This is a ‘syllabus-like’ document since in this era of comprehensive Course Management Systems, I no longer produce a traditional syllabus document. Instead, I use the Canvas site to provide a rich context of what we will learn, resources required to achieve that learning, as well as resources optional to making that learning easier.

The course is divided into modules (essentially chapters of our textbook) and each module has its own web page detailing learning objectives, problem assignments, lecture notes and handouts, links to animations and other on-line resources, implemented in-class clicker questions, and more.

The Canvas site also contains numerous versions of old exams, their static keys, some video answer keys, as well as quizzes (when used). Captured in the rest of this document are the details from each module’s main web page as well as screen shots that summarize categories of information that supports learning in the course.

Pages 2-13 of this document contain the course policies and the course schedule – these are the closest items we have to a syllabus. As each component is created as a web page first, formatting into a paper document does not do justice to how a student learner in the course would access/view the content.

After the schedule are screen shots of examples of the content to be found in representative modules.

Each module (chapter) landing page contains known book typos, an introduction to the big idea of the module, a handful of learning objectives, module (chapter) advice, a listing of module’s sub-themes, a link to the incomplete lecture notes (designed to maximize learning during class rather than simply spending one’s entire class time transcribing!), unanswered clicker questions (posted after the module is completed in class; since answers are only provided in lecture, it is a good strategy to jot down the CQ number and the answer choice at the end of its discussion), end-of-chapter exercises that should be practiced (divided into three sets with every student expected to master at least the first set and chem majors mastering through the third set), and a summary of the optional and required on-line homework for that module.

The Canvas site also gives you instant access to copies of assessments you took, their answer keys, and how you performed on those assessment. Assessment feedback is provided through the Gradescope platform.

Many aspects of the Canvas site’s contents are only hinted out in this document but all of which are fully accessible to enrolled students.

The course’s landing page (on Canvas) contains useful announcements, often written versions of in-class statements. These announcements are usually not pushed to student’s email account.

During the term when the course is taught the individual module’s (chapter’s) incomplete notes are made available to students about one week prior to that content coverage in the class. Similarly, answer keys to old exams and quizzes are only made available about 96 hours prior to the date of the relevant exam/quiz in the current semester. Answer keys for current exams and quizzes are posted the minute all students have turned in their completed assessment. (In other words, this ‘syllabus-like’ document is only made available once the course is completed.)
I expect this to be a normal term (no swipes to enter buildings, no mandatory remote instruction at semester start, no hybrid instruction, no mask mandates). Expectations aside, as necessary and as appropriate, changes will be made to the syllabus, schedule and course policy as demanded by significant changes in the learning environment, and as directed by Pitt's Administration.

Instructor:
Contact: joeg@pitt.edu (e-mail)
Office: CSC, Room 705
Office Hours: Tuesday 9:00-10:00am in person and after every class (immediately outside the lecture hall) for as long as there are questions to answer or points to discuss.
Note: In general I have learned that IM, texting, and email are inefficient methods for a Chemistry conversation or explanation -- but they are great tools to set up a meeting to have a conversation to explain something. Therefore, I do not 'tutor' organic chemistry via email. Please bring your questions to me, in office hours, in lecture, or immediately after any lecture, to your recitation instructor, or to any of the departmental-provided tutors; do not send chemistry questions via email. And if you email me for any reason, do not include pictures or attachments unless I ask for them - due to security risks I do not open emails with attachments or pictures unless they come in response to request by me.

Teaching Assistant:
Name: Jessica Boette
Contact: (e-mail) jtb157@pitt.edu
Office: TBD
Office Hours: TBD

Health and Safety Statement:
In the midst of this pandemic, it is important that you abide by public health regulations and University of Pittsburgh health standards and guidelines. These rules have been developed to protect the health and safety of all community members. For the most up-to-date information and guidance, please visit coronavirus.pitt.edu.

Open and clear communication, in advance is expected from everyone who experiences a significant "event" (medical emergency or family emergency). If due to university-approved reasons, you must miss an assignment, it is mandatory that you alert me in advance if at all possible so that alternate arrangements can be made.

