Chem 220A: Section 1
Organic Chemistry Lecture (Fall 2002)
M, W, F 10:10-11AM
SC 4309

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I will be maintaining a web site for this course at:
http://www.vanderbilt.edu/AnS/Chemistry/Rizzo/chem220a/chem220a.htm

Required Text: Bundled for $168.00
Organic Chemistry, 5th edition, John McMurry
Study Guide and Solutions Manual for Organic Chemistry, 5th Ed. Susan. McMurry

Other Optional Study Guides (available in the Bookstore):

Organic Chemistry, 2nd Ed. (Schaum's Outline Series)	$15.95
3000 Solved Problems in Organic Chemistry (Schaum's Solved Problem Series)	$27.95
Organic Chemistry (REA Problem Solvers)	$29.95

Lab Text required: The Organic Chem Lab Survival Manual, J. W. Zubrick $46.50 (35.00)

Class pak (Campus Copy)	
Laboratory Notebook (Hayden-McNeil)	$15.00
Safety Goggles	$7.95

Molecular Models: Organic chemistry is a three dimensional science. Molecular models are highly recommended for lecture and may be purchased from the Student Affiliates of the American Chemical Society:

Organic Chemistry Models (Molecular Design, Inc.)	$25.00

Office Hours: M, W: 11:00-12:00 am; T, R: 10:00 am-11:00 noon and by appointment.
Office hours are subject to change or cancellation without prior announcement.

Course Content: Chapters 1-14 of McMurry, see following pages.

Course Policies:

Exams: 3 fifty minute exams (100 points each)
1 two-hour final exam (150 points)

The final grades will be determined as follows:

Three Exams	(67% of final grade)
Two-hour final Exam	(33% of final grade)

Grades: 90-100= A range; 80-89= B range; 70-79= C range; 60-69= D range; below 60= F

Exam dates are indicated on the accompanying schedule and will NOT be changed.

Final Exam: The final exam date is Sat. Dec. 21 at 9:00-11:00 am in room SC 4309. There will be no alternative date offered. Please make your travel plans accordingly.

Make Up Exams: I will give make-up exams under the following conditions:

1. If the missed exam can be made up before the next scheduled class period.
2. If the make up exam is arranged prior to the day of the missed exam.
3. There is a legitimate medical or family excuse. These excuses must be verified in writing by the Dean's office for family reasons or a physician for illness. A note stating that you visited Student Health is <u>not</u> sufficient. Having other exams on the same day and anxiety attacks will not be considered.

If all three of these conditions cannot be met <u>and</u> you have an excusable absence from the exam then your final exam will count for a proportionally larger portion of the total grade. It is to your advantage to take all exams.

A note on partial credit: Simply writing down an answer does not entitle you to partial credit. The answer must first be at partially correct; second, it must be relevant to the question being asked. Writing down the answer to a question that is not being asked does not warrant partial credit.

Honor Pledge: You must legibly write the Vanderbilt Honor Pledge on every exam. Writing the honor pledge acknowledges that you are committed to it. Exams that do not have the honor pledge will not be graded, and you will receive a zero.

"I pledge my honor that I have neither given nor received aid on this examination"

A Helpful Hint: There is a tremendous volume of information to be covered in this course and we will need to proceed at a brisk pace. I suggest that you come to class prepared, having already read the chapter. This will allow you to concentrate on concepts that may be unclear to you. Chemistry is a problem solving oriented subject, thus I suggest that you try every problem in the chapters we cover (you may see some of them reappear on exams). Finally, come to class!! Important concepts, i.e., things that may appear on exams, are emphasized in lecture as well as things not covered in the book. This course is challenging; be prepared to dedicate at least 2 hours per night (10 hrs/wk) on organic chemistry.

Letters of Recommendation: I am willing to write you an honest letter of recommendation. Request for letters should be made to me preferably one month before they are due. Requests for letters for early admissions to Vanderbilt Medical School <u>must</u> be made before Spring Break.

Review from General Chemistry: It is assumed that you have mastered the material taught in General Chemistry. Specifically, please review the following topics.

Text: "Chemistry: Science of Change", 3nd ed.; Oxtoby, Freeman & Block
Saunders College Publishing: 1998

Electronic Structure	Chapter: 17-1
Chemical Bonds	17-4 through 17-6
VSEPR	3-6
Atomic Orbitals	16-5
Molecular Orbitals	18-1 through 18-5
Lewis Structure	3-4, 3-5
Chemical Equilibrium	7-1, 7-2, 7-5
Acid-Base Equilibrium	8-1 through 8-4
Thermochemistry	10-2 through 10-5, 11-5 through 11-8

As the course progresses there will be some important numbers and equations you will be expected to commit to memory. These will be explicitly pointed out to you. You should already know the following from General Chemistry.

