Department of Chemistry, Michigan Technological University  
Chemistry 2420, Organic Chemistry II (Spring 2015)  
Syllabus

View this class as a milestone toward your degree at Michigan Tech and your career goal

Time and Place: M W F 02:05 PM-02:55 PM; Room 08-0641, Dow Env. Sci. and Eng. Building

Instructor: Dr. Shiyue Fang  
Tel: 487-2023, Email: shifang@mtu.edu  

Office Hours: M, W 3:00 PM – 4:00 PM in room 19-620C, or by appointment or stop by my office at any time

Primary Textbook (Required): Organic Chemistry, 4th edition by Janice Gorzynski Smith; Publisher, McGraw-Hill; Available in MTU bookstore; 3rd edition of the book is also acceptable; the lecture will follow 3rd edition, which is about the same as the 4th edition.

Useful Reference Book:  

Prerequisite: CH2400 or CH2410

Course Description: Continuation of CH2410. Covers more functional group chemistry; emphasize reaction mechanisms; more involved in multi-step synthesis; introduction to carbohydrates, amino acids, and proteins.

Homework: Homework for each chapter will be online in Sapling Learning (see below for information about Sapling Learning). They will be graded. Please pay attention on grading policy before attempting the questions. For multiple choice questions, each wrong trial will result in a reduction of points. This cannot be adjusted for any reason. For questions other than multiple choice ones, you do not get penalty for wrong trials. The due time is always set to Tuesday night at 11:55 pm, so, please always double check on Tuesdays to see if there is any homework due. Many times, homework for more than one chapter may be due on a single Tuesday. If a due date is set different from this, I will send an email to remind you. If you miss a due time, your score for that assignment will be zero.

Some materials, on which certain homework is based, may not be covered in class. This is intentionally left so to cultivate your self-study habit. You should consult the hints accompanying the questions in Sapling if any or read relative sections of the textbook to solve the problems. You can always consult CLC coaches as well (see below).

When working on the online homework, even though they are graded, you can discuss with your classmates, CLC coaches and other people. However, just taking other people’s answers without working out the problems together is considered cheating. Moreover, doing so will result in low scores in the exams because some questions will be based on online homework. Do not try to memorize the answers because that will not work for you. The formats and the contents of the questions will be changed when putting them in the exams.
Exams: There will be 3 exams, which are 2 mid-terms (1 hour in class) and 1 final (2 hours). All exams will be comprehensive. Some questions for the exams will be a revised version of the questions from the online homework. Some will be from your note in class, the PowerPoint slides discussed in class, and SI sessions (see below). More than 2/3 questions will be multiple choices; the remaining will require short answers, mostly writing an organic reaction mechanism (curved arrow pushing). For the 2 mid-terms, I will probably give 15 to 20 multiple choice questions and 2 to 3 short answer questions. For the final exam, I will probably give 30 to 40 multiple choice questions and 2 to 6 short answer questions. I must emphasize that I may NOT follow this plan. After the exams, keys will be posted in Canvas.

We will grade the exams and quizzes as soon as possible. Once finished, your score will be posted in Canvas. You can pick up your exam from CLC in room 19-208 (see their updated schedule at http://www.chemistry.mtu.edu/pages/clc/index.php). Any questions on the grading should be first directed to TAs who are responsible for grading.

If you cannot take an exam due to illness or family emergency or other reasons, you must inform me before them. I will arrange a makeup or other options for you. Your score will not be higher than the highest one other student obtained in the scheduled exams. If you failed to inform me on time, zero points may be assigned.

The 3 exams are closed book tests, cheating may result in serious consequence for your career (not just the grade of this class), please never even think of taking a chance!

Grading: Total 1000 points (plus 20 bonus points from I-Clicker)

<table>
<thead>
<tr>
<th>Points Range</th>
<th>Grade</th>
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<tbody>
<tr>
<td>1000 (or more)-850</td>
<td>A</td>
</tr>
<tr>
<td>849-800</td>
<td>AB</td>
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<tr>
<td>799-750</td>
<td>B</td>
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<tr>
<td>749-700</td>
<td>BC</td>
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<tr>
<td>699-650</td>
<td>C</td>
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<tr>
<td>649-600</td>
<td>CD</td>
</tr>
<tr>
<td>599-500</td>
<td>D</td>
</tr>
</tbody>
</table>

Exam 1, 200 points (February 18, Wednesday, 2:00 – 3:00 pm)
Exam 2, 200 points (April 1, Wednesday, 2:00 – 3:00 pm)
Final, 300 points (time and place to be announced)
Online homework, 300 points (due on Tuesdays at 11:55 pm)