Your Well-being Matters
College can be an exciting and challenging time for students. Taking time to care for yourself and seeking appropriate support can help you achieve your academic and professional goals. You are encouraged to maintain a healthy lifestyle by eating a balanced diet, exercising regularly, avoiding drugs and alcohol, getting enough sleep, and taking time to relax.
It can be helpful to remember that we all benefit from assistance and guidance at times, and there are many resources available to support your well-being while you are at Pitt. If you or anyone you know experiences overwhelming academic stress, persistent difficult feelings and/or challenging life events, you are strongly encouraged to seek support. In addition to reaching out to friends and loved ones, consider connecting with a faculty member you trust for assistance connecting to helpful resources. The University Counseling Center is also available for you; you can call 412-648-7930 at any time to connect with a clinician.

If you or someone you know is feeling suicidal, please call the University Counseling Center at any time at 412-648-7930. You can also contact Resolve Crisis Network at 888-796-8226. If the situation is life threatening, call Pitt Police at 412-624-2121 or dial 911.

Diversity
I believe in the value of diversity in all aspects of society and especially within the scientific community. I aim to make all students from all backgrounds and identities feel welcomed and to be well-served by this Organic Chemistry 2 course. If there are aspects of this course, my actions, or your experiences within this course, that you feel are acting as barriers to your full participation or achievement, please bring them to my attention as soon as possible so that working together, we can take steps to address them.

Remember that the University of Pittsburgh does not tolerate any form of discrimination, harassment, or retaliation based on disability, race, color, religion, national origin, ancestry, genetic information, marital status, familial status, sex, age, sexual orientation, veteran status, gender identity, or other factors as stated in the University's Title IX policy. The University is committed to taking prompt action to end a hostile environment that interferes with the University's mission. For more information about policies, procedures, and practices, see: https://www.diversity.pitt.edu/civil-rights-title-ix-compliance/policies-procedures-and-practices. Links to an external site.

Course Description - Chem 0320
This two semester sequence of Chem 0310 and 0320 is a 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. The broad goal of the course is to allow a student to develop an understanding of the chemistry of carbon-based compounds and reactions so that they can apply that understanding to, among other things, biochemical reactions. It is especially important to note that success in Chem 0320 relies heavily on utilizing concepts, reagents, and reactions learned and mastered in Chem 0310.

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 mastered the principles of
Chem 0310, understood the concepts, and memorize the reagents/reaction (as but one example, the reagents need for and utility of the ozonolyis reaction).

Chem 0320 course is a continuation of Chem 0310. The semester will continue where Chem 0310 left off, and build extensively on the knowledge provided via that course. It is assumed that you have mastered the material in Chapters 1-13 of the textbook (we are using the same textbook that was used last spring and summer for Chem 0310). We will cover, at a minimum, Chapters 14-26 (with less attention paid to Chapters 25 & 26 than the others) this term, the largest fraction of which deals with chemistry of carbonyl compounds. (Students who received a C- grade or less in Chem 0310 are strongly advised to repeat that course before attempting to take Chem 0320.)

Outline in brief:
The course is organized around Chapters 14-26 in the Vollhardt and Schore (8th edition) textbook. The earned course grade is based on 6 in-class quizzes, 3-in-class hourly exams, graded electronic homework, class participation via "clicker [aka Top Hat] questions", and a comprehensive (for 2-terms of orgo) final exam.

Schedule:
See the separate one page pdf file in this Canvas module for list of content coverage by day, quiz & exam days, and the final exam date/time. Due to anticipated changes in the schedule, and the likelihood of updates, it is advised not to print out the schedule but rather only ever consult the on-line version (which will always contain the date it was updated.)

Copyright Notice:
All materials produced by Professor Joseph J. Grabowski for this course, are made available to enrolled students only, for their own personal use. All other uses of the materials, including but not limited to, reposting on other web sites, is prohibited without the express written permission of Professor Grabowski. These materials may be protected by copyright. United States copyright law, 17 USC section 101, et seq., in addition to University policy and procedures, prohibit unauthorized duplication or retransmission of course materials. See Library of Congress Copyright Office (Links to an external site.) and the University Copyright PolicyLinks to an external site.

