

Chem 545 Synthetic Organic Chemistry (3 credits)

Pre-requisite: Chem 542

Spring 2016

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

Office Hours: by appointment.

Class location and time: Fulmer 432, 12:10-13:00 MWF

Course Textbooks:

It is highly encouraged (especially if you want to stay in this field) that you have access to as many of the following books as possible:

1. "Greene's Protective Groups in Organic Synthesis, 4th Edition" by Peter G. M. Wuts and Theodora W. Greene
2. "Strategic Applications of Named Reactions in Organic Synthesis" by Laszlo Kurti and Barbara Czako
3. "Advanced Organic Chemistry: Reactions, Mechanisms and Structure, 5th Edition" by Michael B. Smith and Jerry March
4. "Transition Metals in the Synthesis of Complex Organic Molecules, 2nd Edition" by Louis S. Hegedus

Course Description: This course will provide a survey of modern synthetic methods in organic chemistry. Reagents and reaction conditions, reaction mechanisms, and selectivity issues will be discussed.

Course Objective: To broaden the understanding of a variety of organic reactions. The students are expected to learn/understand all lectured information and to do additional coursework (handouts) to cultivate their expertise by being exposed to a variety of other related examples in each topic.

Learning Outcomes:

After completing this course, a student should be able to (1) make informed decisions about HOW to effect organic transformations, (2) analyze chemo-, regio-, and stereoselectivity issues, (3) use their understanding of the reaction mechanism to rationalize/predict outcomes, and (4) interpret and understand the relevant synthetic literature.

Grading:

Grades will be determined based on your performance on written exams and quizzes. 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		

Lecture Topics

Acid/base chemistry, pKa

Protection/Deprotection

-OH Oxidation

C=O Reduction

Enolate chemistry

Alkylation

Aldol reaction

Organocatalysis

Olefination

C=C bond functionalizations

Umpolung Chemistry

Cyclic additions (Diels-Alder, [3+2])

Sigmatropic rearrangements

Transition metal catalyzed reactions

Name reactions review
Total synthesis of natural products

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:

Washington State University is committed to enhancing the safety of the students, faculty, staff, and visitors. It is highly recommended that you review the Campus Safety Plan (<http://safetyplan.wsu.edu/>) and visit the Office of Emergency Management web site (<http://oem.wsu.edu/>) for a comprehensive listing of university policies, procedures, statistics, and information related to campus safety, emergency management, and the health and welfare of the campus community.

Class Schedule:

Week 1	Jan 11 Intro., pKa, acid/base	Jan 13 Protection/Deprotection I	Jan 15 Protection/Deprotection II
Week 2	Jan 18 MLK day (No class)	Jan 20 Epoxidation (Park)	Jan 22 (Quiz) Epoxidation (Park)
Week 3	Jan 25	Jan 27	Jan 29
Week 4	Feb 1	Feb 3	Feb 5 (Quiz)
Week 5	Feb 8	Feb 10	Feb 12
Week 6	Feb 15 President' Day (no class)	Feb 17 Exam 1	Feb 19

Week 7	Feb 22	Feb 24	Feb 26
Week 8	Feb 29	Mar 2	Mar 4(Quiz)
Week 9	Mar 7	Mar 9	Mar 11
Week 10	Mar 14 Spring break	Mar 16 Spring break	Mar 18 Spring break
Week 11	Mar 21	Mar 23	Mar 25 Exam 2
Week 12	Mar 28	Mar 30	Apr 1
Week 13	Apr 4	Apr 6	Apr 8 (Quiz)
Week 14	Apr 11	Apr 13	Apr 15
Week 15	Apr 18	Apr 20	Apr 22 (Quiz)
Week 16	Apr 25	Apr 27	Apr 29
Week 17	May 2 Final Exam		