CHEMISTRY 330 **SYLLABUS 2009** **FALL SEMESTER**

Course Description: A study of nomenclature, preparations, reactions, and reaction mechanisms of the functional groups of aliphatic and aromatic compounds. Prerequisite: CHEM 202 (C grade or better, **strictly enforced**). 4 hrs. lect.; 3 hrs. lab.

The Course Objectives:

- To know and understand the bonding and structure of organic compounds
- To appreciate the dependence of molecular properties on bonding and structure
- To know the reactions and to understand the mechanisms by which those reactions take place
- To obtain the ability to carry out simple reactions and learn the process of chemical synthesis
- To learn spectroscopic and related techniques to determine the structure of organic molecules
- To gain practical laboratory experience in a modern organic chemistry laboratory setting

My expectation is that **you will attend all classes**, read the text, do the assigned work, and complete all quizzes and exams. Study of organic chemistry is very "cumulative" in nature; *i.e.*, each topic (in fact, each lecture) builds upon the material discussed and mastered during the previous class. Students who repeatedly miss lectures do it at the risk of failing the course. Attendance for the laboratory sections is required. Please see the "grading scheme" to see the minimum number of points required for the laboratory portion of this course to get a passing grade.

Required Texts & Materials:

Introduction to Organic Chemistry (3rd Edition) by Brown and Poon (ISBN978-0-471-44451-0) (Required)

Introduction to Organic Laboratory Techniques: A Microscale Approach by Pavia, Lampman, Kriz, and Engel (Required)

HGS Molecular Model Set (highly recommended)

Laboratory Notebook (Carbonless Copy Sheets, Required)

Course Instructor: Dr. T. K. Vinod — Currens Hall 438-A
mftkv@wiu.edu — 298-1379
Course Website Portal: http://www.wiu.edu/users/mftkv/Chem330(09)

Meeting Times: 9.00 am-9.50 am; M,W,Th, F in Currens 203. Laboratory meets on Tuesdays in Currens 431

Office Hours: Monday, Wednesday, Friday 10.00 AM-11.00 AM, Tuesday, Thursday 2.30-3.30PM ***or by appointment***

Assessment And Grading: Please click on the "grading scheme" link in the lecture schedule for August 24

Lecture Schedule: A detailed and completely hyperlinked day-by-day lecture schedule and on-line lecture notes can be found at: http://www.wiu.edu/users/mftkv/Chem330(09)

***Laboratory*:** Your safety in the laboratory is of paramount importance and thus your instructor and the Department of Chemistry will ensure that you are informed of all potential hazards associated with each and every experiment. As students enrolled in an organic chemistry course with a laboratory component you have certain responsibilities too. First and foremost is that Safety Goggles must be worn at all times while you are inside the laboratory. The Right to Know Law protects each and every citizen of our State and require employers and people of authority to let you, the citizen, be informed of the hazards associated with toxic substances that you may come into contact with as part of your employment or training. As your organic chemistry instructor I will do the same. Material Safety Data Sheets (MSDS) information about all chemicals utilized in the laboratory can be found at the following web site. http://physchem.ox.ac.uk/MSDS/#MSDS. As a responsible student (citizen) you should visit this site and learn more about the various hazards associated with the different chemicals that you will be working with in the laboratory.

Hands-on experience is a vital factor in learning chemistry. All organic laboratories will be using microscale methods and equipment. Instead of using gram quantities of reagents, milligram quantities will be used thereby reducing reaction times, chemicals used, and waste generated. Consequently, great care must be taken in using the new equipment and employing impeccable microscale laboratory technique. The laboratory grade will be based upon your completion of the experiments, lab reports, technique evaluation, and lab quizzes. *Since the laboratory experience is integral to the overall course, failure to earn a passing grade in the lab will result in automatic failure for the course (see grading scheme at:* http://www.wiu.edu/users/mftkv/Chem330(09)

.

It is extremely important to keep a careful and complete record of the experiments in your laboratory notebook. A reasonable guideline and helpful instructions for record keeping are provided in the laboratory manual (pp. 20 – 26, read it, know it, use it!). Your notebook must be permanently bound and have the carbonless copy (or carbon-copy) numbered pages. All entries in your notebook must be done with a pen and be clear, complete, and erasure free. Any inadvertent errors may be struck through with a single line and an explanation, if necessary. Since

you will not be working singly, it is important that you do keep your notebook separately and uniquely. When a lab is completed, you must submit a report comprised of the copy sheets from your notebook and any other forms/papers that are required by the instructor for a particular experiment.

