CHEM 5310: Advanced Organic Chemistry-II
Spring 2015

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Office Hours: Mondays 2-3 PM and Wednesdays 3-4 PM

Section Information: CHEM 5310-001 (29361)
Time and Place of Class Meetings: SH 315, MWF 9:00-9:50

Description of Course Content: Chemistry 5310 continues our investigation of the relationship between molecular structure and reactivity within/between organic compounds. In particular, we will study advanced mechanisms, including: addition and elimination pathways, carbonyl reactions, aromatic substitution, free radicals, and photochemistry. Additional topics may be selected by class participants.

Student Learning Outcomes:

1. Predict and evaluate the three-dimensional structure of organic molecules,
2. Identify the general reactivity of compound classes,
3. Understand mechanisms from chemical reactivity and empirical kinetic and non-kinetic data,
4. Understand steric, electronic, and conformational effects within terms of various mechanisms, &
5. Predict the products that should arise from ionic, radical, and photochemical reactions.

Requirements: Preparation, class participation, and completion of homework are expected.

Required Textbook:
-Advanced Organic Chemistry: Part A, Fifth Edition, Francis A. Carey and Richard J. Sundberg (Free Online)
-Advanced Organic Chemistry: Part B, Fifth Edition by Francis A. Carey and Richard J. Sundberg
-Strategic Applications of Named Reactions in Organic Synthesis" by Kürti and Czakó
(See below for recommended reading and potential additions for your library.)

Assessment:	Problem Sets[1]	20%
	Midterm Exams[2]	50% = 2 x 25%
	Cumulative Final Exam[3]	25%
	Participation[4]	5%
		100%

[1]Study sessions will be given before each exam to review problem sets and student questions.
[2]There will be no make up exams. If an exam is missed, the following policy[3] will be employed.
[3]If you score better on your final than any midterm exam, your final grade will replace your lowest midterm exam.
[4]Attending class faithfully and completing all work will earn 3% out of 5%. Additional percentages will be awarded based on your ability to participate in class by asking questions and offering plausible answers that are logical and creative, but not necessarily correct.

Important Dates:

January 20th	First day of classes
February 4th	Census Date
~~**February 24th**~~	**EXAM 1**
Spring Vacation	*March 9th-14th, No Class*
March 25th	*ACES – No Class, present your work w/your advisors permission.*
April 3rd	Last day to drop
~~**April 4th**~~ –	**EXAM 2**
May 8th	Last Day of Classes
May 13th	**FINAL EXAMINATION – 8:00 - 10:30AM**

TOPICS TO BE COVERED:

By Chapter:

Cary Sundberg Part A:

1. Polar Additions and Eliminations Reactions – Chapter 5
2. Carbanions and other Carbon Nucleophiles – Chapter 6
3. Carbonyl Reactions – Chapter 7
4. Aromatic Substitution – Chapter 9
5. Radical Reactions – Chapter 11
6. Photochemistry – Chapter 12

Additional Reading assignments will be posted on Blackboard.

Cary Sundberg Part B:

1. Electrophilic addition to Alkenes – Chapter 4
2. Enolates and Other Nucleophiles – Chapter 1
3. Carbon Nucleophiles w/ Carbonyl Compounds – Chapter 2
4. Substitution Interconversion of Functional Groups – Chapter 3

Should time permit, we will discuss additional chapters. You should review the remaining mechanistic chapters of this text (Chapters 5,7, & 9) if you plan on taking Organic Chemistry 3, CHEM 5312

Attendance Policy: Attendance is mandatory, as participation is part of your grade, and most importantly – I will focus on the most critical information in class – studying by reading alone would be an inefficient use of your time.

Academic Honesty: This class has a zero tolerance policy for cheating and academic dishonesty. As future independent scientists, you must understand the potential career ending repercussions of stretching the truth, or fabricating results. Cheating or plagiarism will result in a failing grade for this class.

All students enrolled in this course are expected to adhere to the UT Arlington Honor Code:

I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

Americans with Disabilities Act: The University of Texas at Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including the *Americans with Disabilities Act (ADA)*. All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of that disability. Any student requiring an accommodation for this course must provide the instructor with official documentation in the form of a letter certified by the staff in the Office for Students with Disabilities, University Hall 102. Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability or by calling the Office for Students with Disabilities at (817) 272-3364.

Chemistry and Biochemistry Department Librarian: Antoinette Nelson email: nelsona@uta.edu

Suggested Resources for Organic Chemists (not necessary for this course):

By category:

Reactions/Mechanisms/Structural Theory

1. "Modern Physical Organic Chemistry" by Anslyn and Dougherty
2. "Advanced Organic Chemistry: Part B" Fifth Edition by Francis A. Carey and Richard J. Sundberg
3. "Frontier Orbitals and Organic Chemical Reactions" by Ian Fleming
4. "Pericyclic Reactions" by Ian Fleming
5. "Strategic Applications of Named Reactions in Organic Synthesis" by Kürti and Czakó
6. "March's Advanced Organic Chemistry: Reactions, Mechanisms, and Structure" by Smith
7. "The Organometallic Chemistry of the Transition Metals" by Robert H. Crabtree

Synthetic Strategy

1. "Classics in Total Synthesis" by Nicolaou and Sorensen
2. "Organic Synthesis The Disconnection Approach" Warren and Wyatt
3. "Workbook for Organic Synthesis Strategy and Control" by Wyatt and Warren
4. Journals to Read: See below

Stereochemistry and Stereoselectivity

1. "Basic Organic Stereochemistry" by Eliel, Wilen, Doyle
2. "Stereoelectronic Effects" by Kirby
3. "Principles of Asymmetric Synthesis" by Gawley and Aubé
4. "Stereoselectivity in Organic Synthesis" by Proctor

Radical/Photochemical Reactions

1. "Modern Molecular Photochemistry" by Turro
2. "Radical Reactions in Organic Synthesis" by Zard

*Synthetic Journals for Your Daily RSS Feed:**

1. *ACS Catalysis*[1]
2. *Adv. Synth. Catal.*[1]
3. *Agnew. Chem. Int. Ed.,*[2]
4. *Chem. Commun.,*[2]
5. *Chem-Eur. J.,*[2]
6. *Chem. Sci.*[2]
7. *Eur. J. Org. Chem.,*[1]
8. *Heterocycles*[1]
9. *J. Am. Chem. Soc.,*[2]
10. *J. Chem. Ed.*[2]
11. *J. Org. Chem.,*[1]
12. *J. Med. Chem.*
13. *Nat. Chem.*[2]
14. *Org. Biomol. Chem.,*[2]
15. *Org. Lett.,*[1]
16. *Org. Process Res. Dev.,*[1]
17. *Tetrahedron*[1]
18. *Tetrahedron Lett.*[1]

* Some of these journals are specifically for synthesis,[1] others[2] are general in nature, but can showcase premier syntheses or critical information/examples. This list is, of course, incomplete.