Chemistry 2300

Principles of Organic Chemistry, Fall 2007

Instructor: Dr. Bradley S. Davidson
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Meeting Time/Place: MWF 1:30 – 2:20 pm, Old Main 121

Office Hours: Monday and Thursday, 9:00 – 10:00 am; Tuesday and Wednesday, 2:30 – 3:30 pm, or by appointment

Web Page: Blackboard Vista: online.uen.org/webct/entryPage.dowebct

Materials: Text – "Introduction to Organic Chemistry" Brown and Poon, 3rd Edition, Wiley (2005).

Model Kit – recommended (Available in Chem Stores)

Course Description: Shape, bonding, nomenclature, stereochemistry, physical properties and reactivity of organic molecules are covered for a range of molecules, beginning with simple alkanes and finishing with more complex abiotic and biotic organic molecules known today.

Learning Objectives for Chemistry 2300:

- Apply electronegativity and VESPR to draw the Lewis structures and predict the chemical properties for molecules containing various functional groups.
- Use electronegativity, octet rule, and electron moving to write resonance structures and predict the relative stability of these structures.
- Apply the concepts of acid/base and nucleophile/electrophile to predict chemical reactions.
- Recognize constitutional (structural) isomers, configurational isomers, conformational isomers, and stereoisomers and explain the differences in chemical and physical properties among these compounds.
- Write correct electron-pushing reaction mechanisms for the topic reactions of each chapter.
- Apply the concepts of resonance and inductive effects to predict the chemical and physical properties for different functional groups and the molecules to which these functional groups are attached.
- Explain the reactive mechanisms by using concepts of steric hindrance, stability of carbocations, and leaving group capability.
- Explain or define the roles of molecules that bear lone or nonbonding electron pairs as bases, nucleophiles, or leaving groups in a chemical reaction.
- Explain aromaticity and recognize aromatic compounds.
- Perform all of the detailed learning objectives posted online for each chapter.

Course Outline and Exam Schedule:

Week	Dates	Quiz	Chapter(s)
one	8/27 – 8/31	Pre	Introduction, Chapter 1
two	9/5 – 9/7	1	Chapter 1, Chapter 2
three	9/10 – 9/14	2	Chapter 3, Chapter 4
four	9/17 – 9/21	3	Chapter 4, Review (9/21)
five	9/24 – 9/28		**Exam 1** (9/24), Chapter 5
six	10/1 – 10/5	4	Chapter 6
seven	10/8 – 10/12	5	Chapter 7
eight	10/15 – 10/19	6	Chapter 8, Review (10/19)
nine	10/22 – 10/26		**Exam 2** (10/22), Chapter 9
ten	10/29 – 11/2	7	Chapter 9, Chapter 10
eleven	11/5 – 11/9	8	Chapter 13, Chapter 14
twelve	11/12 – 11/16	9	Chapter 14, Review (11/16)
thirteen	11/19		**Exam 3 (**11/19**)**
fourteen	11/26 – 11/30	10	Chapter 15, Chapter 16
fifteen	12/3 – 12/7	11	Chapter 16, Review (12/7)
sixteen	12/12 (Wed)		**Final Exam** (1:30 - 2:20 pm)

Assessment:

Assessment involves measuring student progress as well as teaching effectiveness. The following assessment strategies have been incorporated into this course.

1. A pre-test/post-test approach will be used to measure comprehension and teaching of important concepts. The pre-test will be administered through Blackboard and must be taken on your own time. The ten multiple choice questions of the pre-test will reappear in the final, in slightly altered form, to assess teaching and learning progress during the semester. If weaknesses are observed in specific subject areas, teaching methods will be reevaluated. Although no formal points will be awarded, you must take the pre-test before you will be permitted to take course quizzes.

2. Student evaluations will be used to evaluate course/instructor strengths and weaknesses. In addition to the standard end-of-course evaluation, a midterm questionnaire will be circulated to assess teaching/learning strategies. Constructive suggestions are welcome anytime.

Online links to chemistry materials:

Jones and Bartlett Publishers' organic chemistry site, which has files of molecular structures, animations of chemical mechanisms, and much more:

www.jbpub.com/organic-online/webhome.htm

A site with self-tests, message boards, and other helpful organic chemistry study aids:

www.chemhelper.com

Los Alamos Periodic Table Site:

pearl1.lanl.gov/periodic

Expansive lists of links for organic chemists:

www.ux1.eiu.edu/~cfthb/links/research
www.organicworldwide.net

Grading Scheme:

Point Distribution: Best two out of three one-hour exams (200 pts)

Best ten out of eleven on-line quizzes (100 pts)

Comprehensive final (200 pts)

Total Points: 500 pts

Grade Breakdown:

The grade received in the course is based on your performance on the exams. Grades are guaranteed as given below for overall percentage score on all exams. Actual grade ranges may be curved somewhat lower, depending on the overall class average.

