Note: Organic chemistry II has an associated laboratory course, Chem 2204. The course has a separate registration. The two parts are to be taken concurrently, but credit for them is earned independently.

1. Course introduction – aka what we are talking about

**Course Prerequisites:** Successful completion of Organic Chemistry I (2201) and the Organic Chemistry Lab I (2203) with both grades C- or better is a prerequisite.

**Course Description:** Detailed examination of the more common functional groups and their reaction chemistry. Emphasis on development of organochemical reasoning powers through planning of multi-step syntheses and solution of structural problems by the combination of chemical and spectroscopic methods. Applications of organic chemistry to biological systems.

**Goals and Objectives:** The primary goal of this course is to understand organic chemistry and to develop critical thinking skills related to the subject matter. The specific objectives are:

- To learn the nomenclature of aromatic rings and carbonyl compounds.
- To learn properties of aromatic and carbonyl compounds, carbohydrates, amino acids.
- To learn the mechanisms of a variety of organic reactions.
- To learn to apply molecular orbital analysis to these reaction mechanisms.
- To be familiar with the nomenclature, preparation and reactions of the functional groups: aromatic rings, aldehydes, ketones, carboxylic acids, and the acid derivatives.
- To understand the three-dimensional shapes of simple organic molecules and how those shapes affect reactivity.
- To use information from Organic Chemistry I and II in multiple step transformations of simple organic molecules.
- To be familiar with the analytical tools used to identify organic compounds.

**Student Learning Outcomes:** Students will be able to:

- Recognize aromatic compounds, aldehydes, ketones, carboxylic acids, and the acid derivatives and know the shape of each functional group.
- Name in a systematic manner simple organic compounds such as carbonyl compounds.
- Construct three-dimensional models of these organic compounds.
- Interpret simple spectral data.
- Understand the following mechanisms: electrophilic aromatic substitution, nucleophilic addition to carbonyl compounds, addition-elimination reactions with acid derivatives.
- Know about organic reactions from O-Chem I and II that are useful in organic synthesis.
- Recognize the organic reactions from Organic Chemistry I and II that are involved in biochemical pathways.
2. Materials – a.k.a. what to get before class starts

**Textbook:** Solomons, Fryhle, and Snyder, *Organic Chemistry*, 12nd Ed., Wiley, 2016 (ISBN 9781119442844) is required. This is in the bookstore and it is a package that includes the textbook (looseleaf), ebook, “WileyPlus” organic online homework system, and solutions manual. It is the book you likely used for Chem 2201. If you choose not to purchase the solutions manual, then the ISBN is 9781119442868. Copies of the textbook and the solutions manual are on reserve in the Paley Library. A molecular model kit, available in the bookstore for about $20 or from the student club (TUCS, 228BE) for $15, is also strongly recommended. The model set, regardless of where you purchased it, can be returned to the TU Chemical Society (student club) for refund at the end of the spring semester. The text “Organic Chemistry” 5th Ed., WWNorton by Jones and Fleming (ISBN 978-0-393-91303-3) provides more depth on organic chemistry and it is also available at the reserve desk in the Library.

**Online Homework:** WileyPlus is our web-based, online homework system. Online homework using the WileyPlus system will be assigned in your course. There will be assignments for each chapter found by going to the WileyPlus Login page which will be provided for you. There is an online help desk that can be accessed ([http://support.wiley.com](http://support.wiley.com)) if any technical difficulties are encountered. The “WileyPlus” program has a self-assessment tool called Orion that will show how you are doing throughout the semester. In order to sign up, browse for “CHEM 2201-2202 Ramella”.

**Canvas:** A Canvas site will be set up for this course. Please check that you are registered and can access this course on Canvas. Announcements and e-mails will be sent out via Canvas so it is imperative that you check this web site and your Temple email account on a regular basis. Supplemental materials, messages and schedule adjustments will be posted there. Class rankings and stats may be posted on this site so you can get a feel for how you are doing in the course.
3. Meetings and schedules – aka where to go and what to do

Lecture Class: Each chapter should be read before it is covered in the lecture (see attached calendar). This is your preparation for the lecture class. If you don’t understand the material after you have read it, the lecture may clarify the material. If you still don’t understand the material, you can ask questions during lecture and recitation sessions. If you are late for class, take a seat that does not interrupt the lecture or disturb other students. Please be sure your cell phone is off during class.

Recitation Class: Each of you has a recitation section and a TA. We recommend that you attend recitation classes because the class sizes are smaller than lecture class. You can interact more with the TA in that setting.