Course Materials:


On-line Homework: Achieve -- See information posted on the Canvas web site (including in each Chapter Module).

Lecture Notes: Incomplete copies of the PowerPoint slides used in lecture are posted to the Canvas site prior to lecture. It is recommend that all students come to the lecture with a copy of these slides to facilitate note taking. These incomplete notes are explicitly designed to help you understand the content during lecture, to minimize the amount of writing you have to do during lecture, and to provide complicated structures/data tables that will be discussed without adequate
time to hand-replicate during the lecture period. No other copies of the PowerPoint slides will be provided since effective note taking is an important step in mastering the material.


Through the Science and Engineering Library in Benedum Hall and through Hillman Library, you can access reserve copies of the 8th edition of Vollhardt and Schore's textbook. The library retains copies of older editions as well. Study Guides and Solution Manuals for most editions are also on reserve in the same locations.

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 quizzes and exams EXCEPT THE FINAL. Model kits are often sold in the bookstore. You can also find some online; for instance, see the model kits available from [https://duluthlabs.com/](https://duluthlabs.com/) (Links to an external site.) and [www.indigo.com](http://www.indigo.com) (Links to an external site.).

Old Exams are available through the Canvas web site. Essentially an infinite supply of organic exams can be found by simple web searches. 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 for a previous term or 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.

Class Meeting Times

Lectures will begin promptly each Monday, Wednesday, and Friday at 9:00 am and will conclude at 9:50 am in the room listed in PeopleSoft (CSC-152). In my opinion, based on many years of both being a student and teaching students, PARTICIPATING IN ALL LECTURES & RECITATIONS and DOING ALL PROBLEM SETS AS IF THEY ARE EXAM QUESTIONS, are by far and away the most efficient ways of learning the Organic chemistry that we will be responsible for.

Please respect the class -- if you must enter the in-person classroom after the start time (see above) or leave before the end time (see above), I request that you use the doors at the rear of the classroom.

Recitations will be a part of this course with the expectation that every student will attend every week. You should faithfully attend and actively participate in your recitation each week. Recitations will be conducted by either by the Teaching Assistant as modest-sized group or by a UTA as a small PLTL group. There are no points directly attached to or available from recitation. Recitations are option though attendance is recorded and shared with the instructor.

Tutoring is a resource all of us should use - it is best thought of as "consultation" - we use it to make our lives easier by relying on experts to guide us to the right path that more quickly will move us into the realm of 'expert understanding'. Consulting is most efficacious when one is prepared with a specific concern to be addresses.

Tutoring, provided by the Chemistry Department, is available, FREE, normally on the balcony outside the lecture hall (see [https://www.chem.pitt.edu/undergraduate/bachelor-science-chemistry/tutoring](https://www.chem.pitt.edu/undergraduate/bachelor-science-chemistry/tutoring) Links to an external site.).
Tutoring: Pitt's Study Lab offers individual and small group tutoring for Chem 0320 for free. Access their web page at https://www.asundergrad.pitt.edu/study-labLinks to an external site. Private (for hire) tutors are listed on the Chemistry Department's web site (see https://www.chem.pitt.edu/undergraduate/bachelor-science-chemistry/tutoringLinks to an external site.).

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. Pedicinio, 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)

Chem 0320 Course Goals
We will continue to address three big questions from Chem 0310 (Orgo 1):
(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 (within 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 Requirements and Grading

Quick Points:
-- I do not assign letter grades, but instead you earn a letter grade.
-- Do not request one or the other of the alternate grading schemes summarized below as both methods are automatically evaluated for all students and the the better outcome applied for each individual.
-- Do not email after the course grades are posted requesting 'extra work' so as to boost the posted letter you earned.

Course Grading: Your course grade will be determined from your performance on the planned six quizzes, three hourly exams, on-line homework, in-class clicker (aka Top Hat) questions and the final exam (ACS, for a full-year of organic chemistry). The dates for each component of each assessment are shown on the Course Schedule and should be considered tentative since they may be changed at the professor's discretion.

