CHEMISTRY 112B - ORGANIC CHEMISTRY - Section 2 (TuTh)

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Office: Duncan 9A
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Spring 2013
lecture: Tu/Th 1:30 - 2:45pm
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PREREQUISITES: Chemistry 112A or equivalent course with a grade of "C" or better ("C-" is not acceptable). Students who have completed Chemistry 8 will receive reduced credit for Chemistry 112B (check with you academic advisor). If you did not take Chem 112A at SJSU, you must see the instructor to verify that the course you took is equivalent to SJSU Chem 112A. You may be asked to provide course syllabi and other information pertaining to your 112A-equivalent course. Any student found to not meet the prerequisites may be dropped from the class at any time during the semester.

REQUIRED TEXTS:
1. McMurry, John. Organic Chemistry, 8th ed., Thomson•Brooks/Cole - either the hardcover (black with orchid) or softcover SJSU edition is acceptable. Earlier editions of McMurry are NOT acceptable for this course.
2. Weeks, D.P. Pushing Electrons
Optional, but highly recommended:
4. A set of molecular models for organic chemistry

COURSE DESCRIPTION: Chemistry 112B is the second semester of the full-year sequence of Organic Chemistry, and should be taken only by students who have completed Chemistry 112A and received a grade of "C" or better. While most of the basic concepts were introduced in Chemistry 112A, in this course we will spend a greater amount of time on the applications of those concepts while continuing to explore the classes and reactions of organic compounds. While some memorization of the course material will be required, you will also be expected to apply the underlying principles (especially in the context of exam questions). To a greater extent than in the first semester, an emphasis will be placed on a mechanistic understanding of organic reactions. It is also important to note that while the exams will emphasize the most recent topics covered in class, you will be expected to have a thorough understanding of all material covered in Chemistry 112A, and may be asked questions on that material at any time. Note that the final exam will be a comprehensive exam that will cover all material from both Chem 112A and Chem 112B. Information on the final exam will be provided as the date nears.

GRADING AND EXAMS: There will be 3 "hour" exams given throughout the semester, each worth 150 points. The Final exam will be worth a total of 200 points. Two highest Hour exam grades will be used in the calculation of your grade. If you do not take one of the Hour exams, for any reason, this will be the score which will not be used in the grade calculation. The Hour exams will be 60 minutes long, and will be given at the start of the lecture period. Once exams are collected, any remaining time may be used for a lecture. Plan to arrive on time when an exam is scheduled, since all exams will be collected at the same time, no extra time is provided if you start late. Also, you must take the exam in the section in which you are enrolled - taking the exam for the other 112B section is strictly prohibited!

The final exam will be comprehensive for all material covered in BOTH semesters Chem 112A and 112B, and will be worth 200 points.
In summary, your final grade will be based on:

- 300 points for two Hour exams (2 x 150 points)
- 200 points for the Final (you can't drop the final)

**TOTAL 500 points**

Grades will be assigned on a "+/-" system. The course grades will be assigned according to the following ranges: 90% and higher “A” range, 80% and higher “B” range, 70% “C” and higher range, 60% and higher “D” range, below 60% “F” range. For example, a point total in the high 90s will be an "A+", mid 90s an "A", low 90s an "A-", and so forth. Historically, these are the grade ranges I use. Any modifications will be in your favor, but will not deviate greatly from the ranges shown. Note that the "class average" for a given exam is not necessarily a "C" grade. Grades are assigned by these grade ranges, not by "curves."

It is possible to do poorly on one exam, but you may improve your overall grade by doing well in another exam, especially since one exam is not counted. In assigning grades, only one set of criteria are applied equally to all students in the class - everyone has the same opportunity as everyone else to earn their grade.

Note that "incomplete" grades will only be considered if you have an unexpected situation or emergency that prevents you from finishing the semester. It is required that you have completed most of the course work with a passing grade until that point. A typical situation is a medical emergency - to be considered you must provide information to verify the emergency. Poor performance in the class or inability to keep up with the material is not an acceptable reason for an incomplete or to drop the class.

