

III. Statement of Course Need

- A. This is the first course in a two-semester sequence (Organic Chemistry I and II) that is required in the following AS programs: Biology, Chemistry, Pre-Medical Professional, and Pre-Pharmacy. Although not required, it is recommended in the Environmental Science programs, and it may be required by some transfer institutions in that field.
- B. In the laboratory portion of the course, students will employ a scientific approach to understanding relevant chemical principles and reactions and solving problems. Students will develop important skills in the laboratory, such as liquid-liquid extraction, recrystallization, distillation, titration, melting point determination, thin-layer chromatography, gas chromatography, infrared spectroscopy, and nuclear magnetic resonance.
- C. This course generally transfers as a program requirement and/or a free elective dependent on the transfer institution.

IV. Place of Course in College Curriculum

- A. Free Elective
- B. This course meets a program requirement for the Chemistry AS program, the Biology and Pre-Medicine and Pre-Pharmacy tracks in the Biological Sciences AS program, and the Chemistry track in the Engineering AS program. It serves as a program option in the Environmental Science AS program.
- C. To see course transferability: a) for New Jersey schools, go to the NJ Transfer website, www.njtransfer.org; b) for all other colleges and universities, go to the individual websites.

V. Outline of Course Content

- A. Introduction and Review of General Chemistry
- B. Structures and Properties of Organic Molecules
- C. Structure, Naming, and Conformational Analysis of Alkanes and Cycloalkanes
- D. Stereochemistry
- E. Spectroscopic and spectrometric methods
 - a. Infrared Spectroscopy
 - b. Mass Spectrometry
 - c. Nuclear Magnetic Resonance
- F. The Study of Organic Reactions
- G. Structure, Naming, and Reactions for Alkanes, Alkenes, Alkynes and Alkyl Halides
- H. Nucleophilic Substitution and Elimination Reactions of Alkyl Halides
- I. Organic Synthesis

VI. Course Learning Outcomes

At the completion of the course, students will be able to:

1. Demonstrate a knowledge of and the ability to critically analyze the principles of organic chemistry. (GE-NJ 3*)
2. Apply basic laboratory techniques to the performance of a variety of organic chemistry experiments. (GE-NJ 3*)
3. Communicate the results of laboratory work in an appropriate professional writing style. (GE-NJ 1)
4. Use the knowledge of reactivity of functional groups to predict the products of organic reactions and design rational syntheses of selected compounds.
5. Draw detailed arrow-pushing mechanisms for organic chemical reactions.
(**embedded critical thinking*)

C. Assessment Instruments

1. Exams (required)
2. Quizzes
3. Laboratory notebook and reports (required)

VII. Grade Determinants

- A. Exams (required)
- B. Quizzes
- C. Laboratory notebook and reports (required)

Primary format, modes, and methods for teaching and learning that may be used in the course:

- A. Lecture/discussion
- B. Laboratory
- C. Group work

VIII. Texts and Materials

- A. Klein, David R, *Organic Chemistry*, latest edition (print or electronic), Wiley.
- B. WileyPLUS online subscription
- C. Molecular model kit
- D. Laboratory manual shared with students online
- E. Carbon-copy laboratory notebook
- F. Safety glasses
- G. Other web sources designated by the instructor

Please Note: The course outline is intended only as a guide to course content and resources. Do not purchase textbooks based on this outline. The RVCC Bookstore is the sole resource for the most up-to-date information about textbooks.

IX. Resources

- A. Organic Chemistry Laboratory (SC-253)
- B. Instrument Room (SC-254)
- C. Software licenses for spectroscopy instruments

X. Check One: Honors Course Honors Options N/A