- IMPORTANT NOTES
  o There will be no makeup assessments (either quizzes, exams, clicker questions, homework assignments, or the final).
  o No late homework assignments will be accepted.
  o See the statement below about quiz or exam regrades.
  o In this continuing-pandemic era, professionally-documented cases of illness or quarantines will be considered when applying the above stipulations.
  o With rare exceptions, quizzes and exams must be taken in person, on the date and time stipulated for that assessment component. Any exceptions MUST be arranged in advance and only those pre-authorized by Pitt policy will be honored.

Basic Weighting Scheme (500 points total):
Two quizzes, 17 points each and an in-class hourly (66 points) will make up each of the three mid-term assessments (= 300 points).
Online homework contribute 75 points to the course grade. (Total points in Achieve will be re-scaled to a maximum possible of 75 points towards the ultimate course grade; the best 12 of the assignment scores will be used; we will shoot for 13 assignments and will have at least 12).
Clicker questions contribute 25 points (scaled from the 100+ questions that are planned).
(Online homework and clicker questions combined = 100 points; their combined performance is treated as one of the five 100-point subparts.)
Final exam 100 points.

Alternate Scheme (aka 'Stuff Happens'): What if you miss one or more components of one of the assessment sets (something happened that prevented you from being there for a quiz or an exam) or turn in poor performance on one of the three assessment sets relative to your performance on the Final (something happened that prevented you from studying for apart of all of an assessment even though you were able to take the quizzes and exam)? Or if you chose to skip both lectures (and therefore
clicker questions) and on-line homework and just do the quizzes, exams, and the final? Answer: At the completion of the course, each student's grade will be calculated as described by the basic weighting scheme AND by dropping the lowest of the four subpart (three assessments [each composed of 2 quizzes and one hourly] and the combined Achieve/Top Hat) scores (the final exam score is never dropped and must be taken by all enrolled students) while increasing the final exam contribution (maximum possible) from 100 points (20% of the Final Grade) to 200 points (40% of the Final Grade). The better final grade for each student, from that pair of calculations, will be used. In effect, if you show improved performance on the final exam, the final exam will count for a larger fraction of your grade then in the basic weighting scheme and a poor mid-course assessment is completely discounted. If you miss components of one set, the alternate method takes the pressure off of you from having to find the time to make up the assessment missed due to stuff happening. Typically, more than two-thirds of all past students have used the Alternate Scheme (for a large variety of reasons, including doing everything and on-time, but just performing at a higher level on the final than on one of the assessments). Keep in mind that everyone is responsible for all the course content even if you "drop an assessment" -- all course content is needed for each quiz, exam, and/or final question.

**Letter Grades:** In order to eliminate competition between students and to foster group learning, I am going to continue the grading approach I used in comparable courses previously. I will set the TENTATIVE point totals now for the letter grade cutoffs. This way, the entire class can earn the letter grade they desire without worrying about what everyone else in the class is doing. The following points are based on a total possible of 500. Note especially that the ± breaks are not public information and are designed for borderline cases. It would be wrong to assume any published grade range is equally sliced across all possible letter grades. Earned Extra Credit (if any is offered) may not exceed 35 points. (The final course performance of the previous semester will be shown in class if you are curious about ultimate outcomes.)

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<td>400 + above</td>
<td>A- to A+</td>
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<td>344-399</td>
<td>B- to B+</td>
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<td>288-343</td>
<td>C- to C+</td>
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<td>232-287</td>
<td>D- to D+</td>
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**Quiz & Exam Re-grades:** The following policy will be strictly adhered to. For any quiz or exam to be re-graded, a completed "Re-grade Request Form" (available on Canvas) must be filled out and returned to Professor Grabowski within seven calendar days of the quiz or exam being returned to the class. Your entire quiz or exam will be re-graded--not only that portion that you request. There is, therefore, a chance that you may lose rather than gain points. while TAs or TFs may have done the initial grading, Prof. Grabowski handles all re-grade requests.

