**Syllabus** – Chemistry 2420, Organic Chemistry II (Spring 2016)  
Department of Chemistry, Michigan Technological University

**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, F 9:30 – 10:30 AM 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:** *Student Study Guide/Solutions Manual* accompany to the primary textbook *Organic Chemistry*, 4th and 3rd editions by Janice Gorzynski Smith; Available in MTU bookstore.

**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 on the Sapling site 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 during the semester except that several at the end of the semester will due on April 24 (Sunday) 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 you miss a due time, your score for that assignment will be zero. It is important to finish homework well before the due dates because the due dates were set well behind the classes finishing the chapters. Otherwise, you will get very busy at the end of the semester.

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 also consult CLC coaches (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 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 100 bonus points from I-Clicker)

- 1000 (or more)-900 A
- 899-850 AB
- 849-800 B
- 799-750 BC
- 749-700 C
- 699-600 CD
- 599-500 D

Exam 1, 200 points (February 17, Wednesday, 2:00 – 3:00 pm)
Exam 2, 200 points (March 30, Wednesday, 2:00 – 3:00 pm)
Final, 300 points (time and place to be announced)
Online homework, 300 points (due on Tuesdays and April 24 at 11:55 pm)

Points of online homework will be determined by:

\[
\text{Your points of online homework} = \left(\frac{\text{total points you earned}}{\text{total points of online homework}}\right) \times 300
\]

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 100 points. Your bonus points will be calculated using the formula:

\[
\text{Your I-Clicker bonus points} = \left(\frac{\text{the total points you earned}}{\text{the total I-Clicker points in the semester}}\right) \times 100
\]

Your total points of the class = Exam 1 + Exam 2 + Final Exam + Online Homework + I-Clicker Bonus

**Certificate of Excellence:** Students with top five total points will be awarded a Certificate of Excellence, which states “Certificate of Excellence, This certificate is awarded to YOUR NAME in recognition of achieving top No. 1 (or other number) ranking in the 2016 spring semester organic chemistry II class that has a total of 155 (or other number) students in Michigan Technological University”.

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**Instruction Methods:** PowerPoint presentation and writing using a camera projector. The PowerPoint slides will be posted in Canvas (they can be found by clicking on “Announcements” under “Course Tools”). It is important for you to record what I write and draw over the projector. These notes 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. Many 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.

Some of the I-Clicker questions (not all) are in the slides posted in Canvas before the classes. You can preview them. But it is important to note that I may adjust the format of the questions to prevent getting points by just remember the answers. So, you need to understand the answers and the materials to get points.

If you have to miss classes and thus missing the opportunities to earn the I-Clicker bonus, you must inform me or keep a suitable record to allow me to adjust your bonus points. For family emergency, send an email to me before the class. For illness, send the doctor proof (with signature) to me (preferably between April 26 and 29, earlier is fine too; you may choose not to inform me at the time of the class). For university organized activities, send the proof (with supervisor signature) to me (preferably between April 26 and 29, earlier is fine too; you may choose not to inform me at the time of the class). For others, let me know by email before the class.

The way to adjust your bonus points is to use your average bonus points in the entire semester to make up your missing points using the following formula:

\[
\text{Makeup I-Clicker bonus points} = \left(\frac{\text{Total bonus points you earned in the semester}}{\text{Total number of I-Clicker questions in the semester}}\right) \times \left(\text{the number of questions you missed due to the authorized absence}\right)
\]

If you only have one or two authorized absences, you might want to ignore the makeup bonus points because it is highly unlikely that it will affect your grade. To see if it will affect your grade, after I calculated your total points and put in Canvas (probably on April 28), you can use the above formula to calculate by yourself.

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


If you have any questions during registration and the entire semester, send an email to support@saplinglearning.com and explain the issue. The Sapling Learning support team is almost always faster and better able to resolve issues than your instructor.

**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://mtu.instructure.com/](https://mtu.instructure.com/)
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 or 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. 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 0.2 points of the total score.
7. 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.
8. 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!
9. Finish your homework timely (well ahead of due date is strongly suggested because the due dates are normally set far behind the date we finish the chapters; 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.
10. 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>
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<tbody>
<tr>
<td>14</td>
<td>Nuclear magnetic resonance spectroscopy</td>
<td>01/11, 01/13, 01/15, 01/18 (Martin Recess, no class), 01/20</td>
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<tr>
<td>15</td>
<td>Radical reactions</td>
<td>01/22, 01/25</td>
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<tr>
<td>16</td>
<td>Conjugation, resonance, and dienes</td>
<td>02/27, 02/29, 02/01</td>
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<tr>
<td>17</td>
<td>Benzene and aromatic compounds</td>
<td>02/03, [02/5, Winter Carnival recess, no class], 02/08</td>
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<td>18</td>
<td>Electrophilic aromatic substitution</td>
<td>02/10, 02/12, 02/15 02/17, 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>02/19, 02/22</td>
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<tr>
<td>20</td>
<td>Introduction to carbonyl chemistry; organometallic reagents; oxidation and reduction</td>
<td>02/24, 02/26, 02/29, 03/02</td>
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<td>21</td>
<td>Aldehydes and ketones-nucleophilic addition</td>
<td>03/04, [03/05-03/13, spring break, no class], 03/14, 03/16, 03/18</td>
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<tr>
<td>22</td>
<td>Carboxylic acids and their derivatives-nucleophilic acyl substitution</td>
<td>03/21, 03/23, 03/25, 03/28 03/30, 1 hour in class exam 2</td>
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<tr>
<td>23</td>
<td>Substitution reactions of carbonyl compounds at the α carbon</td>
<td>04/01, 04/04</td>
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<td>24</td>
<td>Carbonyl condensation reactions (if time allows)</td>
<td>04/06, 04/08</td>
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<td>25</td>
<td>Amines (if time allows)</td>
<td>04/11, 04/13, 04/15, 04/18</td>
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<td>26</td>
<td>Carbon-carbon bond-forming reactions in organic synthesis (if time allows)</td>
<td>04/20, 04/22 Final exam, to be announced</td>
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<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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<td>29</td>
<td>Lipids</td>
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<tr>
<td>30</td>
<td>Synthetic Polymers</td>
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