

PHY6645, Quantum Mechanics (Fall 2023)

Instructor: Dr. Inna Ponomareva; Office: ISA 5103; E-mail: iponomar@usf.edu; telephone: 974-7286

Text: Quantum Mechanics , 2nd ed; Publisher: Wiley; Authors: Claude Cohen-Tannoudji, Bernard Diu, Franck Laloe

Recommended books:

Hack Your Brain: Secrets of an Elite Manhattan Tutor, by Elie Venezky and Patrycja Slawuta

The Little Book of Talent: 52 Tips for Improving Your Skills, by y Daniel Coyle

Make It Stick: The Science of Successful Learning, by Peter C. Brown, Henry L. Roediger III, Mark A. McDaniel

Other requirements: computer, internet connection, webcam and microphone, in case we have to switch to on-line mode

Class: TR 9:30am-10:45am ISA 4010

Office Hours: WF 9:30 am-10:30 am and by appointment.

Course Outline and Objectives

The course targets fundamental principles of quantum mechanics. The focus in this semester will be on introduction and mathematical tools of quantum mechanics, its postulates and their application to model problems, angular momentum, and particles in central potential. The main ideas are understood and re-enforced by developing conceptual knowledge and problem-solving skills. Problems will be assigned from each chapter of the text. In addition, conceptual questions will be offered. Two randomly chosen problems from the homework may be graded. The homework will be due at the beginning of the first lecture of the next chapter. In addition, there will be a quiz after each chapter that emphasizes basic concepts of the material learned. I will give exact dates for these quizzes about one week in advance. Mini-quizzes may be given in each class and the best seven results will be used for the grade. In studying for the quizzes and examinations you are encouraged to work on problems in the book in addition to those assigned. Please read the text before each lecture. Although I will not require attendance, it is paramount that you come to every lecture in order to keep up with the work. Please come see me during office hours if you have missed a lecture to get 'up to speed' on the course work.

Course Grading Breakout	Homework Problems	10 %
	Mini-quizzes	10 %
	Quizzes	20 %
	Mid-term Exam	30 %
	Final Exam	30 %

Course Grading: each problem/question (except for the ones for mini-quiz) will be graded on a scale 0-4, and the average grade for the assignment will be computed. More specifically,

- 0 the concept comprehension/skill has not been demonstrated or attempt at solution is not sound
- 1 the problem solved or question answered about 25%
- 2 the problem is half solved or question is half answered
- 3 the problem solved or question answered about 75%
- 4 the problem is fully solved or question is fully answered

The GPA-inspired scale will be used to assign final letter grade for the course:

3.7 – 4.0 A	1.7 – 1.9 C
3.3 – 3.6 A-	1.3 – 1.6 C-
3.0 – 3.2 B+	1.0 – 1.2 D+
2.7 – 2.9 B	0.7 – 0.9 D
2.3 – 2.6 B-	0.3 – 0.6 D-
2.0 – 2.2 C+	0.0 – 0.2 F

Tentative Schedule and Examination Dates

Week Beginning	Topics (Chapters in Text)
Aug 20	Intro to the fundamental ideas of quantum mechanics (I + complements)
Aug 27	
Sept 3	The math tools of quantum mechanics (II + complements)
Sept 10	
Sept 17	The postulates of quantum mechanics (III + complements)
Sept 24	
Oct 1	Application of postulates to simple cases (IV + complements)
Oct 8	Mid-term on Chapters I, II, III & IV + Ch. IV Quiz on Thurs Oct 12
Oct 15	The 1D harmonic oscillator (V + complements)
Oct 22	
Oct 29	Angular momentum in quantum mechanics (VI + complements)
Nov 5	
Nov 12	Particle in a central potential (VII + complements)
Nov 19	
Nov 26	
Dec 3	FINAL on Chapters V, VI, and VII + Ch. VII Quiz on Thursday Dec 7 7:30 AM – 9:30 AM (tentative)

NOTES

Students who anticipate being absent from exams due to a major religious observance must provide notice of the date(s) and event(s) to the instructor, in writing, by the second class meeting. Notes and Tapes are not permitted for purposes of sale.

Any student with a disability is encouraged to meet with me privately during the first week of class to discuss accommodations. Each student must bring a current Memorandum of Accommodations from the Office of Student Disability Services (974-4309, SVC1133) which is prerequisite for receiving accommodations. Accommodated examinations through the Office of Student Disability Services require at least two weeks notice.

USF has a set of central policies related to student recording class sessions, academic integrity and grievances, student accessibility services, academic disruption, religious observances, academic continuity, food insecurity, and sexual harassment that apply to all courses at USF. Be sure to review these online: usf.edu/provost/faculty-success/resources-policies-forms/core-syllabus-policy-statements.aspx

COVID NOTE

If class is to be moved on-line due to COVID we will continue meeting during the regular class times via zoom or other software. Webcamera, microphone, computer and internet are required for that. For examinations we will use on-line proctoring (honorlock).