



## Course Information



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### Chemistry 0310, Organic Chemistry 1

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Office Hours: Tuesday and Friday 4:00-5:00 pm, or send an email to set a specific time. (When emailing to arrange a meeting, please suggest three specific times that you can meet -- I'll respond by reply email with which of those times works for me as well.) (Please note - that due to the multiple responsibilities that I have, on occasion I will not be at these office hours. In those cases, I will try to remember to post a note on my door.) If my door is open, come on in. If my door is closed and there is no note, it is highly likely I will be back within 5 or so minutes.) You can also send me an AOL IM (username is joegphd) to see if I am in or to make an appointment. Note, that in general, I feel that IM and email is an insufficient method for a conversation or explanation -- but they are great tools to set up a face-to-face meeting to have a conversation or to explain something.



### Class Meeting Times - Chem 0310

Lectures will begin promptly each Monday and Wednesday at 6:00 p.m. and will conclude at 7:15p.m. in Benedum Hall, Room 157. In my opinion, based on many years of both being a student and teaching students, ATTENDING ALL LECTURES and FAITHFULLY DOING ALL PROBLEM SETS are by far and away the most efficient ways of learning the Organic chemistry that we will be responsible for.

*Note: Benedum 157 used to be Benedum 155 -- the number changed in August 2009 following the renovations.*

**Please respect the class** -- if you must enter the classroom after the start time (see above) or before the end time (see above), or if you must make a "coffee run" in the middle of lecture, I request that you use the doors at the rear of the classroom.

**Recitations** will be a part of this course. At each recitation, Wednesdays, 7:20-8:10pm, BH-157 (OR at such other times and locations as arranged by the instructor), we will have small group PLTL-type workshops based primarily on end-of-chapter problems. You should faithfully attend and actively participate in the same group each week. PLTL is a well-designed, well-researched, and well-documented "successful strategy" for substantially improving performance in Organic Chemistry for those students who avail themselves of that opportunity. We will take attendance at recitation.

**Tutoring** is available, FREE, in the Fishbowl (see <http://www.chem.pitt.edu/p.php?pid=114>)

**Tutoring** is available, FREE, in the Academic Resources Center (ARC; see <http://www.as.pitt.edu/arc>).

- The Academic Resource Center provides tutorial services for undergraduates in specific Arts and Science courses. Peer-lead study skill workshops are also provided.
- The fall 2101 Tutorial Schedule includes: Chemistry 0310 (along with many other courses).
- Survival Workshop Series and other Workshops will highlight skills specific to studying, test taking, note taking, time management and more.
- Students who would like one-on-one or group tutorial assistance should call the ARC: 412-648-7920 to check tutor availability and schedule an appointment.
- For a full listing of courses and workshops, visit <http://www.as.pitt.edu/arc>.
- Check out their calendar of events: <http://calendarwiz.com\arcservices>

Private (for hire) tutors are listed on the Chemistry Department's web site (see <http://www.chem.pitt.edu/p.php?pid=114>).



### Alternate Recitation Times

We recognize that having a recitation on Wednesday evening after the normal 75-minute lecture might not serve every students' needs. Therefore, we have arranged a limited number of opportunities for alternate recitation times for Chem 0310 (instead of the 7:20-8:10pm normal time). If you are willing to COMMIT to one of these alternate times, please add your name and select JUST ONE time. Note that the date and

time of JUST THE FIRST meeting is shown -- each group will continue to meet that same day of the week/time for the rest of the semester. The first 8 respondents for each date/time get the seats and the rest form a waiting list."

Sign-up for alternate recitation times here: <http://doodle.com/t8dbqxkkkvfycxw5>.

### Course Description



This two semester sequence of Chem 0310 and 0320 is an introduction to the theory and practice of organic chemistry through the study of structural principles, reaction mechanisms, and synthesis of all types of organic (i.e., carbon-based) compounds. The basic goals of the courses are to develop an appreciation of and skills at using the methods of "molecular analysis" which have made organic chemistry such a powerful intellectual discipline that leads to understanding many phenomena, from the basis of cellular structure and function to how to provide specific therapeutics at affordable costs to combat a host of human ailments. The two-course sequence will prepare a student for advanced topics in biochemistry, molecular biology, medical sciences, chemistry, chemical engineering, and material sciences, to name but a few.

**Prerequisites:** A strong understanding of all the topics covered in general chemistry is helpful in Chemistry 0310 and it is impossible to master the material in Chemistry 0320 without having understood the principles of Chem 0310. (Students who receive less than a C- grade in Chem 0310 should repeat that course before attempting to take Chem 0320.)

**Outline in brief:** The course is organized around Chapters 1-13 in the Vollhardt and Schore (5th edition) textbook. Course evaluation is based on 3 in-class hourlies (each is cumulative from the beginning of the semester), 10 take-home "Exam 4" parts (of 11 offered), and a comprehensive final.

**Other options:** Have you consider taking Honors Organic Chemistry? If you are interested in considering this alternative, small-enrollment class, please see Prof. G.

