Organic Synthesis
The University of Toledo
Department of Chemistry & Biochemistry, College of Natural Sciences and Mathematics

CHEM 8410/6410/4410 CRN: 14486/14485/17273

Instructor: Peter R. Andreana, PhD
Email: peter.andreana@utoledo.edu
Office Hours: MWF: 10-11, TR 3-4
Office Location: WO 2232B
Office Phone: 419-530-1930
Term: Spring 2019

Class Location: BO 2059
Class Day/Time: TR/10-11:50 am
Lab Location: N.A.
Lab Day/Time: N.A.
Credit Hours: 4.0

COURSE/CATALOG DESCRIPTION
CHEM 8410/6410/4410 Organic Synthesis

COURSE OVERVIEW
The objective of CHEM 8410/6410/4410 is to introduce students to a series of reaction transformations in chemistry and discuss physical properties behind them. As such, both reactions and reactive intermediates will be discussed. Problem sets and homework assignments will be provided. Organic reactions of functional groups such as alcohols, alkenes and radicals, amongst others will be discussed. Extensive discussion at the interface of organic/biochemistry and bioinorganic chemistry is surely to be expected.

STUDENT LEARNING OUTCOMES
Consider each of these outcomes in terms of your understanding and abilities in Organic Synthesis as they are now...at the start of this course. Consider these outcomes periodically throughout the semester. As a result of your studies in CHEM 8410/6410/4410, you will demonstrate:
- a positive attitude about studying/learning organic chemistry;
- an understanding of bonding of many types;
- an understanding of acid-base chemistry;
- an understanding of hydrocarbons, stereochemistry and resonance;
- confidence in your ability to analyze and solve chemical problems;
- an ability to recognize and complete substitution and elimination reactions;
- an understanding of aromatic compounds and their reactions;
- effective time management and skills in note taking.

TEACHING STRATEGIES
The instructor will provide a learning environment such that students can meet the above outcomes. The instructor will provide independent assignments for you to achieve the above noted goals. The instructor will provide materials through BlackBoard facilitating and reinforcing learning objectives. Furthermore, a variety of instruction techniques and assessment activities will be utilized to help you meet your potential in this class. The instructor intends for you to finish this class with a new skill level in which to succeed in future chemistry endeavors. Finally, the instructor wants you to know that Organic Chemistry, and hence synthesis, is EVERYWHERE!
PREREQUISITES AND COREQUISITES
CHEM 2410 and 2420 Organic Chemistry I and II

REQUIRED TEXTS AND ANCILLARY MATERIALS
Important to Have:

Ancillary:
A. Fleming, I. Frontier Orbitals and Organic Chemical Reactions.
B. Kirby, A. J. Stereoelectronic Effects.
C. Deslongchamps, P. Stereoelectronic Effects in Organic Chemistry.

TECHNOLOGY REQUIREMENTS
Hardware: computer (Since many students will have access to “E-“versions of the texts required/recommended, laptops are not only permitted, they are encouraged! However, this privilege will be revoked pending wrongful decisions for their use in class (e-shopping, Facebooking, Tweeting, etc.).) Laptops WILL NOT be allowed during exams.
Software: Adobe Acrobat, Microsoft Office
Online learning tools: Blackboard

UNIVERSITY POLICIES
Policy Statement on Non-Discrimination on the basis of Disability (ADA)
The University is an equal opportunity educational institution. Please read The University’s Policy Statement on Nondiscrimination on the Basis of Disability Americans with Disability Act Compliance

ACADEMIC ACCOMMODATIONS
The University of Toledo is committed to providing equal access to education for all students. If you have a documented disability or you believe you have a disability and would like information regarding academic accommodations/adjustments in this course please contact the Student Disability Services Office

ACADEMIC POLICIES
For information on FERPA, Cheating and Plagiarism, Assessment of Student Learning outcomes and Student Code of Conduct, please refer the appropriate section of the current university of Toledo Catalog. Any act of academic dishonesty as defined by the University of Toledo policy on academic dishonesty (found at http://www.utoledo.edu/dl/students/dishonesty.html) will result in an F in the course or an F on the item in question, subject to the determination of the instructor.

WITHDRAWAL POLICY
Please read The University of Toledo’s Policy on class Withdrawal. This can be found in the Office of the Registrar and is noted here: http://www.utoledo.edu/catalog/2000catalog/admissions/registration_policy.html. Students who decide not to attend or stop attending any or all classes for which they have registered must drop or withdrawal from the course(s). Drops and withdrawals can be processed online through...
the myUT portal (provided there are no holds), and can also be processed at Rocket Solution Central (RSC) located in Rocket Hall, Room 1200. Failure to drop or withdrawal from a course for which a student has stopped attending may result in a grade of "F". Specific drop and withdrawal dates for a term are listed on the University's academic calendar and here, or by contacting Rocket Solution Central (RSC) 419.530.8700.

WARNING:

Withdrawing from a course(s) will result in a grade of "W", which will appear on your official transcripts. Once a withdrawal is processed, it cannot be rescinded. Based on the date of withdrawal, fees may or may not be adjusted. Since withdrawn courses reduce your enrolled hours, withdrawing from courses may have an adverse effect on financial aid benefits, scholarships, loan deferments, athletic eligibility, health insurance, veterans' benefits, degree requirements, or other areas. If you are uncertain what effect withdrawing from the course(s) would have, it is recommended that you contact the appropriate department for guidance.

