INSTRUCTOR: Mrs. B. Freeman, Assistant Professor of Physical Science
LECTURE HOURS: Thurs. 6:30 - 9:45 pm (HH204)
LAB HOURS: Tues. 6:30 – 9:30 pm (HH303)
OFFICE: HH 103H

Tutoring: Wednesday 2:00-4:30pm, Thursday 2:30-3:30pm

OFFICE HOURS: Tues -11:30 am-12:30 pm
           Wed. - 11:30 am-1:30pm
           Thurs.-11:30am -12:30 pm & 5:15 pm – 6:15 pm

PHONE: 410-572-8758
EMAIL: bfreeman@worwic.edu

I. Course Description
The course is a continuation of course CHM 201 and the study of carbon compounds. The focus is on
the mechanism and stereochemistry of organic reactions. Identification of organic compounds using
mass, infrared, and nuclear magnetic resonance spectroscopy is also explored. 39 lecture hours and
39 lab hours per semester. Prerequisite: CHM 201 (with a grade of C or better), acceptable
mathematics diagnostic assessment score or permission of the department head. Laboratory fee:
$30. Usually offered in the spring. (4 credits)

II. TEXT
A) Lecture Textbook
C) Lab Manual provided by instructor.

III. Other Required Materials:
A) Marble Composition Book
B) Blackboard:
Blackboard is being used as a supplementary site in this course. To access course content in Blackboard
you need to have access to a computer with an Internet connection, (other requirements may apply).
Please refer to this link for computers available on campus that meet these requirements:
http://www.worwic.edu/Students/LearningResources/ResourceLabs.aspx
Please follow these directions to access course syllabi and any other materials posted for this course:
Login Information:
From the Wor-Wic home page, click on myWor-Wic (top-right above Quick Links).
1. Enter your Wor-Wic user ID and password (same as your Wor-Wic email user ID
and password) to access the portal homepage.
2. In the “My Blackboard Classes” web part, click on a class listed to be directed to the
Blackboard site.
3. Blackboard may also be accessed through Quick Links on the college homepage and also through a link at the bottom of the homepage.
4. and also through a link at the bottom of the homepage.

Blackboard academic integrity and computer usage policy:
All students logging into Blackboard affirm that they understand and agree to follow Wor-Wic Community College policies regarding academic integrity and the use of College resources as described in the college catalog. Wor-Wic Community College considers the following as violations of the computer usage policy:
- Using the campus computing network and facilities to violate the privacy of other individuals
- Sharing of account passwords with friends, family members or any unauthorized individuals

