

PHYS 6336 – Quantum Mechanics II

Spring 2021

(Some details listed in this syllabus subject to change due to evolving COVID-19 situation.)

Instructor: Professor Joel Meyers (jrmeyers@smu.edu, Office phone: 214-768-2048)

Lectures: TuTh 12:30-1:50 PM, Fondren Science Building 155 (and online)

Required Textbook: *Lectures on Quantum Mechanics, Second Edition*, by Steven Weinberg (ISBN 9781107111660)

Other Useful Reading:

- *Quantum Mechanics*, Eugene Merzbacher
- *Modern Quantum Mechanics*, JJ Sakurai
- *Quantum Mechanics*, Claude Cohen-Tannoudji

Grading:

- Homework - 50%
- Quizzes - 30%
- Final exam - 20%

Office Hours: By appointment, Fondren Science Building 209 or online

Course Objectives: After taking this course, students should be able to:

- Apply symmetry principles to quantum mechanical systems
- Employ approximate methods to time-independent and time-dependent quantum problems
- Calculate the rate of quantum mechanical scattering by a potential
- Apply the techniques of general scattering theory
- Understand and interpret the canonical and path-integral formulations of quantum mechanics
- Be prepared for a course in quantum field theory

Topics to be covered:

- Symmetry principles
- Time-independent perturbation theory
- Time-dependent perturbation theory
- Potential scattering
- General scattering theory
- Quantum theory of radiation
- Entanglement

Homework: Students are allowed and encouraged to work in groups on homework, but each student must submit unique and individual answers to be graded. Homework submitted after the deadline without prior arrangement will be graded at 50% credit until solutions are posted, after which submissions will receive 0% credit.

Quizzes: Short quizzes will be sent out to be submitted online before the start of each class. Some will test basic concepts from previous lectures and readings. Others will be ungraded (i.e. full credit will be given for any attempt) and will be used to assess background knowledge before beginning a new topic. The lowest 2 quiz scores will be dropped (including quizzes that are not submitted by the deadline). We will discuss solutions at the beginning of each class period, and as such quiz submissions after the deadline will not be accepted without prior arrangement.

Final Exam: The final exam will be comprehensive, take-home, open-book and open-notes, must be completed individually, and must be submitted online by Monday May 10 at 2:30 PM.

Grading Scale: Final grades will be assigned according to the following scale, though grades may be adjusted upward (never downward) at the discretion of the instructor. For example, a final score of 83.1 would earn a B in the course, but it may be adjusted to an A- with a particularly good final exam performance.

Letter Grade	Score Range
A	93-100
A-	90-93
B+	87-90
B	83-87
B-	80-83
C+	77-80
C	73-77
C-	70-73
D+	67-70
D	63-67
D-	60-63
F	0-60

Disability Accommodations: Students needing academic accommodations for a disability must first register with Disability Accommodations & Success Strategies (DASS). Students can call 214-768-1470 or visit <http://www.smu.edu/Provost/SASP/DASS> to begin the process. Once approved and registered, students will submit a DASS Accommodation Letter to faculty through the electronic portal DASS Link and then communicate directly with each instructor to make appropriate arrangements. Please note that accommodations are not retroactive and require advance notice to implement.

Religious Observance: Religiously observant students wishing to be absent on holidays that require missing class should notify their professors in writing at the beginning of the semester, and should discuss with them, in advance, acceptable ways of making up any work missed because of the absence.

[\(See University Policy No. 1.9\)](#)

Excused Absences for University Extracurricular Activities: Students participating in an officially sanctioned, scheduled University extracurricular activity should be given the opportunity to make up class assignments or other graded assignments missed as a result of their participation. It is the responsibility of the student to make arrangements with the instructor prior to any missed scheduled examination or other missed assignment for making up the work. (See [2018-2019 University Undergraduate Catalogue](#))