**CHEM 348 Organic Chemistry II**
**Spring 2018**

**Instructor:**
Dr. Greg Crouch, Fulmer 414, gcrouch@wsu.edu

**Prerequisite:** A letter grade of C or better in Chem 345.

**Contacting Instructors and TAs:** Use your official WSU email account when contacting instructors or TAs. Please put "chem 348" in the subject field of the email. TA email addresses are located on the main menu of the course homepage.

**Office Hours:**

- Dr. Crouch: M/W/F 11:00 am – noon **and** by email appointment. When emailing for an appointment, provide several times that are open in your calendar. For example: "I would like to meet with you. My free times are Monday from 2-4pm, Wed from 9-10, and Thur from 12-2."
- TAs office hours are held in Fulmer 318. A schedule will be posted on the course website as well as on the door to Fulmer 318 no later than the first week of class.

**Class Meeting:**

- Section 1 MWF 10:10-11:00 pm Todd 216

**Course Website:** All course material is on our website at:

- http://learn.wsu.edu
- In addition, we have a course Facebook group page at: http://www.facebook.com/groups/chem.348

**Required Course Materials:** Digital access to Bruice's *Organic Chemistry* (8th edition) with Mastering Chemistry for online homework is included in your course fee and available via the course Blackboard website. This system does not use codes. See https://chem.wsu.edu/firstday/ for details

*For all Mastering Chemistry Support issues, see the instructions in the Course Materials folder on the course website.*

If you don't already have one, you will need an organic model kit. These can be very expensive so be careful. A cheap model kit is http://www.darlingmodels.com/Individual-Orders-Molecular-Model-Kits/KIT-3-ISBN-978-09648837-4-1-MOLECULAR-VISIONS-Organic-Kit/prod_7.html Model kits can also be purchased on eBay or Amazon for a reasonable price. It is essential you have a model kit before the first exam.

**Course Objectives and Description:** Students completing Chem 348 will be able to

1) Rationalize molecular reactivity based on functional groups,
2) Develop abstract reasoning skills sufficient to preform synthesis and mechanism type questions typical of second semester organic chemistry.
3) Be able to interpret experimental data (NMR/IR) to assign reasonable molecular structures.
4) Extend problem solving skills to a small group learning community.

*Couse Description*

This course builds on the functional group/synthetic approach introduced in Chem 345 with a focus on synthesis and mechanism. In addition to lecture, Chem 348 provides an opportunity to develop your chemical problem solving skills through small group workshops. These workshops have limited enrollment and are run by senior teaching assistants. By participating in these workshops, you will learn useful ways of solving synthesis and mechanism problems that directly relate exams. There will be 12 workshops throughout the semester. In Chem 348, 70% of your grade is based on exams, 10% on homework, and 20% on attendance and participation in the workshops.

*Workshops*
There will be 12 workshops throughout the semester where attendance is required. In these workshops you will be provided with problem sets that cover important nomenclature, structures, reactions, and mechanisms that you will be responsible to learn. These problem sets and keys will be posted on the course website the following week. If you come to office hours for help on these problem sets, you must bring your work. In other words, do not bring blank pages and ask me or a TA to solve the problem. This does not help you prepare for exams.

**Student Learning Outcomes:**

1. Use chemical acid/base reactivity to predict chemical equilibrium.
2. Describe chemical reactivity in terms of organic functional group chemistry, including functional group transformation.
3. Interpret structural changes within a chemical framework considering bond making and bond breaking.
4. Propose reasonable mechanisms that convert starting materials to product
5. Interpret stereochemical data that informs a mechanistic hypothesis.
6. Plan an organic synthesis using a retrosynthetic approach based on known chemical reactions.
7. Interpret experimental data in reasonable ways.
8. Work as an effective team member of a problem solving small group.

**Assessment:** Student Learning Outcomes 1 - 7 will be assessed with homework, lecture participation, and hand-graded exams. We do not use multiple choice exams so we can assign partial credit for reasonable answers Student Learning Outcome 8 will also be assessed by attendance and participation in the 12 required workshops.

**Assignments & Grading Policy**: This course will be graded on the basis of homework, two midterm exams, a comprehensive final exam, and workshop participation.

- *Midterm exams:* Two hourly exams will be administered to assess subject mastery. These exams are <u>not</u> multiple choice. Prior semester exams are provided on the course website. The second midterm exam (as well as the final) are comprehensive. Each midterm exam is 20% of your grade. If you miss a midterm exam, your final will count at 50%
- *Final exam:* A three-hour mandatory final exam will be given at the end of the course. The final exam is worth 30% of your grade.
- *Homework:* Mastering Chemistry online homework is used in this course and is worth 10% of your grade.
- *Workshops:* Weekly problems solving workshops are worth 20% of your grade. These workshops are graded on attendance and participation. You may miss up to two Workshops and still receive full credit for this component of the course.

**Grade Scale:** This course will use the following grade scale. Please note this scale may change slightly from year-to-year.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A | 92-100 | B | 83-85 | C | 72-76 | D | 61-64 |
| A- | 89-91 | B- | 80-82 | C- | 69-71 | F | <60 |
| B+ | 86-88 | C+ | 77-79 | D+ | 65-68 | | |

**Grade Summary:** A sample calculation is shown below that includes a hypothetical grade for each component.

| | | *sample calculation* | | | | |
|---|---|---|---|---|---|---|
| *graded components* | *weight* | score | weight | | | weighted score |
| homework | 10% | 70 | x | 0.1 | = | 7 |
| test 1 | 20% | 67 | x | 0.2 | = | 13.4 |
| test 2 | 20% | 62 | x | 0.2 | = | 12.4 |
| final | 30% | 77 | x | 0.25 | = | 23.1 |
| workshop | 20% | 90 | x | 0.2 | = | 18 |
| | 100% | | | sum | | 73.9 |

In the sample calculation above, the composite score of 73.9 would round to 74 and correspond to a letter grade of C according to the grade scale. However, since the final exam is comprehensive, we also consider that score alone and if it is better than the composite score, that will be the grade awarded. For this example, the final exam score is 77%, which corresponds to a letter grade of C+, so that is the grade awarded for the class.

| composite score | final exam | best score | best letter grade |
|---|---|---|---|
| 74 | 77 | 77 | C+ |

We do not give make-up exams. *If you miss one hourly exam, the final exam will increase to 50% of your course grade*.

