grade penalties, ranging from a *zero* on an assignment or exam to failure of the course, depending on the severity of the offense. Searching for homework problem solutions online is CHEATING.

Mini Project: You will choose a project from the "Project List" page. Your project consists of writing up the solution to the project's corresponding problems in the form of a short research paper. That means that the paper must be typed and written at a level so that one of your classmates could read it and know exactly what you are doing. You must tell me what project you will submit **no later than Monday, 8 April 2024**. On Monday, 6 May 2024, our last day of class, you will give me your project paper when class begins. During that last class, you will give a 10- to 15-minute oral presentation of your project. You should prepare transparency slides, *PowerPoint* slides, and/or whatever else you need to give an effective presentation. I will provide more details about the "Mini Project" as the course progresses.

ZERO-TOLERANCE Electronic Device Policy: The use of cell phones, smart watches, laptops, and all other electronic devices is NOT permitted during class and lab. Texting, tweeting, and other forms of electronic communication are NOT permitted during class. Simply turn off your cell phone and stow it and any other electronic devices out of sight. Each offense of this policy results in a one-point reduction of your final course average.

Disabilities: University of Lynchburg is committed to providing all students equal access to learning opportunities. The Center for Accessibility and Disability Services (CADR) works with eligible students with disabilities (medical, physical, mental health and cognitive) to make arrangements for appropriate, reasonable accommodations. Accommodations are available as applicable in both live and virtual classroom settings. Students registered with CADR who receive approved accommodations are ***required to provide letters of accommodation each semester to each professor if they wish to use their accommodations. A meeting to discuss accommodations the student wishes to implement in individual courses is strongly suggested.*** Accommodations are not retroactive and begin when the accommodation letter is provided to faculty. For information about requesting accommodations, please visit <http://www.lynchburg.edu/academics/disability-services>, or contact Julia Timmons, timmons.j@lynchburg.edu, phone 434.544.8687 or Meg Dillon, dillon.ma@lynchburg.edu, phone 434.544.8709.

Problem Session: Tuesdays, 6:00 pm - 8:00 pm in Hobbs 316