### Course Rationale



"We believe that a course should do more than provide students with a strong background of knowledge in a field. We believe that a course should enable students to use their strong backgrounds to solve problems, and that a truly valuable course should focus beyond the final exam to add to students' future lives, abilities, and skill sets and prepare students to think for themselves in the discipline after the course is over. Designing such a course is a challenge and involves providing not only opportunities for students to master content but also opportunities for students to practice thinking for themselves in the discipline so that they will be prepared to do so after the course is over." (Tewksbury and Macdonald, 2008)

"Science is not necessarily about absolute truths. It represents our best discernment based on the results of scientific processes applied to quantifiable data. Theories change and evolve over time as our understanding grows, new questions are asked, experiments are performed, and new data are gathered. Science doesn't have all the answers, nor does it purport to. Scientists don't gather "facts". That said, critical thinking and analysis are applied in an unbiased fashion to data gathered in response to a question posed. The results have their limitations. They can also illuminate startling findings (e.g., evolution, the expanding universe, plate tectonics, global warming). Provable, testable results provide strong insights into our natural world." (J. Pedicino, 2008)

"Chemistry is a central science in the sense that it bridges such disparate areas as physics and biology, and connects those long-established sciences to the emerging disciplines of molecular biology and materials science. Similarly, ... organic chemistry sits at the center of chemistry, where it acts as a kind of intellectual glue, providing connections between all areas of chemistry. One does not have to be a chemist, or even a scientist, to profit from the study of organic chemistry." (M. Jones, 1997)

### Course Goals



We will address three big questions:

- (1) How do I understand structure and properties of millions of compounds?
- (2) How do I appreciate and predict electron movement in any organic reaction mechanism (i.e., how do I appreciate and predict reactivity of organic compounds)?
- (3) How do I apply the fundamental principles of organic chemistry to appreciate structure, properties, and reactions of compounds that will only be discovered tomorrow?

By addressing the three questions noted above, we will begin to experience (with the sub-discipline of organic chemistry) the three things that chemists do (*J. Chem. Ed.*, 2006, 83, 655-661):

- they *explain* phenomena.
- they *analyze* matter to determine its chemical make-up.
- they *synthesize* new substances.

In addition, we will also use and further develop items in a chemist's *toolbox* (a collection of procedures and models that are used as needed when directing syntheses, conducting analyses, and developing explanations).

In a broader sense, the goal of this course is help all students enhance their proficiency in science.

Proficiency in science can be considered to have four strands:

1. Know, use, and interpret scientific explanations of the natural world.
2. Generate and evaluate scientific evidence and explanations.
3. Understand the nature and development of scientific knowledge.
4. Participate productively in scientific practices and discourse.



### Course Materials

**Text:** *Organic Chemistry: Structure and Function*, 5th Edition (Third printing), by K.P.C. Vollhardt and N.E. Schore; W.H. Freeman and Company, 2007. [Also available as an eBook at <http://ebooks.bfwpub.com/orgchem.php>]

**Lecture Notes:** Incomplete copies of the Powerpoint slides used in lecture are posted to the CourseWeb site prior to lecture. It is recommend that all students come to class with a copy of these slides to facilitate note taking. No other copies of the powerpoint slides will be provided.

**Optional:** *Study Guide and Solutions Manual for Organic Chemistry: Structure and Function, 5th Edition* by N.E. Schore; W.H. Freeman and Company, 2007.

In the Chemistry Library in Eberly Hall, you can access reserve copies of both the 4th and 5th editions of Vollhardt and Schore's textbooks. Study Guides and Solution Manuals for both editions are also on reserve in the same location.

**Models:** A set of molecular models helps students understand the molecular-based approach that we use in this course. Although not required, it is strongly recommended that you borrow or buy a set of models such as Molecular Model Set for Organic Chemistry by Allyn & Bacon and that you use these models throughout the course. You will be allowed to use molecular models during all exams EXCEPT THE FINAL. (If you don't have a set of plastic models, use jelly beans and toothpicks.) Model kits are sold in the bookstore. You can also find some on-line; for instance, see the \$30 model kit available from [www.indigo.com](http://www.indigo.com).

**Handouts** may be provided to you at various times throughout the semester - often these handouts will contain material presented on the projector screen during the lecture. Handouts will only be provided at the one lecture section in which they are discussed so be sure to pick them up at that time. Handouts can also be retrieved, "after the fact", from the course web site.

**Old Exams** are available through the Course Web site. Additionally, the ACS-SA sells old exams from a variety of previous Chem 0320 courses - all of these provide additional practice at problem solving and are a good general purpose learning tool. Be advised that there is no implied guarantee that exams written for courses using a different text or by a different Professor are perfectly relevant to any specific exam in our course; they are of course an excellent resource to really self-test your knowledge of the broader world of Organic Chemistry and so are a valuable additional resource for the dedicated student.



### Course Requirements and Grading

**Course Grading:** Your course grade will be determined from your performance on the equivalent of four "hourly" exams and the final exam. The hourly exam dates shown on the Course Schedule are tentative and may be changed at the professor's discretion.

- IMPORTANT NOTES
  - There will be no makeup hourly exams.
  - No late "4th Hourly" assignments will be accepted. (Click here for an amusing article on excuses for missing due dates.)
  - See the statement below about exam regrades.
  - A multi-page take-home exam that is turned in without being stapled will not be graded.

**Basic Weighting Scheme** (500 points total):

Four hourly exams 100 points each (= 400 points)

Final exam 100 points

### Alternate Scheme (aka 'Stuff Happens')

What if you miss one of the hourly examinations (something happened that prevented you from being there for that hourly or being able to complete the take-home exam in time to turn it in) or turn in one poor