

**CHEM 542 Advanced Organic Chemistry
Fall 2015**

Instructors:

Dr. Greg Crouch, Fulmer 414, 335-8388, gcrouch@wsu.edu

Dr. Rob Ronald, Fulmer 415a, 335-3364, rcr@wsu.edu

Class Meeting: MWF 10:10-11:00 PM, Fulmer 432

Recommended Textbooks (We are recommending five Oxford Science Monographs): *Foundations of Organic Chemistry* (#9), Hornby, M., and Peach, J., Oxford University Press 2010 (ISBN: 978-0-19-855680-0); *Organic Stereochemistry* (#88), Robinson, M. J. T., Oxford University Press 2005 (ISBN: 978-0-19-879275-8); *Mechanisms of Organic Reactions* (#45), Maskill, H. Oxford University Press 2011 (ISBN: 978-0-19-855822-4); *Reactive Intermediates* (#8), Moody, C. J., and Whitham, G. H. Oxford University Press 2006 (ISBN: 978-0-19-855672-5); *Structure and Reactivity in Organic Chemistry* (#81), Maskill, H. Oxford University Press 2005 (ISBN: 978-0-19-855820-0).P

However, there are other books that would be acceptable: *The Search for Organic Reaction Pathways*, Peter Sykes, Wiley and Sons (1971) [Actually, Prof. Sykes has written a number of textbooks on organic reaction mechanisms and any of them would be acceptable]; *Advanced Organic Chemistry* 2nd Ed., Miller, B., Pearson (2004); *Organic Chemistry, An Intermediate Text*, Hoffman, R. Oxford University Press (1997) [this text has been used previously in Chem 542 so there may be copies around that you could borrow]; *Advanced Organic Chemistry, Part A: Structure and Mechanisms*, 5th Ed., Carey, F. A., and Sundberg, R. J. Springer (2007).

Course Description: This course is designed to provide students with foundational knowledge of advanced organic chemistry and prepare students for more advanced coursework and research needs. The course will focus on molecular structure, stereochemistry, and reaction mechanisms (When possible, relevant papers from the literature will be used to illustrate specific concepts).

Topics to be Covered in the Course

- Acids and Bases
- Bonding and Orbitals
- Stereoisomerism in Organic Molecules
- Conformational Analysis
- Addition and Elimination Reactions
- Carbenes and Nitrenes
- Aromatic Substitution Reactions
- Investigation of Organic Reaction Mechanisms
- Kinetics and Isotope effects
- Organic Reaction Mechanisms, Reaction maps
- Catalysis of Organic Reactions
- Radical Reactions
- Nucleophilic Reactions
- Carbonyl Chemistry

Course Objective:

To provide advanced undergraduates and first-year graduate students with a working knowledge of graduate level organic chemistry

Learning Outcomes

1. Describe chemical reactivity in terms of organic functional group chemistry, including functional group transformation.
2. Interpret structural changes within a chemical framework considering bond making and bond breaking.
3. Propose reasonable mechanisms that convert starting materials to product, including both polar and radical pathways
4. Interpret stereochemical data that informs a mechanistic hypothesis.

Grading Scheme: This course will be graded on the basis of the two halves of the course, each worth 50% of your grade.

During the first half your grade will be based on two examinations each 50% of the first half grade.

For the second half of the course two quizzes (20%) and one exam will be given (80%). Homework will be voluntary. The scores on these exams will be used to assign letter grades based on the following scale:

A	90-100	B	80-83	C	70-73	D	60-63
A-	87-89	B-	77-79	C-	67-69	F	<60
B+	84-86	C+	74-76	D+	64-66		

Students with Disabilities:

Reasonable accommodations are available for students with a documented disability. If you have a disability and need accommodations to fully participate in this class, please either visit or call the Access Center (Washington Building 217; 509-335-3417) to schedule an appointment with an Access Advisor. All accommodations MUST be approved through the Access Center.

Academic Integrity:

Academic integrity will be strongly enforced in this course. Any student caught cheating on any assignment will be given an F grade for the course and will be reported to the Office Student Standards and Accountability. Cheating is defined in the Standards for Student Conduct WAC 504-26-010 (3). It is strongly suggested that you read and understand these definitions: <http://conduct.wsu.edu/default.asp?PageID=338>

Safety Statement:

The following websites detail the WSU Safety policy and plan. The content of these sites will be discussed on the first day of the term

- <http://safetyplan.wsu.edu>
- <http://alert.wsu.edu>
- <http://oem.wsu.edu>