50:750:413 - Elements of Quantum Mechanics

Instructor	Dr. Sean O'Malley	E-mail	omallese@camden.rutgers.edu
Phone	856-225-6159	Office Hours	TBA
Office	CNS 216G	Final Exam	TBA

Class time: T & R 2:00 – 3:20 pm

Text: Introduction to Quantum Mechanics (3rd ed.), D. Griffiths & D. Schroeder

(The 2nd ed. is also acceptable and can be found on the Canvas site)

Description:

This course is an undergraduate-level introduction to nonrelativistic quantum mechanics. It will cover the experimental and theoretical foundations of quantum mechanics and how they apply to various problems in physics and chemistry. Students will become familiar with the formalisms of quantum mechanics and understanding how to calculate and interrupt properties of various quantum systems.

A brief list of topics includes wave-particle duality, Schrodinger wave equation, interpretation of the wave function, Heisenberg uncertainty principle, tunneling, the hydrogen atom, spin, elementary perturbation theory. These and other topics that we will cover in the course are crucial in examining how nanotechnology, electronic devices, and photonics function.

Details:

1) Office hours are just a formality – You can email and arrange for a remote meeting at any time.
2) There will be **semester exams** pertaining to the material covered during lecture. (100 pts ea.)
3) There will be several **quizzes.** (up to 20 pts ea.)
4) There will be **graded homework assignments** (10 pts ea.)
5) There will be **class participation** (50 pts) stemming from the submission of your lecture notes and participation in discussion questions.

Grading:

A	90-100%		C	67-75%
B+	87-89%		D	55-66%
B	80-86%		F	<55%
C+	76-79%			

Instructor's Statement:

Do not engage in any form of academic dishonesty. If you do not know what academic dishonesty is, please consult this statement:

https://policies.rutgers.edu/10213-currentpdf

I will report any violations of this policy to the campus Judicial Officer.

Please note that it is necessary to explain all steps that you take on exams – make an effort to **clearly** show your work. Answers without justification will not be accepted! You may be asked to explain your reasoning.

*During an exam (and some quizzes) you will need to have you webcam on so that I can see your desk while you are taking the exam.

Attendance is strongly suggested at all class meetings in accordance with the policies and guidelines set forth in the student manual.

Attending the remote lecture is not enough. Take notes and read-up on the relevant topics on the web or in relevant textbooks.

Class Resources:

canvas.rutgres.edu

Class Outline:
1) The wavefunction
2) Time-independent Schrodinger equation
3) Formalism
4) Quantum mechanics in #D
5) Identical particles
6) Symmetries & conversation laws
7) Time-independent perturbation theory
8) Scattering