

Chemistry 342  
Syllabus  
Department of Chemistry and Biochemistry  
Term II 2002-2003

Instructor: Dr. Jonathan Stevens  
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Office Hours: MW 11am - 12 pm.

Other hours to me with me are available by appointment. Additionally, feel free to drop by the office any time. If I am there, I will do what I can to help you.

Objective: The course will familiarize the student with the basic principles of quantum mechanics, and its applications to chemistry.

Prerequisites: two semesters calculus, two semesters physics, organic chemistry

A working knowledge of calculus, trigonometry, and the behavior of functions is essential for success in this course. Differentiation and integration of polynomials as well as exponential, sine, and cosine functions is common in quantum mechanics, and I will assume all students know how to do this. More abstract mathematical topics include differentiation and integration of functions of multiple variables, complex numbers, operators, and group theory; these mathematical topics will be discussed in class.

Text: Physical Chemistry, Seventh Edition. P. Atkins and J. dePaula, W.H. Freeman and Company, New York, 2002.

Other things you need for this course: You will need an electronic calculator capable of performing exponential functions, taking square, cube, etc. roots, and logarithmic (log and ln) functions. The student solutions manual is a good study aid and may prove helpful in working homework problems.

Other texts: "Exploring Chemistry with Electronic Structure Methods", J.B. Foresman and A. Frisch, Gaussian, Inc, Pittsburgh, 1996. This text will be useful for the out of class assignment. Copies will be placed on reserve at the Circulation desk of the library.

Suggested Reading (for fun?): "In Search of Schrödinger's Cat: Quantum Physics and Reality" John Gribbin, Bantam Books, New York, 1984. This book offers an explanation of quantum physics for laymen, without resort to complex mathematics. I believe it is an excellent introduction to the "non-intuitive" nature of the physics. Later chapters of the book are highly speculative. Copies of this book will be placed on reserve at the library.

Class Meeting times:T-Th 9:55-11:10 a.m.

All class meetings will be in Chemistry 213 unless announced otherwise.

Important Dates:

Last day to withdraw without a "W": Jan 30

Mid-term Grades due: Feb 24

Last day to withdraw (with a "W"): Mar 26

The final exam is comprehensive (cumulative) and is scheduled on Thursday April 22 from 8-9:50 a.m.

Tentative Lecture Schedule:

Date	Text Chapter and Topic
Jan 6-8	Chapter 11 Introduction to Quantum Mechanics
Jan 13-15	Begin Chapter 12 model systems
Jan 20-22	Chapter 12 continues
Jan 27	Begin Chapter 13-atomic systems
Jan 29	Exam I
Feb 3-5	Chapter 13 continues
Feb. 10-12	Chapter 14
Feb 17-26	Chapter 15
March 2-4	Spring Break
March 9	Begin Chapter 16
March 11	Exam II
March 16-18	Finish Chapter 16, begin Chapter 17
March 23-25	Chapter 17-Chapter 18
Mar 30-April 7	Chapter 18 continues, begin kinetics(Ch.25,27?)
April 8	Exam III
April 13-15	Chapter 27
April 22	Final Exam

\*Topics of study will follow the text, but the presentation of material in the text may be supplemented or replaced by handouts and lecture notes given in class.

Grading:

3 Exams, 100 points each

Tentative Exam schedule:

Exam I: Jan 30

Exam II: March 13

Exam III: April 10

Final exam: 150 points (see above for date and time of final).

Exams will focus on solving problems, with partial credit given for partial success. Questions are of the “show your work” variety.

**Homework:**

Homework comes in two varieties, the graded and ungraded. Ungraded homework assignments will not be collected, though answer keys will be placed in the library and the problems may be discussed and solved in class.

Graded homework problems may be discussed in class, but will not be completely solved in class. Each student is responsible for working the problems, and for showing his/her work. The steps and reasoning in each problem must be explained thoroughly (use some words, not just equations.). Three graded homework assignments will be given, worth 30 points each. Typically a week or more will be provided to work on the assignment. Students are permitted to work in groups, ask advice from professors, or seek the help of the text, or student solutions manual. However, each student hands in his/her assignment individually. Problems may be assigned from the textbook or I may make them up myself. Please note that simply copying answers as presented in the manual, will not allow full credit. The solutions manual does not thoroughly explain the working of the problems the way that homework assignments require. (In addition, the answers are sometimes incorrect.)

Total points possible: 540

No grades will be dropped.

**Grading Scale:**

% of points earned	Grade
> 92.5 %	A
90.0 –92.4	A-
87.5-89.9	B+
82.5-87.4	B
80.0-82.4	B-
77.5-79.9	C+
72.5-77.4	C
70.0-72.4	C-
67.5-69.9	D+
60-67.4	D
<60.0	F

**Regrading:** If a student is dissatisfied with the grading of any test or homework question, the question can be regraded. This must be brought to my attention within 1 week after the exam or quiz has been returned.

Make-up Policy: Exams may be made up in the event of death or wasting illness. Documentation is required.

Academic Integrity: Cheating is not permitted and will not be tolerated. Anyone found cheating on any quiz, test or assignment will be given a zero for that assignment and will be referred to the Dean's office for additional penalties. (Refer to the University Catalog and E&S Student Handbook for further explanation of academic integrity.)

Answer Keys for all tests, quizzes, and homeworks will be kept on file at the Circulation Desk of the library.

#### How to survive Chemistry 342:

1. Attend class regularly, and ask many questions in class. Class participation will greatly enhance your learning of the lecture material.
2. Do ALL the homework problems, and ask questions about them in class. Sometimes I will work selected problems in lecture, but not all of them. You should attempt all problems, and ask questions about those you find especially difficult.
3. Study daily. Trying to cram P-chem into your head the night before the exam is a painful, frustrating, and all too often futile experience.
4. Study in groups: Find several other students in the class and study consistently with them. You may find it helpful to work problems in teams, or to have different people work different problems, and then have each person present his/her results.
5. See your professor. Make use of office hours or make appointments if the office hours schedule doesn't work with yours.