Points of online homework will be determined by: \[
\frac{\text{(total points you earned)}}{\text{(total points of online homework)}} \times 300 = \text{your points of online homework}
\]

Bonus points from I-Clicker (see below for more information): Correct answers will get 100% points; incorrect ones will get 10% points. The total for the course is 20 points. Your bonus points will be calculated using the formula: \[
\frac{\text{(the total points you earned)}}{\text{(the total I-Clicker points in the semester)}} \times 20 = \text{your I-Clicker bonus points}
\]

Because the bonus is only a small fraction of the total points (each question only worth about 0.02 out of 1000 points), which has limited influence on your grade and it is bonus, I will not make any adjustments on bonus points for anyone for any reason including absence due to illness and university services.

Your total points = Exam 1 + Exam 2 + Final Exam + Online Homework + I-Clicker Bonus
**Instruction Methods:** PowerPoint presentation and writing using a projector. The PowerPoint slides will be posted in Canvas (they can be found by clicking on “Announcements” under “Course Tools”). The posted slides are slightly different from the ones in class. Many key words and other information are missing. You should print the slides and fill the information in the class. You also need to record what I write and draw over the projector. These will not be posted or provided to you. The only way to have it is to write and draw with me. I do not prevent you from getting notes from your classmates however. All questions in the exams will be the revised version of those in the notes, PowerPoint slides, the online homework, I-Clicker questions and SI sessions.

**I-Clicker:** Frequency code is BA. The default is AA. You must change to BA every time your battery is out. Follow instructions on the back of your clicker to make the change. If you had registered your Clicker for other courses at MTU, you do not need to register again although registering again is OK. If you have not registered, you must register in Canvas. In Canvas, click on “i>clicker” and follow the instruction there.

**Sapling Learning:** We will be using Sapling Learning for our homework.

To get started:
1. Go to [http://saplinglearning.com](http://saplinglearning.com) and click "US Higher Ed" at the top right.
2. Sign in
   a. If you already have a Sapling Learning account, log in and skip to step 3.
   b. If you have a Facebook account, you can use it to quickly create a Sapling Learning account. Click “Create an Account”, then “Create my account through Facebook”. You will be prompted to log into Facebook if you aren’t already. Choose a username and password, then click “Link Account”. You can then skip to step 3.
   c. Otherwise, click "Create an Account”. Supply the requested information and click "Create my new account". Check your email (and spam filter) for a message from Sapling Learning and click on the link provided in that email.
3. Find your course in the list (listed by subject, term, and instructor) and click the link.
4. Select a payment option and follow the remaining instructions.

Once you have registered and enrolled, you can log in at any time to complete or review your assignments.

During sign up – and throughout the term – if you have any technical problems or grading issues, send an email to support@saplinglearning.com explaining the issue. The Sapling Learning support team is almost always faster and better able to resolve issues than your instructor.

To optimize your Sapling Learning experience, please keep your internet browser and Flash player up to date and minimize the use of RAM-intensive programs/websites while using Sapling Learning.

**Canvas:** You can find the scores of the three exams in Canvas after two or more days. You should expect a slight delay of the reports of your scores due to the large size of the class. A copy of the syllabus is also posted in this site for your record. As told above, the PowerPoint slides will be posted here. You also need to register I-Clicker there. You can login using the same user name and password as your MTU email at [https://mymichigantech.mtu.edu:8447/cas-web/login?service=https%3A%2F%2Fmtu.instructure.com%2Flogin%2Fcas](https://mymichigantech.mtu.edu:8447/cas-web/login?service=https%3A%2F%2Fmtu.instructure.com%2Flogin%2Fcas)

**Chemistry Learning Center:** The Chemistry Learning Center provides walk-in, individual appointments and study groups for organic chemistry courses. Importantly, someone is there to help you individually to solve any problem for the class including those in the graded online homework. There is no charge for the help. The place
is room 19-208, Chem. Sci. & Eng. Bldg. You will have to visit their website to find updated hours. You can also contact the director Ms. Lois Blau for any information; room 19-206A, phone 906-487-2297, email lablau@mtu.edu. The website is http://www.chemistry.mtu.edu/pages/clc/overview.php

A Teaching Assistant (SI Leader) will teach supplementary instruction sessions each week. He or she will let you know the time and place. It is very important for you to attend these sessions. These sessions are free. The method of instruction will be different from mine. In my class, I must cover sufficient materials so that most of the students have the knowledge base in organic chemistry for their future studies toward their degrees and for their career goals. As a result, my pace of teaching is relatively fast, and I will have less interaction with you such as asking questions and directing a practice on blackboard. The sessions of TA do not have the obligation to cover all materials. He or she can focus on specific subjects that require more attention. As a result, these sessions will be slower and probably approach materials in a different angle that is preferred by some students. In addition, you will have more chances to ask questions and to practice. To encourage you to attend these sessions, I may incorporate questions discussed in them into the exams.

