

UNIVERSITY OF TEXAS AT DALLAS  
CHEM 2323 – SPRING 2006

## Organic Chemistry I

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### GENERAL INFORMATION

**ORGANIZATION AND OBJECTIVES:** This course is primarily designed to provide a unified overview of fundamental organic chemistry. Students who successfully complete this course acquire an integrated understanding of molecular architecture, molecular transformations, reaction energetics and mechanisms, synthetic strategy, and structure determination. An important goal is to foster an appreciation of the subject by encouraging students to explore their own interest in it.

**PREREQUISITE:** One year of general chemistry, theory and experiment.

**TEXTBOOK:** L. G. Wade, Jr. Organic Chemistry. 6th. ed. The solutions manual is optional but highly recommended. A problem-solving book such as Schaum's Organic Chemistry, or Drew Wolfe's Test Yourself is also recommended for students preparing for the MCAT or other special admission tests.

### GRADING AND COURSE POLICY

There are 4 exams and 8 quizzes. Students are allowed to drop one of the first three exams and one quiz with no penalty. Exam 4 is mandatory and cannot be dropped. The grade distribution and letter grades assignments are shown below. The numbers indicate the final percent grade after round off.

- 3 EXAMS at 25% each 75%
  - 8 QUIZZES 15%
  - ATTENDANCE 10%
- 95 - 100 = A+

80 - 84 = B+

65 - 69 = C+

50 - 54 = D+

90 - 94 = A

75 - 79 = B

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60 - 64 = C

45 - 49 = D

85 - 89 = A

70 - 74 = B

55 - 59 = C

40 - 44 = D-

Tests are based on lecture notes, assigned readings, quizzes, exercises, AND previous tests. While all quizzes are partial, ALL TESTS ARE COMPREHENSIVE. In addition to studying the newest material to prepare for exams, students should review previous tests because some questions will reappear in the new tests in different form. The format of all tests and quizzes is multiple choice and true/false.

Attendance will start to count on the third week of classes and will be recorded randomly at unspecified dates. Your attendance grade will be strictly based on records and not on verbal accounts.

THERE IS NO TEST RESCHEDULING, EXTRA CREDIT, OR EXCEPTIONS MADE FOR ANYONE.

YOU ARE THE SOLE AND MASTER CRAFTSMAN OF YOUR GRADE !

ADDITIONAL INFORMATION

CLASSROOM ETIQUETTE. You are taking this class by your own decision in order to further goals that are important TO YOU. The instructor and fellow students expect mature behavior from you at all times. Any behavior that is disruptive to class, inconsiderate, or offensive reflects poorly on the offender and is subject to disciplinary action. Examples of disruptive behavior are horseplay, giggling, loud speech, and use of cellular telephones in class.

Use of cellular telephones in the classroom is prohibited. Please silence your telephone before entering the classroom. If you must take a call during class time, please leave the classroom. Likewise, communication of any kind with anyone during tests is prohibited. If you have an emergency during a test, you must surrender your test and resolve the issue with your instructor at a later time. However, this does not carry any obligation on the part of the instructor to reissue the test or change the grading policy.

STOPPING ATTENDANCE. Any student who stops attending class must officially withdraw from the course. Failure to do so results in automatic failing grade.

INCOMPLETE GRADES. You can request an incomplete grade only if you miss the last exam, and if a compelling and documented reason is provided. You cannot request an incomplete simply because

you missed any other tests or performed poorly in them. The college Master will not allow it. In that case you should drop the course. Any incomplete grades that are not removed within one term turn into failing grades. The deadlines for graduate students are different and usually shorter.

Please consult your advisor if in doubt, or view the UTD catalog link for Grading Policy at

<http://www.utdallas.edu/student/catalog/undergrad04/policies-grades.html>

PREFERENTIAL TREATMENT occurs when a student is granted exceptional status based on bias, unsubstantiated claims, frivolous arguments, or tenuous evidence. The instructor will not honor requests for preferential treatment, so please do not ask!

DISHONEST CONDUCT. Engaging in questionable behavior or activities is a personal, albeit not a trivial choice. Offenders are subject to applicable policy and are accountable not only to the instructor, but to the university system as a whole, and ultimately to the people of the State of Texas.

