WELCOME TO CHEMISTRY 232!

Do you value molecular structure and reactivity? You should; this course reinforces your use of a sophisticated graphic, textual, and verbal scientific language; organic chemistry—an active field of study, research, and scholarship—provides molecular level foundation for deeper comprehension and problem-solving in biochemistry, green chemistry, environmental chemistry, molecular biology, genetics, pharmaceuticals, medicine, biotechnology, toxicology, and many other related fields.

Chemistry 232 is a non-mathematical, logical, problem-solving course. It focuses on written and symbolic representation of molecular structure, functional groups, nomenclature, physical properties, reactivity, mechanisms, and synthesis of organic compounds.

Examples presented contain underling principles and concepts that are applied repeatedly throughout this course, future organic chemistry courses, biochemistry, molecular biology, and other science courses. Examples have real-world application; yet, the primary focus is learning to problem-solve, via application of chemistry fundamentals.

Content is delivered—and learning is evaluated—based on national norms, American Chemical Society guidelines, and research-based best practice in second-year organic chemistry education.

Extensive drawing is required, due to the emphasis on molecular structure and reactivity. While the structures and drawings are important, most of us need words and language to remember, to recall, and to think. Consequently, to obtain full credit, all correct answers on card games (TIPs), quizzes, and exams must include both drawings and key words.

SPACE FOR NOTES ABOUT THIS COURSE:
Upon your successful completion of Chemistry 232, you must be able to demonstrate that you can...

1. Count valence electrons and calculate formal charges;
2. Draw common bonding patterns for H, Li, Be, B, C, N, O, and F, from memory;
3. Recognize, name, and draw organic functional groups, from memory;
4. Recognize, name, and draw organic compounds using IUPAC naming;
5. Explain and apply all concepts related to atomic, hybrid, and molecular orbitals;
6. Identify areas of increased or decreased coulombic charge, within molecules;
7. Explain and estimate the attractive forces, within and between molecules;
8. Describe the intermolecular forces present within different chemical mixtures;
9. Explain and analyze conformations, configurations, and isomers;
10. Compare relative stability of molecules based on energy considerations;
11. Describe relationships between structure, reactivity, and physical properties;
12. Use known pKa values and acid-base concepts to analyze and explain reactions;
13. Use the concepts of ARIO to analyze base or nucleophile reactivity and stability;
14. Explain how and why unique functional groups react the way they do;
15. Predict missing products, starting materials, or reagents for all reactions; and,
16. Draw functional group reactants, products, and reagents, from memory;
17. Draw electron flow via curved-arrow notation (electron-pushing formalism);
18. Explain and propose plausible mechanisms of elementary reactions;
19. Explain and propose plausible mechanism for all reactions covered;
20. Design multi-step synthesis routes to target products;
21. Apply what was learned to reason a solution for related problems;
22. Appreciate the ubiquitous relevance of molecular structure and reactivity.
COURSE ORGANIZATION
This is a blended lecture, laboratory, and online course in which new topics are first presented using a variety of formats including: assigned textbook readings, our D2L course website, the WileyPlus online system, in lecture, or in laboratory.

Our scheduled class lecture periods will be used for a combination of introducing new topics, reviewing key concepts, demonstrating the application of new content through problem-solving examples, active learning opportunities, and formative or summative evaluations of learning.

The first few meetings of this course are a partial review of selected organic chemistry concepts and reactions invaluable to your future study of organic chemistry (Chapters 8 & 9).

The remainder of the course is organized by functional groups, molecular structure, elementary chemical reaction mechanisms, and synthetically useful reactions of organic molecules. This course is fast paced, continually builds on what is learned in the first month, and is cumulative by nature.

MORE MOTIVATION: WHY LEARN ORGANIC CHEMISTRY?
Organic chemicals are everywhere and make up over 95% of the more than 136 million (and counting) known chemical substances. Do you read ingredients lists and labels? You should start looking at the chemical names. Do you read the news? You should start looking for chemical names. During your time in this course you will start to notice more and more names of chemicals that are part of your daily life; and, you will begin to have a better understanding of what those chemicals might look like and how they might interact with other chemicals; including how those chemicals might interact with all of the individual chemicals that make up you.