The Gas Law Constant, $R = 1.99\ cals \bullet mol^{-1} \bullet {}^{\circ}K^{-1}$ (2.0 is close enough)

-or- $= 8.314\ J \bullet mol^{-1} \bullet {}^{\circ}K^{-1}$

Gibb's Free Energy: $\Delta G^{\circ} = \Delta H^{\circ} - T\Delta S^{\circ}$

$\Delta G^{\circ} = -RT \ln K_{eq}$

$pK_a = -\log K_a$

In addition, it is also assumed that you know the vocabulary of General Chemistry. That is, you should know the names, structures and charges of the common anions (see Table 3-2, pg. 90 of Oxtoby, Freeman & Block) and the names and structures of common mineral acids (see Table 4-2, pg. 138 of Oxtoby, Freeman & Block) and bases.

Tentative Class Schedule

Wed.	Aug.	28	Chapter 1	
Fri.		30	Chapter 1 (con't)	
Mon.	Sept	2	Chapter 2	
Wed.		4	Chapter 2 (con't)	
Fri.		6	Chapter 3	
Mon.		9	Chapter 3 (con't)	
Wed		11	Chapter 3 (con't)	
Fri.		13	Chapter 4	
Mon.		16	Chapter 4	
Wed.		18	Chapter 4	
Fri.		**20**	**EXAM Chapters 1-4**	
Mon.		23	Chapter 5	
Wed.		25	Chapter 5 (con't)	
Fri.		27	Chapter 5 (con't)	
Mon.		30	Chapter 6	
Wed	Oct	2	Chapter 6 (con't)	
Fri.		4	Chapter 6 (con't)	
Mon.		7	Chapter 7	
Wed.		9	Chapter 7(con't)	
Fri.		11	Chapter 7(con't)	
Mon.		14	Chapter 8	
Wed.		16	**EXAM Chapters 1-8**	Mid-semester progress reports due
Fri.		18	Chapter 8 (con't)	
		21-22	October Break (No Class)	
Wed.		23	Chapter 9	
Fri.		25	Chapter 9 (con't)	
Mon.		28	Chapter 9 (con't)	
Wed.		30	Chapter 10	
Fri.	Nov.	1	Chapter 10(con't)	
Mon.		4	Chapter 10(con't)	
Wed.		6	Chapter 11	
Fri.		8	Chapter 11 (con't)	
Mon.		11	Chapter 11 (con't)	
Wed.		13	Chapter 12	
Fri.		14	**EXAM Chapters 1-11**	
Mon.		18	Chapter 12(con't)	
Wed.		20	Chapter 12(con't)	
Fri.		22	Chapter 13	
		25-29	Fall Break (No Class)	
Mon	Dec.	2	Chapter 13 (con't)	
Wed.		4	Chapter 13 (con't)	
Fri.		6	Chapter 14	
Mon.		9	Chapter 14 (con't)	
Wed.		11	Chapter 14 (con't)	

Sat., Dec. 21, 9:00-11:00 pm FINAL EXAM CHAPTERS 1-14

Suggested Problems: Listed are representative problems from each chapter. Organic Chemistry is a problem solving oriented course. It is suggested that you work all the problems in each chapter and more if possible. Working problems will enhance your ability to do well on exams.

Chapter 1 Structure and Bonding
Problems: 1-6, 8-14, 16, 21-23, 25-28, 34, 37-41, 44-46

Chapter 2 Polar Bonds and Their Consequences
Problems: 1-19, 21, 22, 25-31, 33, 34, 36, 38-47, 49-53, 55, 56

Chapter 3 Organic Compounds: Alkanes and Cycloalkanes
Problems: 1-13, 16-20, 22, 23, 26-30, 33, 34, 37-40, 42-44, 46-48

Chapter 4 Stereochemistry of Alkanes and Cycloalkanes
Problems: 1-19, 22, 23, 25-29, 32-35, 38-44, 52

Chapter 5 An Overview of Organic Reactions
Problems: 1-15, 18-30, 37-40

Chapter 6 Alkenes: Structure and Reactivity
Problems: 1-22, 24-31, 35-42, 44, 46, 47, 49, 51, 52

Chapter 7 Alkenes: Reactions and Synthesis
Problems: 1-16, 20-27, 30-33, 35, 38-44, 48, 49

Chapter 8 Alkynes: An Introduction to Organic Synthesis
Problems: 1-26, 28-33, 36-41

Chapter 9 Stereochemistry
Problems: 2-27, 29-36, 41, 43-55, 58, 62, 64-66

Chapter 10 Alkyl Halides
Problems: 1-17, 21-27, 29, 30, 32-37, 40

Chapter 11 Reactions of Alkyl Halides: Nucleophilic Substitution and Eliminations
Problems: 1-20, 25-28, 30-32, 35-40, 45-48, 52

Chapter 12 Structure Determination: Mass Spectrometry and Infrared Spectroscopy
Problems: 3, 5-15, 29-37, 39, 41

Chapter 13 Structure Determination: Nuclear Magnetic Resonance Spectroscopy
Problems: 3, 4, 6-23, 25, 27, 30-40, 42-54

Chapter 14 Conjugate Dienes and Ultraviolet Spectroscopy
Problems: 1-6, 9-12, 15-19, 21, 26, 31-37, 40, 47, 50, 54