

Syllabus-PHYS 4211-Introduction to Quantum Mechanics

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Office hours: Office hours: *MW: 10:30-11:20am, Tuesday: 11:00am-12:00n*

This course will be your introduction to the world of quantum theory. You will be introduced to a new methods and new thinking (as opposed to Newtonian Mechanics) to understand the physics of the particles. This new philosophy will be introduced with new mathematical methods.

Textbook: Introduction to Quantum Mechanics by *David J. Griffiths*. Homework problems will be assigned from the book.

Exams/homework: There will be two hourly tests and a final exam. . Weekly homework will be assigned and graded as indicated below.

Final grade = Exam1-20% + Exam2-20% + Final-35% + HW-25%

The course will cover the following subjects:

- Point particle versus the wave function
 - ◆ Wave function
 - ◆ Introducing the Schrödinger Equation
 - ◆ Probability, normalization
 - ◆ Expectation value, momentum
 - ◆ Introduction to The Uncertainty Principle
- Solving Schrödinger Equation
 - ◆ Stationary states
 - ◆ Potential wells
 - ◆ Free particle
 - ◆ Harmonic oscillator
- Hilbert Space
 - ◆ Hermitian operators
 - ◆ Eigenvalues, Eigenfunctions

- ♦ Observables
- ♦ Dirac notation
- ♦ Statistical interpretation
- ♦ The Uncertainty Principle
- Quantum Mechanics in Three Dimensions
 - ♦ Schrödinger Equation in Spherical Coordinates
 - ♦ The Hydrogen atom
 - ♦ Angular momentum and spin in Quantum Mechanics
- Identical particles
 - ♦ Two-particle systems
 - ♦ Atoms, molecules, solids
 - ♦ Quantum statistics
- Introduction to time-independent perturbation theory

Disability Services Statement

Students at Seton Hall University who have a physical, medical, learning or psychiatric disability, either temporary or permanent, may be eligible for reasonable accommodations at the University as per the Americans with Disabilities Act (ADA) and/or Section 504 of the Rehabilitation Act. In order to receive such accommodations, students must identify themselves at the Office of Disability Support Services (DSS), provide appropriate documentation and collaborate with the development of an accommodation plan. The DSS phone number is 973-313-6003. For further information, please go to our website at

<http://studentaffairs.shu.edu/health/DisabilitySupportServices.html>