Please note on the schedule that there is one week's worth of make-up lab sections. The following restrictions apply: You **may only makeup ONE lab exercise**, and you must submit a "Make-Up Lab Request" Form by the deadline specified by the instructor.

***Quizzes & Exams*:** Eight in-class quizzes (10-15 min. duration) will be administered during the term and the "best six" scores for the quizzes will be considered along with other scores (see Grading Scheme on the course homepage) when assigning the final grade for the course. Students **will not** be allowed **MAKE-UP missed quizzes**. In class exams will consist of multiple choice questions as well as those requiring short paragraph answers**. Under no circumstance will a student be allowed to make–up a missed exam without a doctor's note indicating your inability to attend class on the day of the exam.**

Useful Resources: http://sdo.wiu.edu/facultyStaff/absencepolicy.asp (absence policy)

http://www.wiu.edu/policies/acintegrity.php (academic integrity policy)

http://sjp.wiu.edu/CodeOfConduct/index.asp (Disorderly conduct)

Emergency Preparedness: WIU Office of Risk Management and Emergency Preparedness provides resources on how to respond to emergency situations. Please view the video resources at www.wiu.edu/rmep/ (Click "Resources" on the right side of the page)

WIU Policies: It is the policy of Western Illinois University to accommodate individuals with disabilities pursuant to federal law and the University's commitment to equal educational opportunities. It is the responsibility of the student to inform the instructor of any necessary accommodations at the beginning of the course. Any student with a disability requiring accommodations should contact the Office of Disability Support Services.

CHEMISTRY 331 - LABORATORY INFORMATION
&
SAFETY RULES

Hands-on experience is a vital factor in learning chemistry. For the first semester of this organic sequence, the emphasis of the laboratory exercises will be on microscale methods and techniques. The laboratory grade will be based upon your completion of the experiments, lab reports (pre-lab and post-lab), and technique evaluation. *Since the laboratory experience is integral to the overall course, failure to earn a passing grade in the lab will result in automatic failure for the course.* Notebooks will be checked to verify that they contain the information necessary for the day's experiment. If a student comes to the lab with an incomplete prelab report or does not seem to be prepared to do the work, that student will not be allowed to continue in that day's lab until the lab instructor is convinced of the student's preparedness for the experiment.

Notebooks: It is extremely important to keep a careful and complete record of the experiments in your laboratory notebook. A reasonable guideline and helpful instructions for record keeping are provided in the laboratory manual (pp. 20 -26). Your notebook must be permanently bound and have the carbonless copy (or carbon-copy) numbered pages. All entries in your notebook must be done with a pen and be clear, complete, and erasure free. Any inadvertent errors may be struck through with a single line and an explanation, if necessary. Since you will not be working singly, it is important that you do keep your notebook separately and uniquely.

The laboratory notebook is a record of what happened in the experiment. It should be understandable to others and should contain enough information such that the experiment could be repeated at a later date by you or by someone else. You are free to develop your own style for the notebook within some guidelines. Using your own style does not mean that you have license to be sloppy or careless. Much of the notebook will be data (descriptions, numbers, calculations, etc.), but a modicum of other information is also required. Procedural information, changes in method or technique, etc. should be recorded immediately, providing a complete narrative of everything you do as you are doing it. Therefore, you will have to do a little writing before, during, and after each lab. All entries in your notebook should be in pen. A table of contents in your notebook should also be kept current. Any graphs, computer print-outs, and spectra should be attached in the notebook (taped or stapled) for a permanent record of the data.

Reports: When a lab is completed, you must submit a report comprised of the copy sheets from your notebook and any other forms/papers that are required by the instructor for a particular experiment. This includes copies of any graphs, print-outs, and spectra obtained during the experiment. Record all information in **ink**! (Since we are using carbonless-copy pages, make sure you use the cardboard backer sheet between copy sheets, and that you write firmly and legibly so the lab instructor may read and grade your reports!)

