

Course Syllabus (Preliminary)

PHY 520 : INTRODUCTION TO QUANTUM MECHANICS : Fall 2026

Instructor : Sumit R. Das, CP 289

Class Timings : Mondays, Wednesdays and Fridays 11:00- 11:50 Hrs

Classroom: TBD

First Day of Class : August 24, 2026

Last Day of Class : December 9, 2026

Office hours : Mondays and Wednesdays, 9:30-10:30 Hrs.

Grader :

Office Hours of Grader

This syllabus is on the course website and on canvas and may need to be revised from time to time. Whenever there is a revision, I will announce this.

Textbooks

- Primary Textbook : John S. Townsend, "A Modern Approach to Quantum Mechanics" (2nd Edition), University Science Books.
- From time to time I will use other books - I will provide references when I do that. One useful book is Shankar "Principles of Quantum Mechanics" (2nd Edition) Springer.
- An excellent recent book is David Tong, "Quantum Mechanics" (Cambridge University Press). Much of the material in this book is contained in the public domain lecture notes:
<https://www.damtp.cam.ac.uk/user/tong/teaching.html>

Pre-requisites

The material covered in PHY 361 and MA 214

General Description

This is the first semester of a 2 semester course in Quantum Mechanics.

I will follow the primary textbook rather closely. However I will probably not be able to cover *all* sections of the book. The book, however, is suitable for self-study.

Course Syllabus

The Chapter numbers below refer to the primary textbook unless stated otherwise.

1. Stern-Gerlach Experiments, Spins, Qubits and Quantum State Vector (Chapter 1)
2. Matrix Mechanics. Operators and representations (Chapter 2)
3. Angular Momentum (Chapter 3)
4. Time Evolution: Schrodinger equation, Heisenberg picture, 2 level systems (Chapter 4)
5. 2 spin-1/2 particles, Addition of angular momenta, EPR paradox, Bell's inequalities (Chapter 5)
6. Wave mechanics in 1 dimension; Bound states and scattering (Chapter 6)
7. One dimensional Harmonic Oscillator (Chapter 7)

Homework and Exams

1. Home assignments approximately once in 10 days or so. You will need to scan the homework assignments and upload them to canvas.
2. **Midterm October 12, 2026.**
3. **Final Exams : December 16, 10:30 - 12:30.** This is scheduled in accordance with <https://registrar.uky.edu/examination-schedules>

Grading Policy

Grades will be assigned on the basis of the following weights

1. 30 % for Home assignments
2. 30 % for Midterm
3. 40 % for Finals

Grades will be assigned roughly in accordance with the university guidelines. However, I reserve the right to change the thresholds for assigning letter grades which correspond to total number of points obtained.

Course Evaluations

Course evaluations are an important (and mandatory!) component of our Department's instructional program. You will receive an email which provides instructions about how to do this.