CEHM 239
ORGANIC CHEMISTRY II
Spring 2010

Instructor: Professor Hyun-Soon Chong
Chemistry Division, BCPS Dept, IIT, LS 398, Chong@iit.edu, 312-567-3235

Course Hours: TR 1:50pm-3:05pm in LS 111

Office Hours: MW 3-5pm in Room LS 398 or by Appointment

                   2. Solution manuals for Organic Chemistry (Simick, 7th Ed. Prentice Hall)

Blackboard: Lecture notes, answer keys to exams and quizzes, and other announcements will be posted online.

Course Objectives
1. Write mechanisms of organic chemical reactions leading to or involving ethers, epoxides, sulfides, aromatics, carbonyl compounds, carboxylic acid derivatives, and amines.
2. Draw structures of products of organic chemical reactions involving ethers, epoxides, sulfides, aromatics, carbonyl compounds, carboxylic acid derivatives, and amines.
3. Devise short-synthetic sequences leading to organic molecules.
4. Elucidate the structure of organic molecules by interpretation of ultraviolet (UV), infrared (IR), nuclear magnetic resonance (NMR) and mass spectra.
5. Demonstrate proficiency in organic nomenclature and other topics related to ethers, epoxides, sulfides, aromatics, carbonyl compounds, carboxylic acid derivatives, and amines.
6. Identify the structure and understand the biosynthesis of carbohydrates, nucleic acids, amino acids, peptides, proteins, lipids and synthetic polymers.

Evaluation: Final mark will be determined from your performance in the following areas:

Midterm Exam 1: 100 points
Midterm Exam 2: 100 points
Midterm Exam 3: 100 points
Homework: 100 points
Quizzes (11): 100 points
Final Exam: 200 points

Total: 700 points

Homework, Quizzes, and Classroom

It is strongly suggested that the students do solve all in-chapter problems for sections covered in the lecture. Homework problems at the end of each chapter of the textbook will be assigned and collected regularly in the lecture. The purpose of homework is to help you learn the course material and monitor your progress on the class. There will be 11 quizzes throughout the semester. One lowest quiz score will be dropped from your grade calculation. There will be no make-up quizzes. The assigned homework problems and lecture notes will make up the bulk of the quiz questions. Students are expected to study the appropriate chapter of the text before coming to class.
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The lecture schedule is only a rough guide and will be likely changed as needed.

**TENTATIVE COURSE SCHEDULE**

<table>
<thead>
<tr>
<th>DATE</th>
<th>Chapter (Sections)</th>
<th>Homework problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 12</td>
<td>Chem 237 review and Chem 239 introduction</td>
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<tr>
<td>Jan 14</td>
<td>Chapter 12. Infrared (IR) spectroscopy and Mass spectrometry (1-6)</td>
<td>Chap 12: 2-3, 5-7, 10-11, 14, 15, 16-18, 20, 23, 25 (Due: 1:50 pm, Jan 21)</td>
</tr>
<tr>
<td>Jan 19</td>
<td>Chapter 12. Infrared (IR) spectroscopy and Mass spectrometry (7-11)</td>
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<tr>
<td>Jan 21</td>
<td>Chapter 13. NMR Spectroscopy [Quiz 1]</td>
<td>Chap 13: 3, 6, 9, 11, 12, 32, 34, 36, 39-40, 45, 47 (Due: 1:50 pm, Jan 28)</td>
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<tr>
<td>Jan 26</td>
<td>Chapter 13. NMR Spectroscopy</td>
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<tr>
<td>Jan 28</td>
<td>Chapter 14. Ethers, Epoxides, and Sulfoxides [Quiz 2]</td>
<td>Chap 14: 2, 7, 9, 15, 19, 26, 28, 33, 35, 39, 41, 47 (Due: 1:50 pm, Feb 4)</td>
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<tr>
<td>Feb 2</td>
<td>Chapter 14. Ethers, Epoxides, and Sulfoxides</td>
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<tr>
<td>Feb 4</td>
<td>Chapter 15. Conjugation Systems and UV spectroscopy [Quiz 3]</td>
<td>Chap 15: 5, 8, 9, 11, 14, 16, 18, 19, 25, 27, 30, 33, 36 (Due: 1:50 pm, Feb 16)</td>
</tr>
<tr>
<td>Feb 9</td>
<td>Chapter 15. Conjugation Systems and UV spectroscopy</td>
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<tr>
<td>Feb 11</td>
<td>Chapter 15. Conjugation Systems and UV spectroscopy</td>
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<tr>
<td>Feb 16</td>
<td>EXAM 1</td>
<td>Chapters 12-15</td>
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<tr>
<td>Feb 23</td>
<td>Chapter 16. Aromatic Compounds</td>
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<tr>
<td>Feb 25</td>
<td>Chapter 17. Reactions of Aromatic Compounds [Quiz 5]</td>
<td>Chap 17: 2, 7, 8, 12, 15, 17(a,b), 19, 22, 29(b,d,e), 40, 46, 47, 49 (Due: 1:50 pm, March 4)</td>
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<tr>
<td>March 2</td>
<td>Chapter 17. Reactions of Aromatic Compounds</td>
<td></td>
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<tr>
<td>March 4</td>
<td>Chapter 18. Ketones and Aldehydes [Quiz 6]</td>
<td>Chap 18: 6(a,c), 7(a,d), 9, 11, 12, 17(b,d), 24, 27, 28, 31(a,d,f), 34(a,b,d,f), 44, 49, 50, 51, 58, 63, 66 (Due: 1:50 pm, March 23)</td>
</tr>
<tr>
<td>March 9-11</td>
<td><strong>Spring Break</strong></td>
<td>No Classes</td>
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<tr>
<td>March 16</td>
<td>Chapter 18. Ketones and Aldehydes</td>
<td></td>
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TENTATIVE COURSE SCHEDULE

