

**CHEM 542 Advanced Organic Chemistry
Fall 2014**

Instructors:

Dr. Ming Xian, Fulmer 468, 335-6073, mxian@wsu.edu

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

Office Hours: by appointment

Textbook: Not required, but I recommend you have at least one reference book such as *Organic Chemistry*, Claydon, Greeves, Warren and Wothers, Oxford.

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, reaction mechanisms, and synthetic methods. When possible, relevant papers from the literature will be used to illustrate specific concepts.

Course Objective:

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

Student Learning Outcomes (SLOs)

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.
5. Plan an organic synthesis using a retrosynthetic approach based on known chemical reactions.

Homework: homework will be given but not graded.

Assessment: SLOs will be addressed by a number of topics covered in lectures and homework practices. SLOs will be evaluated by in class quizzes and exams.

Grading Scheme: This course will be graded on the basis of the quizzes and three exams. 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		

Attendance policy: You are expected to attend all the lectures and exams. There are no 'make-up' exams or quizzes.

Lecture Schedule

Week	Starting	Monday	Wednesday	Friday
Week 1	August 25	Lecture	Lecture	Lecture
Week 2	September 1	Labor Day	Lecture	Lecture Quiz 1
Week 3	September 8	Lecture	Lecture	Lecture

Week 4	September 15	Lecture	Lecture Quiz 2	Lecture
Week 5	September 22	Lecture	Lecture	Lecture
Week 6	September 29	Exam 1	Lecture	Lecture
Week 7	October 6	Lecture	Lecture	Lecture Quiz 3
Week 8	October 13	Lecture	Lecture	Lecture
Week 9	October 20	Lecture	Lecture Quiz 4	Lecture
Week 10	October 27	Lecture	Lecture	Lecture
Week 11	November 3	Exam 2	Lecture	Lecture
Week 12	November 10	Lecture	Lecture	Lecture Quiz 5
Week 13	November 17	Lecture	Lecture	Lecture
Week 14	November 24			
Week 15	December 1	Lecture Quiz 6	Lecture	Lecture
Week 15	December 8	Review	Review	Review
Finals	December 15	Exam 3 TBA		

Lecture Topics

Functional Groups, Orbitals, Aromaticity, Oxidation Levels, Acidity and Basicity, pKa, Bronsted and Lewis Acids and Bases, Structural Effects on Acidity, Electronegativity, Inductive Effects, Resonance Effects, Stereochemical Structures, Chirality, Resolution of Enantiomers, Stereoselective Reactions, Formation of Enantiomers/Diastereomers, Conformational Analysis, Strain in Ring Systems, Stereoelectronic Effects, Functional Group Manipulation, Carboxylic Acids, Esters, Amides, Acid Chlorides, Aldehydes, Ketones, Imines and Imine Derivatives, Alcohols, Amines, Alkenes, Alkanes, Carbon–Carbon Bond Formation, Generation of Nucleophilic Carbon Reagents, Generation of Electrophilic Carbon Reagents, Enolates, Diastereoselection in Aldol Reactions, Organometallic Compounds, C=C Formation, Cyclopropanation Reactions, Metal-Catalyzed Carbon–Carbon Bond Formation, Pd(0)-Catalyzed Carbon–Carbon Bond Formation, Olefin Metathesis, Free-Radical Reactions, Free-Radical Polymerization, Retrosynthetic Analysis.

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>