Violators are subject to college disciplinary procedures

IV. COURSE OBJECTIVES AND ASSESSMENT GOALS, AND ASSESSMENT STRATEGIES:

<table>
<thead>
<tr>
<th>Course Objectives</th>
<th>Assessment Goals</th>
<th>Assessment Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Define and use the terms $S_N 1$, $S_N 2$, $E_1$, and $E_2$ correctly. GEO 2,3,6, 7,</td>
<td><strong>a)</strong> Propose a mechanism for the reaction and predict the stereochemistry. <strong>b)</strong> Predict the products, including stereochemistry, of a nucleophilic substitution of an alkyl halide.</td>
<td>Lab Assignment Exam Question</td>
</tr>
<tr>
<td>2. Determine the characteristics of alcohols, ethers, and epoxides. GEO 2,3,6</td>
<td><strong>a)</strong> Name alcohols, epoxides and ethers. <strong>b)</strong> Explain the properties and acidity of alcohols, ethers, and epoxides. <strong>c)</strong> Predict the products and formulate the mechanisms of reactions involving alcohols, epoxides, and ethers.</td>
<td>Exam Question</td>
</tr>
<tr>
<td>3. Discuss properties and reactions of alkenes and alkynes. GEO 2,3,6</td>
<td><strong>a)</strong> Name and differentiate between alkenes and alkynes. <strong>b)</strong> Write chemical equations describing the acceptable mechanisms for alkene and alkyne reactions. <strong>c)</strong> Outline the synthesis for the formation of alkenes and alkynes from different functional groups.</td>
<td>Exam Question</td>
</tr>
<tr>
<td>4. Examine Techniques (Mass, Infrared Red, Nuclear Magnetic Resonance Spectroscopy) used to identify unknown organic compounds. GEO 2,3,6,7</td>
<td><strong>a)</strong> Use the characteristic absorption frequencies of functional groups to determine an unknown compound. <strong>b)</strong> Identify the molecular ion and use the molecular weight to determine an</td>
<td>Exam Question Lab Assignment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>unknown compound.</td>
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<td></td>
<td></td>
<td>c) Distinguish spectral information from solvent and standard reference NMR signals to determine an unknown compound.</td>
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</tbody>
</table>
| 5 | Examine the cleavage of nonpolar bonds by radical reactions. GEO 2,3,6 | a) Explore general features of radical reactions.  
 b) Diagram the mechanism for radical reactions. |
| 6 | Discuss the chemistry of conjugated molecules. GEO 2,3,6 | a) Outline the mechanism and stereochemistry of the Diels-Alder reaction.  
 b) Explain the differences between the reactions of conjugated double bonds and isolated double bonds.  
 c) Write contributors to the resonance hybrid for simple systems such as allyl radical (cation), carbonate, nitro. |
| 7 | Understand the characteristics of aromatic compounds GEO 2,3,6 | a) Explain the unusual stability of conjugated double bond systems by the valence bond (resonance) and the molecular orbital (Huckel, aromaticity) methods;  
 b) Distinguish between the two approaches.  
 c) Write the mechanism of electrophilic substitution of benzene for nitration, halogenation, alkylation, acylation, protonation, and sulfonation, including production of the electrophile.  
 d) Sketch contributors to the intermediate resonance-stabilized ion and the electrophile. |
| 8 | Determine the identity of unknown organic compounds GEO 1,2,3,6,7,8 | a) Identify the functional group and molar mass of a compound using IR and MS spectroscopy  
 b) Perform chemical tests to identify the functional group and physical properties of the unknown  
 c) Present a formal Powerpoint presentation detailing the results |
V. COURSE EVALUATION: Your grade will be determined by the weighted average. The breakdown is as follows:

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Percent of Total</th>
<th>Grading Scale Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture Exams (3)</td>
<td>30%</td>
<td>90-100%=A</td>
</tr>
<tr>
<td>Cumulative Final Exam</td>
<td>20%</td>
<td>80-89%=B</td>
</tr>
<tr>
<td>Writing /Electronic Literacy</td>
<td>10%</td>
<td>70-79%=C</td>
</tr>
<tr>
<td>Assignment</td>
<td></td>
<td>60-69%=D</td>
</tr>
<tr>
<td>Quizzes</td>
<td>15%</td>
<td>↓ 59%=F</td>
</tr>
<tr>
<td>Laboratory</td>
<td>25%</td>
<td></td>
</tr>
</tbody>
</table>

Each lecture exam is designed to meet the goals and objectives for the course. The student is evaluated on the information presented in the textbook. The exams may consist of multiple choice, true and false, matching, and short answer questions involving analytical thinking.

The written/literacy project will involve a literature search in which students will research a specific chemistry related current event topic (ex. Explain how results from doping athletes could show negative readings). Students will work in groups to deliver a formal, ACS formatted Powerpoint presentation discussing their topic. This project is explained in greater detail in Part IX. Selected topics will be posted in the course content session of Blackboard.

The laboratory experience will involve collecting and analyzing data to identify two unknown organic compounds. Students are required to keep a laboratory notebook. The *marble composition book* used in Organic Chemistry I is acceptable. Specific guidelines for entering data into the lab notebook as well as other pertinent lab information are contained in the laboratory manual. A Powerpoint presentation (using the guidelines in Part IX) of the research is submitted to me prior to giving an oral report. The lab counts 25% of your final grade. The lab notebook will receive 15% of the grade and the Powerpoint presentation (written and oral) receives the remaining 10% of the grade. The lab will meet in HH 303.

**Make-up policy:** With a valid documented excuse, only one missed exam may be made up. The student must notify the instructor by email (worwic account) about making up the exam. The missed exam must be made up before the next class section. The best 3 of 6 quizzes will be used in the calculation of your grade. There are NO make-ups for quizzes. *LATE ASSIGNMENTS* will not be accepted unless approved by the instructor.