DATE Chapter (Sections) Homework problems

Jan 12 Chem 237 review and Chem 239 introduction

Jan 14

Chapter 12. Infrared (IR) spectroscopy and Mass spectrometry (1-6)

Chap 12: 2-3, 5-7, 10-11, 14, 15, 16-18, 20, 23, 25 (Due: 1:50 pm, Jan 21)

Jan 19

Chapter 12. Infrared (IR) spectroscopy and Mass spectrometry (7-11)

Jan 21

Chapter 13. NMR Spectroscopy [Quiz 1]

Chap 13: 3, 6, 9, 11, 32, 34, 36, 39-40, 45, 47 (Due: 1:50 pm, Jan 28)

Jan 26 Chapter 13. NMR Spectroscopy

Jan 28

Chapter 14. Ethers, Epoxides, and Sulfides [Quiz 2]

Chap 14: 2, 7, 9, 15, 19, 26, 28, 33, 35, 39, 41, 47 (Due: 1:50 pm, Feb 4)

Feb 2 Chapter 14. Ethers, Epoxides, and Sulfides

Feb 4

Chapter 15. Conjugation Systems and UV spectroscopy [Quiz 3]

Chap 15: 5, 8, 9, 11, 14, 16, 18, 19, 25, 27, 30, 33, 36 (Due: 1:50 pm, Feb 16)

Feb 9

Chapter 15. Conjugation Systems and UV spectroscopy

Feb 11

Chapter 15. Conjugation Systems and UV spectroscopy

Feb 16 EXAM 1 Chapters 12-15

Feb 18

Chap 16: 7, 8, 12, 13, 15, 17-18, 27, 32, 34, 38, 42 (a-d), 45, 48(a-c). (Due: 1:50 pm, Feb 25)

Feb 23 Chapter 16. Aromatic Compounds

Feb 25

Chapter 16. Aromatic Compounds [Quiz 4]

Chap 17: 2, 7, 8, 12, 15, 17(a,b), 19, 22, 29(b,d,e), 40, 46, 47, 49. (Due: 1:50 pm, March 4)

March 2 Chapter 17. Reactions of Aromatic Compounds
March 4

Chapter 17. Reactions of Aromatic Compounds [Quiz 5]

Chap 18: 6(a,c), 7(a,d), 9, 11, 12, 17(b,d), Chapter

18. Ketones and Aldehydes

24, 27, 28, 31(a,d,f), 34(a,b,d,f), 44, 49, 50, [Quiz 6]

51, 56, 63, 66 (Due: 1:50 pm, March 23)

