Course Outline

Description
This course is the continuation of CHEM 3300 course. Topics that are covered include elimination reactions, substitution reactions, spectroscopy, chemistry of aromatic compounds, chemistry of carbonyl compounds, chemistry of carboxyl compounds and their reactions, oxidation-reduction reactions, carbohydrates, lipids amino acids, proteins and synthetic polymers. Includes laboratory sessions.

Chapters 11 – 19 and parts of 20, 21, and 24 from the textbook and any additional material covered in the class.

Prerequisite: CHEM 3300 with a grade of C or better

Outcomes
After completion of the course, the student will be expected to:

- Demonstrate mastery of simple organic reaction mechanisms
- Recognize functional groups, and name simple organic compounds
- Describe simple resonance schemes, stability and reactivity of organic molecules
- Apply the rules of nucleophilicity and electrophilicity of organic groups
- Demonstrate the use of simple spectroscopic data in structure determination
- Understand and apply the basic rules of reactivity of organic compounds
- Demonstrate the ability of recognize functional groups in biochemical and natural systems
- Apply Structure-activity relationship to elementary biochemicals and pharmaceuticals
- Recognize the role of organic chemistry in pharmaceutical discovery, synthesis, and activity

Required Material

Accessories: A scientific calculator (TI 30 or equivalent), a set of index cards, and a couple of 3.5" 1.44Mb floppy disks, white lab coat, goggles, lab notebook, hand soap, and paper towels.

Recommended Material
Molecular model kit, Chemsketch (free) software (www.acdlabs.com)

Course Evaluation
The grades are computed by weighing lecture course work (75%) and laboratory work (25%) The classroom performance will be based on four examinations, homework and quizzes. First three exams will be conducted during the class time and the final exam is comprehensive and will be conducted during the last week of classes. Class exams will be based on the material covered up to and including the material discussed in the previous class. The test may have some multiple choice and some free response questions. Quizzes will be administered at the beginning of each lab.

Lecture grade weight

<table>
<thead>
<tr>
<th>Exam 1</th>
<th>Exam 2</th>
<th>Exam 3</th>
<th>Quizzes/Assignments</th>
<th>Final Exam</th>
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</thead>
<tbody>
<tr>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>15%</td>
<td>25%</td>
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</tbody>
</table>

Final grade criteria

- 90% and above A
- 80% to 89.9% B
- 70% to 79.9% C
- 60% to 69.9% D
- Others F

A +/- system may be used

Important Dates

- Last day to drop: November 25
- Exam #1: Sept. 21
- Exam #2: Oct. 26
- Exam #3: Nov. 23
- Final Exam: Dec 13 - 17

Lab report grades are based upon

- Pre-lab quiz /preparation
- Safety, behavior in lab, work quality
- Quality of write-up, data presentation
- Conclusions, explanation of results

Lab grade weight

<table>
<thead>
<tr>
<th>Lab reports</th>
<th>Mid term exam</th>
<th>Quizzes</th>
<th>Lab Notebook</th>
</tr>
</thead>
<tbody>
<tr>
<td>60%</td>
<td>10%</td>
<td>20%</td>
<td>10%</td>
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</table>
Guidelines and Classroom Etiquette

- Attendance is required and will be recorded in all lecture and lab periods.
- You will be responsible for all the material covered in the class.
- Unprofessional behavior and academic dishonesty (defined below) will not be tolerated and dealt with administratively.
- There will be no makeup exams or makeup labs.
- Calculator and must be used for computing purposes only.
- Lab reports are due within the prescribed time. Late reports will not be accepted. No drop labs.
- Unpreparedness and Unsafe behavior in the laboratory will result in immediate dismissal from the lab.
- Academic dishonesty (cheating, plagiarism, bribery, etc.) on exams, assignments, and lab reports will be dealt with harsh penalty, at minimum, with a failing grade in the course. As a general policy in this course, a penalty for cheating will always be greater than the penalty for doing the work poorly, or not doing it at all. Any sign of cheating during the examination will result with a zero on that test and will be immediately referred to the student Honor court. This may result in probation or suspension.

What is unprofessional behavior?
Consistent late arrival, leaving the class early, disruptiveness by beepers or cell phones, eating food, drinking beverages, leaving to the restroom, general disruptive behavior due to not studying prior to class.

What constitutes cheating/plagiarism?
The use of notes, books and any other resources such as programmable calculators with stored information during the exam, copying from another student during a test, submitting work without proper citation of source, submitting lab reports where information is lifted from another persons work (present or past), shared prelab write-ups.