Natural and synthetic organic chemicals are in the clothes, cars, foods, toys, pharmaceuticals, plastics, and most other consumer goods that we use every day. Volatile organic chemicals are present in the air we breathe. Consequently, an understanding of organic chemistry is essential to making rational social and political decisions in regards to chemicals in our society.

SPACE FOR NOTES ABOUT THIS COURSE:
IDEAL PRIOR KNOWLEDGE FROM CHEMISTRY 231
BEFORE THE START OF CHEMISTRY 232, YOU SHOULD BE ABLE TO:

1. Define and explain (with words and drawings) all keywords and concepts (in the REVIEW OF CONCEPTS AND VOCABULARY section at the end of each chapter) from Chapters 1 through 8
2. Solve all Chapter 1, 2, and 3 end-of-chapter problems in Klein's textbook
3. Identify, name, and draw all functional groups, from memory
4. Recall pKa values of most acidic proton in each functional group, from memory
5. Identify the most acidic proton in a molecule and estimate pKa values
6. Identify the most basic electron pair (lone pairs, pi-bond, or sigma bond) in a molecule
7. Use ARIO concepts to explain base or nucleophile relative reactivity and stability
8. Identify nucleophilic sites (lone pairs, pi-bond, or sigma bond, formal negative charges, and delta negative charges) of molecules
9. Identify electrophilic sites (open p-orbitals, formal positive charges, and delta positive charges) in molecules
10. Demonstrate an understanding of IUPAC naming for Chapter 4, 7, and 8 organic molecules
   a. Be able to draw organic molecules from IUPAC names
   b. Be able to correctly write IUPAC names based on structural formulas and bond-line structures
11. Demonstrate a firm understanding of curved-arrow notation (electron-pushing formalism); and, a firm understanding of how it is used to describe resonance, electron flow, and elementary reaction mechanisms (see Chapter 2 and Chapter 6)
12. Propose plausible curved-arrow notation mechanisms for Chapter 3 through 7 reactions
13. Predict and draw the product(s) of ALL Chapter 3 through 7 reactions, when provided with starting material(s) and reactant(s)
14. Predict and draw the starting material(s) of ALL Chapter 3 through 7 reactions, when provided with product(s) and reactant(s)
15. Predict and draw the reactant(s) for ALL Chapter 3 through 7 reactions, when provided with starting material(s) and Products(s)
16. Propose multi-step synthesis routes (up to four steps) using all Chapter 3 through Chapter 7 reactions. See the end-of-chapter problems in Chapters 7 for examples; and, explore Chapter 11 for more examples.
REQUIRED AND RECOMMENDED MATERIALS
Purchasing what you need to be successful in a course is much less expensive (and less stressful) than repeating a course. Required and recommended materials for the lecture and laboratory portions of this course are listed below.

To deeply learn—instead of surface learning or strategic learning—learning the fundamentals of any scientific discipline will require both substantial time investments and some monetary investments. While the required materials are a monetary investment, please understand that these materials have been carefully selected in an effort to minimize the amount of time that it will take you to deeply learn fundamentals of organic chemistry.

Please also consider that that you will use most of the required materials for this course in both Chemistry 231 and Chemistry 232. An organic chemistry textbook is also a valuable reference when taking related courses such as Biochemistry, Molecular Biology, Genetics, and other related courses that include applied organic chemistry.

It is well worth your time to talk with students that have previously completed both Chemistry 231 and 232 at Millersville University with a grade similar to the one that you desire to obtain. Ask them what they did to be successful in this course sequence.

REQUIRED MATERIALS

1. Daily online access to EDpuzzle (free), Remind (free), Chemistry 232 D2L course website, and your Millersville email account

2. Daily WileyPLUS access to our WileyPLUS Chemistry 231 and Chemistry 232 site. Note: WileyPLUS access includes a full online version of Klein’s Organic Chemistry 3rd Edition textbook! REQUIRED BUNDLE: ONLINE ACCESS (ONLINE TEXTBOOK) AND E-BOOK (STUDY GUIDE & STUDENT SOLUTIONS MANUAL); ISBN 9781119430162; WILEYPLUS COURSE CODE = 676834

3. Molecular Model Kit for Organic Chemistry. You will need this to complete at least two of the labs. Most molecular model kits for organic chemistry will suffice. I recommend the following option (1013Alpha Organic Chemistry Set for Student, which can be found online... http://bit.ly/2DypD4m