**EXAM POLICIES:**

*Roll may be taken at any time during exams (always bring a picture ID), and seats will be assigned at my discretion.*

*During the exams, you may use an organic molecular model kit but ONLY if disassembled and with written instructions removed. NO OTHER SOURCE OF INFORMATION IS ALLOWED. This includes notes or information of any kind on any medium. Calculators, computers, cellphones, PDAs or any electronic devices are NOT allowed at your desk during exams, and must be left in the front of the room. Anyone found violating this rule will receive, at minimum, an automatic score of "0 points" for the exam and this exam will be counted as one of the 2 hour exam scores (the second highest score will be dropped). A violation will be reported to the SJSU Office of Judicial Affairs (see Academic Integrity below). A student found in violation may receive sanctions ranging from a reduction of the grade in this course to more serious sanctions from the University.*
MAKEMEUP AND REGRADE POLICY:
You are required to take 2 of the 3 Hour exams given. If any Hour exam is not taken for any reason, that exam will be your one exam score that is not counted. A makeup will only be considered if you miss a second Hour exam due to an unforeseen emergency and provide a verifiable reason. In all cases, you must contact me as soon as reasonably possible. Before any action may be taken, you will be required to provide a verifiable document describing your emergency with the doctor's name and phone number. Note this only applies if you miss a second hour exam.

Absence due to personal or work related issues is not a reason to miss an exam. See the course attendance policy below.

Any request for a regrade or recalculation of any exam or quiz must be made within one week after the exam is returned in class (if you are not in class the day it is returned, it is your responsibility to obtain your exam from me). No regrades will be considered beyond this time. The exam must be left with me, and I will review the entire exam.

ATTENDANCE IN CLASS: You are required to attend every class meeting for this section of Chem 112B. DO NOT enroll in this class if you cannot attend every class session due to work or other commitments. Some of the topics we will cover are not found in the textbook, and will only be discussed in lecture.

NOTE THE FINAL EXAM DATE AND TIME IS INFLEXIBLE since it involves a standardized exam - put this date and time on your calendars NOW!

ACADEMIC INTEGRITY: Any form of cheating or unfair advantage will be dealt with seriously in this course, and will result in an appropriate penalty. At minimum, an infraction will result in "0" points for that exam and it will count as one of two Hour Exam Scores (meaning the second highest exam score will be dropped); a grade of "F" for the course may also be given. The SJSU "Policy on Academic Dishonesty" as described in detail in the SJSU Catalog will be the guideline for any action taken, and the case will be referred to the SJSU Office of Judicial Affairs. The instructor or the SJSU Office of Judicial Affairs may apply more serious penalties. An infraction may also result in a student's name being placed in a Chemistry Department file and other sanctions.

DISABILITY RESOURCE CENTER ACCOMMODATION (DRC): If you require special test accommodations from the Disabled Resource Center (DRC), you must bring it to my attention as soon as possible with your completed paperwork for the DRC. My policy is to schedule all exam accommodations at the start of the semester. All accommodations for exams must be scheduled to coincide with the regular scheduled time for the rest of the class. (this includes the final exam).

EMERGENCIES AND BUILDING EVACUATIONS: If you hear a continuously sounding alarm, or are told to evacuate the building by an Emergency Coordinator, walk quickly to the nearest exit (out the door and turn left to exit the Science Building). Take your personal belongings as you may not be allowed to return. Follow the instructions of the Emergency Coordinators. Be quiet so you can hear instructions. Once outside, move away from the building. Do not return to the building unless the Police or the Emergency Coordinator announce that this is permissible.
SUGGESTIONS FOR A COURSE STRATEGY: You probably already know that it is imperative that you keep up with the material for the course. You are responsible to know the assigned material from the textbook. In addition, you can expect material to be covered in lecture which is not in the McMurry text. As the course progresses, much of the successive information we will cover will draw on concepts that were discussed earlier, including from Chem 112A. Some exam questions will pertain to information we covered in Chem 112A. Note also that the Chem 112B final exam will be cumulative for both semesters of Ochem (112A and 112B).

There are at least 4 elements which will greatly improve your chances for doing well in CHEM 112B. These are:

1. Keeping up with the readings in the book, and especially, read the assigned pages before coming to class. Your comprehension of the material will be significantly better, since you will know what is already in the text and will spend most of your time copying down new and reinforcing information. Immediately after class, go over your notes and make a "short list" of important concepts (e.g, in the margins of your notebook or on a separate piece of paper).

2. Attending lectures - the lectures will serve to emphasize and expand on ideas in the text which are important, and also to provide more illustrative examples. I may also give important hints in the lecture that are not be described in the book. Some of the material we will cover is not found in McMurry, so the only way to know about these topics is to hear them in lecture!

3. Work the problems in the assigned chapters - this cannot be emphasized enough. These will not be collected or graded, but nevertheless have an extremely important role in this course. You must be able to work these problems independently in order to do well in this course. As with the assigned readings, keep up with the problems in a timely manner. First work on the textbook problems without the Study Guide, then check the answers to see how you did. If there is a problem, try to rationalize it with the answer shown.

   Unless otherwise stated, you are responsible for all of the problems in the chapters we cover in McMurry. It also is a good idea to look at other organic textbooks or study guides to gain experience in working on as many problems as you can.

