CHEMISTRY 7200 SYLLABUS 2019
ORGANIC SYNTHESIS I
M, W, F  9:35AM-10:40AM HEB 2010
Instructor: Dr. Jon Rainier, 3152 HEB
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Office Hours: I have reserved the 4th floor Conference room from 12:00-2:00 pm for class discussion. You should plan to attend these to work through homework and discuss any material. Otherwise please stop by my Office or make an appointment.

Class Objective: To study and try to understand organic reactions and organic reaction mechanisms.

Methods: lectures, discussion, problem solving

Prerequisites: Organic Chemistry I and II.  Physical Organic Chemistry I is recommended.

We Aim to be Inclusive: I intend for all students from all backgrounds and perspectives to have their learning needs addressed in this class. I intend for all materials to be presented in a way that is respectful of diversity: gender, disability, race, age, sexuality, ethnicity, culture, and socioeconomic status. I am not perfect and appreciate any suggestions for improvement from all students.

Schedule-Parallel Curricula

<table>
<thead>
<tr>
<th>DATES (Approximate except exam)</th>
<th>TOPIC (In class)</th>
<th>DATES (Approximate except exam)</th>
<th>TOPIC (out of class)</th>
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</thead>
<tbody>
<tr>
<td>August 19, 21, 23</td>
<td>Introduction and Alkenes</td>
<td>August 19, 21, 23</td>
<td>Enolates and C-Nucleophiles (Ch. 1)</td>
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<td>August 26, 28, 30</td>
<td>Cyclopropanes-alkylation, carbones, carbenoids, etc.</td>
<td>August 26, 28, 30</td>
<td>Carbonyl Additions (Ch. 2)</td>
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<td>September 4, 6</td>
<td>Cyclobutanes-cycloadditions, etc.</td>
<td>September 4, 6</td>
<td>Functional Group Interconversion (Ch. 3)</td>
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<td>September 9, 11, 13</td>
<td>Cyclopentanes-radicals, metal mediated cyclizations, etc.</td>
<td>September 9, 11, 13</td>
<td>Electrophilic Additions to C-C Multiple Bonds (Ch. 4)</td>
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<tr>
<td>September 16, 18, 20</td>
<td>Cyclohexanes-Diels Alder, metathesis, electrocyclizations, etc.</td>
<td>September 16, 18, 20</td>
<td>Reductions (Ch. 5)</td>
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<td>September 23, 25, 27</td>
<td>Sigmatropic Rearrangement-Claisen, Cope, etc.</td>
<td>September 23, 25, 27</td>
<td>Reactions Involving Transition Metals (Ch. 8)</td>
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<tr>
<td>September 30, October 2, 4</td>
<td>Electrocyclic Ring Closure, etc.</td>
<td>September 30, October 2, 4</td>
<td>Oxidations (Ch. 12)</td>
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Recommended Text: László Kürti and Barbara Czakó “Strategic Applications of Named Reactions in Organic Synthesis,” Elsevier (or some other name reaction book)

Philosophy/Course Outcomes: Organic synthesis is a science that is central to chemistry, materials science, and biology/life in that it deals with molecular interactions. It will be impossible to cover all organic reactions during this class. My intention is to provide you with a strong foundation for your future.

All questions, opinions, and comments are welcomed. The most effective classes are those that are interactive.

Grading:

Quizzes: (300 points) Material will come primarily from the lectures, named reactions, and homework. Every Friday beginning on August 30 (50 points each).

Homework: (350 points) You will be given weekly homework assignments-due each Friday on Canvas (50 points ea.)

Named Reactions: (150 points) You will be given weekly named reactions that you will need to compile into a blue book (or the equivalent). Your entry must include the generic reaction, a mechanism(s), a recent (later than 2010) reference, and the first reference of the reaction in the literature-due each Monday.

Reactions Document: (ca. 50 points) You will be asked to upload a more recent example of reactions that we discuss in class onto a class google doc.

Project: (100 points) Each student is expected to prepare a short (<15 pages) paper that outlines 3 different syntheses of a molecule. The syntheses must be longer than 15 linear steps from commercially available material and span at least a 10 year time period. Included must be a comparison of the syntheses (number of steps, efficiency, creativity), and mechanisms for each step (due October 4)

Total: 400 points

Canvas: I will use Canvas extensively to give you information (notes, papers, keys, etc). Grades will be posted on Canvas in a timely manner.

Last day to withdraw is Friday, September 13. Last day to drop (or add) is Friday, August 23.

Americans with Disabilities Act: The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you will need accommodations in this class, reasonable prior notice needs to be given to the Center for Disability Services (CDS), 162 Olpin Union Building, 801-581-5020. CDS will work with you and me (Rainier) to make arrangements for accommodations. All written information in this course can be made available in an alternative format with prior notification to the Center for Disability Services.

Sexual Misconduct: Violence and harassment based on sex and gender (including sexual orientation and gender identity/expression) is a civil rights offense and subject to the same kinds of accountability and support applied to other recognized civil rights (race, religion, color, age, disabilities, veteran’s status, etc.). If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-7066, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677 (COPS)

Wellness: Personal concerns such as stress, anxiety, relationship difficulties, depression, cross-cultural differences, etc., can interfere with a student’s ability to succeed and thrive. For helpful resources contact the Center for Student Wellness at www.wellness.utah.edu or 801-581-7776.

Safety Escort: If you ever feel nervous walking to your mode of transportation, dorm, or another building, please contact the campus police at 801-585-2677 for a safety escort.
**Student Code:** By submitting an assignment, you are representing that it is your own work and that you have followed the rules associated with the assignment. Incidents of academic misconduct (including cheating, plagiarizing, research misconduct, misrepresenting one's work, and/or inappropriately collaborating on an assignment) will be dealt with severely, in accordance with the Student Code (http://www.admin.utah.edu/ppmanual/8/8-10.html). A single instance of academic misconduct may result in a failing grade for the course. Multiple instances of academic misconduct may result in probation, suspension or dismissal from a program, suspension or dismissal from the University, or revocation of a degree or certificate.

**Expectations**

You should expect me to be courteous, engaged, and available. I expect the same of you. All of us should expect a challenging class.

Disruptions (reading anything (newspapers, novels, magazines, textbooks, phones), or the operation of computers, iphones or other “smartphones”, cell phones, or any other electronic device (unless taking notes) will not help this class to be effective. Please do not text-message during class as I find this incredibly rude!

**Strategies for Success**

There are many strategies that one can use to succeed in this course. The most tried and true involve some component of the following:

**Attend lectures.** This mostly involves taking detailed notes and be prepared for lectures in advance. As mentioned above, active participation in lecture is encouraged.

**Understand every homework problem, name reaction, and lecture reaction.** Be able to give a detailed answer to the questions without having to glance at an answer booklet. It is important to remember that each assigned question is like an onion: don't be afraid to peel back the outer layers. Bounce questions and answers off of peers, other instructors, or me. Come up with your own questions (and answers)...PROBLEM SOLVE!

**Don't forget that Organic Synthesis is by definition, comprehensive.**