Course Syllabus: Organic Chemistry II
Chem 224-02, Spring 2012

Professor:	Dr. Jordan Fantini		
Phone:	740-587-6491	Class:	MWF 10:30 – 11:20 AM, Ebaugh 202
Email:	fantinij@denison.edu	Laboratory:	F 1:30 – 4:20 PM, Ebaugh 215
Office Hours:	Mon and Thurs p.m. (use tungle)	Office:	Ebaugh 208

Course Goals (see **Learning Objectives** given out with each chapter for detailed goals.)

- To make connections between the shape and electronic structure of molecules, and their reactions
- To master a body of organic reactions in order to propose multi-step syntheses of compounds
- To learn the fundamentals of organic structure determination by a combination of NMR, IR, UV-vis, and mass spectrometry
- To learn a great deal about the reactions of compounds containing the C=O group
- To continue to develop an understanding of the principles of reaction mechanisms
- To develop an understanding of the elements of an organic reaction
- To continue to learn techniques for laboratory analysis
- To foster an appreciation for the relationship between organic chemistry and biological systems

Course Philosophy

This semester we will embark on a new exploration of organic chemistry that builds on the foundation learned in the first semester of organic chemistry and gives a beginning for connecting organic molecules with the science of life. We will study functional groups containing the C=O bond and their special properties. These functional groups are prominent in DNA and proteins, and their properties are intricately related to the behavior of these molecules.

Communication is a skill important to all scientists. Being able to effectively communicate your own understanding of concepts will help you on exams and, likely, in most other aspects of life. During this semester, we will explore together ways of expanding our communication skills. This exploration will include working in groups, class discussions, writing reports, writing a paper, and oral presentations. In order to participate fully in these exercises, it is important to read the assigned material, and attempt to understand it. I encourage students to form study groups to prepare for exams and review the suggested problem sets. Exams necessarily test your written communication skills along with your mastery of the material. On an exam, you are the teacher – teaching the grader what you know about the problems.

As this course is progressive, new topics build on the previous ones. Falling behind can have long term consequences. If at any time you feel that your understanding of the subject covered is lacking, I encourage you to see me for help outside of class. Often things will seem clearer in a one-on-one or small group session. I am happy to work with you and match your efforts toward your goal of learning.

This class is an exploration for both you and me. While my intent is to maximize everyone's benefits from this class and I hope that you will embrace this exploration, I also realize that each class has its own personality. I am extremely interested in feedback and encourage you to share with me your thoughts about this class at any point as the semester progresses.

Office hours

Office hours are on Monday and Thursday afternoons. **All appointments must be made using Tungle** so that I can be sure to note the time of our appointment in my calendar.

Required Materials

Organic Chemistry (3rd Edition) by Janice Gorzynski Smith (**with CONNECT**) (ISBN: 978007-740571-7)
Making the Connections: A How-To Guide for Organic Chemistry Lab Techniques (1st or 2nd Edition is OK) by Anne B. Padias (ISBN: 1st ed. 978-0738019857; 2nd ed. 978-0738041353)
Safety goggles (not safety glasses)
Bound Composition Notebook (must have permanently attached pages)
CHEM 224 Lab Packet (Denison University Bookstore) (New this semester)

Suggested Optional Materials

Student Study Guide/Solutions Manual to accompany Organic Chemistry by Janice Gorzynski Smith & Erin R. Smith (ISBN: 978-0077296650)

Student Model Kit – A model kit to build organic molecules and to help visualize the three dimensional structure of compounds. The model kit is not required, but it is strongly recommended!!!

Note Taking

Note taking is an important part of any class. Your notes are your primary source of information when studying. It is important, therefore, to approach note taking in a useful way from the first day of class. I would describe my lecture style as moderately informal. I will lecture, but I will also ask questions and encourage discussions. I will write equations, problems and structures on the board or show figures on the screen when I think it is important for illustration. **These illustrations are not meant as a complete set of notes.** To get the most out of your notebook, you should also be taking notes on the lecture itself, including marking any passages that I stress more than once, as particularly important. I will write a broad outline of the topics covered each day. These outlines should provide you with headings for your notebook, but your notes should have more detail.

How to Succeed

The best way to get a good grade in this class is to truly understand the material. The better you understand, the better your grade will be. Please try not to get caught up in memorization, focus on the learning.

