Physics 212 – Statistical Mechanics – Fall 2022

Course Arrangements

Michael Peskin

This sheet gives the basic arrangements by which the course Physics 212 will be run this fall. If you have any issues or questions, please feel free to email me at the contact information below.

Course Web Site

The course has a dedicated web site at

www.slac.stanford.edu/~mpeskin/Physics212/

This site gives the planned schedule of lectures. Last year, I made a fairly complete set of lecture notes. I will revise them for this year and post the new versions before each lecture. The problem sets and quizzes (see below) and their solutions will be posted on this page. The problem sets will also appear on Canvas, but you should consider the web page the authoritative version. If there are corrections to the problem sets, I will post the most current version there. Finally, the page has links to recommended reference books. Most of these are available from the Stanford Library in electronic editions; please follow the links to SearchWorks.

Contact Information

Course Instructor:	Michael Peskin
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The best way to contact me is always by email: mpeskin@slac.stanford.edu . I am usually at SLAC, or, these days, working from home in Sunnyvale. But I am happy to meet you in my Varian office – or by Zoom – at a time convenient for you. Please email me for an appointment.

CA:	to be determined
office:	
email:	
office hours:	

I will update this page when the CA is enrolled.

Lectures

The lectures in the course will be given on Mondays and Wednesdays, 3:00-4:20 pm, in room 60-109, on the Main Quad next to Mem Church.

When I teach, I normally give over the first 15–20 minutes to questions from the class. I will assign 2 students to ask questions at the beginning of each lecture. Of course, anyone else who has a question or discussion item can also contribute. Also, I would be happy if students would interrupt me during the lectures. Please take this seriously. The more interactive the class is, and the slower I go, the more you will learn.

Problem Sets

Physics 212 will have weekly problem sets, handed out at the web site on Wednesdays and due on the following Friday at 4pm (9 days later).

The main goal of the problem sets is to let you actively engage with the course material. This is the best way to learn. Problem sets will not be graded severely; see below. But if you do not do them, you will get only superficial knowledge from this course.

I strongly encourage you to form a homework group with your friends and collaborate on the problem sets. This will also give you a chance to discuss the course material with others. (If you have difficulty finding homework collaborators, please ask me to help you.) The best approach is start working on the problem set, then discuss all of the difficult issues with your group, then write up the solution yourself. Please do not simply copy someone else's solution.

Make a pdf of your solution and turn it in on Gradescope. Problem sets will be graded by weight, not by detailed content, on a 0–1–2 scale. I will write a detailed solution set for each problem set. You should consult either of me or the CA if you have difficulty making your solution agree with the model. Any student with all 2's on the problem sets is guaranteed a B in the course. To get a higher letter grade, you will need to do the quizzes and final exam.

In previous years, some students have put off the first problem sets, intending to catch up later in the term. This is almost always a big mistake. The problem sets in the course are difficult, and they become harder if you get out of sync with your classmates. Please try to hand in each problem set on time.

Quizzes and Exam

There will be a take-home final exam in Physics 212, and there will also be 1 or 2 Quizzes–take-home 1-problem exercises given during the term. These will actually be graded seriously and will count toward your letter grade. Quizzes will be announced by email to the course roster. They will be posted on the course web site and on Canvas. I expect you to work on the Quizzes and Final by yourself. To solve the problems, you can use any reference materials you can find, but please do not discuss the questions with any other human—except that you can email me for clarifications or hints.

Stanford has an honor code for graded papers. You are on your honor to upload your Quiz solution to Gradescope within 24 hours after you download the Quiz and, similarly, to

hand in the Final by the designated time. You must write on your solution "I acknowledge the Stanford Honor Code." and sign it.

I would like to collect all of the solutions to a Quiz within 3 days of the announcement. If this is impossible for you, please email me and we will make another arrangement.

Computing

I assume that you all have access to a computer system such as Mathematica or MatLab for operations such as diagonalizing matrices and graphing. If this is an issue for you, please let me know. The first problem set is based on a simulation using python. If you do not have python on your computer, you can download python 3.9 for free. (If you have an older version of python, please upgrade to python3.) Here is the process:

1. Download `miniconda3` from `https://docs.conda.io/en/latest/miniconda.html`. (For Macs, use the `pkg` option.)

2. On the command line, type `conda install -c conda-forge numpy` to install the `numpy` library. Repeat with `scipy` and `matplotlib`.

3. You can now run python interactively, by typing `python` or run the program `A.py` by typing `python A.py`.

Many people find it easiest to use python through Jupyter notebooks, but I will not require you to use these. Python is a working language for many groups in the Physics Department, so your effort in learning python will not be wasted.