COURSE EXPECTATIONS

All students are requested but NOT obliged to attend all lectures. You are also expected to be punctual if you are to attend. If you are a few minutes late for a class, please sit in a seat that does not require you to climb over numerous other students. You are also expected to be on time for all exams and extra time will NOT be allocated to any student who arrives late. You are expected to be considerate toward your fellow students and it is requested that you do not hold conversations during class. Any student who persists in talking during the lectures will be asked to leave the room.

Please turn your cell phone off BEFORE entering the lecture room. Be respectful towards yourself and those trying to learn Organic Synthesis.

GRADING

No student will be excused from taking any exam, except for valid medical reasons. Any situation should be attested to by a medical practitioner or other suitably qualified professional. However, even with valid reasons, a) no student will be allowed to miss the final exam; b) no student will be allowed to miss any mid-term exams. In the event that you have valid reasons AND you have also got the permission from the Dean of undergraduate studies for missing the final exam or missing two (2) or more mid-term exams, you will get an “Incomplete” grade and you need to take the missed exams with another class next year to obtain your letter grade. If you do not have a valid reason to miss any exam, you will get 0 points for that exam. There are no make-up exams for this class.

Graded exam papers will be randomly photocopied. All requests for re-grading any part of an exam should be submitted in writing to Dr. Andreana, together with the unaltered exam paper, no later than one (1) week (7 days) after the exam paper has been returned to you. You should indicate, in writing, which question you believe has been incorrectly graded, and state why. You should note that the entire paper will be re-graded by Dr. Andreana (not only the concerned problems), and that any other errors in grading will be corrected at that time.
Final Grading:

One Hour Exams (3): 300 pts  
Final Exam: 200 pts  
Problem Sets (5): 150 pts  
Quizzes (5): 50 pts  
Homework Assignments (5): 50 pts  
Total: 750 pts

A = 87-100%  
B = 74-86%  
C = 61-73%  
D = 48-60%  
F = 48% and below  
Delineating +’s and -’s will be at the discretion of the professor.

There will be three one-hour exams, one administered approximately every four weeks. These will focus on topics from previous week’s discussions. There will also be a comprehensive final exam worth 200 pts.

**Final Exam Date: Tuesday April 30th, 2019 from 10:15 am – 12:15 am (2 hrs).**

Mechanism based homework assignments will be graded only for completion (10, 5 or 0 PTS). The assignments will not be returned after the grade has been recorded.

Quizzes will not be announced in class. It is up to the student to keep up with the notes and materials discussed in class.

Problem sets will be available online on Fridays, and will be due in class in two weeks or as noted on the assignment sheet. Grades/question (3 questions/PS) will be available as follows: 10 (exceptional effort), 8 (complete), 5 (incomplete or inadequate effort), 2 (poor effort), 0 (nonexistent). **No late problem sets will be accepted!**

**COMMUNICATION GUIDELINES**

Email accounts are required for this class. Throughout the semester, communication will be handled by email. You MUST activate your UTAD email account (“something else”@utoledo.edu) OR (“something else”@rockets.utoledo.edu). For correspondence, please identify yourself as a student in CHEM 8410_6410_4410. Place “CHEM 8410_6410_44100” in the subject box when communicating electronically.

**STUDENT SUPPORT SERVICES**

Make friends with senior Organic Chemistry-based students! Get into group learning and when things go entirely wrong seek out help from your professor!
## COURSE SCHEDULE

<table>
<thead>
<tr>
<th>Week</th>
<th>Day</th>
<th>Date</th>
<th>Topic</th>
<th>Lecture/Exam</th>
<th>PS/Hmwk</th>
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<tbody>
<tr>
<td>1</td>
<td>Tuesday</td>
<td>01-15-19</td>
<td>Aldol</td>
<td>Lecture 1</td>
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<td>Thursday</td>
<td>01-17-19</td>
<td>Aldol-Stereochemistry</td>
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<td>01-22-19</td>
<td>Mannich</td>
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<td>Mannich</td>
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<td>Tuesday</td>
<td>01-29-19</td>
<td>Synthetic Equivalents</td>
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<td>Synthetic Equivalents</td>
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<td>4</td>
<td>Tuesday</td>
<td>02-05-19</td>
<td>Wittig, Peterson, Tebbe</td>
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<td>Sulfenylation</td>
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<td>5</td>
<td>Tuesday</td>
<td>02-12-19</td>
<td><strong>Exam 1 Covers Lectures 1-8 (75 mins)</strong></td>
<td>In-PS1</td>
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<td>02-26-19</td>
<td>Conjugate Additions</td>
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<td>Conjugate Additions</td>
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<td>In-Hmwrk2</td>
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<td>Tuesday</td>
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<td><strong>Holiday – Spring Break</strong></td>
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<td>Heteroatom Exchange</td>
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<td><strong>Final Exam</strong></td>
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<td>Thursday</td>
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¥This Course Schedule is subject to change upon miscellaneous events.
€Prof. Andreana will be out of town. Possible substitute.
§The Final Exam date, time and room number is subject to change.