For each experiment, the notebook/report should contain:

Prelab Report will contain	Postlab Report will contain
Title and Date	Title and Date
Purpose	Results
A brief procedure in your own words with safety	Discussion of results with explanations provided for

issues, if any, noted	low yields, unexpected result/observations etc.
Reagents and chemicals used with quantities (preferably in a tabular form)	Conclusions
Answers to the assigned pre-lab questions (in complete sentences)	Answers to all assigned post lab questions (in complete sentences)
	Spectra and other recordings must be attached

Chemistry Lab Safety
WIU CHEMISTRY DEPARTMENT

The chemistry laboratory can be a place of discovery and learning. However, by the very nature of laboratory work, it can be a place of danger if proper common-sense precautions aren't taken. While every effort has been made to eliminate the use of explosive, highly toxic, and carcinogenic substances from the experiments which you will perform, there is a certain unavoidable hazard associated with the use of a variety of chemicals and glassware. You are expected to learn and adhere to the following general safety guidelines to ensure a safe laboratory environment for both yourself and the people you may be working near. Additional safety precautions will be announced in class prior to experiments where a potential danger exists. Students who fail to follow all safety rules may be asked to leave the lab or suffer grading penalties.

Attire

1. Safety goggles must be worn at all times while in the laboratory. This rule must be followed whether you are actually working on an experiment or simply writing in your lab notebook. You must wear safety goggles provided by the chemistry department.
2. Contact lenses are not allowed. Even when worn under safety goggles, various fumes may accumulate under the lens and cause serious injuries or blindness.
3. Closed toe shoes and long pants must be worn in the lab. Sandals and shorts are not allowed.
4. Long hair must be tied back when using open flames.

Conduct

1. Eating, drinking, and smoking are strictly prohibited in the laboratory.
2. No unauthorized experiments are to be performed. If you are curious about trying a procedure not covered in the experimental procedure, consult with your laboratory instructor. Never work alone in the lab.
3. Never taste anything. Never directly smell the source of any vapor or gas; instead by means of your cupped hand, waft a small sample to your nose. Do not inhale these vapors but take in only enough to detect an odor if one exists.
4. Coats, backpacks, etc., should not be left on the lab benches and stools. There is a hook rack along the back wall at either end of the lab. There are coat racks just inside the each entrance to the balance room at the back of the lab. Beware that lab chemicals can destroy personal possessions.
5. Always wash your hands before leaving lab.
6. Learn where the safety and first-aid equipment is located. This includes fire extinguishers, fire blankets, and eye-wash stations.
7. Notify the instructor immediately in case of an accident.

Proper Handling of Chemicals and Equipment

1. Consider all chemicals to be hazardous unless you are instructed otherwise. Material Safety Data Sheets (MSDS) are available in lab for all chemicals in use (http://physchem.ox.ac.uk/MSDS/#MSDS). These will inform you of any hazards and precautions of which you should be aware.
2. Know what chemicals you are using. Carefully read the label twice before taking anything from a bottle. Chemicals in the lab are marked with hazardous labels when necessary. Assume all chemicals to be hazardous.
3. Excess reagents are never to be returned to stock bottles. If you take too much, dispose of the excess.
4. Many common reagents, for example, alcohols and acetone, are highly flammable. Do not use them anywhere near open flames.
5. Always pour acids into water. If you pour water into acid, the heat of reaction will cause the water to explode into steam, sometimes violently, and the acid will splatter.
6. If chemicals come into contact with your skin or eyes, flush immediately with copious amounts of water and consult with your instructor.
7. Never point a test tube or any vessel that you are heating at yourself or your neighbor--it may erupt like a geyser.
8. Dispose of chemicals properly. Waste containers will be provided and their use will be explained by your TA. Unless you are explicitly told otherwise, assume that only water may be put in the lab sinks.
9. Clean up all broken glassware immediately and dispose of the broken glass properly.
10. Contact the instructor for clean-up of mercury spills.
11. Never leave burners unattended. Turn them off whenever you leave your workstation. Be sure that the gas is shut off at the bench rack when you leave the lab.
12. Beware of hot glass--it looks exactly like cold glass.
13. Never pipette a liquid by mouth. Use a pipette bulb.
14. Do not use cracked or broken glassware.

I_____ acknowledge that I have read and understand the Chemistry Lab Safety Rules above and agree to follow the safe laboratory practices listed.

Signed_____ Date_____