

Physics 1370- Quantum Mechanics

University of Pittsburgh

Fall 2018

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Office Hours: Wednesdays 12pm-2pm

TA: name

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Textbooks:

- David H. McIntyre, *Quantum Mechanics: A Paradigms Approach* (Pearson, 2012). (required)
- J. J. Sakurai, San Fu Taun, *Modern Quantum Mechanics*, revised edition (Addison-Wesley, 1994). (optional)
- R. Shankar, *Principles of Quantum Mechanics*, 2nd ed. (Plenum Press). (optional)
- R. Liboff, *Introductory Quantum Mechanics*, 3rd ed. (Addison-Wesley, 1997). (optional)
- Leslie E. Ballentine, *Quantum Mechanics: A Modern Development*, 2nd edition (World Scientific, 1998). (optional)

Course Description:

This is the first term of a two-term course, intended to provide a solid grounding in the foundations and applications of quantum mechanics. The lectures will cover the same material as the required text, but not necessarily in the same order. You are responsible for all material covered in lecture, reading, and problem sets.

To ensure that you are understanding the underlying concepts covered during the lecture, I will integrate conceptual (“clicker”) questions in the lectures. I will ask such questions several times during the lecture. You will be asked first to think about the question by yourself, and then discuss it with your neighbor. Then, I will poll the class to see how many of you obtained the correct answer. Each student will be assigned a personal response system transmitter (clicker). At the end of the class, please return the clicker to the correct bin number. It is important that you take the peer discussion seriously because research in physics education shows that you can learn a lot from your peers. Moreover, the kinds of questions asked in the class will help you understand that memorization of definitions is NOT the goal of the course and it is important that you pay attention to your knowledge structure and learn to interpret and draw inferences using various principles in diverse situations. If you actually make an effort to organize, repair and extend your knowledge, you will retain the material and be able to use it in the future after the course is over.

Occasionally, you will work during the class on tutorials with a classmate. Each tutorial will be preceded by a pre-test and the pre-test and tutorial will generally take the whole class period. You should complete the tutorial at home if you did not complete it during the class. The post-test for each tutorial will be given in the following class. Tutorials will reinforce the material covered in lecture but sometimes they will be used to introduce new material. A majority of the questions in the pre-test and post-test for the tutorials will be conceptual.

Problem Sets & Exams:

There will be approximately one problem set per week, two midterm exams, and a final exam. The final grade will be determined by the homework (20%), tutorial pre-tests (5%) tutorial post-tests and class quizzes (15%), mid-term exams (15% each), and final exam (30%). Pre-tests will be given immediately after lecture, and will be graded for participation only. Post-tests will be given after clicker questions and/or tutorials, and will be graded for correctness. You can earn up to 5 bonus percentage points towards the course grade based upon your responses to the clicker questions. For the clicker questions, you will get 80% for trying each question regardless of whether your answer is correct or not and 100% if you get it correct.

Grades will be based on these criteria with weights of 15% for the combined problem sets, 20% for each midterm, 40% for the final exam, and 5% for in-class questions. Problem sets will be assigned on Friday, and due the following Friday. To receive any credit the work must be handed in the day it is due, before the solution set is distributed. All exams will be closed book and in class.

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and the Office of Disability Resources and Services, 216 William Pitt Union, (412) 648-7890/(412) 383-7355 (TTY), as early as possible in the term. DRS will verify your disability and determine reasonable accommodations for this course. Academic integrity is very important. Anybody found cheating in the course will obtain a failing grade in the course.