**Extra Credit:** A maximum of 35 points of earned extra credit can be used in computing a final grade regardless of how many Extra Credit points are offered. There may or may not be any Extra Credit offered during the semester. If any amount of Extra Credit is offered, that amount is solely up to the discretion of the instructor. Any Extra Credit will be offered to the class as a whole. It is anticipated that the only Extra Credit offered this term will be through:

1. first identification of typos in the textbook (does not apply to the Study Guide/Solution Manual) that is listed on this web page (must match both version and printing); 1 point per typo, maximum 5 points per student. Use the appropriate Discussion Board Forum to communicate typos to me AND to the class.
2. thoughtful participation on surveys designed to collect data used to revise practices so as to
improve student learning.
(3) extra credit problem sets (e.g., Adaptive Quizzes, Mechanism Challenges).

Words from the preparers of standard exams...
"Every year, students tell us that they really know more than they demonstrate on their final examination in organic chemistry. Sometimes the questions are described as "tricky"; sometimes insufficient time is thought to be the problem; and sometimes the material is judged to be different from what was covered in class. These problems most often result from chemistry having been learned as a set of reactions and techniques, rather than as a coherent set of conceptual models that enables comprehension of the submicroscopic world. We urge you, as you are learning chemistry, to strive for genuine understanding of the concepts and models. For example, rote learning of named organic reactions that are meaningless to you is not learning chemistry; and that knowledge will not serve you at exam time." (Preparing for Your ACS Examination in Organic Chemistry, I.D. Eubanks and L.T. Eubanks, 2002 American Chemical Society Division of Chemical Education Examinations Institute.)

More About Assessments

Quizzes: As shown on the schedule, there will be at least 6 quizzes (numbers 1-6) as part of the three assessments, with each assessment focused on three or four book chapters. Each quiz is 17 points (13 minutes each). Quizzes are focused on recent material with specific guidance on an upcoming quiz provided a lecture or two prior to the quiz. Exams (66 points, 50 minutes) are more broadly focused and integrate recent and older material in most questions.

Final Exam: The final exam in this course will be a standardized exam for 1-year of Organic Chemistry. It is designed by the American Chemical Society Exams Institute and is wholly in-line with content covered in our course. The exam is a 70-question, 110 minute exam, multiple choice (4 possible answers). No aids are allowed (no calculators, models, NMR shift tables, etc.). In previous semesters, most students completed the exam prior to the end of the exam period. As you likely expect for a final exam, many questions integrate several different ideas from throughout the course. A few questions may cover examples that we have not covered but those types of 'extension' questions are solvable by application of the core concepts of organic chemistry that we did extensively use. In my mind, the best way to answer most ACS-like exam questions is to read the question, work out the solution, and only then look at the answer choices. Rely on the organic chemistry "instincts" you have been honing for two semesters. The final problem sets in Achieve are a set of questions selected by the software company and designed to review for an ACS exam. While the ACS sells a practice book (http://uwm.edu/acs-exams/students/student-study-materials/ (Links to an external site)), I don't think it has any value compared to the resources already in use by you.

Exam dates and times: All assessments are given only at the one time that the entire class has the assessment. No early or delayed exam dates are possible for individuals (excepting DRS approved accommodations). The set drop policy can be used if you have to miss a quiz or exam (note that it is not possible to 'drop' the final). The schedule has the dates for all quizzes, exams and final listed but those dates are subject to change as we actually progress through the semester. A change in date of a planned quiz is rare and on the few occasions that it did happen in the past, it was delayed by one class period to accommodate either actual pacing for that term, or on appeal of a large fraction of the class due to other exams/functions on the same date. Again, due to the on-going pandemic, consideration of extenuating circumstances are more likely this term than in a "normal" term.
Top Hat
We will use Top Hat (as clickers) during every class. TopHat, like Canvas is one of the suite of software platforms provided to all instructors and students at Pitt; there is no additional charge for using Top Hat.

If your access device is not available or not functioning in a specific class, use the paper form on the lecturer's bench in front of the class and turn that form in to Prof. G immediately at the end of class.