BE INFORMED AND MAKE WISE DECISIONS: Before deciding to engage in dishonest activities,

view the UTD catalog link for Student Conduct and Discipline policy at:

<http://www.utdallas.edu/student/catalog/undergrad04/app1.html>

CHEATING IS THE FEEBLEST APPROACH TO THE CHALLENGES THAT COLLEGE AND LIFE WILL POSE TO YOUR CHARACTER.  
TOPICS FOR ORGANIC CHEMISTRY I – SPRING 2006

STUDY TIP: Skim the lecture notes and textbook readings prior to their discussion in class. After class, go for a more in depth reading, then work on the assigned problems. Do this even if you don't consider yourself ready. You will not really learn the material until you've worked as many problems as possible.

#### TEST & QUIZ SCHEDULE

The instructor reserves the right to make revisions to this schedule as needed

#### DATES PROJECTED TOPICS

Quiz 1 Mon. Jan. 23 Atomic structure, covalent bonding, and Lewis formulas.

Quiz 2 Fri. Feb. 3

Orbital theory, electron delocalization and resonance, alkane and alkyl halide nomenclature, conformations of alkanes.

TEST 1 wed. Feb. 8 Ch. 1 - 3 and relevant lecture notes

Quiz 3 Fri. Feb. 17 Stereochemistry (ch. 5)

Quiz 4 Mon. Feb. 27

Reaction profiles and energetics, synthesis of halogenated alkanes (ch. 4), and Bronsted acid-base theory.

TEST 2 Fri. Mar. 3 Ch. 4, 5, Bronsted acid-base theory, and relevant lecture notes

Quiz 5 Mon. Mar. 20 Sn1 and Sn2 reactions (ch. 6)

Quiz 6 Mon. Mar. 27 E1 and E2 reactions (ch. 6 and 7)

TEST 3 Fri. Mar. 31 Ch. 6, 7 and relevant lecture notes

Quiz 7 Mon. Apr. 10 Reactions of alkenes (ch. 8)

Quiz 8 wed. Apr. 19

Alkynes, carbon nucleophiles, alcohols, and Grignard reactions (ch. 9 and 10).

TEST 4 Mon. Apr. 24 Ch. 8 - 10 and relevant lecture notes

PLEASE NOTE: Due to tight final grade deadlines, THERE IS NO OFFICIAL FINAL EXAM AS INDICATED IN THE CLASS SCHEDULE. Test # 4 occurs on the last day of class.

#### TOPIC DESCRIPTIONS

Chapter 1: Introduction & review of general chemistry. Atomic structure & bonding, Lewis formulas, resonance, conjugation, electron mobility, polarity, and electron density distributions.

Chapter 2: Fundamentals of molecular structure: Basic molecular orbital theory, hybridization, sigma and pi bonding in hydrocarbons, structural and geometric isomerism, introduction to functional groups.

Chapter 3: Alkanes and conformational analysis. Basic rules of organic nomenclature, conformational analysis of alkanes & cycloalkanes, alkanes as basic skeletons in the makeup of complex molecules.

Chapter 5: Stereochemistry. Symmetry and chirality, stereoisomerism, R/S nomenclature, chiral environments and the differentiation of stereoisomers, Fischer formulas, meso forms.  
Chapter 4: Reaction mechanisms & alkane chemistry. Introduction to molecular transformations, basic bond formation and bond breaking processes, reaction intermediates, free radical mechanisms, energetics, free radical halogenation and its importance in the functionalization of alkanes.

Ionic (polar) mechanisms: Bronsted acid-base chemistry. Sections 1-13, 1-14, and additional notes. Structure and acidity, trends in acidity and basicity, introduction to Lewis acid-base theory.

Chapter 6: Ionic mechanisms and nucleophilic substitutions. Alkyl halides as synthetic precursors, nucleophilic substitutions of tetrahedral carbon, S<sub>N</sub>1 and S<sub>N</sub>2 reactions.

Chapters 6 and 7: Elimination reactions and alkene synthesis. E1 and E2 reactions, competing processes in Lewis acid-base chemistry, alkene synthesis and properties.

Chapters 8 and 9: Chemistry of Carbon-Carbon pi-bonds (Alkenes and Alkynes).

Electrophilic and other addition reactions, oxidative cleavage, alkenes in organic synthesis, functional group equivalents, alkynes as acids, alkynide ions as nucleophiles and bases, use of carbon nucleophiles in organic synthesis.

Chapter 10: Alcohols: structure and synthesis. Structural characteristics and physical properties of alcohols, use of Grignard reagents as carbon nucleophiles in alcohol synthesis, reductions of carbonyl compounds, thiols.

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