Course Outline:

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Homework Practice Problems</th>
<th>Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 – Conjugated Systems</td>
<td>(13) 1-50</td>
<td>Midterm 1</td>
</tr>
<tr>
<td>14 – Aromaticity</td>
<td>(14) 1-38</td>
<td></td>
</tr>
<tr>
<td>15 – Aromatic Ring Substitution</td>
<td>(15) 1-56</td>
<td></td>
</tr>
<tr>
<td>20.6-20.8 – Diazonium Salts</td>
<td>(20) 11-15, 21-25, 31</td>
<td></td>
</tr>
<tr>
<td>16 – Ketones and Aldehydes</td>
<td>(16) 1-55</td>
<td>Midterm 2</td>
</tr>
<tr>
<td>17.1-17.7 – Carboxylic Acids</td>
<td>(17) 1-8</td>
<td></td>
</tr>
<tr>
<td>17 – And Their Derivatives</td>
<td>(17) 9-49</td>
<td>Midterm 3</td>
</tr>
<tr>
<td>18 – Chemistry at the ( \alpha )-Position</td>
<td>(18) 1-37</td>
<td></td>
</tr>
<tr>
<td>19 – Chemistry at the ( \alpha )-Position, Part II</td>
<td>(19) 1-60</td>
<td></td>
</tr>
<tr>
<td>21 – Transition Metal Complexes</td>
<td>(21) 1-25</td>
<td></td>
</tr>
<tr>
<td>22 – Carbohydrates</td>
<td>(22) 1-42</td>
<td></td>
</tr>
<tr>
<td>20.1-20.5 – Review of amines</td>
<td>(20) 16-20, 26-30</td>
<td></td>
</tr>
<tr>
<td>24 – Amino Acids</td>
<td>(24) 1-23</td>
<td></td>
</tr>
<tr>
<td>23 – Lipids</td>
<td>(23) 1-25</td>
<td></td>
</tr>
</tbody>
</table>

The above outline is only for reference. A detailed class schedule with exam dates is available as a separate file in the same Canvas folder.

Attendance: Your attendance at all lectures and recitations is expected and essential to your success in this course. In case of emergency, you may attend a lecture or recitation section other than your assigned one; you need to notify the instructor ahead of time if you need to do so and a proper solution will be found.
4. Scores and grades – aka what you need to pass the course

Grading:
- Midterm Exam 1: 200
- Midterm Exam 2: 200
- Midterm Exam 3: 200
- Final: 200
- Recitation Worksheets: 50
- Quizzes: 150
- Total: 1000

Grades will be based on the natural breaks.

Exams: There will be three midterm exams and a final exam. Unless other plans have been made, the exams will be administered in the place and time where the regular lectures take place. Exam questions will be similar to assigned book problems. Unless your instructor indicates otherwise, each midterm exam will be 200 points. The final exam will be 200 points and is an ACS cumulative standardized exam, covering ALL materials taught in this course as well as material from Organic Chemistry I and relevant General Chemistry foundations. There are several copies of the American Chemical Society Official Guide “Preparing for Your ACS Examination in Organic Chemistry” in the reserve collection of the Paley Library.

Quizzes and Homework:
- Many quizzes will be given during the semester. These quizzes are designed to prepare you for examinations and to make sure you understand key materials and concepts.
- The assigned homework problems in the book are listed in the Course outline of section 3. Answers to all assigned problems can be found in the Study Guide that accompanies the textbook. It is important that you work through each problem and understand the theory and methods used for its solution, and do this before the recitation in which it is discussed. Copying the answer from the Study Guide into your notebook is a waste of time. This problems are not graded but will be very good practice for the graded WileyPlus homework.
- The graded homework will be administered through WileyPlus; see section 2 for details.

Make-up Exams/Quizzes: Make-up Exams will be administered only in case of a serious problem and if notified to the instructor in advance. A missed quiz may be made up by going to a different recitation section, if any are left during the same week; you will need to previously agree with the instructor about this.

Testing Policy: All tests are given in a "Closed Books" environment. No books, notes, or reference material may be consulted during any test. You can use model sets during the exam. Giving or receiving information during examinations is a violation of the Temple Student Discipline Code and will result, at minimum, in a grade of F for this course. Electronic devices, including calculators, phones, and PDA's are not permitted in the exam room. You will be held responsible for all the material and assigned problems in the scheduled chapters, except for any sections that your instructor specifically tells you that you may exclude. Cell phones are to be turned off during exams.
5. Administration – aka boring stuff I need to tell you (and you should be aware of)

Drop/Add: Drop/Add actions are possible during the first two weeks of classes. Academic Advising must be consulted to take any of these actions. Your instructors are not a part of this process. The Temple University policy should be reviewed if you contemplate such action. The University has set the last date to drop to be Monday, January 28th.

Withdrawals: Withdrawals are possible after the drop deadline. The university has set the latest date to be Wednesday, March 18th. Note that a withdrawal (W) is an institutional procedure that does not involve your instructors in any way. This is not complete until the withdrawal form has been signed by academic advising and submitted to the Registrar's office. Temple University Policy (#02.10.14) on Withdrawal should be consulted. Please click (http://www.temple.edu/registrar/students/excusedwithdrawal.asp) to view the policy.