4. Ask questions - during the class, immediately afterwards (while a point is fresh in your mind), or during the office hours. I am usually available for questions immediately after each lecture. Take advantage of the scheduled office hours. I also welcome email questions (see below). One important point: don't wait until the semester is almost over to begin asking me questions! ASK THEM AS THEY COME UP!

Before the exam, review your list of important concepts and your notes. Work the problems as if you were taking an exam (no peeking in the solutions guide!). You are strongly advised not to wait until the last moment and try to "cram" all the information in the few days before an exam. Because of the many concepts involved, learning by strict memorization will almost certainly lead to a poor result on an exam in this course. A key to success in Organic Chemistry will be to "make sense" of the concepts and facts that are presented. GOOD LUCK!
WHERE TO VIEW GREENSHEETS, SCHEDULES AND OTHER USEFUL INFORMATION:

You can always find key documents for this course on the King Library Course Reserves site:

http://library.sjsu.edu/course-reserves/course-reserves

Enter my name, then click the link for Chem 112B
(IMPORTANT: I teach 2 sections of Chem 112B – make sure you are looking at the Greensheet with the correct schedule!) To open documents, you will need your SJSU ID and password.

Besides the Greensheet and Schedule, you will find useful documents - note that I have left a large number of documents posted to my Chem 112A site. A few days before each of the three Hour Exams I will post a sample Hour Exam. These samples are intended to give you an idea of the format of my exams. However, you should never rely on a sample exam as your primary study guide - you must have a good understanding of ALL the material covered up to the exam. This includes information covered in the lecture, textbook and study guide, and any other information provided prior to the exam. I don’t provide answer keys to problem sets or exams but if time allows I may be able to check your work.

MY BEST ADVICE TO YOU:

If you feel at some point in the semester that you are "lost" or not doing as well as you like, come see me or take advantage of the available Resources listed below immediately for assistance. If you wait until right before an exam or until the last few weeks of classes, it will be very difficult to catch up due to the volume of material. Keeping up with the material and working the problems is very important to succeed in Chem 112B. However, it is also true that spending many hours studying does not necessarily equate to doing well on the exam - what is important that you understand the underlying principles and know how to apply them, not just memorize information or know how to answer specific problems from the textbook or sample exams.

Office Hours and Email Questions:

The University requires me to post 2 hours of office a week (see start of greensheet for these hours). In addition, until at least the first Hour Exam, I will hold a third hour of office which will vary from week to week (to be announced in lecture). If this extra office hour is attended by more than a handful of students, I may continue it beyond the first Hour Exam, but if usage is low, it will be discontinued and I will only hold the 2 posted office hours.

My office hours are times dedicated to assist you and students in all of my courses. They are usually quiet except immediately before exams, so if you have questions, see me early on and not wait until the pre-exam rush, when many students show up - I can answer only a limited number of questions from a crowd.

I am also open to email questions at any time, so you do not have to wait until the next office hour. Unless I'm traveling, I generally answer emails 7 days a week, and usually reply within a day (understand that I usually answer these emails on my personal time - I do my best to reply in a timely manner). This service is there for you to use, but you have to take the initiative!

My email is roy.okuda@sjsu.edu

Some important points regarding email questions:
- ask your questions well before the exam! Please note that I have a great deal of work to prepare each exam, so I may not get to questions in the day or two immediately before each exam.

Note email is only for questions about course material and problems. I do not reply to email messages regarding grades or personal matters - you must see me in person for such issues. Also, I always will give you the limits of the topics covered in each exam in the lecture (which is mandatory for your attendance) - I generally don't respond to emails asking what topics will be included in an exam – this will be covered in the lectures just prior to each exam.

OTHER RESOURCES:

**DISCLAIMER:** I do not have any control or oversight of any of these resources.

-COSAC (College of Science Student Advisory Center) has student tutors who are available for walk-in or scheduled assistance with questions - http://www.science.sjsu.edu/cosac/
-Academic Workshops (flyer provided) are primarily problem-solving sessions
-LARC (Learning Assistance Resource Center) - http://www.sjsu.edu/larc/

**Course Goals and Student Learning Objectives:**

CHEM 112B covers Program Learning Objective #2 for the SJSU Chemistry Department: http://www.sjsu.edu/chemistry/Academic_Programs/undergraduate_program_learning_objectives.html