5. Safety Goggles or Glasses - Over-The-Glass (OTG) means over prescription glasses. Examples from Google searches for safety glasses and goggles or OTG safety glasses:

6. Combination lock to share with your lab partner.
HIGHLY RECOMMENDED LECTURE MATERIALS

7. A physical copy of the textbook (Organic Chemistry, 1st or 2nd or 3rd Edition by David R. Klein). I highly recommend getting your hands on a physical copy of the textbook (any edition) for those times when WileyPLUS online access is not feasible and/or desirable. Various options exist, including binder ready (loose leaf) versions, e-books, used books, etc. Plus, I think that it is very difficult to see how different parts of this subject connect when using an online and/or electronic textbook. This course is highly cumulative and connecting concepts from one chapter into future chapters is imperative to your success in this course. The binder ready (loose leaf) textbook would be my personal choice if I were a student in this rigorous problem-solving course.

8. Organic Chemistry as a Second Language: Second Semester Topics, 3rd Edition, David R. Klein, John Wiley & Sons, 2012, ISBN 1118144341. Used, e-text, and older editions also available. Sometimes it is nice to see something explained a different way, but also know that it falls in line with the textbook and the course in a way that a Google search just might not provide.


LECTURE SCHEDULE (MWF, 10:00 – 10:50 am, 149 Roddy Hall)

<table>
<thead>
<tr>
<th>Chapter in 3rd Edition Klein: 2nd or 1st Edition</th>
<th>Chapter Topic</th>
<th>EXAM Schedule</th>
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<tbody>
<tr>
<td>Chapter 8: 9</td>
<td>Alkenes</td>
<td>EXAM 1 – Fri. 8-Feb</td>
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<tr>
<td>Chapter 9: 10</td>
<td>Alkynes</td>
<td>EXAM 2 – Fri. 22-Feb</td>
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<td>Chapter 10: 11</td>
<td>Radicals</td>
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<td>Chapter 11: 12</td>
<td>Synthesis</td>
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<td>Chapter 12: 13</td>
<td>Alcohols &amp; Phenols</td>
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<td>Chapter 13: 14</td>
<td>Ethers, Epoxides, &amp; Sulfur</td>
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<td>Chapter 16: 17</td>
<td>Dienes, Diels-Alders, etc.</td>
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<td>Chapter 17: 18</td>
<td>Aromatic Compounds</td>
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<tr>
<td>Chapter 18: 19</td>
<td>React Aryls</td>
<td>EXAM 5 – Fri. 12-Apr.</td>
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<tr>
<td>Chapter 19: 20</td>
<td>Aldehydes, Ketones, Imines, ...</td>
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<td>Chapter 20: 21</td>
<td>Carboxylic Acids &amp; Derivatives</td>
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<td>Chapter 21: 22</td>
<td>Enols &amp; Enolates</td>
<td>EXAM 6 – Fri. 3-May</td>
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CUMULATIVE FINAL EXAM – 8:00 AM TO 10:00 PM ON THURS. 9-MAY.
Millersville University Final Exam Schedule for Spring 2019 (http://bit.ly/2zQsZin)
Millersville University Academic Calendar for Spring 2019 (http://bit.ly/2zUKC0K)
EXAM DATES: Exam 1 (2/8); Exam 2 (2/22); Exam 3 (3/8); Exam 4 (3/29); Exam 5 (4/12); Exam 6 (5/3); Final Exam (5/9). **Note:** If a class is canceled due to adverse weather, then the missed exam will be given the next time the class meets. Check the Millersville University website for campus closure due to storms. [http://millersville.edu/](http://millersville.edu/)

LECTURE ATTENDANCE, EXAM, & QUIZ POLICY

**This class meets at 10:00 am.** I have very good data for past semesters of this course. There is a very strong correlation between consistent attendance and successfully completing this course. Also, at least 2.5% of your grade in this course will be determined based partially on attendance taken in class. You are responsible for all notes, discussions, assignments and handouts presented in each class (whether you are absent or present). You are expected to be present when any evaluation (quiz, exam, think-in-pair-share, active learning exercise, etc.) is given. Absences that you know about in advance may be excused. Excused absences include attendance at university events (athletic and educational), military duty, bereavement, critical illness in the family, or personal illness in which a physician indicates that you were too ill to attend class. A request for an excused absence should include a written justification of the reason for the absence and be signed by the appropriate individual (coach, faculty member, physician, etc.). Only valid excuses will be accepted to make up any missed assignments. Work not made up will receive a grade of zero. Departure times for travel before university breaks are not a valid excuse to miss class, so please make your travel arrangements accordingly. Most Exams are on Friday mornings and most Quizzes are on Monday mornings. Please see the University Attendance Policy for more information. [http://www.millersville.edu/registrar/faculty/attendance_policy.php](http://www.millersville.edu/registrar/faculty/attendance_policy.php)

