

Statistical Mechanics

PHY 385L

Unique Number 56985

(Spring Semester, 2017)

Instructor: Prof. Greg Fiete. Office: RLM 7.328; Ph: 232-8084. fiete@physics.utexas.edu

TA: Mr. Qi Chen

Classes: MWF 10:00 am-11:00 am, RLM 5.114.

Office hours: Friday 11:00 am-12:00 noon and by appointment.

Textbooks: *Statistical Physics of Particles* (Cambridge), and *Statistical Physics of Fields* (Cambridge), by Mehran Kardar. This is a modern and rigorous treatment of statistical mechanics applicable to nearly all branches of physics (and biology).

References: There are a number of other texts that are also useful references for statistical mechanics. They include: *Statistical Physics* (Butterworth & Heinemann), by Landau and Lifshitz; *Statistical Mechanics* (Pergamon) by Pathria; *Statistical Mechanics 2nd Edition* (Wiley) by Huang.

Prerequisite: Graduate standing and graduate classical mechanics 385K or consent of instructor.

Course Requirements and Grading Policy:

***CLASS ATTENDANCE.** Class attendance is important to reinforce topics covered in the homework and vice-versa.

***Homework sets** (assigned roughly every 2 weeks) to emphasize the most important ideas from class.

***Mid-term exam** (In-class, Monday March 27, 2017)

***Final exam.** This is a core course, which requires a **final exam** that counts for **50% of the course grade** by department policy.

The final grade will be based on homework (35%), the midterm (15%), and the final (50%). Since this is a core course, the class average will be curved to B+ by department policy.

Material to be covered:

We will cover nearly all of the text of *Statistical Physics of Particles* and roughly chapters 1-4, 9 of *Statistical Physics of Fields*. A few additional modern topics may be treated if time permits.

Perspective of instructor:

Statistical Mechanics is arguably the most widely applicable topic in physics, which has extended in modern times to include areas of biology, neuroscience, epidemiology, finance, etc.

Required University Notices and Policies

University of Texas Honor Code

The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the university is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community.

Use of E-Mail for Official Correspondence to Students

Email is recognized as an official mode of university correspondence; therefore, you are responsible for reading your email for university and course-related information and announcements. You are responsible to keep the university informed about changes to your e-mail address. You should check your e-mail regularly and frequently—I recommend daily, but at minimum twice a week—to stay current with university-related communications, some of which may be time-critical. You can find UT Austin's policies and instructions for updating your e-mail address at <http://www.utexas.edu/its/policies/emailnotify.php>.

Documented Disability Statement

If you require special accommodations, you must obtain a letter that documents your disability from the Services for Students with Disabilities area of the Division of Diversity and Community Engagement (471-6259 voice or 471-4641 TTY for users who are deaf or hard of hearing). Present the letter to me at the beginning of the semester so we can discuss the accommodations you need. No later than five business days before an exam, you should remind me of any testing accommodations you will need. For more information, visit <http://www.utexas.edu/diversity/ddce/ssd/>

Religious Holidays

By UT Austin policy, you must notify me of your pending absence at least fourteen days prior to the date of observance of a religious holy day. If you must miss a class, an examination, a work assignment, or a project in order to observe a religious holy day, I will give you an opportunity to complete the missed work within a reasonable time after the absence.

Behavior Concerns Advice Line (BCAL)

If you are worried about someone who is acting differently, you may use the Behavior Concerns Advice Line to discuss by phone your concerns about another individual's behavior. This service is provided through a partnership among the Office of the Dean of Students, the Counseling and Mental Health Center (CMHC), the Employee Assistance Program (EAP), and The University of Texas Police Department (UTPD). Call 512-232-5050 or visit <http://www.utexas.edu/safety/bcal>.

Emergency Evacuation Policy

Occupants of buildings on the UT Austin campus are required to evacuate and assemble outside when a fire alarm is activated or an announcement is made. Please be aware of the following policies regarding evacuation:

Familiarize yourself with all exit doors of the classroom and the building. Remember that the nearest exit door may not be the one you used when you entered the building.

If you require assistance to evacuate, inform me in writing during the first week of class.

In the event of an evacuation, follow my instructions or those of class instructors.

Do not re-enter a building unless you're given instructions by the Austin Fire Department, the UT Austin Police Department, or the Fire Prevention Services office.