I usually try to use about 3 clicker questions a day in lecture (but ranges from 0-7). All, or nearly all, clicker question posed will be considered when determining final clicker point score (which may be reported as an integer using standard scientific rounding practices).

Points due to clicker use will be scaled to a maximum of 25 (of the 500 course base); see the Grading section for additional details.

As a sign of your personal integrity, use only your own device (or paper form) in each class.

Top Hat questions are graded as participation only, and not for accuracy. While I "dream" that every student answers each Top Hat question after careful thought and significant scrap paper work, as long as you put an answer into the system, you will get credit for it. We have a mechanism in place for earning those participation points if you have to miss lecture due to a Pitt sponsored event or Pitt-mandated "stay at home" policy.

Course Policies

Remote Communication Devices: Under no circumstances should a cell phone ring during lecture OR a student disrupt the class by taking or placing a phone call. Using a cell phone in ANY FASHION during an exam is consider cheating so please put your cell phone out of sight during quizzes and exams (a clock will be provided). Smart watches must also be stored away during an exam or quiz.

Letters of Recommendation: It is common for students in Orgo to request letters of recommendation (for Pharmacy School, Medical School, Dental School, Summer Research Programs, etc.) from their lecturer. If you want a useful letter of recommendation at the end of the term, it is imperative that you go out of your way to make sure I know who you are (and feel free to remind me often of your name as I am terrible with recalling names). If you anticipate needing a letter, arrange to make such a request by the end of the term - requesting a letter a year "after the fact" is not nearly so useful as you might imagine.

Religious Observances: The University of Pittsburgh has a tradition of recognizing religious observances of members of the University community in instances where those observances may conflict with University activities. When conflicts occur between a religious observance and a University activity or evaluation, the students and faculty are expected to make every effort to reach mutually agreeable arrangements to reschedule the activity or provide a substitute activity or evaluation. Students are expected to alert the faculty to the potential for such conflicts early in the term.

G-Grades: (First see Arts and Sciences policy on G-grades posted here: https://catalog.upp.pitt.edu/content.php?catoid=72&navoid=6226#grading-systemsLinks to an external site.) For this course, a G-Grade will be granted if the student has taken all quizzes/exams up to the appropriate point in time, has regularly participated in the lectures (lots of Top Hat contributions) and recitation, and is up-to-date on their electronic homework. The G-Grade allows one additional year to complete course work (note that there are three terms per year including the
summer term). To arrange for a G-grade, a contract must be negotiated and signed with the Professor prior to the date of the final exam for the course.

**Cheating Policy:** Don’t!

**Academic Integrity:** Students in this course will be expected to comply with the University of Pittsburgh's Policy on Academic Integrity. Any student suspected of violating this obligation for any reason during the semester will be required to participate in the procedural process, initiated at the instructor level, as outlined in the University Guidelines on Academic Integrity. This may include, but is not limited to, the confiscation of the examination of any individual suspected of violating University Policy. Furthermore, no student may bring any unauthorized materials to an exam, including dictionaries and programmable calculators.

**Disability Services:** If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and Disability Resources and Services (DRS), 140 William Pitt Union, (412) 648-7890, drssecrep@pitt.edu, (412) 228-5347 for P3 ASL users, as early as possible in the term. DRS will verify your disability and determine reasonable accommodations for this course. All students certified by DRS must take their exams through Pitt's Testing Center as the Department has neither the space nor the proctors to provide a fair alternative testing environment.

**Accessibility:** Canvas is ADA Compliant and has fully implemented the final accessibility standards for electronic and information technology covered by Section 508 of the Rehabilitation Act Amendments of 1998. Please note that, due to the flexibility provided in this product, it is possible for some material to inadvertently fall outside of these guidelines.

**Copyright Notice:** See above.

**Statement on Classroom Recording:** To ensure the free and open discussion of ideas, students may not record classroom lectures, discussion and/or activities without the advance written permission of the instructor, and any such recording properly approved in advance can be used solely for the student's own private use. Likewise, taking pictures of my slides is prohibited since taking effective notes is an important skill to master and a valuable part of the learning process. Use the incomplete notes posted on the web site to facilitate your note taking (lecture assumes you are using them).

