

### Lecturers

Section S01: MWF 9-9:50, MW MacMillan 117, F Barus & Holley 166 Professor Amit Basu  
[Amit\\_Basu@Brown.edu](mailto:Amit_Basu@Brown.edu) Office Geochem 445

Section S02: TTh 9-10:20, MacMillan 117 Professor Matthew Zimmt  
[Matthew\\_Zimmt@brown.edu](mailto:Matthew_Zimmt@brown.edu) Office Geochem 201

**Laboratory Instructor** Dr. Craig Yennie

[Craig\\_Yennie@brown.edu](mailto:Craig_Yennie@brown.edu) Office Geochem 347

### Course Description

The course focuses on the constitution and properties of the different classes of organic compounds, with heavy emphases on reaction mechanisms and synthesis. The laboratory work involves an introduction to microscale preparative and analytical techniques of organic chemistry and the preparation of representative organic compounds. The course involves three hours of lecture and five hours of combined pre-laboratory and laboratory per week. Several additional faculty- or student-led problem sessions are scheduled throughout the week. You are strongly encouraged to attend one or more of these problem sessions, as they provide a good venue for you to practice and develop your skills in organic chemistry.

Lectures, readings, and problems in Chem0360 will introduce reactions of organometallic compounds, the carbonyl and carboxyl groups, amines, aromatic compounds and more. Concepts will be covered at essentially the same pace in each lecture section of the course. The two sections will take common exams administered during evening slots. Material may be presented faster or slower than outlined in the Syllabus, in which case the scope of each exam will be adjusted appropriately, and will be announced in class and on Canvas.

The lab for Chem 0360 has its own Canvas website. Information about the lab can be found there.

You must be enrolled in Chem 0360 and take all the exams in order to take and receive a score for the lab. If you drop the course during the semester, either formally or by ceasing to take the Hour Exams, you will not be allowed to continue to take the lab.

### Prerequisites and Registration

1. You must have already received credit for Chemistry 0350 in order to register for this course.
2. If you did not pass Chem0350, you may not take Chem0360. If you did not take Chem0350 at Brown but have taken the equivalent course elsewhere, please provide your instructor with the following:
  - a) A copy of the transcript showing the course and the final grade.
  - b) A detailed copy of the syllabus listing all of the topics that were covered.
  - c) If you already received pre-approval for the course from the Brown Chemistry Department, provide your instructor with a copy of this pre-approval form.
  - d) If you have already had this credit transferred to Brown, a copy of the transfer credit approval form is sufficient.

### Textbooks

Lecture Textbook and supporting materials

Organic Chemistry, 2<sup>nd</sup> Edition, Brown, Iverson, Anslyn, Foote. (Same textbook as in Chem0350).

A solutions manual is also available.

Chemistry modeling sets are available in the bookstore, and are highly recommended. ChemDraw Ultra, a chemical structure drawing program that runs on both Windows PCs and Macs is available free to all Brown students and can be downloaded from the CIS website. This program can be very useful for the preparation of laboratory reports. There are additional components that come with this suite of programs, some of which run only under Windows, such as Chem 3D, a structure modeling program with a simple user interface.

Laboratory Textbook

See the Chem 0360 Lab Canvas site.

### **Problems from Brown, Iverson, Anslyn, Foote**

The key to success in organic chemistry is practice at working with the conceptual and factual material, not rote memorization. This is most effectively achieved by solving chemistry problems. There are numerous problems in the text, both within the chapters and at the end of each chapter. Just as with any physical or mental skill (riding a bicycle, swimming, playing a musical instrument, solving crossword puzzles, acting) you cannot learn passively by just watching a video, taking notes in a lecture, or memorizing all the steps. You must be actively engaged to develop the necessary skills.

### Learning Objectives from doing homework problems.

1. Identify facts you don't know (e.g., reagents, rxns, mechanisms, FG polarization).  
If you can't start a problem, you may be missing key facts. Don't look to the answer key; reread the relevant section(s) of the book or notes to identify the missing piece(s).
2. Identify concepts you aren't confident applying or have not integrated with prior knowledge.  
If you are not sure your answer to a problem is correct, the problem involves concepts you are not confident applying. Use the book / notes to develop "question sets" you can use to challenge / test every step of your answer. When an answer satisfies all your tests, you can have confidence that it is correct. At that point, you will not need an answer key. A good use of the answer key is confirming that your "**question sets**" adequately test your solution.
3. Develop, practice and share (compare) strategies for solving every type of problem.  
A key goal of solving homework problems is developing effective strategies for problem analysis, problem solving and "answer checking". After working a group of similar problems, deliberately evaluate your problem analysis, solving and checking strategies; compare yours with strategies used by other students in your study group. Use those strategies that work best and fastest for you.
4. Identify your personal "silly mistakes list".  
Everyone makes their own sets of silly mistakes. Mistakes made on homework "cost" nothing. Once made, you don't want to repeat them. Keep a list of the silly mistakes you make and develop a question or check to catch / avoid each mistake. Reread the list immediately before doing problems to remind yourself of prior mistakes and to strengthen your "error checking" process. You want that process to be strong when you take exams.

These are four critical objectives for your homework efforts. Notice, "get the right answer" is not one of these four objectives. Homework should be done with the goal of developing the problem solving and checking processes noted above. Simply checking your homework answer in an answer key does NOTHING to prepare you for an exam. Homework done to develop these maximizes your chance of getting correct answers on exams (i.e. learning).

Solve problems using the above process for one hour every day. Take a 10 minute break halfway through. You will need separate time for reading, etc. It is common that people spend an hour per day (or more) practicing for a sport, musical instruments, etc. The reason is simple - "learning requires doing" and "practice makes perfect."

**Chem0360 Syllabus: Lecture, Reading, and Exams (listed at the end)**

Lectures, Readings, and Problems in Chemistry 0360 will discuss reactions of organometallic compounds, the carbonyl and carboxyl groups, amines, aromatic compounds. Knowledge of spectroscopic techniques and the chemistry from Chem0350 is required. The assigned material will be covered at essentially the same pace in each lecture section of the course. The same exams will be given to both sections of the class at the same time.

<b>Week</b>	<b>Date</b>	<b>Chapter</b>
1	Sept. 3-5	Ch 15 Organometallic Compounds
2	Sept. 8-12	Ch 16 Aldehydes and Ketones
3	Sept. 15-19	Ch 16 (cont.)
4	Sept. 22-26	Ch 16 (cont.) / Ch 17 Carboxylic Acids
5	Sept. 29-Oct. 3	Mxn Primer II, Ch 18 Carboxylic Acid Derivs.
6	Oct. 6-10	Ch 18 (cont.)
7	Oct. 13-17	Ch 19 Enolate anions and enamines
8	Oct. 20-24	Ch 19 (cont.)
9	Oct. 27 - 31	Ch. 21 / 22 Benzene: derivatives and reactions
10	Nov. 3-7	Ch. 21 / 22 (cont.)
11	Nov. 10-14	Ch. 23 Amines
12	Nov. 17-21	Ch. 23 (cont), Ch. 24 Catalytic C-C bond formation
13	Nov. 24-26	Ch. 24 (cont.)
14	Dec. 1-5	Ch. 20 Dienes and Diels Alder Rxns
15	Dec. 8-11	Ch. 25 Carbohydrates

**Tentative Exam Schedule - contingent on room availability**

Exam 1	Mon., Sept. 29,	7 - 9 PM
Exam 2	Wed., Nov. 5,	7 - 9 PM
Exam 3	Wed., Dec. 3,	7 - 9 PM
Final	Sun., Dec. 14	2 - 5 PM