CLASSROOM ETIQUETTE

Because concentrations of certain neurotransmitters (e.g. dopamine, serotonin, acetylcholine, etc.) are important for learning, curiosity and attitude are everything. It is nearly impossible to learn something that you are not curious about and do not want to learn. Please plan to have a positive, focused, and determined to succeed attitude during class and lab time. Instead of knowing the right answer, focus on learning to get it right. Learn from your mistakes as we go.

To make the most of our limited time together, when in class or in lab, organic chemistry is the only acceptable subject worth talking about. Arriving at class late and leaving class early are actions that are disruptive and detrimental to a healthy learning environment. Arrive early or at least on time. Lecture starts at 10:00 am on Mondays, Wednesdays, and Fridays. Plan to stay in lecture until 10:50 am. Laboratory lectures begin at the start of lab and cover information that will be on the open notebook laboratory final exam during the last week of lab.

Feel free to ask relevant (on-topic) chemistry questions in lecture; however, socializing and chatting off topic during class is rude, unreasonable, and unfair to you and other students interested in learning and participating. **Please understand that I will take disruptive behavior such as habitual tardiness, frequent or excessive talking during class, cell phone disruptions, poor attitudes about chemistry, or leaving before class is over into account when determining your final grade for this course.**
COURSE EVALUATION SCHEME
Active Learning, & Attendance (120 points) 8 %
EDpuzzle Assignments (120 points) 8 %
WileyPLUS Assignments (120 points) 8 %
Exam 1 (60 points) 4 %
Exam 2 (60 points) 4 %
Exam 3 (120 points) 8 %
Exam 4 (120 points) 8 %
Exam 5 (120 points) 8 %
Exam 6 (180 points) 12 %
ACS Cumulative Final Exam (240 pts.) 16 %
Laboratory (240 points) 16 %

\[ \sum = 100.0 \% \]

GRADE DISTRIBUTION (in percentage points)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Minimum</th>
<th>Maximum</th>
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<tr>
<td>A</td>
<td>100 – 92.0</td>
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<tr>
<td>A-</td>
<td>91.9 – 90.0</td>
<td>B-</td>
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<tr>
<td>B+</td>
<td>89.9 – 88.0</td>
<td>C+</td>
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<tr>
<td>C</td>
<td>77.9 – 70.0</td>
<td>D</td>
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<tr>
<td>D-</td>
<td>69.9 – 65.0</td>
<td>D-</td>
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<tr>
<td>F</td>
<td>&lt; 57.0</td>
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PRE-REQUISITE GRADE CUT-OFF FOR CHEMISTRY 326 (Biochemistry 1): the Millersville University pre-requisite Chemistry 232 grade required for enrollment into CHEM 326 (Biochemistry 1) is a C-letter grade for all non-chemistry majors; HOWEVER, it is a C letter grade for all chemistry majors.

EVALUATION DETAILS

Cumulative Hourly Exams [660 points]
There will be six 50-minute exams given during the scheduled lecture time on the days indicated in the lecture schedule. All exams are cumulative, due to the nature of organic chemistry as a field of study. All exams start promptly at 10:00 am. Attendance at exams is mandatory. THERE ARE NO MAKE-UP EXAMS. If an exam is canceled due to inclement weather, then it will be held at the very next class lecture meeting.

ACS Cumulative Final Exam [240 points]
There will be one ACS cumulative final exam given during the scheduled final exam time on the day indicated on the lecture schedule (https://www.millersville.edu/registrar/academic-calendar/fallfinalscalendar.php). Attendance at the final exam is mandatory. This sixth, and final, exam will be held only during the pre-arranged final exam period for this lecture time.
Graded Online Assignments via WileyPLUS & EDpuzzle [240 points]
These points will be added to the grade book before the end of the semester based on your online assignment grades in WileyPLUS and EDpuzzle. More information will be provided on D2L.

