Syllabus

Physics 431 - Spring 2016
Quantum Mechanics

Professor

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Office Hours

M 1:30 - 2:50, W 9 - 9:50, F 11 - 11:50

Text

- *Introduction to Quantum Mechanics* (2nd edition), by D. Griffiths

Course Content

In this course we will study in greater conceptual and mathematical detail the revision of classical mechanics you first learned about in Modern Physics. The great edifice of classical Newtonian mechanics began to crumble toward the beginning of the twentieth century. Th replacement (or better yet) refinement of non-relativisitic particle mechanics was achieved in the mid-twenties. The previous theory was f to be particularly inadequate in the analysis of atomic structure. We will occasionally refer to important advances that were made in the development of quantum mechanics in the crucial years of 1925-27. In particular we will briefly look at a classical mechanical approach invented by Hamilton and Jacobi in the 19th century that served as a springboard in Schrödinger's creation of his quantum wave equatio

We will throughout the course endeavor to understand what is the relation between classical and quantum mechanics, and under what circumstances their respective predictions either agree or disagree. We will begin with the study of Schroedinger's equation in one dimen applied first to an infinite square well potential, then to a finite potential well. From there we move to the quantum description of a harmo oscillator, and then finally to the situation that surprisingly requires a bit more mathematical sophistication - the free particle. After establi the general mathematical framework we will then finally consider the hydrogen atom and multielectron atoms. We will confer together to decide what topics to address in the final weeks of the semester.

Attendance and Participation

Attendance in class is required. Class participation will be taken into account in computing the final grade. A reading schedule will be po on the course Moodle site.

Academic Integrity

You are expected to abide by the college academic integrity policy which is outlined in the *Environment*, the student handbook.The follow activities constitute a not necessarily exhaustive list of offenses which are in violation of the college's Academic Integrity Policy:

Turning in work done by someone else.
Working on an assignment with others when the instructor asked for individual work.
Receiving unpermitted help on an assignment.
Writing or providing a paper for another student.
Getting Q/A from someone who has taken test.
In a course requiring computer work, copying a friend's program rather than doing your own.
Helping someone else cheat on a test.

Falsifying lab or research data.
Fabricating or falsifying a bibliography.
Copying from another student during a test or examination without his or her knowing it.
Copying from another student during a test with his or her knowledge.
Copying a few sentences of material from a written source without footnoting them in a paper.
Turning in a paper either purchased or plagiarized, in large part, from a term paper "mill" or website.
Copying a few sentences of material from an Internet source without footnoting them in a paper.
Using unpermitted crib notes (cheat sheets) during a test.
Copying material almost work for word from any written source and turning it in as your own work.
Altering graded test and submitting it for additional credit.
Turning in a paper copied from another student.
Using a false excuse to obtain extension on due date.
Hiding or damaging library/course material.
Cheating on a test in any other way
Cheating on a written assignment in any other way.

These general policies apply unless explicit written instructions to the contrary are distributed by the instructor. You must become familia
the requirements set out in this syllabus. If there is ever a question about the appropriateness of an action, ask the instructor for clarificat

Homework

Problems will be assigned weekly each Friday. They will not be collected. Rather, in the class meeting on Wednesdays, twelve days after
Friday on which they are assigned, you will be given a short quiz based on the homework assignment. You may consult your homework
solutions during the quiz. You are encouraged to discuss homework with anyone who will listen, and you will be invited to ask questions
class about the assignment on the Wednesday preceding the in-class quiz. To qualify to participate in this discussion you must show me
written evidence that you have already worked on the assigned problems. The solutions to the assignments will be posted on Moodle
following the quiz..

Examinations

There will be two midterm examinations, and also a comprehensive final examination. The in-class portions of the midterm exams are
scheduled for Friday, March 18 and Friday, April 22. The final examination date will be announced. The exams will also have an open-boo
take-home component.

Grading

The final grade will be computed as follows:

Mid-term exams	40%
Homework Quizzes	20%
Class Participation	15%
Final Examination	25%

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