**Course Advice**

**Exams:** Will be composed of questions requiring ability to APPLY knowledge learned. Will only occasionally be solely focused on memorized lecture or reading material. Can include questions directly from assigned problem sets.

Topics will include:
- Structure and Reactivity Questions
- Organic Reactions (Give products; give reagents; give starting material)
- Reaction Mechanism Analysis
- Organic Synthesis

Our Organic Chemistry Answer Key is posted in the General Documents Folder under the Course Documents area. I strongly encourage you to read, study, reflect on, and to practice the items summarized on this short document.
Some advice from previous Organic classes to you...
Areas to become adept at
  o Mechanisms and Curved Arrow Notation.
  o Use the homework problems to prepare for the exams.
  o Tests very much reflect the lecture notes (in terms of areas emphasized).
  o Learn to take notes rather than just "transcribe" the lecture.

Areas that caused students problems
  o Skipping lecture and/or recitation.
  o Doing problems by looking at the answer key prior to writing out your own complete answer.
  o Creating "rules" for organic chemistry that are inappropriate.
  o Not keeping up - the course is fast paced.
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Updated 7-Sep-22
Recent Announcements

- #9 Vice-Provost McCarthy's message of 9/7/22
  In case you missed it or in case you need some of its information later in the term (archived here): htt...

- #8 Crucial steps related to Covid (per Pitt's CMRO)
  As sent by email on Tuesday, 30 August 2022: click here for their detailed message.

- #7 Sign up for small groups (in lieu of big group) recitation
  If you are interested in replacing your "big group recitation" with a small, UTA-led group, email me th..

2231 CHEM 0320 SEC1030 ORGANIC CHEMISTRY 2

University of Pittsburgh
Organic Chemistry 2
Chemistry 0320, Fall 2022
Prof. Joseph J. Grabowski
• Zoom

• Recitation, Fall 2022

• Module 0 - Ubiquitous Concepts (last updated 7/26/22)

• Chapter 14 - Delocalized Pi Systems (last updated 8/16/22)

• Chapter 15 - Benzene and Aromaticity (last updated 8/28/22)

• Chapter 16 - Electrophilic Attack on Derivatives of Benzene (Last updated 9/5/22)

• Chapter 17 - Aldehydes and Ketones (last Updated 8/2/22)

• Chapter 18 - Enols, Enolates, and the Aldol Reaction (Last updated 8/2/22)

• Chapter 19- Carboxylic Acids (Last updated 8/2/22)

• Chapter 20 - Carboxylic Acid Derivatives |Last updated: 8/2/22|

• Chapter 21 - Amines and Their Derivatives (Last updated: 8/2/22)
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Course Information

Syllabus

Syllabus Adencum (IT items)

Schedule_2231.pdf

Read these unfiltered pieces of advice from fall 2021 Orgo 2 students at the end of their course - advice to beginners of Orgo 2.

Read these unfiltered pieces of advice from fall 2021 Orgo 2 students at the end of their course - advice on Adaptive Quizzes

To contact me, meet me outside the lecture hall immediately after any class or utilize the in-person office hours (no appointment needed). If you email me at joeg@pitt.edu, it should be for issues not related to "chemistry help" as chemistry discussions need to be done with a drawing surface available.

7 Tips for Mastering Organic Chemistry (5.00 min YouTube video)

Organic Chemistry Tutors (Free!)

Study Lab Overview

Study Lab's One-on-One Peer Tutoring

Study Lab's Academic Coaching

Study Lab's Study Skills Tools and Resources

Pitt Bookstore: Compare Prices and Purchase Textbooks

Pitt's AY2023 Official Calendar

Scanning Work on a Mobile Device
• Recitation, Fall 2022

Note: Answer keys will not be posted for recitation problems (some answers will be available through Achieve)

An Option to Recitations...