- Do all the problem sets—you will see these types of questions again.
- Do all the textbook problems—the textbook problems cover the basics thoroughly and offer more-involved problems. **Let the textbook problems guide you to read the book.**
- Ask questions! Questions let me know where to focus my help.
- If you are a good memorizer, make flash cards—memorizing can't get you all the way but it can help.
- Utilize the Chemspa. These students are there to help and have been in your shoes.
- Before each exam, do the problem sets and textbook problems again without looking at the answers! Only if you can do them at home will you be able to do them on the exam.
- Don't fall behind! As hard as it is to keep up, it is harder to catch up.
- Don't highlight passages in the book unless you have done everything else above first!

Assignments

Problems out of the textbook will be assigned for each chapter. These assignments will not be collected. Remember that practice is the best way to reinforce learned concepts and uncover holes in your knowledge. Working through these suggested problems is *essential* to doing well in this course. Problem sets will be assigned, collected and graded to give you more feedback on your understanding. CONNECT online homework will also be assigned. The online homework allows for multiple tries up until the time it is due.

Course Communication.

I've set up a course question-and-answer site piazza.com. This is a place we can address chemistry questions for the benefit of the whole class. Please post any chemistry questions for me on that site instead of sending by email. All other questions, including questions of a personal or confidential nature, should still be sent by email.

This is the second semester I have used the piazza site. It worked nicely last semester. It was recommended by one of the profs in Math. Please give it a try for a few weeks and then let me know what you think of it. We can adjust what we are doing if it's not the right thing for our class.

Online Homework Links.

Here is the web page for the online homework. Online homework will be due approximately once a week. Your code from last semester should work again for this semester.

10:30 class	http://connect.mcgraw-hill.com/class/j_fantini_chem_224-02

Disclaimer

I have borrowed liberally (and copied some sections) from the syllabi of Drs. M. Mitton-Fry and Reczek in compiling this document. I thank them for their help. Any errors should be blamed on me not them. I may periodically update the syllabus or correct mistakes in class or by e-mail.

Exams

Exams are: Friday Feb. 17 during lab time, Weds. March 7 at 7 pm, and Weds. April 18 at 7 pm.

Since the exam dates are set far in advance I expect all students to be able to plan appropriately. No make-ups will be given. If you have a legitimate verifiable excuse for missing an exam please see me in advance of the exam day to discuss your options. The conditions for taking an evening-scheduled exam at an alternate time are explained at the end of this syllabus. The college does not allow a final to be given at any time other than that scheduled. Our **Final is May 4, 2011 at 9:00 am**. (until noon).

Optional Exam Retakes

For the first two exams in the course, I shall prepare two versions of the exam. They are similar in most fashions and neither one is made intentionally more difficult than the other. Should a student not be satisfied with the grade they earn on an exam the first time around, they may take the optional retake. The student's exam grade shall be the higher of the two grades, EXCEPT that the highest grade that can be earned for credit on the optional retake is a "B". This means an 83% is the highest grade that will be counted on a retake (middle of the "B" range). In other words, the retake exists to give the opportunity to overcome a great "goof-up" the first time around, but on the other hand, an "A" must be earned on the first attempt. Retake exams will be in the week following the exam. ***There is no such retake available for the Third Exam or the Final Exam.*** (See also the explanation at the end of the syllabus.)

Grade Determination

The *tentative* point total is as follows:

3 Exams	300	
Final Exam	200	
Quizzes/Assignments/Particip.	150	
CONNECT homework	50	
Drug paper	100	(more info to come)
Oral presentation	50	(more info to come)
Laboratory	200	
Total Points	**1000**	

The 200 points that make up the laboratory component of the grade will roughly be weighted as follows: lab results and analysis 40%; quizzes, reports and notebook record 50%; lab technique as assessed by instructor 10%.

The *tentative* grade assignments for the course are:

88 – 100% - some form of A
78 – 87% - some form of B
68 - 77% - some form of C
58 - 67% - some form of D
< 58% - F

I may lower the cutoffs for receiving a given letter grade, but I will not raise them. I will not be grading on a bell curve with some set number of D's or F's. It may be possible for everyone to receive A's if everyone has put forth maximum effort and has complete mastery of the material.

A Comprehensive Final Exam is scheduled for Friday May 4th at 9:00 am. You must take the Final, at the time scheduled, in order to pass the course.

Disability Statement. **(text of this section provided by the Office of Academic Support and Enrichment)**
Any student who feels he or she may need an accommodation based on the impact of a disability should contact me privately as soon as possible to discuss his or her specific needs. I rely on the Academic Support & Enrichment Center in 102 Doane to verify the need for reasonable accommodations based on documentation on file in that office. If you wish to take advantage of these accommodations, please let me know in advance so the appropriate arrangements may be made.

