Quantum Mechanics 341

Text: Quantum Mechanics 2nd Ed., David Griffiths, Prentice Hall.
supplemental text: Modern Physics and Quantum Mechanics, Anderson (out of print-order on Amazon for about $10.00)
Mr. Joseph L. Powlette CHS 110, 610-861-1438
Powlette@cs.moravian.edu office hours posted

Lecture #	Topic	Readings
1	Schrödinger's Equation	P.1-9
2.	Separation of Variables & Fourier Transforms	P.24-25,61-67
3.	Dirac Delta Function Spread of Wave Function	Cont.,P.68
4.	Probability Nature Of the Wave Function, Gamma Function	P.9-23
5.	Introduction of Operators	P.26-30
6.	1 Dimensional Applications, Finite Square Well	P.78-80
7.	Cont.	
8.	Graphical Solution To Finite Well	
9.	Barrier Potentials	P.81-84
10.	Alpha Decay	P.322-325
11.	Harmonic Oscillator (H.O.)	P.51-56
12.	Energy Solution	
13.	Hermite Polynomials	P.56-59
14.	Solns. using Hermite Polynomials	Not in Text

15.	Raising & Lowering Operators for H.O.	P.40-51
16.	Postulates of Quantum Mechanics	Not in Text
17.	Hermite Operations & Precise Definition of the Uncertainty Principle	P.96-106,455-457,110-112
18.	Commutators, Separability & Conservation Laws	P.111-118
19.	Linear Vector Spaces Schmidt Orthogonalization Procedure	P.93-96,438-440
20.	Cont.	Not in Text
21.	Matrix Theory	P.441-455
22.	Similarity Transformation	P.447
23.	Matrix Elements in Quantum Mechanics (H.O. again)	Not in Text
24.	Hydrogen Atom	P.131-140
25.	Cont.	
26.	Radial Wave Equation	P.140-152
27.	Energy Solution And Summary	P.152-160
28.	Cont.	
29.	Angular Momentum	P.160-170
30.	Commutation of Angular Momentum Operators	Cont.
31.	Angular Momentum Matrix	Not in Text

32.	Magnetic Moment of Hydrogenic Electrons	Not in Text
33.	Spin	P.171-180
34.	Perturbation Theory (non-degenerate)	P.249-255
35.	Second Order Perturbation	P.255-257
36.	Examples	Not in Text
37.	Sudden Approximation	Not in Text
38.	Free Particle in E and B Field Degenerate Perturbation Theory	P. 257-256
39.	Atoms in External Electric Field	Not in Text
40.	Time Dependent Perturbation Theory	P. 340-354
41.	Fermi’s Golden Rule	Cont.
42.	Number 2	

Final exam: Monday, 1:30PM December 10, 2012	

Grades will be determined by 25% laboratory, 50% problems and 25% final exam.
Lectures are on CD disks and instructors notes will be supplied. Problem sets will be supplied (one per week).The order of the CD lectures follows the included syllabus. These are aids and not a substitute for class attendance or note taking. laboratory will be one selected independent project.
The instructor is always available for questions and one formal meeting per week will be required.

Goals of the course

At the completion of the course, students should be able to:

- Understand the probabilistic nature of quantum mechanics.
- Use the Schrödinger equation, matrix and algebraic techniques to solve some standard problems of quantum mechanics.
- Understand the nature of a quantum mechanical measurement and the interpretation of the quantum mechanics.
- Appreciate how quantum mechanics has shaped our understanding of the physical world.

"Students who wish to request accommodations in this class for a disability should contact Elaine Mara, assistant director of learning services for academic and disability support at 1307 Main Street, or by calling 610-861-1510. Accommodations cannot be provided until authorization is received from the Academic Support Center."