Advanced Organic Chemistry (Chem 251)

Instructor: Cynthia Dowd (Samson 303; 202-994-8405; cdowd@gwu.edu)
Time: Tues/Thurs, 11:10am-12:25pm
Location: Cor111
Office Hours: Tues/Thurs, 9:30-11:00am and by appointment

Course Goals:
The overall objective of this course is to build knowledge of organic chemistry from a synthetic reaction perspective. Chem 251 builds on basic information learned at the undergraduate level about a functional group’s general properties and reactions. We will learn more advanced reaction methodology including mechanisms to facilitate synthesis of more complex molecules. Reactions will be combined in a step-wise process, enabling the student to create complex and interesting organic molecules.

Learning Objectives:
By the end of the semester, the student should know how to:
1. Explain the progression of a synthetic reaction using a mechanistic diagram;
2. Interpret data from primary literature that indicate reaction conditions, yields, and major/minor products;
3. Design reaction routes that lead to specific desired molecules as the major products from defined starting materials;
4. Predict the products of complex synthetic schemes; and
5. Demonstrate knowledge of a variety of advanced synthetic organic reactions by completing multistep synthesis reaction schemes;

Course outline and schedule of lectures:
Sept 1 Introduction to course and brief review
Sept 1, 3, 8, 10 Chapter 1 (Enolates and other Carbon Nucleophiles)
Sept 10, 15, 17 Chapter 2 (Reactions of Carbon Nucleophiles with Carbonyls)
Sept 22, 24, 29 Chapter 3 (Functional Group Interconversion)
Oct 1 Exam I (Chapters 1-3)
Sept 29, Oct 6, 8 Chapter 5 (Reduction)
Oct 13, 15, 20 Chapter 12 (Oxidation)
Oct 20, 22, 27 Chapter 4 (Electrophilic Addition to C-C Multiple Bonds)
Oct 29, Nov 3, 5 Chapter 6 (Cycloadditions, Rearrangements and Eliminations)
Nov 10          Exam II (Chapters 4-6 and 12)
Nov 12, 17       Chapter 7 (Organometallic Groups I and II)
Nov 19, 24       Chapter 8 (Transition Metals)
Nov 24, Dec 1    Chapter 9 (Carbon-Carbon bond forming with B, Si, Sn)
Dec 3            Course Review
Dec XXX          Final Exam

Exams and grading:
There will be two in-class exams (100 points each) plus a cumulative final (200 points). The in-class exams will be approximately Oct. 1 and Nov. 10 but are subject to change. The Dec. 3 lecture will serve as review.

Additional Reading:
- Carey and Sundberg, *Advanced Organic Chemistry Part A.*

ACADEMIC INTEGRITY
I personally support the GW Code of Academic Integrity. It states:: “Academic dishonesty is defined as cheating of any kind, including misrepresenting one's own work, taking credit for the work of others without crediting them and without appropriate authorization, and the fabrication of information.” For the remainder of the code, see: http://www.gwu.edu/~ntegrity/code.html

SUPPORT FOR STUDENTS OUTSIDE THE CLASSROOM
DISABILITY SUPPORT SERVICES (DSS)
Any student who may need an accommodation based on the potential impact of a disability should contact the Disability Support Services office at 202-994-8250 in the Marvin Center, Suite 242, to establish eligibility and to coordinate reasonable accommodations. For additional information please refer to: http://gwired.gwu.edu/dss/

UNIVERSITY COUNSELING CENTER (UCC) 202-994-5300
The University Counseling Center (UCC) offers 24/7 assistance and referral to address students' personal, social, career, and study skills problems. Services for students include:
- crisis and emergency mental health consultations
- confidential assessment, counseling services (individual and small group), and referrals
  [http://gwired.gwu.edu/counsel/CounselingServices/AcademicSupportServices]

SECURITY
In the case of an emergency, if at all possible, the class should shelter in place. If the building that the class is in is affected, follow the evacuation procedures for the building. After evacuation, seek shelter at a predetermined rendezvous location.