

PHYS 201 Thermodynamics and Statistical Mechanics

Instructor: Maia Magrakvelidze; (office: JEPS 429)

Textbook: “*Classical and Statistical Thermodynamics*” by A. H. Carter, ISBN 0137792085

Prerequisites: PHYS 106

Section	Time	Room #
LECTURE (TR)	2:00-3:15 p.m.	HCC 329

Recommended Textbooks:

1. “An Introduction to Thermal Physics” by D. V. Schroeder, ISBN 0201380277
2. “Thermal Physics: thermodynamics and Statistical Mechanics for Scientists and Engineers” by R. F. Sekerka, ISBN 0128033045
3. “*Thermal Physics*” (2nd edition) by C. Kittel and H. Kroemer, ISBN 0716710889

Course Description and Objectives: The course introduces students to introductory level thermal and statistical physics. The first part of the class is focused on classical theory of thermodynamics, where fundamental laws are expressed in terms of state variables. The kinetic theory of gasses is covered next that makes transition from classical to statistical theory. Lastly the statistical interpretation of many particle system is introduced and the connection is made between the classical and statistical theory.

Student Learning Outcomes: Success in this course means that students have applied analytical techniques or rules to solve problems in a variety of contexts; students have developed a keen sense of “self-confidence” in the applications of the laws of thermal physics; students have developed an understanding of the important of thermal physics in nature.

A. Homework:

There will be one homework (on average) assigned each week. Doing homework problems is an important part of obtaining success in class, helping you organize your thoughts, learn the concepts, and apply them. Try to do Homework as soon as possible after the lecture, so you don’t get behind. **NO LATE HOMEWORK IS ACCEPTED.**

B. Help: Any student needing help should take full advantage of instructors during her/his office hours or by appointment. **Students should give an honest and exhaustive effort and have her/his questions clearly formulated BEFORE seeking help.**

C. Reading: Even though there is no required text book, students are advised to regularly review class notes and go through the material in the suggested textbooks.

D. Exams: There are two 1-hour exams during the semester (each 100 points) and one two-hour final exam (200 points). No makeup exams. **The final exam is mandatory and comprehensive.** The exams are closed-book and closed-note. A sheet of “useful equations” will be provided with your exam, but please note that having equations available does not guarantee success – understanding the material is the key. Try to study the concepts and how to apply them; **do not** just

try to memorize how to solve **particular** problems. **Make-up exams are given only in extraordinary circumstances and only with prior arrangement.**

E. Quizzes: There will be one quiz (on average) in every week on average during the semester. Each quiz will include material covered in previous classes (total 300 points). You will be allowed to bring to each quiz, *one* original 8.5" by 11" sheet of paper containing constants, formulas, and any other information that you might find useful. Both sides of the sheet may be used. No formulas or constants will be provided on the quizzes.

F. Grading: Grades are determined on a 1000 point scale as shown below. You cannot get a good grade in the course unless you do all the homework, and take all the exams.

A	A-	B+	B	B-	C+	C	D	F
930-1000	900-929	870-899	830-869	800-829	770-799	700-769	600-699	Below 600

Available points:

- Final exam: 200 points;
- Exams (each 100): 200 points;
- Quizzes: 300 points;
- Homework: 300 points;
- Total available: 1000 points.

Plagiarism: Plagiarism and cheating are serious offenses and may be punished by failure on the exam, paper or project; failure in the course; and/or expulsion from the university.

Note: If you have any condition such as a physical or learning disability, which will make it difficult for you to carry out the work as I have outlined it or which will require academic accommodations, please notify me.

Honor Code: I encourage students to work collaboratively; however, cheating is a serious offense. Please read and understand your University of Mary Washington Honor Code.

Lecture topics:

Introduction – review of topics covered in intro physics...

Nature of Thermodynamics – (Ch.1 to 2)

Laws of Thermodynamics – (Ch.3 to 10)

Kinetic Theory of Gases – (Ch.11)

Classical and Quantum Statistics – (Ch.12 to 17)

Bose-Einstein and Fermi-Dirac Gases – (Ch.18 to 19)

Dr. Magrakvelidze ☺**Spring 2018**

	Monday	Tuesday	Wednesday	Thursday	Friday
7:00					
8:00	Gen.Physics Jepson 219	Gen Physics Jepson 217	Gen.Physics Jepson 219	Gen Physics Jepson 217	Gen.Physics Jepson 219
9:00			Gen Phys. Lab Jepson 217		
10:00	Office Hours	Gen.Phys. Lab Jepson 217		Office Hours	
11:00					
12:00	LUNCH	LUNCH	LUNCH	LUNCH	
1:00					
2:00		THERMO HCC 329	RESEARCH MEETING	THERMO HCC 329	
3:15					
4:00					
5:00					

OFFICE HOURS: Open Door Policy (if not in office please make an appointment)