PLTL (aka Workshop) Sessions for Term 2231

Recitation 1 (Week of Monday 8/29)

0A-1_MechanismPractice.pdf

Recitation 2 (Week of Monday 9/5) - Suggested Problems

Recitation 3 (Week of Monday 9/12) - Suggested Problems

Recitation 4 (week of Monday 9/19)

Recitation 5 (Week of Monday 9/26)
- Module 0 - Ubiquitous Concepts (last updated 7/26/22)

  - Background

  - Achieve - Getting Started Practice (Also in the Achieve Module)

  - Adaptive Quizzes, Orgo 1 Topics (some for Extra Credit)

  - Some Orgo 1 Practice - Achieve Problem Sets

  - A Potpourri of Things to Keep in Mind

  - LAH & Water

  - Orgo Answer Key (also in the “General Course Documents” module)

  - For Reference: A More Elaborate pKa Chart (also in the "General Course Documents" module)

  - Arrows.pdf

  - Curved (Curly) Arrows

  - 7 Tips for Mastering Organic Chemistry (5.00 min video)

    Nomenclature (6.07 min) This video has practice on going from condensed to Kekule structures. Make sure you can go from the IUPAC name to the Kekule structure for all the compounds ever isolated, synthesized, or imagined.

  - Acidity and Basicity in Organic Chemistry (JOVE, 2:34 min)

    Acids and Bases in Organic Chemistry: Leah4Sci’s “complete resource to help you really GET acids and bases”. A series of 10 short videos, ranging from a basic understanding (12:39 min) of the core concepts to each of her 5 ‘factors’ (CARIO) to practice (11:06 min)
Chapter 14 - Delocalized Pi Systems (last updated 8/16/22)

Background 14

Incomplete Lecture Notes 14 (pdf, 1 slide per page)

Incomplete Lecture Notes 14 (pdf, 4 slides per page)

V&S (8th ed): Section 12.12 Oxidative Cleavage-Ozonolysis (p. 558-561)


Orgo 1 Review: Radical Halogenation of Alkanes, 20 min video, Organic Chemistry Tutor

Orgo 1 Review: Halogenation of Alkenes (Khan Academy, 8:12 min)

Orgo 1 Review: Ozonolysis (Khan Academy, 13:42 min)

Orgo 1 Review: Grignard Reactions (Khan Academy, 13:44min)

Orgo 1 Review: Resonance Structures (8:02 min)

MOs of Butadiene

Animation--Radical allylic halogenation (1:18 min)

Explanation: Reactions at the Benzylc Position (Khan Academy; 10:12 min)

Animation--Addition of HCl to 1,3-butadiene. (0:39 min)

Explanation: Kinetic vs Thermodynamic Product - 1,2 vs 1,4 Addition of HBr to 1,3 Butadiene with additional examples (12:51)

Animation--Diels-Alder Endo Rule (0:17 min)

The Organic Chemistry Tutor Explains the Diels Alder Reaction (11:13)

Explanation: Rate and Regioselectivity in the Diels-Alder Reaction (5:46min)
### Explanation: Nice discussion of cyclopentadiene and the Diels-Alder reaction including kinetic versus thermodynamic control.

- Achieve 14
- Exercises 14
- Clicker Questions

- Chapter 15 - Benzene and Aromaticity (last updated 8/28/22)
Exams - Chem 0320, Organic Chemistry II - Spring 2022 (Term 2224)

Old Exams -- General Information

- Exam 3, Spring 2022 (Term 2224), Q4 Answer Key
- Exam 3, Spring 2022 (Term 2224), Q3 Answer Key
- Exam 3, Spring 2022 (Term 2224), Q2 Answer Key
- Exam 3, Spring 2022 (Term 2224), Q1 Answer Key
- Exam 3, Spring 2022 (Term 2224), Blank
- Exam 2, Spring 2022 (Term 2224), Q1 Answer Key
- Exam 2, Spring 2022 (Term 2224), Q2 Answer Key
- Exam 2, Spring 2022 (Term 2224), Q3 Answer Key
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- Exam 1, Spring 2022 (Term 2224), Q1 Answer Key
- Exam 1, Spring 2022 (Term 2224), Q2 Answer Key
- Exam 1, Spring 2022 (Term 2224), Q3 Answer Key
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