ADA Policy
Nova Southeastern University provides reasonable accommodations for students with documented disabilities. If you have a disability for which you believe you require accommodations, please contact Ms. Sue Mills, Assistant Director of Academic Services (e-mail: smills@nova.edu; telephone: 954-262-8405 or 1-800-338-4723, ext. 8405)

Writing across Curriculum (WAC) Policy
In keeping with the University’s Writing Across the Curriculum Policy, this course will include evaluation through written work. Students will be graded on their knowledge of the subject and their ability to communicate in writing. Students are expected to use standard English and demonstrate college level writing skills.

Things you should know:

<table>
<thead>
<tr>
<th>Week of</th>
<th>Lab</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>8/23</td>
<td>8/26</td>
<td>Introduction</td>
</tr>
<tr>
<td>8/30</td>
<td>1</td>
<td>Lab lecture</td>
</tr>
<tr>
<td>9/9</td>
<td>9/13</td>
<td>S_N1 and S_N2 Substitution Reactions</td>
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<tr>
<td>9/20</td>
<td>9/23</td>
<td>Spectroscopy Exercises</td>
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<tr>
<td>9/27</td>
<td>9/30</td>
<td>Synthesis of Esters</td>
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<tr>
<td>10/4</td>
<td>10/7</td>
<td>Reactions of Aromatic Compounds I</td>
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<tr>
<td>10/11</td>
<td>5</td>
<td>Lab Lecture</td>
</tr>
<tr>
<td>10/18</td>
<td>10/218</td>
<td>Reactions of Aromatic Compounds II</td>
</tr>
<tr>
<td>10/25</td>
<td>10/28</td>
<td>Solid-solid Reaction</td>
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<tr>
<td>11/1</td>
<td>11/4</td>
<td>Borohydride Reduction</td>
</tr>
<tr>
<td>11/8</td>
<td>11/11</td>
<td>Aldol Condensation</td>
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<tr>
<td>11/15</td>
<td>11/18</td>
<td>Extraction of a Natural Product</td>
</tr>
<tr>
<td>11/22</td>
<td>9</td>
<td>Lab Lecture</td>
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<tr>
<td>11/29</td>
<td>12/2</td>
<td>Saponification of a triglyceride</td>
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<td>12/6</td>
<td>10</td>
<td>Lab Lecture</td>
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<tr>
<td>16</td>
<td></td>
<td>Final Exam Week (no lab)</td>
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HOW TO STUDY CHEMISTRY?

Listening to Lectures
Read assigned material before coming to class. You will be sufficiently familiar with the material so you will more readily understand the lecture.

Taking Notes
- Try to capture the ideas and concepts of a lecture.
- Don't recopy your notes. You don't learn while copying material.
- Don't use a tape recorder. It takes too long to review the material.
- Take notes and review them immediately after class. In some research, a group that reviewed material immediately after a class recalled more than a group that didn't.
- Remembering what you have heard is usually more difficult than remembering what you have read. Therefore, take class notes so that you will have something to read.
- Don't do your remembering by memorizing. We need to be selective in what we memorize. William James said, "The essence of genius is to know what to overlook."
- Memorization should only be done with material that is understood. It should not be used as a means of escaping the effort to understand. Do not learn by memorizing what can be learned by reasoning. Use the five R's of note taking (the Cornell system):
  - Record: The meaningful ideas and concepts
  - Reduce: After class, summarize the main ideas and concepts
  - Recite: Say out loud in your own words the main ideas of the class.
  - Reflect: Take a few minutes to ponder over the main ideas of the class
  - Review: Once a week, review the ideas of all the semester's lectures.

Asking Questions
- During class, ask questions of yourself. It helps to keep you mentally alert. It helps you to look for answers in class.
- Always have at least two questions that you would like to ask each time you go to your class.

Making a Schedule
- Schedules are crucial to student success. They are a means of gaining extra time by making you more efficient and by helping you use small blocks of time that usually are wasted without a schedule.
- Schedules also help you prevent avoiding your study.

Studying
- Use daylight hours. Research shows that each hour used for study during the day is equal to one and a half hours at night.
- Study before each class. The material will be fresh in your mind.
- Study each subject in a one-hour block of time. It makes you more efficient. You don't become bored. Longer blocks of time lead to a waste of time.
- Allow time for sleep.
- Set realistic goals for yourself. You can reward yourself for being successful. If you waste all afternoon and then set a goal of studying chemistry from 6:00 p.m. to midnight, you may not be realistic. The chances are that you won't be successful; you will become frustrated.
- Study at a desk.
- Recite while studying. If you recite while writing, you will be learning while using your eyes and ears. If you can't say it, you don't know it.