Academic Integrity Statement. **(text and image of this section provided by the Provost of Denison University)**
Proposed and developed by Denison students, passed unanimously by DCGA and Denison's faculty, the Code of Academic Integrity requires that instructors notify the Associate Provost of cases of academic dishonesty, and it requires that cases be heard by the Academic Integrity Board. Further, the code makes students responsible for promoting a culture of integrity on campus and acting in instances in which integrity is violated.

Academic honesty, the cornerstone of teaching and learning, lays the foundation for lifelong integrity. Academic dishonesty is intellectual theft. It includes, but is not limited to, providing or receiving assistance in a manner not authorized by the instructor in the creation of work to be submitted for evaluation. This standard applies to all work ranging from daily homework assignments to major exams. Students must clearly cite any sources consulted—not only for quoted phrases but also for ideas and information that are not common knowledge. Neither ignorance nor carelessness is an acceptable defense in cases of plagiarism. It is the student's responsibility to follow the appropriate format for citations. Students should ask their instructors for assistance in determining what sorts of materials and assistance are appropriate for assignments and for guidance in citing such materials clearly.

For further information about the Code of Academic Integrity see
http://www.denison.edu/academics/integrity/

Writing Center. **(text of this section provided by the Denison University Writing Center)**
The Center is a free resource available to all Denison students. Student writing consultants from many majors help writers one-on-one in all phases of the writing process, from deciphering the assignment, to discussing ideas, to developing an argument, to finalizing a draft. Because proofreading is a last step in that process, writers should leave plenty of time for getting their ideas right before expecting proofreading help. Consultants also can help writers with personal documents, like job and internship applications. The Center is located on the fourth floor of Barney-Davis Hall; satellite locations are on the third floor of the Library (the Entry level) and the first floor of Fellows near the Computer Lab. Appointments between 4 p. m. and 9 p. m., Sunday through Thursday, can be made in the Barney location by phoning 587-JOT1. The satellite locations are drop-in; check the website at http://www.denison.edu/writingctr/ for those hours.

Courtesy Statement.
Please come to class on time, and plan to stay until the end. Please turn your cell phones off during class and do not send or receive text messages. If your phone rings during class, I will try to dance to its tune until you turn it off. I will also be duly embarrassed if my phone rings—yes I have made this mistake a time or two before. The use of lap top computers during class time is not allowed.

Assignments

Working with a pencil and paper—actively engaged with your textbook and the end-of-chapter problems—is one of the most effective tools a student has for learning organic chemistry. I will assign problems from the textbook that relate to the covered material. Because the ideal learning process is iterative, it is important to complete these problems, then review the material to better develop the concepts and then repeat the practice problems. These are not graded, but are strongly suggested for success and mastery of the course material. Working through these problems is essential to doing your best in this course. If you have questions on these problems, please ask. If you have questions, chances are your classmates do as well.

About once a week you will be assigned a set of online homework problems using the Connect system. You will have the opportunity to try these problems as many times as necessary to achieve mastery of the question. These are graded, but you get to keep trying the problems as many times as you like before the due date!

There will be other assignments associated with the course, including Problem Sets. See the following section on Quizzes..

Quizzes

There will be approximately ten(10) quizzes this semester. More than 75% of the time, quizzes will be announced ahead of time. At the end of the semester I will drop some amount of your lowest (or missed) quizzes. *Because of this drop policy, there will not be make-up quizzes, even if the quiz is missed for an excused absence.*

There will be several problem sets handed out over the course of the semester. These count toward your grade in the same category as quizzes, though the longer sets will be worth more points. These problems are written by me and are directly related to the types of questions you will encounter on an exam.

Engagement/Participation

Your class engagement/participation grade will be based on the amount and quality of effort that I perceive you are putting into the class. Ways to make it evident to me that you are putting forth effort to learn the material include: (1) attend class, (2) do the homework problems, (3) ask questions and respond to questions in class, (4) answer questions during problem sessions, (5) bring questions to ask me during office hours, (6) attend help sessions, (7) form study groups. Class engagement and participation will increase your level of success in this course and increase how much you get out of the course. In terms of your grade, I also take this into consideration when a student's numerical grade is very near a dividing line between two grades.

Attendance

I will not take attendance, but I think it's a great idea to come to class. Material presented in class complements the textbook, so if you miss a class you are responsible for begging for class notes from your classmates. If you miss a quiz, you will receive a zero for that quiz (note: the lowest few quiz grades are dropped).

Unexcused absence from an exam will result in a score of zero on the exam. Examinations may be made up or an adjustment will be made if an excused absence is submitted and accepted prior to the examination. It is your responsibility to provide written verification of excused absences. Sports and arts schedules are ALREADY PUBLISHED! Please don't wait until just before a game/match/recital/etc. to inform me that you need to miss class for an extra-curricular event.