Incompletes: Please note that an "Incomplete" or "I" is only to be given in accord with institutional procedures. An “I” cannot be assigned until the specific requirements have been met, and an Incomplete Contract has signed and submitted. This course is governed by Temple policy see: www.temple.edu/vpus/documents/UniversityIncompleteForm.5.25.06.doc for more info. To obtain an "incomplete" designation, at least 50% of the work of the course must be completed and there is a valid reason acceptable to academic advising for missing the remainder of the course. The student's accumulated total to that point must be more than 75% of the possible points.

For those students who are assigned a grade of "I", all previous scores will stand and be used is the calculation of the final score when the course is completed. Students wishing to pursue an incomplete must obtain an Instructor Approval for an Incomplete Form (available from the web page) that the student and instructor must complete, before presentation to academic advising for final approval. No “I” designation may be requested after the final exam of the student’s section of this course has been administered.

Academic Integrity: All students are expected to adhere to the highest levels of academic integrity. Any students found cheating (i.e. copying answers to exam, quiz, or homework; submitting experimental data that they did not collect; presenting graphs and calculations; or otherwise taking credit for work that they did not perform) will receive a failing grade in the course. They will also be reported to the Dean's office in the College of Science and Technology. There are dire consequences. Please do not give cause to suspect cheating. Cheating can be detected during and after tests are handed in.

Disability Resources and Services: Any student who has a need for accommodation based on the impact of a disability should contact their instructor privately to discuss the specific situation as soon as possible. Contact Disability Resources and Services at 215-204-1280 in 100 Ritter Annex to coordinate reasonable accommodations for students with documented disabilities. (http://www.temple.edu/disability/)

Non-Course Content Problems: If speaking with the instructor does not resolve the issue, then you should speak with the course coordinator (Prof. Steve Fleming, 344 BE). The coordinator will attempt to mediate, consistent with department policy. However, if you are having problems with the professional conduct of your instructor you should contact the department chair directly.
6. Support and suggestions – aka wink wink… this is how you pass the class

Organic chemistry is a fascinating subject. Depending on how well you understood O-Chem I, O-Chem II might be a more challenging course. If you have learned how to “push electrons,” then you are in good shape for the additional information that will be presented in this second semester. You can make O-Chem easier by:

1. **Doing additional problems.** Do as many problems as you have time for, beyond those assigned. Even if they are from another book, the practice will help.
2. **Studying regularly.** If you fall behind, it's hard to catch up. Some students will need to work on organic chemistry 10-15 hours per week outside of class. Some will be able to understand the material with 2-3 hours per week. It has been my experience that: a) paying attention to detail and b) wanting to learn why things happen, are the most common characteristics of students who do well in O-Chem.
3. **Understanding the theory and method.** You may try to memorize definitions and summaries at the end of each chapter, but there is too much material to memorize it all, particularly in O-Chem II.
4. **Working together.** Study groups are very helpful. Be an active contributor in your group.
5. **Seeking help immediately if you have trouble.** Make use of instructor office hours and additional time that your instructor can give you. Don’t wait until the last minute! A lot of the material taught in this course is cumulative and you need to understand material throughout the course to understand later material.
6. **Using the language of O-Chem.** Organic Chemistry is like learning a new language. There is fundamental terminology that must be incorporated in your vocabulary. Then there are concepts you will learn and you will be asked to apply the concepts in scientific analysis. These types of questions are not handled well by memorization. Unlike many other courses, the concepts introduced each week of the class will remain important during the remainder of the course, including material from O-Chem I.

HELP!!! Make certain you take full advantage of all the academic support services available at Temple. These include instructor office hours, TA office hours, the Center for Learning and Student Success (CLASS) located at 1810 Liacouras Walk, 2nd floor, as well as supplemental help sessions. The services provided at the CLASS include one-on-one tutoring, computer lab, weekly group tutorials/supplementary instruction, final exam review sessions, and a resource library. The center is open 6 days a week. For additional information check [http://www.temple.edu/class/](http://www.temple.edu/class/)

The reserve desk in the Paley Library has several organic chemistry texts, including the Jones/Fleming text, and study guides that are available for limited time checkout. There are several copies of the American Chemical Society Official Guide “Preparing for Your ACS Examination in Organic Chemistry” in the reserve collection.

**On-Line Tools:**

- Practice Quizzes: [http://www.chemhelper.com/practicetests.html](http://www.chemhelper.com/practicetests.html)
- Organic Quizzes and Summaries: [http://pages.towson.edu/ladon/orgrxs/reactsum.htm](http://pages.towson.edu/ladon/orgrxs/reactsum.htm)
- Electronic Flashcard: [http://www.chemistry.ohio-state.edu/organic/flashcards/](http://www.chemistry.ohio-state.edu/organic/flashcards/)