Laboratory [240 points]
It is in your best interest to keep a very detailed lab notebook. We will use laboratory wait time to work on chemistry problems related to lecture course content.

CURIOUS, HAVE QUESTIONS, OR NEED HELP?
Please stop by my office during office hours for assistance outside of class. Ask me questions during laboratory. Set up an appointment via email, if my office hours don’t fit your schedule. Email me your chemistry questions. Start a discussion on our D2L site. Form a study group. Get a tutor. Free tutoring (individual or group) is also available through Student Services. Call or stop by the tutoring office in Lyle Hall for additional information. http://www.millersville.edu/tutoringcenter/schedules/chemistry.php

TIPS FOR SUCCESS: Study for this course by solving as many problems as possible! Then solve more problems. Do not try to only memorize every individual thing for this course. Bulk memorization alone may seem to work during CHEM 231, and will come back to haunt in CHEM 232.

Instead, try to focus on the major concepts, and examples, and develop some flexibility in the application of those concepts to new examples. Look for similarities and difference in the course content. Make connections and organize new information based on your understanding of old information.

While there are fundamental principles, concepts, structures, and vocabulary that must be remembered (memorized), successful completion of this course depends upon your ability to problem solve by utilizing newly acquired information.

Be curious. Do good work. Problems are puzzles. Work lots of problems. Then do more problems! Learn to enjoy problem solving. Make the problem solving a game. When in doubt, draw it out.

Actively attend lecture. And, take good notes to practice quickly drawing correct structures. Don’t get behind due to the fast pace of this course. It is not possible to effectively cram for this course. Do all of the required readings before each lecture. Each chapter covered is required reading.

12 hours minimum active practice problem work time, with feedback, outside of class per week, is a minimum rule-of-thumb in for this course, in order to obtain at least a “C” letter grade.
LEARNING ACCOMMODATIONS
Please see the Office of Learning Services in Lyle Hall (http://www.millersville.edu/learningservices/) as soon as possible if you have special learning needs for this class. If you have a condition that may affect your ability to perform laboratory exercises, to exit lab safely from the premises in an emergency, or which may cause an emergency during class, or lab, please discuss this in confidence with your instructor and someone at the Office of Student Support Services. Appropriate accommodations may then be provided.

ACADEMIC HONESTY & DISHONESTY
Plagiarism is the deliberate or even accidental representation of another’s work as your own without proper reference. Although you will work together on some material and experiments, this does not mean that lab reports and assignments should be identical. Each participant uses the collective data and discussion to prepare his or her own individual report. You should be familiar with the University policy on academic honesty and dishonesty as outlined in the Student Handbook and Academic Honesty and Dishonesty brochure; the content applies to this course. If you are caught, you will be removed from the course, assigned an F for the course, and a report will be filed with the associate Provost for Academic Programs and Services (http://www.millersville.edu/about/administration/policies/).

University Approved Class Attendance Policy (http://www.millersville.edu/registrar/faculty/attendance_policy.php):
1. Students are expected to attend all classes. It is the student’s responsibility to complete all course requirements even if a class is missed. If a student misses class for an officially excused reason, then he/she is entitled to make up the missed work but only at the convenience of the faculty member. Responsibility for materials presented in, assignments made for, and tests/quizzes given in regularly scheduled classes lies solely with the student.

2. The University policy is that faculty will excuse absences for the following reasons:
   a. personal illness
   b. death or critical illness in the family
   c. participation in a university-sponsored activity
   d. jury duty
   e. military duties
   f. religious holidays

3. Faculty judge the validity of student absences from class within the University's approved guidelines and may require documentation for excused absences. Faculty will evaluate any reason, other than those listed above, for a student missing class and determine whether the absence is justified. In these circumstances, a student may make up missed work at the discretion of the instructor.

4. In the case of foreseeable absences, students are encouraged to notify the faculty member in advance. A student who will miss class due to participation in an official University activity must notify the instructor well in advance of the activity to assure that the absence is excused.