**Attendance:** Each student is expected to actively participate in each scheduled class. Arriving on time and staying through the whole class is a vital part of class participation. If a student is absent, they lose
the benefit of getting good notes for the exam. **It is the student's responsibility** to contact the instructor (by phone or email) immediately after an absence to get any materials missed. Do NOT wait until the next scheduled class period to gather missed information.

**VI. Emergency Information Statement**

In the event of severe inclement weather or other emergency, information about the closing of the college will be communicated via e2Campus and the College's website. Faculty will communicate with students about their courses and course requirements, such as assignments, quiz and exam dates, and class and grading policies, via Blackboard. Students will be responsible for completing all assignments in accordance with class policies.

**VII. Services for Students with Disabilities**

Wor-Wic provides reasonable accommodations for students with disabilities, in compliance with the Americans with Disabilities Act of 1990 and Section 504 of the Rehabilitation Act of 1973. If you are in need of accommodations, please contact the counseling office at (410) 334-2899. For more information, see Wor-Wic's Services for Students with Disabilities web page.

**VIII. Sexual Violence Disclosures**

Wor-Wic Community College seeks a campus free of sexual violence which includes sexual harassment, domestic violence, dating violence, stalking, and/or any form of sex or gender discrimination. Please be aware that if a student discloses a personal experience verbally or in writing as a Wor-Wic student to a faculty or staff member, the employee cannot maintain confidentiality and has the mandatory responsibility to notify one of the college's Title IX coordinators. However, if you'd like to make a confidential disclosure of any such violence, you can contact Wor-Wic's director of counseling (X-2900) or you can contact the Life Crisis Center at 410-749-HELP or 2-1-1.

Information on rights of victims of sexual violence and related resources is available in the college catalog and at the public safety page of Wor-Wic's website: http://www.worwic.edu/Administration/PublicSafety.aspx.

Revised

**IX. ELECTRONIC / WRITING ASSIGNMENT**

This is the “Writing Assignment” and “Electronic Information Literacy Assignment” portion of your grade for CHEM 202 and will count for 10% of your overall grade in the course. It relates to the General Education Objectives (GEO’s) #1, 2, 3, 4, 5, 7 and 8 as listed in the Wor-Wic College Catalog. If you follow the directions and do a nice job it should be a great opportunity to improve your overall grade for the course. Be sure to check off each of the “Requirements” and “Format” items on this handout to confirm that you have included everything that is necessary to complete this assignment.

You may seek writing assistance from a qualified instructor in the Reading/Writing Center (MTC204). “Drop in” conferences are available on a “first-come, first-serve” basis during the regular hours. Come prepared with your original assignment and a printed copy of your written work. Center hours are:

- Monday & Thursday 8:30 am - 6:30 pm
- Tuesday & Wednesday 8:30 am - 8:00 pm
- Friday 10:00 am - 1:30 pm
- Sat 10:00 am - 1:00 pm

Please do not wait until the last minute to seek writing assistance.

**A. Requirements:**
The current event topics are selected from a Table found in the course content session of Blackboard. A Powerpoint presentation is prepared by members of a group. Each member will be responsible for discussing a certain section of the ACS (American Chemical Society) format listed below. For example, student 1 will discuss the Abstract for the topic while student 2 discusses the Objective of the topic. Assume that your target audience knows nothing about your topic. For instance, all scientific/medical abbreviations must be defined (i.e., don’t just refer to “ACS” without saying what it stands for). The Powerpoint should contain a minimum of 10 slides. You may also include visuals and videos. The total presentation time must not exceed 15 minutes. You will be graded on both group and individual deliveries. Refer to the Grading Rubric for details regarding grading. A list of group members, topics, and presentation dates will be posted in the course content session of Blackboard. Submit all Powerpoint presentations to me electronically (via email) before the date of your presentation. Failure to do so will affect your grade. Make sure that your slides include all categories from the following ACS format:

**Abstract** – this section should be written in complete sentences and give a summary of the current event topic. What is the significance of the topic? Citations are not necessary in this section since the sources are cited in other sections.