March 9-11 Spring Break No Classes

March 16 Chapter 18. Ketones and Aldehydes
<table>
<thead>
<tr>
<th>Date</th>
<th>Topics</th>
<th>Chapters/Assignments</th>
</tr>
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<tbody>
<tr>
<td>March 18</td>
<td>Chapter 18. Ketones and Aldehydes [Quiz 7]</td>
<td>Chapters 16-18</td>
</tr>
<tr>
<td>March 23</td>
<td><strong>EXAM 2</strong></td>
<td>Chap 19: 17, 20, 22, 25(a-c, e-g), 26(a-c), 28(b), 31(c,d), 32, 39, 40, 41, 42, 44, 45-48, 56 (Due: 1:50 pm, April 1)</td>
</tr>
<tr>
<td>March 25</td>
<td>Chapter 19. Amines</td>
<td>Chap 20: 11, 19, 21, 29, 33-37, 39 (Due: 1:50 pm, April 8)</td>
</tr>
<tr>
<td>March 30</td>
<td>Chapter 19. Amines</td>
<td>Chap 21: 9(b,d), 25(d-f), 34, 48, 49, 50, 53 (Due: 1:50 pm, April 15)</td>
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<tr>
<td>April 1</td>
<td>Chapter 20. Carboxylic Acids</td>
<td>Chap 21: 9(b,d), 25(d-f), 34, 48, 49, 50, 53 (Due: 1:50 pm, April 15)</td>
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<tr>
<td>April 8</td>
<td>Chapter 21. Carboxylic Acid Derivatives [Quiz 9]</td>
<td>Chap 21: 9(b,d), 25(d-f), 34, 48, 49, 50, 53 (Due: 1:50 pm, April 15)</td>
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<tr>
<td>April 13</td>
<td>Chapter 21. Carboxylic Acid Derivatives</td>
<td>Chap 22: 4, 8, 13, 17, 19, 24(b,c), 36, 38, 44, 47(a,b,d), 55(b,c,e), 59, 61, 62, 63, 65, 68, 69 (Due: 1:50 pm, April 27)</td>
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<tr>
<td>April 15</td>
<td>Chapter 22. Condensations and alpha substitutions of carbonyl compounds [Quiz 10]</td>
<td>Chap 22: 4, 8, 13, 17, 19, 24(b,c), 36, 38, 44, 47(a,b,d), 55(b,c,e), 59, 61, 62, 63, 65, 68, 69 (Due: 1:50 pm, April 27)</td>
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<tr>
<td>April 20</td>
<td><strong>EXAM 3</strong></td>
<td>Chap 22: 4, 8, 13, 17, 19, 24(b,c), 36, 38, 44, 47(a,b,d), 55(b,c,e), 59, 61, 62, 63, 65, 68, 69 (Due: 1:50 pm, April 27)</td>
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<td>April 22</td>
<td>Chapter 22. Condensations and alpha substitutions of carbonyl compounds</td>
<td>Chap 22: 4, 8, 13, 17, 19, 24(b,c), 36, 38, 44, 47(a,b,d), 55(b,c,e), 59, 61, 62, 63, 65, 68, 69 (Due: 1:50 pm, April 27)</td>
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<td>April 27</td>
<td>Chap 23. Carbohydrates and Nucleic Acids, Chap. 24. Amino Acids, Peptides, and Proteins [Quiz 11]</td>
<td>Chap 22: 4, 8, 13, 17, 19, 24(b,c), 36, 38, 44, 47(a,b,d), 55(b,c,e), 59, 61, 62, 63, 65, 68, 69 (Due: 1:50 pm, April 27)</td>
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<td>April 29</td>
<td>Chapter 25. Lipids, Chapter 26. Synthetic Polymers</td>
<td>Chap 22: 4, 8, 13, 17, 19, 24(b,c), 36, 38, 44, 47(a,b,d), 55(b,c,e), 59, 61, 62, 63, 65, 68, 69 (Due: 1:50 pm, April 27)</td>
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<tr>
<td>May 3-8</td>
<td><strong>Comprehensive Final Exam (2 Hour)</strong> Day/Time/Place (TBA)</td>
<td>Chap 22: 4, 8, 13, 17, 19, 24(b,c), 36, 38, 44, 47(a,b,d), 55(b,c,e), 59, 61, 62, 63, 65, 68, 69 (Due: 1:50 pm, April 27)</td>
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Chapter 18. Ketones and Aldehydes March 18
March 23 EXAM 2 Chapters 16-18

March 25
Chap 19: 17, 20, 22, 25(a-c, e-g), 26(a-c), 29(b), 31(c,d), 32, 39, 40, 41, 42, 44, 45-48, 56 (Due: 1:50pm, April 1)
March 30 Chapter 19. Amines
April 1
Chapter 19. Amines
Chap 20: 11, 19, 21, 29, 33-37, 39 (Due: 1:50 pm, April 8)
April 6 Chapter 20. Carboxylic Acids
April 8
Chapter 20. Carboxylic Acids [Quiz 8]
Chap 21: 9(b,d), 25(d-f), 34, 48, 49, 50, 53 (Due: 1:50 pm, April 15)
April 13 Chapter 21. Carboxylic Acid Derivatives
April 15
Chapter 21. Carboxylic Acid Derivatives [Quiz 9]
Chap 22: 4, 8, 13, 17, 19, 24(b,c), 36, 38, 44, 47(a,b,d), 56(b,c,e), 59, 61, 62, 63, 65, 68, 69 (Due: 1:50 pm, April 27)
April 20 EXAM 3 Chapters 19-21
April 22
Chapter 22. Condensations and alpha substitutions of carbonyl compounds [Quiz 10]
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April 27
April 29
Chapter 25. Lipids Chapter 26. Synthetic Polymers
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Day/Time/Place (TBA) Chapters 12-22