Specific Course Learning Objectives for Chem 112B:
• Demonstrate understanding of core concepts and to effectively solve problems in organic chemistry.
• An understanding and ability to apply all material covered in Chem 112A (McMurry Chapters 1 to 14)
• Appreciation for the nature and scope of organic chemistry.
• Application of key concepts from general chemistry including electronegativity, bonding (ionic and covalent), hybridization of atomic orbitals, and molecular orbital theory to organic systems.
• Draw valence bond and Lewis dot structures for organic species, including formal charges and oxidation numbers.
• Draw structures for organic compounds in a variety of methods (including, but not limited to, line-bond, Lewis Dot, dash/wedge, Fisher, Haworth projections); show stereochemistry and regiochemistry accurately.
• Apply acid-base concepts to organic systems; predict ordering of acid or base strength; understand the roles of acids and bases in reaction mechanisms.
• Name the various forms of carbonyl-containing compounds, amines, carbohydrates, lipids, nucleic acids, amino acids and their various derivatives using systematic (IUPAC) nomenclature.
• Learn common names and acronyms for key chemicals and solvents.
• Understand the concept and definitions of aromaticity.
• Draw products and reaction mechanisms for many reactions including all aromatic compounds, carbonyl-containing compounds, amines, carbohydrates, amino acids, lipids.
• Recognize stereochemistry and be able to apply the Cahn-Ingold-Prelog system to designation of stereochemistry (E/Z, R/S, re/si).
• Apply stereochemical aspects to reaction mechanism.
• Understand the fundamentals of reaction kinetics and be able to apply to the determination of reaction mechanism.
• Employ the reactions learned in designing multistep organic synthesis.
• Learn and be able to apply the material presented in Chapters 15 - 28 in the text (McMurry, 8th edition) as
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading in McMurry</th>
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<tbody>
<tr>
<td>Jan 24</td>
<td>Benzene &amp; Aromaticity</td>
<td>15: 1 - 6</td>
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<tr>
<td>Jan 29</td>
<td>Chemistry of Benzene</td>
<td>16: 1 - 6</td>
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<tr>
<td>Jan 31</td>
<td>Chemistry of Benzene</td>
<td>16: 7 - 11</td>
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<tr>
<td>Feb 5</td>
<td>Alcohols &amp; Phenols</td>
<td>17: 1 - 5</td>
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<td>Feb 7</td>
<td>Alcohols &amp; Phenols</td>
<td>17: 6 - 10</td>
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<td>Feb 12</td>
<td>Ethers, Epoxides, Thiols, Sulfides</td>
<td>18: 1 - 9</td>
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<td>Feb 19</td>
<td>Aldehydes &amp; Ketones</td>
<td>19: 5 - 9</td>
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<tr>
<td>Feb 21</td>
<td>Hour Exam 1: **</td>
<td>60 min exam</td>
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<tr>
<td>Feb 26</td>
<td>Aldehydes &amp; Ketones</td>
<td>19: 11 - 13</td>
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<td>Feb 28</td>
<td>Carboxylic Acids &amp; Nitriles</td>
<td>20: 1 - 4</td>
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<tr>
<td>Mar 5</td>
<td>Carboxylic Acids &amp; Nitriles</td>
<td>20: 5 - 7</td>
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<td>Mar 7</td>
<td>Carboxylic Acid Derivatives</td>
<td>21: 1 - 4</td>
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<td>Mar 12</td>
<td>Carboxylic Acid Derivatives</td>
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<td>Mar 14</td>
<td>Carboxylic Acid Derivatives</td>
<td>21: 8 - 9</td>
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<td>Mar 19</td>
<td>Carboxyl α-substitution Rxns</td>
<td>22: 1 - 4</td>
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<tr>
<td>Mar 21</td>
<td>Hour Exam 2: **</td>
<td>60 min exam</td>
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<td>Apr 2</td>
<td>Carboxyl α-substitution Rxns</td>
<td>22: 5 - 7</td>
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<td>Apr 4</td>
<td>Carboxyl Condensation Rxns</td>
<td>23: 1 - 8</td>
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<td>Apr 9</td>
<td>Carboxyl Condensation Rxns</td>
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<td>Apr 11</td>
<td>Amines</td>
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<td>Apr 16</td>
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<td>Apr 18</td>
<td>Carbohydrates</td>
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<td>Apr 23</td>
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<td>25: 7 - 11</td>
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<td>Apr 25</td>
<td>Amino Acids &amp; Proteins</td>
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<td>Apr 30</td>
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<td>May 2</td>
<td>Lipids and Natural Products</td>
<td>27: 1 - 7</td>
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<td>May 7</td>
<td>Heterocycles &amp; Nucleic Acids</td>
<td>28: 1 - 8</td>
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*any changes may be announced only in class. It is your responsibility to be aware of any changes!

**May 15 (Wednesday) 12:15 - 2:30pm FINAL EXAM**