

PHY 4523, Statistical Physics - Spring 2019

Syllabus

AIM: PHY 4523 focuses on the statistical treatment of the (quantum mechanical or classical) dynamics of individual particles and the general physical properties that can be deduced. *Statistical mechanics* is a very general framework for analyzing equilibrium systems which also provides a microscopic basis for thermodynamics. We will look at many applications of statistical thermodynamics taken from different areas of physics.

PRE-REQUISITES: It will be assumed that you have successfully completed an introductory course in classical thermodynamics at the level of PHY 3513 (Thermal Physics) or PHY 3062 (Accelerated General Physics III). Some experience with quantum mechanics will be advantageous but not absolutely necessary.

HOMEWORK: You will be assigned at least four homework problem sets to be turned in the week following the assignment. You will also be recommended to attempt other problems from the textbook. You are expected to work on your own and your submitted homework papers should be your own work. The homework will account for 40% of your overall score in PHY 4523. The homework must be handed in on time and be legible to count for credit. The best three scores of the assignments will be counted for credit.

EXAMS: There will be two in-class exams. The exams will be designed to test your understanding of fundamental concepts and methods. Memorization and regurgitation of material covered in lectures and homework will not be sufficient. Formula sheets or textbooks will be allowed; details will be announced nearer the time.

FINAL PAPER: A final paper written on a topic of statistical physics will be required. The topic must be chosen well before the end of the course and must be approved by the instructor. The paper should be original, 12 point font, single spaced and from 7 to 10 pages excluding references. It should be written as if explaining the subject to a fellow undergraduate student.

In the event of a documented conflict with another event, it may be possible to take an exam shortly after its scheduled time. Make-up exams will be offered only for serious medical conditions or University-approved absences supported in writing by the appropriate professional. Any request for a special exam sitting or a make-up must be made a week ahead for any scheduled absence, and as soon as reasonably possible after an unforeseen absence.

GRADE: Your grade will be assigned on the basis of an overall score, derived as follows:

| | |
|----------------|------|
| Homework | 40 % |
| Mid-Term Exams | 30% |
| Final Paper | 30% |

PROJECTED GRADING SCALE*

| | | | | | | | | | | |
|--------|-----|------|------|-----|------|------|-----|------|------|-----|
| Grade | A | A- | B+ | B | B- | C+ | C | C- | D+ | E |
| G. Pt. | 4.0 | 3.67 | 3.33 | 3.0 | 2.67 | 2.33 | 2.0 | 1.67 | 1.33 | 0 |
| Score | 85+ | 75+ | 70+ | 65+ | 60+ | 55+ | 50+ | 45+ | 40+ | 40- |

*The actual grading scale may vary depending on numerous factors within +/- 2.5 points out of 100. There will also be an extra-credit assignment which will allow you the chance to compensate at least partially for missed homework or a poor performance on one of the exams.

STUDENTS WITH DISABILITIES: Students who require accommodation for disabilities must first contact the Dean of Students Office. That office will provide documentation, which the student must bring to his/her instructors during the *first week* of the semester.

ACADEMIC HONESTY: Each student is expected to hold himself/herself to a high standard of academic honesty. Under the UF academic honesty policy, unauthorized assistance or the use of unauthorized resources is strictly forbidden on work-for-credit. Although discussions among the students are highly encouraged, you are to work alone on all homework assignments unless specified differently. Fabrication or falsification of excuses or related documentation is also a violation of the UF academic honesty policy. *Violations of this policy will be dealt with severely. There will be no warnings or exceptions.*