Title IX Statement:
Millersville University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment and to comply with Title IX of the Education Amendments of 1972 and guidance from the Office for Civil Rights, the University requires faculty members to report incidents of sexual violence shared by students to the University’s Title IX Coordinator. The only exceptions to the faculty member’s reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. For more information on Title IX: http://www.millersville.edu/socialeq/title-ix-sexual-misconduct/index.php
Pre-Laboratory & Laboratory Required Texts: Weekly handouts will be provided in lecture and posted on D2L prior to Pre-Laboratory & laboratory. See page 2 for information about the required notebook, safety goggles, and lock.

LABORATORY OBJECTIVES
At the completion of CHEM 232 Laboratory, you should be able to...

1. Demonstrate proper laboratory safety when working in the lab
2. Keep a neat and organized record of laboratory data in a notebook
3. Demonstrate proper methods to categorize and dispose of chemical waste
4. Set up apparatus for experimental techniques: reactions, distillations, filtrations, etc.
5. Purify organic products by recrystallization (solids) and distillation (liquids)
6. Characterize organic products by physical, chemical, and spectroscopic properties
7. Solve unknown organic structures using 1D & 2D NMR spectral data
8. Explain any of the experiments that we conducted using key words and drawings

PRE-LABORATORY & LABORATORY SCHEDULE (331 Caputo Hall.)*

<table>
<thead>
<tr>
<th>Week</th>
<th>Day</th>
<th>Activity</th>
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<tbody>
<tr>
<td>1</td>
<td>22-JAN</td>
<td>Pre-Test &amp; Review of CHEM 231 &amp; Mech. Workshop (Chapter 6)</td>
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<tr>
<td>2</td>
<td>29-JAN</td>
<td>Limonene &amp; Bromination</td>
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<tr>
<td>3</td>
<td>5-FEB</td>
<td><em>Check-in, Safety, Spectroscopy Review &amp; Problem Set</em></td>
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<tr>
<td>4</td>
<td>12-FEB</td>
<td>Reaction Review (Chapters 1 through 9)</td>
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<tr>
<td>5</td>
<td>19-FEB</td>
<td>Imine Formation from an Aldehyde (Multi-Step Synthesis – Step 1)</td>
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<tr>
<td>6</td>
<td>26-FEB</td>
<td>Oxone Oxidation of Aldehydes</td>
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<tr>
<td>7</td>
<td>4-MAR</td>
<td>2D NMR &amp; Problem Set 2 (SPS2)</td>
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<tr>
<td>8</td>
<td>12-MAR</td>
<td>Spring Break</td>
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<tr>
<td>9</td>
<td>19-MAR</td>
<td>Diels-Alder Reaction Part 1</td>
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<tr>
<td>10</td>
<td>26-MAR</td>
<td>Diels-Alder Reaction Part 2</td>
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<tr>
<td>11</td>
<td>2-APR</td>
<td>Suzuki-Miyaura Cross-Coupling</td>
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<tr>
<td>12</td>
<td>9-APR</td>
<td>Nitration of Methyl Benzoate</td>
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<td>13</td>
<td>16-APR</td>
<td>Acetal Formation</td>
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<tr>
<td>14</td>
<td>23-APR</td>
<td>Imine Reduction &amp; Amide Formation (Multi-Step Synthesis – 2 &amp; 3)</td>
</tr>
<tr>
<td>15</td>
<td>30-APR</td>
<td>Finish Labs // Notebooks Collected in Lab // Check-out</td>
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</tbody>
</table>

*Note: activities & experiments subject to change.

PRE-LABORATORY & LABORATORY ATTENDANCE: Attendance at each laboratory session is mandatory. Failure to attend each and every laboratory meeting equals failure of this course. Only valid excuses will be accepted in order to make up labs. In the event of an anticipated excused absence, arrangements should be made to make up work prior to the absence. Students are not allowed to work by themselves when there is not a lab in session. You are expected to have read the procedure thoroughly, to have prepared your notebook based on the notebook guidelines for this course, and to have completed the weekly pre-laboratory assignment prior to each lab. SAFETY IS VERY IMPORTANT IN THE LABORATORY. General safety guidelines will be presented in the laboratory and should be followed at all times. Specific safety precautions for each experiment will be covered before each lab. Failure to follow safety guidelines is reason for dismissal from a lab and a grade of zero on the experiment. Additional laboratory guidelines including notebooks and reports are covered in the week 1 handouts.