A 100 – 93%
A- 92 – 90%
B+ 89 – 87%
B 86 – 83%
B- 82 – 80%
C+ 79 – 77%
C 76 – 73%
C- 72 – 70%
D 69 – 60%
F 59% and below

Procedures:

1. The format of the exams is a combination of multiple choice (30%) and fill-in (70%), where you will be expected to draw chemical structures and explain you answers. The exams are meant to test your understanding of the topics covered in lecture, not your ability to repeat memorized problems. Expect some questions that require you to apply your understanding to new problems. Practice problems and past exams will be available on the Blackboard Vista site for download. They will provide the best examples of the fill-in questions.

2. The on-line quizzes will be available through the Blackboard Vista site from 7:00 am Monday until 7:00 am the next Monday on the weeks shown in the schedule, above, and must be taken on your own time. They will consist of ten multiple choice questions chosen randomly from a bank of questions. They will be open-book, with a time limit of 30 minutes, and can be taken as many times as you want, with your highest score being recorded. You will benefit the most from the quizzes if you prepare and try to take them without help from the book or your notes. You have an entire week, 24/7 to take the quizzes. Do not ask for an extension.

3. A "special molecule" will be identified a week before each exam, either by discussion in class, assigned reading, or a web link. An **extra credit** question about the "special molecule" worth 10 pt will be offered on each midterm exam.

4. There will be no make-up exams. It is possible to take an exam in advance, but only with a valid excuse and prearrangement with me. If you miss an exam without prearrangement, then that will be the exam dropped from your overall score.

5. It is an official University policy that unless you have three exams on the same day, you must take the final exam in this course at the officially scheduled time. Permission to take a final at any other time for any other reason can only be obtained from the Dean of Science.

6. Addition mistakes or questions over exam grading should be discussed with me within one week following the return of the exam. No point adjustments will be made after this time.

7. All answer keys, practice tests, lists of assigned problems, etc. will be posted on the course website. Answer keys and practice tests will be available in pdf format, which will require you to have Adobe Acrobat Reader on your computer. This can be downloaded free at www.adobe.com/products/acrobat/readstep2.html.

8. The University add/drop policies are described in the Fall Schedule of Classes on pages 106 and 107. August 31st is the last day to add a class without an instructor's signature; students may add courses between September 1st and 17th only with the instructor's signature. The last day to add is September 17th. Page 107 describes the drop policy. In short, a student may drop a class without any notation on the transcript until September 17th (the first 20% of the class). After that date, any drop receives a permanent "W" notation on the transcript. After 60% of a class is completed (October 25th), the advisor (not the Dean's Office) must approve of a drop. In addition, the "W" is accompanied by the grade in the class at the time of the drop. Finally, after 75% of a class is completed (November 15th), a student may not drop a class for any reason. The University policy on giving a grade of Incomplete will be strictly followed. See the section on Academic Policies in the Fall Semester Schedule of Classes guide, pages 102 – 109, for current policies.

9. The main function of office hours is to discuss and solve problems that you may be having with the course materials, assigned problems, and concepts presented during lecture. Try to formulate questions in advance. Do not expect a mini review session.

10. All individuals are responsible for understanding the contents of this document.

11. Reasonable accommodation will be provided for all persons with disabilities in order to ensure equal participation with the program.

Suggestions:

1. Try not to simply memorize. You will be more successful if you strive to understand the underlying principles.

2. Organize your reactions. Categorize them by reacting functional group, reagent, and product functional group. Look for similarities in mechanism.

3. Make up flash cards with reagents on one side and products on the other and with organic and inorganic reagent on one side and organic reagent and product on the other. Drill yourself.

4. Keep up with lecture and reading materials.

5. Make sure to take the quizzes! In addition to helping your overall comprehension and exam performance, do not miss easy-to-obtain points.

6. Work the problems! Work the problems! Work the problems! (practice makes perfect)

7. Use the web sites listed above.

8. Study in groups, but make sure everyone contributes.

9. Use molecular models to visualize the three-dimensional nature of organic molecules.