

# CHEMISTRY 12B – Organic Chemistry (5 Units)

## COURSE OVERVIEW

### Summary

Chem 12B is the second part of the College of Chemistry organic chemistry series, and focuses on the chemical/physical properties, and the reactions and synthesis of, major classes of organic compounds. This class is more difficult than the 3A/3B series, and there is a larger emphasis on multistep synthesis and reaction mechanisms.

The course looks at a broad spectrum of organic compounds, and typically 2-5 lecture days are spent on each topic (see below). The course also includes a weekly 5-hour lab that closely supplements the material learned in lecture. The lab requires the usage and interpretation of spectra from commonly utilized instrumentation such as mass spectrometry, HPLC, and NMR. Programs such as MestReNova and ChemDraw will also be utilized to interpret data. An analysis of your sample-derived NMR will typically be required every week.

### Prerequisites

- Chemistry 12A (Required)
- Chem 3A is sufficient, there are several students each semester with that background, and they do fine

### Topics Covered

- Addition Reactions of Nucleophiles
  - Strong and Weak
- Enolate Chemistry
- Nucleophilic Addition-Elimination Reactions
- Functional Group Interconversions
  - Protecting Groups
- Aromatic Substitutions
  - Electrophilic and Nucleophilic substitutions
  - Heterocycles
- Cross-Coupling Reactions
  - Suzuki, Stille, Sonogashira, Heck, Kumada
- Pericyclic Reactions
- Radical Reactions

## WORKLOAD

### Course Work

- 5 problem sets
- 3 midterms
- Final
- 5 Lecture Quizzes
- 5 Lab Quizzes
- 12 Lab Reports (finished in-class each lab period)
- 3 Formal Lab Reports
- 1 Lab Final

### Time Commitment

Per Week: 3 hours of lecture, 5 hour lab, 1 hour lab lecture

## CHOOSING THE COURSE

### When to take

The class is a lower division requirement for Chemistry/Chemical Biology majors, and can fulfill an elective requirement for Chemical Engineers. As it is a prerequisite for many future chemistry courses, it is suggested to take this course the Spring of your second year. This class is *very* time-intensive, so plan your semester accordingly.

### What next?

- Chem 113: Advanced Mechanistic Organic Chemistry
- Chem 114: Advanced Synthetic Organic Chemistry
- Chem 115: Organic Chemistry – Advanced Lab Methods
- Chem 135: Chemical Biology

## ADDITIONAL COMMENTS/TIPS

This class is necessary for Chemistry/Chemical Biology majors, and fulfills requirements for the Biotechnology, Chemical Processing, Energy & Environment, Materials Science & Technology concentrations, or a science elective for Chemical Engineering majors.

This class builds off of itself and only requires some background from 12A.

There are several reactions and reaction conditions that require some degree of memorization. Having a good understanding of the material and the reaction mechanism is necessary.

Labs typically finish an hour or so early.

Do not expect that, just because you did well in 12A, you will do well in 12B.

Last edited: Spring 2018