**Study Suggestions:**

1. **Spend a minimum** of 12 hours (3 in class, 9 outside class to review materials) per week for this course.
2. Preview sections that are going to be covered. Very few students can get a good grade without preview.
3. While reading including preview and review, it is important not only use your eyes, but also use your hands. Always grab a pen to mark important words in the book and write important things on a paper. A good reader also summarize frequently for example after each subsection. This is a difference maker!
4. Make sure to come to class every time even though you have difficulty to follow me. It is very common for students not being able to understand everything in the class.
5. For materials I put on the projector, you should record to your notebook even though you can find them in the textbook. The goal is to help you to practice drawing reaction mechanisms, which cannot be done by reading book or other means; it is not for keeping something on paper.
6. When I present with PowerPoint, you need to fill in key words and other information that is missing in the slides you printed from Canvas. Treat this as practice and as a means to keep your attention.
7. For I-Clicker questions, try your best to get correct answer. If you did not, do not let this distract your attention from the class. Each I-Clicker question only has about 0.02 points of the total score.
8. **After class, you must review your notes and slides, and read the materials covered in the book no later than two days!** If you do not refresh the knowledge timely, you will forget and you have to learn it again.
9. If you find something difficult to understand, find help in CLC, or ask classmates or me timely; never let questions build up, as this will make your study more and more difficult, and eventually painful!
10. **Finish your homework timely** (well ahead of due date is suggested because the due date is normally set far behind the date we finish the chapter; otherwise, you will find very busy toward the end of the semester). Keep a record on the questions that you lost points or you feel difficult.
11. Before each exam, review your note, PowerPoint slides and the online homework (especially the questions you marked difficult).
**Tentative Schedule** (I am sure we cannot follow the schedule exactly):

Graded online homework assignments are due on Tuesdays at 11:55 pm unless noted otherwise

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Chapter Title</th>
<th>Tentative Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Nuclear magnetic resonance spectroscopy</td>
<td>01/12, 01/14, 01/16, 01/19 (Martin Recess, no class), 01/21</td>
</tr>
<tr>
<td>15</td>
<td>Radical reactions</td>
<td>01/23, 01/26</td>
</tr>
<tr>
<td>16</td>
<td>Conjugation, resonance, and dienes</td>
<td>02/28, 02/30, 02/02</td>
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<tr>
<td>17</td>
<td>Benzene and aromatic compounds</td>
<td>02/04, [02/06, Winter Carnival recess, no class], 02/09</td>
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<tr>
<td>18</td>
<td>Electrophilic aromatic substitution</td>
<td>02/11, 02/13, 02/16, 02/18, 1 hour in class exam 1</td>
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<tr>
<td>19</td>
<td>Carboxylic acids and the acidity of the O-H bond</td>
<td>02/20, 02/23</td>
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<tr>
<td>20</td>
<td>Introduction to carbonyl chemistry; organometallic reagents; oxidation and reduction</td>
<td>02/25, 02/27, 03/02, 03/04</td>
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<tr>
<td>21</td>
<td>Aldehydes and ketones-nucleophilic addition</td>
<td>03/06, [03/09-03/13, spring break, no class], 03/16, 03/18, 03/20, 03/23</td>
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<tr>
<td>22</td>
<td>Carboxylic acids and their derivatives-nucleophilic acyl substitution</td>
<td>03/23, 03/25, 03/27, 03/30, 04/01, 1 hour in class exam 2</td>
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<tr>
<td>23</td>
<td>Substitution reactions of carbonyl compounds at the (\alpha) carbon</td>
<td>04/03, 04/06</td>
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<tr>
<td>24</td>
<td>Carbonyl condensation reactions (if time allows)</td>
<td>04/08, 04/10</td>
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<tr>
<td>25</td>
<td>Amines (if time allows)</td>
<td>04/13, 04/15, 04/17, 04/20</td>
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<tr>
<td>26</td>
<td>Carbon-carbon bond-forming reactions in organic synthesis (if time allows)</td>
<td>04/22, 04/24, Final exam, to be announced</td>
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<tr>
<td>27</td>
<td>Carbohydrates (if time allows)</td>
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<td>28</td>
<td>Amino acids and proteins (if time allows)</td>
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<tr>
<td>29</td>
<td>Lipids</td>
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<tr>
<td>30</td>
<td>Synthetic Polymers</td>
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