**Introduction or Objectives** – background material that provides justification for the study. (For example: If the topic is “Athletes being undetected for drugs”, what are some of the illegal drugs commonly found and why are athletes taking them?)

**Methods/Procedure** – a description of the techniques used. Figures can also be used to illustrate the method or materials used in the study. Every photo or figure must either have a caption under it (in your own words) that explains what it is or have a number and be referred to somewhere in the text. (Ex. What is the procedure used to detect the drug?)

**Results** – graphical depiction of experimental results such as IR Spectrum, NMR diagrams, table of data. You must cite the source of the image or graph, right below it, and not violate copyright law. (Ex: List results of drug testing.)

**Discussion/Conclusion** - Explain relevance of results. Draw legitimate conclusions instead of speculating. (Ex: Explain why known drug users tested negative for drugs).

**References** - You must give in-text citations for all the information in your presentation (in every section except abstract). If there is more than one source of the information in a section, each piece of information must have a citation adjacent to it. YOU CANNOT GROUP IN-TEXT CITATIONS AT THE END OF A SECTION. You must also have a list of complete references at the end of the presentation in correct APA Style. The in-text citations and complete reference entry must clearly match (same name, date, etc.)

**B. Format**  
You must use at least 4 references for the text portion (not counting photos) following these guidelines:

At least 2 must be from an electronic database (such as those available through the WWCC media centers or another institution of higher learning)

- no more than one - general reference book (e.g., encyclopedia)
- no more than two - web sites (must be “legitimate” sources e.g., American Chemical Society); (NOT Wikipedia, blogs, advertisements for medicines, or special interest group websites/literature)
- no more than two science reference books (e.g., your chemistry text)
• as many as you want – professional science journals, popular science magazines or widely distributed news magazines (e.g., Discover, National Geographic, Time, Newsweek etc.)
• see me if you have any questions about the “validity” of a source for this assignment
  o you must use “APA Style” for in-text citations and the “References” list; the WWCC media center has electronic databases for finding your references and printed guidelines available for “Citing Sources: APA Style”.

Name _______________________   Total Score ____________

C. Grading Rubric for the Presentation – Four Components:

1. **20%**: Visuals, Appearance, & PowerPoint Content – well organized and enhances the presentation of the topic

2. **50%**: Oral Content of Presentation – clearly presented IN YOUR OWN WORDS with sufficient information. This grade is based upon how well information is conveyed without the aid of
notecards or reading from PowerPoint slides and how well questions asked by fellow class members/instructor are answered.

3. **20%**: Proper (APA) style and completeness of in-text citations and separate reference list
   (NOTE: YOU WILL RECEIVE A ZERO FOR THE ENTIRE POWERPOINT IF REFERENCE LIST OR IN-TEXT CITATIONS ARE MISSING and will BE REFERRED FOR DISCIPLINARY ACTION IF PLAGIARISM IS SUSPECTED!)

4. **10%**: Correct grammar, spelling, and clarity of communication

Each of the four components above will be judged by the instructor and awarded a (n):

90-100 (A) for completing all requirements above & exceeding expectations for quality & professionalism

80-89 (B) for completing all requirements above & better than average quality for sophomore-level science

70-79 (C) for completing all requirements above & average quality with only minor deficiencies or errors

60-69 (D) for not completing some requirements above & having below-average quality or several errors

50-59 (E) for not completing several requirements above & having unsatisfactory quality or excessive errors for a sophomore-level presentation

0   (F) for not completing most requirements above or reference list or in-text citations missing or plagiarism or dishonesty

That number will be multiplied by the percentage listed for that component and the total score (0-100pts.) from all four components will be written in the blank below by your professor. (NOTE - Grade will be reduced 5% for every day (not lecture) late!)

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<thead>
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<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>Subtotal</th>
</tr>
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<tbody>
<tr>
<td>1. Visuals...</td>
<td>.20</td>
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<td>2. Content...</td>
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<td>3. APA...</td>
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<td>4. Grammar...</td>
<td>.10</td>
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</tbody>
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EXCELLENT PRESENTATIONS MAY BE USED AS EXAMPLES FOR FUTURE CLASSES. PLEASE LET ME KNOW IF YOU HAVE ANY OBJECTION TO YOUR PRESENTATION BEING USED.