Laboratory

TO OBTAIN A PASSING GRADE IN THE COURSE YOU MUST COMPLETE ALL ASSIGNED LABORATORY WORK. Makeup of non-health related excused lab absences must be arranged ahead of time. Excused lab makeups should be done during the same week the rest of the class does the lab experiment. When you need to make up lab with another section, you must inform me, but it is still **your responsibility to obtain permission to attend the other professor's lab**. Please exercise good manners by seeking that permission at least 24 hours before their lab is scheduled to meet.

Office Hours

I have regular office hours for this course. There may be an announced change in these times but for now they are:

Monday 1:00 – 3:30 p. m.
Thursday 1:00 – 3:30 p. m.

Please make an appointment via tungle.me to meet during one of these times. Generally choose a 30-minute meeting duration. If you have a course conflict with these times, please let me know so we can make other arrangements. Come to office hours with any questions about the course material. I encourage you to bring some friends and we will work on things at a white board. You can also post questions on Piazza and I will respond within 24 hours and sometimes more like 24 minutes. The "Chemspa" hours will be announced in the second week of class.

Evening review sessions. I'll hold one of these every week, if possible. The specifics will be announced, but it will probably be on Wednesday evenings at 7 pm before Dr. M. Mitton-Fry's review at 8 pm. Dr. Mitton-Fry and I have coordinated our syllabi and welcome students from the other's sections to attend the reviews.

Laboratory Syllabus

Introduction

This lab coincides with the second semester lecture course in organic chemistry. While there is a relationship between the lab and lecture materials it will sometimes not be very direct. Thinking and doing organic chemistry require distinct approaches. In the laboratory we will be using important techniques for doing organic chemistry—distillation, recrystallization, extraction, etc.—and learning how materials actually behave. If done properly, these efforts will strongly complement your classroom-based understanding of organic chemistry. Analytical techniques in chromatography and spectroscopy will get extensive attention.

You will be learning (1) fundamental ideas and techniques important to doing laboratory work, (2) careful observation and record keeping, (3) reliability and independence in the organic laboratory, and (4) the scientific questions that are important in the organic chemistry laboratory. Particular care should be devoted to your pre-lab preparations.

Safety

Working in an organic chemistry laboratory poses certain risks which we have attempted to minimize. However, safety in the laboratory requires a strong commitment from all of us.

1. Safety goggles must be worn at all times. Do not wear contact lenses in the lab.

2. Sandals should not be worn in the lab at any time and shorts are discouraged. Clothing is much easier to replace than skin! A laboratory coat may be a good investment.

3. Never work alone in the laboratory. Someone must always be aware of what you are doing. Unauthorized experiments are not permitted.

4. Know the location and purpose of the safety devices in your lab.

5. Dispose of glassware and chemical wastes in the containers provided. Minimize the amounts of chemicals you use.

6. Know the properties of the chemicals you are using.

7. Avoid the use of open flames.

8. Avoid contact with the materials you are handling. Inhalation and absorption through the skin or open cuts are common routes of entry. Gloves may be recommended for certain operations.

The lab notebook

This semester you will make significant progress in learning to keep a notebook record of your work.

Use the beginning of the notebook keep a Table of Contents, which should be kept up to date. All pages should be numbered and none should be torn out. The record of each experiment should include the following sections:

Before coming to lab: *(STARTING WITH WEEK 2! You can come to Week 1 without this done!)*

1. Title and experiment reference.
2. A statement of purpose -- be specific.
3. Balanced equations, where appropriate, that define stoichiometry of the limiting reagent, the formation of side products, and/or the mechanism.
4. A table of reactants, products, solvents, and reagents that list relevant physical properties and the amounts of materials used. The information required for this table can be found in the description of the experiment, the Aldrich Chemical Co. catalog, *the CRC Handbook of chemistry and Physics* or the *Dictionary of Organic Compounds*.
5. Calculation of the theoretical yield. Your table should include all the information that was used to calculate the theoretical yield.

As you proceed to do the experiment:

7. A record of what you actually do that includes observations of physical changes, specific details about techniques used and the results obtained, and any calculations, *created as you perform the experiment*. Analytical results such as TLC slides should be attached in the notebook and their interpretation recorded.

During or after the experiment (as appropriate):

8. Your interpretation of results and a discussion that explains the results.
9. A conclusion.

You should prepare your notebook record in such a way that someone not only can repeat your work but also can repeat it with more understanding than if only the lab text were available. In other words the notebook record should allow someone else to benefit from the fact that you did the experiment.