

CHEMISTRY 435 and 531 - PHYSICAL ORGANIC CHEMISTRY

Syllabus, Fall 2016, Blackstock

description: *the theory and mechanism of organic molecular structure and transformations. detailed evaluation of organic electronic structure; molecular orbital analysis; molecular dynamics and energetics; molecular symmetry; organic reaction mechanisms; stereochemistry of reactions; and energetics of reaction paths. the chemical literature of physical organic chemistry and key practitioners in the field. ChemDraw and Scifinder will be used in the course. Some computational molecular modeling will be performed by graduate students in the course.*

prerequisites: organic chemistry (2 semesters) and physical chemistry (1-2 semesters)

time/place TR 9:30-10:45 AM SHLB 2106
instructor: S. C. Blackstock, 348-0748, blackstock@ua.edu
office hours: SHLB 2050 (W,Th 11:00-11:30 or by appointment)
textbook: *Modern Physical Organic Chemistry* by Anslyn and Dougherty, 2006
website: <http://physicalorganicchemistry.people.ua.edu>
tools: ChemBioDraw, Scifinder, Spartan, pencasts, tegrity

Tentative Course Schedule

Ch 1 Molecular Structure and Thermodynamics	Aug 18, 23, 25, 29, Sep 1, 6
Ch 6 Stereochemistry	Sep 8, 13, 15, 20
Exam 1 (Mon)	Sep 19 7:00 - 9:00 PM
Ch 15 Thermal Pericyclic Reactions	Sep 22, 27, 29, Oct 4, 6, 11
Ch 2 Molecular Energetics and Conformational Analysis	Oct 13, 18, 20, 25, Nov 1, 3
Exam 2 (Tues)	Oct 17 7:00 - 9:00 PM
Ch 7 Kinetics and Reaction Energy Surfaces	Nov 8, 10
Ch 8 Mechanistic Analysis of Organic Reactions	Nov 15, 17
Ch 5 Acid-Base Chemistry	Nov 22, 29
Exam 3 (Tues)	Nov 21 7:00 - 9:00 PM
Ch 11 Molecular Rearrangements	Dec 1
Final Exam (Wed)	Dec 7 8:00 - 10:30 AM

COURSE LEARNING OBJECTIVES: Students who complete this course should gain a detailed knowledge of the electronic structure of organic molecules and how that structure affects a molecule's properties and reactivity. Specific learning objectives are provided with the lecture outlines and homework assignments for each chapter of material. Familiarity with the chemical literature in the field and the practitioners of the science is also expected.

ATTENDANCE: All students are expected to attend all lectures and recitations. Attendance may be recorded. Students should be present on time to be counted as attending.

CELL PHONES: Interactive electronic devices (including cell phones) should be powered off and not used during lecture unless they are explicitly required as part of the class activity.

HOMEWORK and LECTURE QUESTIONS: Reading and problems will be assigned for each chapter. Some homework assignments will be collected for grading. Some questions given in lecture will be collected for grading. Students are encouraged to discuss assigned problems with each other, but each student should *individually* work each problem on paper. Answers to problems will be posted or presented at class review sessions. Several review sessions outside lecture time will be scheduled during the semester for homework review.

EXAMS & GRADING: The course grade will derive from three exams (100 pts each), graded homework and lecture questions (75 pts), a class presentation (25 pts), and a comprehensive final exam (200 pts). Graduate students (531 course) will complete a short quantum mechanical calculation assignment worth 50 pts. Total points for the course(s) will be 600 and 650 pts for CH435 and CH531, respectively.

Grading scale: For this course the grading scale will be A (85-100%), B (70-84%), C (55-69%). The instructor reserves the option to slightly widen the grade scales but will not narrow them (i.e. 84% is guaranteed to be a B, could be an A- if grading scales are extended slightly).

CLASS PRESENTATION: Each student will give a 5 minute presentation (~5 ppt slides) on an assigned topic and field questions from the class. The student will research the current literature on the topic, conduct a "pre-presentation" with the instructor prior to class presentation, and present the topic findings to the class. Students will use ChemDraw and Scifinder in preparation of the presentation.

GRADUATE STUDENTS: All graduate students will complete a computational modeling assignment. The Spartan program will be used to do the computations and the results will be compiled into a report.

HONOR CODE: The Alabama honor code applies to all work performed in this course. Homework problems may be discussed openly with other students and reference materials may be consulted at will. However, each student should ultimately write out solutions by herself/himself and in her/his own words. Exams (and any quizzes) are to be taken without any external aids other than those specified by the instructor. All acts of dishonesty in coursework constitute academic misconduct and the Academic Misconduct Disciplinary Policy will be followed in any such event.

Disability Accommodations: If you require disability accommodations, please contact Ms. Jackie McPherson in the Department of Chemistry Office (348-5954) or Disability Services in the Center for Teaching and Learning (248-4285) to make initial arrangements and then contact the instructor.

Emergency Procedures: UA's primary communication tool for sending out information is through its website at www.ua.edu. In the event of an emergency, students should consult this site for further directions. In the event of an emergency, the instructor will use email and the course website to provide additional course information.