X. **ACADEMIC INTEGRITY**

Academic integrity is expected of all students. Cheating and plagiarism are violations of academic integrity. See the Current Catalog Appendix for full description of these and other forms of academic dishonesty. Any student found violating the academic policy will receive an automatic "0" for the assignment and then the matter will be turned over to the Student Disciplinary Committee.

Documented evidence of the plagiarism or cheating will be kept in the Math and Science Office.
Plagiarism is defined as copying or imitating the language, ideas or thoughts of another author and presenting them as one's original work or the copying of another's words in any medium without documenting the borrowing and thus failing to give credit to the original author in proper format (such as MLA or APA documentation format). Each instructor will be available for consultation regarding any confusion a student may have before submitting an assignment. Students are encouraged to use all available resources, including the instructor, assignment directions, handouts, suggested web resources and media center and/or writing center staff for help in avoiding plagiarism.

Cheating is defined as the act of obtaining information or data improperly or by dishonest or deceitful means. This includes the intentional use or attempted use of unauthorized materials, information or study aids in any academic exercise. This ALSO includes helping or attempting to help another student to cheat or submitting the same paper for two different classes without the explicit authorization/approval of both instructors, etc. (see Current college catalog). Each instructor will be available for consultation regarding any confusion a student may have before submitting an assignment.

Standards of performance and definitions are included in the Student Conduct Policy (College Catalog).

XI. Classroom Behavior
All students are expected to demonstrate civil behavior in the classroom and laboratory. They should not behave in any way that detracts from a positive classroom environment. Students are expected to arrive on time and be prepared for class. All cell phones and electronic devices should be turned off before coming to class.

XII. COURSE SCHEDULE (Tentative)

<table>
<thead>
<tr>
<th>Date(s)</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 19, 26</td>
<td>Chapter 9: Alcohol, Ethers, and Epoxides</td>
</tr>
<tr>
<td>Jan. 26</td>
<td>Quiz 1.</td>
</tr>
</tbody>
</table>
Feb. 2, 9  Chapter 10: Alkenes
Feb. 9  Quiz 2
Feb. 16, 23  Chapter 11: Alkynes
Feb. 16  Quiz 3
Feb. 23  Exam 1
Mar. 2, 16  Chapter 12: Oxidation and Reduction
Mar. 16, 23  Chapter 13: Mass Spectrometry and Infrared Spectroscopy
March 16  Quiz 4
March 23  Exam 2
Mar. 30  Chapter 15: Radical Reactions
April 6  Chapter 17: Benzene and Aromatic Compounds
April 6  Quiz 5
April 13  Chapter 20: Organometallic Reagents
April 13  Quiz 6
April 20  Exam 3
April 27  Final Exam (6:30-8:30 pm)

*subject to revision

LABORATORY

**Date(s)**  **Topic**
January 17  Introduction; Lab Safety
January 24  Experiment- Preparation of Acetylsalicylic Acid (Aspirin)/Lecture
<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 31</td>
<td>Experiment- Isomerization of Maleic Acid to Fumaric Acid/Lecture</td>
</tr>
<tr>
<td>February 7</td>
<td>Experiment- Esters/ Lecture</td>
</tr>
<tr>
<td>February 14</td>
<td>First day of Research Project</td>
</tr>
<tr>
<td>February 21</td>
<td>Research Project</td>
</tr>
<tr>
<td>February 28</td>
<td>Research Project</td>
</tr>
<tr>
<td>March  7</td>
<td>Spring Break / NO CLASS</td>
</tr>
<tr>
<td>March 14</td>
<td>Research Project</td>
</tr>
<tr>
<td>March 21</td>
<td>Research Project</td>
</tr>
<tr>
<td>March 28</td>
<td>Last Day of Research Project</td>
</tr>
<tr>
<td>April 4</td>
<td>Lecture</td>
</tr>
<tr>
<td>April 11</td>
<td>Powerpoint Presentations</td>
</tr>
<tr>
<td>April 18</td>
<td>Powerpoint Presentations/ Lecture/lab notebooks due</td>
</tr>
</tbody>
</table>

*subject to revision*