

San José State University
Department of Chemistry
CHEM 112B Organic Chemistry II

Instructor:	Dr. David Brook
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Office hours:	TuW 1330-1430 and by appointment
Class days/time:	TuTh 0900-1015
Classroom:	YUH 124
Prerequisites:	CHEM 112A with a grade of C or better

Online Information

Copies of the course syllabus and other materials may be found on the Canvas learning management system course website. Homework will be posted on a separate website for which you must enroll at www.saplinglearning.com. You are responsible for regularly checking with the messaging system through MySJSU (or other communication system as indicated by the instructor) to learn of any updates. Please put 'CHEM112B' in the subject line of any email related to this class

Course Description and Goals

A continuation of Chem 112A. Several more classes of organic compounds will be studied in some detail. There will be an emphasis on thorough mechanistic understanding of reactions, this is not just a "memorization" course. Review of concepts from the first semester is strongly encouraged. We will ultimately apply our understanding of classes of organic compounds to develop an appreciation for more complex biological systems.

Organization: The sequence of topics in the text will be followed approximately, though time will be taken to review earlier material and place newer material in context. A tentative schedule is given below, but will be subject to change as regards to the topics and assigned reading. Because the course is built up in a cumulative manner, material from the first chapters will be important to understanding later chapters. It is therefore important not to fall behind. You should seek help with material you may be having trouble with as you go along rather than deferring it to right before an exam.

Course Learning Outcomes

Upon successful completion of this course students will be able to:

1. Show mastery of the topics covered in CHEM 112A (Ch 1-11, 14, 16 of McMurry)
2. Show mastery of the material covered in CHEM 112B (Ch 17-28 of McMurry)
3. Identify the main classes of organic compounds by functional group, provide IUPAC names for simple organic molecules and draw skeletal structures for given IUPAC names
4. Recall the main reactions of and main synthetic routes for alkenes, alkyl halides, aromatic compounds, alcohols, ethers, thiols, thioethers, amines, aldehydes, ketones, carboxylic acids, esters, amides, acid chlorides, acid anhydrides and nitriles.
5. Suggest appropriate mechanisms for the above reactions using the curved arrow formalism, and be able to describe how the mechanism may change according to the structure of the molecule and/or the reaction conditions
6. Predict reaction products based on a knowledge of reaction mechanism
7. Suggest possible pathways for short (3-4 steps) multistep syntheses of organic compounds, accounting for functional group/reaction condition incompatibility and understanding and using the concept of protecting groups as necessary

Program Learning Objectives

This class contributes toward program learning objective 2, listed on the department website:

http://www.sjsu.edu/chemistry/Academic_Programs/undergraduate_program_learning_objectives.html

Required Items

Textbook

- McMurry, Organic Chemistry

Online Homework

- Register on www.saplinglearning.com

Useful but not essential:

- McMurry, Study Guide and Solutions. Manual for Organic Chemistry (6th or 7th ed.)
- Weeks, Pushing Electrons
- Scudder, Electron Flow in Organic Chemistry
- ACS organic chemistry exam study guide

Other equipment requirements

- A set of molecular models.
- Student photo-ID card at all exams (see below).

Course Requirements and Assignments

SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in [University Policy S12-3](http://www.sjsu.edu/senate/docs/S12-3.pdf) at <http://www.sjsu.edu/senate/docs/S12-3.pdf>.

Grades

Grades will be based on online homework (100 points), the best two of three mid-term exams (100 points each), and a final exam (200 points) (500 points total). Dates are given in the class schedule below.

Online Homework

Online homework will be completed using Sapling Learning (www.saplinglearning.com). You must enroll on the Sapling website (cost \$42) and search for CHEM 112B. In addition to contributing to your grade, the online homework problems give you important practice and feedback in solving problems in organic chemistry. There are ten sets of problems for the semester. Each problem set has a deadline indicated on the course schedule. You may ask for an extension on a particular problem set for a legitimate reason, but I strongly recommend you get as much done as you can before the deadline. You may take repeated attempts to answer each question correctly, but each time you lose 5% of the possible credit. If particular problems are causing you grief, I am happy to provide help, either via email or in office hours. If by email, make sure to include your name and the problem set and question number.

ONLINE HOMEWORK IS AN IMPORTANT PART OF YOUR GRADE. IT MUST BE COMPLETED BY MIDNIGHT ON THE DAY OF THE FINAL. Even if the website accepts answers after this time they will not contribute toward your final grade.

Midterms

Midterms will be part multiple choice, part short answers. Though they will focus on the most recently studied material, because of the way the course is structured this will, of necessity, include material covered in earlier lectures and in CHEM 112A.

Final Exam

The final exam will consist of an American Chemical Society standardized test in organic chemistry. The printed exam includes some material (spectroscopy) that is not covered in the class. **You will not be expected to answer spectroscopy questions on the final exam.** Nevertheless, the final exam is challenging and can be a cause of disappointing final grades. The good news: there is a study guide available. **Buy it** (or check it out from the library) **and use it.**

Letter Grades

Letter grades will not be assigned to individual exams or homework. Final letter grades will be based on the point total of all graded work. To earn a grade of A students need to score 85% or greater over the whole semesters work. Lower grades (including +/-) will be

assigned in 5% intervals below this, i.e. 80%-84% A-, 75%-79% B+, 70-74% B, 65-69% B-, 60-64% C+, 55-59% C, 50-55% C-, 45-50% D+, 40-45% D.

University Policies

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' [Syllabus Information web page](http://www.sjsu.edu/gup/syllabusinfo/) at <http://www.sjsu.edu/gup/syllabusinfo/>"

Class Schedule (Tentative)

Days	Topics	Chapters
8/22	Review 112A	
8/27, 8/29	Review 112A	1-15
9/3, 9/5	Aromatic Chemistry, Conjugation	15, 16
9/10, 9/12	Alcohols, Phenols	17
9/17, 9/19	Ethers, Epoxides, Sulfides, Amines	18, 24
9/24, 9/26	Review, Exam 1	
10/1, 10/3	Aldehydes and Ketones, Nucleophilic addition	19
10/8, 10/10	Carboxylic Acids and Nitriles	20
10/15, 10/17	Nucleophilic Acyl Substitution	21
10/22, 10/24	Review, Exam 2	
10/29, 10/31	Carbonyl alpha substitution	22
11/5, 11/7	Carbonyl condensation	23
11/12, 11/14	Carbonyl Condensation	23
11/19, 11/21	Review, Exam 3	
11/26	Biomolecules	
12/3, 12/5	Introduction to polymer chemistry	(31)
12/13	Final Exam - 7:15 am!	