Chemistry 550 ***Introduction to Quantum Mechanics*** Autumn 2005
MWF 9:30-10:20 in BG 108
CHEM 475 Tutorial Th 9:30-10:20 in MGH 058 (or BG108 if announced) is open to 550 students

Instructor: Assistant Professor David Ginger, Bagley Hall 213
ginger@chem.washington.edu
address ALL subject related questions to the discussion forum below so your peers may contribute to, and benefit from, the discussion
(put CHEM550 or CHEM475 in the subject of *any* email directed to me)

Office Hours: Prof.: David Ginger Mon 10:30-11:30. Fri. 4-5pm, and by appointment, Bag 213
Grader: Svetlana Kilina

Text: Quantum Chemistry, Ira N. Levine, Prentice Hall 5th Edition

Library Reserves:
Quantum Chemistry and Spectroscopy by Tom Engel
Quantum Chemistry by Donald A. McQuarrie
***Introduction to Quantum Mechanics* by David J. Griffiths**
Molecular Quantum Mechanics by Atkins and Friedman
Introduction to Quantum Mechanics in Chemistry, M. Ratner and G. Schatz
Principles of Quantum Mechanics, by Ramamurti Shankar
Quantum Mechanics, by Claude Cohen-Tannoudji
Quantum Mechanics in Chemistry, M. Ratner and G. Schatz

Discussion Forum: http://catalyst.washington.edu/webtools/epost/register.cgi?owner=dginger&id=12797

Course Website: http://faculty.washington.edu/dginger/CHEM550_A2005/index.html

TENTATIVE CLASS SCHEDULE

At times, lectures may deviate significantly from the text – you should still keep reading it!

Day	Week	Reading	Day	Week	Reading
M		Chapters 1-3: Diff EQ, Schrod Eqn,	M	Nov 7	Chapter 9: cont
W	Sep 28	Particle in Box, operators, Fourier	W	Nov 9	Chapter 10: Spin
F	Sep 30	Series	F	Nov 11	Veteran's Day—No Class
M	Oct 3	Chapters 1-3, Chapter 7	M	Nov 14	Chapter 10: cont
W	Oct 5	operators and postulates, series	W	Nov 16	Chapter 11: Many electron atoms
F	Oct 7	expansions, tunneling	F	Nov 18	
M	Oct 10	Chapter 4: Harmonic oscillator and	M	Nov 21	Chapter 13: Diatomic molecules,
W	Oct 12	molecular vibrations	W	Nov 23	BO approx, MO theory
F	Oct 14		F	Nov 25	Thanksgiving—No Class
M	Oct 17	Chapter 5: Angular momentum	M	Nov 28	Chapter 16.1-16.3: Semiemp. Methods
W	Oct 19	and molecular rotations	W	Nov 30	Bloch's Theorem
F	Oct 21	Exam 1-to be confirmed	F	Dec 2	Misc review: time-dep
M	Oct 24	Chapter 6: Hydrogen atom	M	Dec 5	perturbation, molecular
W	Oct 26	Chapter 8: Variational Methods	W	Dec 7	Spectroscopy, Bell's theorem
F	Oct 28		F	Dec 9: Last day of instruction	
M	Oct 31	Chapter 8: Variational Methods &			
W	Nov 2	Chapter 9: Perturbation Theory			
F	Nov 4				

Exam 2
TBA

— OVER —

TRANSITION TO DIFFERENT METHODS OF LEARNING

You are now, or soon will be, college graduates. This class will be one of the last times anyone will ever actively teach you anything. By the time you leave school, you won't know everything there is to know, even about even a specialty area in chemistry. The goal of education is ultimately not to teach you facts, but to teach you a way to think, making sure you are proficient at finding information for yourself, evaluating the validity of that information, combining it with your prior experience, knowledge, (and even intuition) and deciding how to apply that information to the problem you happen to be facing at a particular point in time.

HOMEWORK

Homework will be assigned and due weekly, with a schedule to be modified as on the website and announced in class. Assignments will usually take many hours to complete, many more if you have to catch up with the reading. Physical chemistry is a cumulative subject, understanding the material in one week requires mastery of the material from each previous week. This is especially true of many of our computer problems-which will build on one another. You are ENCOURAGED to work in groups. Most homework will be graded for completion only, though selected problems will be graded for correctness. Part of the homework grade is based on how clearly you allow others to follow your thinking and is non-negotiable, regardless of the correctness of the final result.

COMPUTERS

The university site license for maple allows all students free use of Maple on university owned hardware, and allows staff (graduate student assistants are considered staff for the purposes of the license) to use Maple on private hardware. Request and download your copy today: http://www.washington.edu/computing/software/sitelicenses/maple/

CLASS SESSIONS

Class sessions will be more useful if you 1) read the text prior to lecture and 2) attempt the homework throughout the week.

TEAMWORK

Collaboration on the problem sets is not only permitted, but is ***encouraged***. However, each student **MUST** turn in their **own** completed problem set showing their own thinking. Copying, or allowing another to copy, problems to which they have not contributed is plagiarism. Take home exams may be given. In the event a take-home exam is given students will NOT be permitted to communicate with anyone except the instructor in any form or manner regarding any test problems or material until after all exams have been returned. Plagiarism at any time, and giving or receiving assistance of any kind on exams shall be regarded as academic misconduct. All cases of academic misconduct will be submitted to the registrar with an X as a final grade with a recommendation for the maximum UW sanction.

GRADING

There will be two exams plus a final exam, as indicated on the schedule. Grading will be based on the total number of points obtained on the exams and the homework. Unannounced 'pop quizes' may be given during lectures, and will each count as one homework grade. Lowest homework quiz score will be dropped before computing the average.

CHEM 550	CHEM 475
Problem Sets: 50	Problem Sets: 100
Exam 1: 125	Exam 1: 100
Exam 2: 125	Exam 2: 100
Final: 200	Final: 200

Extra Credit—Bonus points up to 10% of the total hw score will be added to the homework score for correct, thoughtful replies to other students questions on the discussion board, for finding a major error in a problem answer or derivation (not just 3.14159 instead of 3.14 for pi, or a dropped – sign on one side of an equation). The awarding of any and all extra credit will rest with the non-negotiable judgement of the professor.