

PHYS 8101: Quantum Mechanics I

University of Georgia, Fall 2008
TR Period 5 (2:00-3:15 PM), Room 254

- Instructor:** Professor Steven P. Lewis Phone: 542-0158
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- Office hours:** By appointment, for now. If there is demand for regularly scheduled office hours (or a ‘boot camp’ session), I will revisit the issue.
- Textbook:** *Modern Quantum Mechanics* by J. J. Sakurai (Addison Wesley, 1994).
[N.B., Not all of the course material will come from this textbook.]

This is the first half of a two-semester graduate course on theoretical quantum mechanics. It is assumed that you have had a rigorous undergraduate course on quantum mechanics at the level of these classic textbooks: *Introduction to Quantum Mechanics* by Griffiths, *Quantum Physics* by Gasiorowicz, or *Introductory Quantum Mechanics* by Liboff. It is also assumed that your math skills are pretty strong, meaning that you are able to work problems at the advanced undergraduate level without excessive difficulty. If you feel that you might not be adequately prepared yet to take this class, come see me and we can discuss your situation and options.

Quantum mechanics is a fascinating subject, rich in its physical scope and elegant in its mathematical structure. Quantum mechanics is also a rigorous, intellectually demanding subject. The natural consequence of these two aspects of quantum mechanics is that you will undoubtedly need to work very hard to learn this subject deeply, but you will be rewarded for your efforts by gaining insight into the fascinating nature of the quantum world. What do I mean by “work very hard”? This varies from student to student, of course, but I anticipate that you will spend ~10-15 hours per week outside of class on this course. This may sound daunting, but I bet you’ll find that you have it in you to do it. And I have no doubt that you’ll find quantum mechanics is worth the effort.

Grades: Your grade for this course will be based on homework (30%), a midterm exam (35%), and a final exam (35%). Ranges for semester letter grades will be *no worse for you* than the following:

A+	[Nonexistent]	B+	= [83-85)	C+	= [73-75)	D+	[Nonexistent]
A	= [87-100]	B	= [77-83)	C	= [67-73)	D	= [50-65)
A-	= [85-87)	B-	= [75-77)	C-	= [65-67)	D-	[Nonexistent]

Here a square bracket means that the end point is included in the range, and a round bracket (parenthesis) means the end point is not included in the range. Actual grade ranges may end up having lower cutoffs, depending on the overall level of performance.

Exams: There will be two exams: a midterm and a final. They will be equivalent, in the sense that the midterm will cover material from the first half of the semester, and the final will emphasize material from the second half. However, since quantum mechanics builds on a foundation as it progresses, it will not be possible for the final exam to be totally decoupled from the first half of the semester.

In order to make the two exams equivalent, it will be necessary to give you more than the 75-minute class period for the midterm. Therefore, we will need to schedule a time outside of class when all students will be able to meet for 2-3 hours. This will be a one-time instance, and arrangements will be made as the exam date approaches. The midterm will probably take place sometime in either the week of October 6 or the week of October 13. The final exam will be on Thursday, December 11, at 3:30-6:30 PM. Both exams will be closed-book and closed-notes.

Homework: Doing lots of homework problems is *by far* the best way to learn quantum mechanics. You will have 7-8 homework sets this semester. I expect your homework papers to be written up *neatly* on 8½"×11" paper (*i.e.*, *not* legal-size) and handed in *on time*. Late homework, without a valid excuse or a prior extension, will receive a penalty. Incomplete homework assignments (*i.e.*, problems either missing or inadequately attempted) will be returned for completion and subject to a lateness penalty. I *strongly* advise you to start homework sets as soon as they are assigned and not wait until there are only one or two days left.

I also strongly encourage you to work with other classmates on homework. You can learn a lot from each other by working together to puzzle through tough problems. That said, you must each turn in your own original work. It is not acceptable to copy or paraphrase each other, or any other resource for that matter. On the last page of each homework set you hand in, please list the names of the people you worked with. Also, if significant insights for any problem solutions come from other textbooks, websites, people, etc., make sure you cite your sources clearly and fully (always a good habit).

The manner of grading homework will depend on how much grading support (if any) is assigned to this class. Further details will follow in the first few weeks of the semester.

Course Neglect: Any student who is showing serious neglect for this course (*e.g.*, failing to turn in homework or turning it in very late, rarely or never attending class, etc.) may be asked to withdraw, or alternatively, may be withdrawn by the instructor. For graduate students in the Department of Physics & Astronomy, such cases will be brought to the attention of the Graduate Coordinator.

Academic Honesty Policy: The University of Georgia has a comprehensive policy on academic honesty, which you should all be aware of. The complete policy statement can be viewed online at: <http://www.uga.edu/honesty/>.