**Test Schedule:** All tests and exams are evening exams. If you off campus due to a university sponsored event, you may arrange for an academic counselor to proctor the exam. You must make these arrangements within the first two weeks of the semester. If you miss an hourly exam, the final exam will count at 50%.

| | | |
|---|---|---|
| **Test 1**, Thursday 2/15 from 8 - 10:00 pm. | **Test 2**, Thursday 3/29 from 8 - 10:00 pm. | **Final**, Wednesday 5/2 from 7-10:00 pm. |

Tests 1 and 2 are written for a standard one-hour time frame so it is permissible to start Test 1 or Test 2 up to 9:00 pm and still have sufficient time to complete the exam. The final exam is written for an average student to complete in 90 minutes. Officially approved and scheduled night examinations have priority everything except officially scheduled lectures and labs. If you have a conflict with another evening academic activity such as a biology or physics lab course, you must arrange for an alternate test time at least two weeks prior to the exam. There is no penalty for missing an hourly exam as it simply increases the weight of the final exam. Do not make travel plans before the final exam. Your travel cannot be accommodated.

**Test Policy and Regrades:** Bring only your student ID, a model kit, and pencils to the exams. You will be provided scratch paper. You may not bring any electronic or internet connected device to the exam. Do not bring or leave visible any notes. If you are observed using any electronic device, reading off fellow student's tests, or using notes, you will fail the exam and be asked to leave the testing room. Such action is interpreted as a breach of academic integrity and will be reported to the Office of Student Conduct. Once exams have been graded, they will be distributed electronically. Look over the exam carefully and make sure the points have been added correctly. If you find an error, complete a regrade form (course website) and email this completed form to your course instructor within two weeks of the exam. Regrades submitted after that time may not be reviewed. Be very clear when completing the regrade form. For example, "there is an error in my total points" or "on question 2, I drew the correct intermediate structure…." Avoid requests that include "I feel as if I deserve more points."

**Lecture Schedule**

| *Week* | *Starting* | *Monday* | *Tuesday* | *Wednesday* | *Thursday* | *Friday* |
|---|---|---|---|---|---|---|
| Week 1 | January 8 | Lecture 1 | | Lecture 2 | | Lecture 3 |
| Week 2 | January 15 | MLK Day | | Lecture 4 | | Lecture 5 |
| Week 3 | January 22 | Lecture 6 | | Lecture 7 | | Lecture 8 |
| Week 4 | January 29 | Lecture 9 | | Lecture 10 | | Lecture 11 |
| Week 5 | February 5 | Lecture 12 | | Lecture 13 | | Lecture 14 |
| Week 6 | February 12 | Lecture 15 | | Review | Test 1 | No lecture |
| Week 7 | February 19 | Pres Day | | Lecture 16 | | Lecture 17 |
| Week 8 | February 26 | Lecture 18 | | Lecture 19 | | Lecture 20 |
| Week 9 | March 5 | Lecture 21 | | Lecture 22 | | Lecture 23 |
| | March 12 | Spring Break | | | | |
| Week 10 | March 19 | Lecture 24 | | Lecture 25 | | Lecture 26 |
| Week 11 | March 26 | Lecture 27 | | Review | Test 2 | No lecture |
| Week 12 | April 2 | Lecture 28 | | Lecture 29 | | Lecture 30 |
| Week 13 | April 9 | Lecture 31 | | Lecture 32 | | Lecture 33 |
| Week 14 | April 16 | Lecture 34 | | Lecture 35 | | Lecture 36 |
| Week 15 | April 23 | Review | | Review | | Review |
| Finals | April 30 | | | Final Exam 7-10 pm | | |

**Lecture Topics:** Given that we will only cover selected sections in the required textbook, lecture slides will be available in advance of lecture on the course website. You may use these to orient lecture with readings from the textbook.

**Students with Disabilities:** Reasonable accommodations are available for students with a documented disability. If you have a disability and need accommodations to fully participate in this class, please either visit or call the Access Center (Washington Building 217; 509-335-3417) to schedule an appointment with an Access Advisor. All accommodations MUST be approved through the Access Center. For more information, contact a Disability Specialist

**Academic Integrity:** You are encouraged you to work with classmates on assignments, however, each student must turn in original work. No copying will be accepted. Falsified lab data is also a violation of academic integrity. Students who violate WSU's Standards of Conduct for Students will receive an F as a final grade in this course, will not have the option to withdraw from the course, and will be reported to the Office Student Standards and Accountability. Cheating is defined in the Standards for Student Conduct WAC 504-26-010 (3). It is strongly suggested that you read and understand these definitions. In addition, if during an exam you use an internet connected or other electronic devices, you will fail the exam and be reported as described above.

**Safety Statement:** Washington State University is committed to enhancing the safety of the students, faculty, staff, and visitors. It is highly recommended that you review the Campus Safety Plan (http://safetyplan.wsu.edu/) and visit the Office of Emergency Management web site (http://oem.wsu.edu/) for a comprehensive listing of university policies, procedures, statistics, and information related to campus safety, emergency management, and the health and welfare of the campus community.