

Chemistry 442/552
Quantum Mechanics
Spring 2009
Syllabus

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Web page: web.pdx.edu/~shusteg - course WEBCT/Blackboard
page link

Office Hours: Tuesday 11-12, Thursday 9-12 in chemistry
commons, and immediately following lectures.

Text: Physical Chemistry, McQuarrie and Simon, University
Science Books, 2008.

Homework: Weekly problem assignments, unless otherwise
announced, will be due on Wednesdays. Homework will
be posted on the BLACKBOARD page. Homework is due at
class time. Late homework accepted through Thursday
for partial credit.

Computer software: The Mathcad program is available on the
chemistry commons computers, SB 1 221. You can
purchase a personal student copy through OIT for \$20.
Only for Windows.

For molecular modeling, Spartan software is available
on the chemistry commons computers. This software is
more expensive, but if you are interested in student
software, you can look at the website:
www.wavefun.com

Grades: Homework: 25%
In-Class participation: 10%
Midterms: 15% each
Final: 35%

The midterms are tentatively scheduled for weeks 4
and 7, but this is subject to change.

Success in this course will depend on your understanding of
key concepts but also your ability to apply these
concepts to solve problems. You will need to develop

strong math skills and will benefit from learning a symbolic math program such as MathCad. You *must* do homework assignments to succeed. Group work on homework is encouraged. I expect about 50% of in class midterm problems to be taken from the homework.

What we will be doing; Scheduled lecture time will be used in several ways. Some class meetings will follow a standard lecture format. Other meetings will be used for problem solving sessions. This will include conceptual exercises, examples and problem solving practice. It is expected that you will attend class regularly and your participation during problem solving sessions is worth 10% of your grade.

You are responsible for any information or announcements given in class. Contact me as soon as possible if you miss any exams.

Below is a rough schedule of topics that we will cover. This document will continue to evolve, for updates, check BLACKBOARD. I hope to post learning objectives for each topic/chapter covered.

Week	Chapter(s)	Topics	Objectives
1	2,3 A,B	Complex Numbers Classical Wave Equation Prob and Stat Schrodinger Eq	Do diff eq problems, Manipulate complex numbers
2	3,4 C	Particle in a Box Postulates Vectors	Learn to use Mathcad Set up particle in a box problems Comfort with vectors
3	5	Harmonic Oscillator Vib spectroscopy	Be able to use HO solutions - be able to interpret IR information
4	D,5	Spherical Coordinates Rigid Rotor - rotational spectra	Be able to use rotational solutions - understand spectra model
5	E,6	H - atom Determinants	
6	7 8	Approximate Methods Multi-electron Atoms	
7	9/10, F	MO Theory - Huckel Matrices	
8	13	Molecular Spectroscopy	
9	13/14	Molecular Spectroscopy	
10	14/15	NMR / Lasers	