RARITAN VALLEY COMMUNITY COLLEGE
ACADEMIC COURSE OUTLINE

CHEM 213 – ORGANIC CHEMISTRY I – LECTURE ONLY

I. Basic Course Information

A. Course Number and Title: CHEM 213 – Organic Chemistry I – lecture only

B. New or Modified Course: Modified from CHEM 211

C. Date of Proposal: Semester: Spring Year: 2020

D. Effective Term: Fall 2021

E. Sponsoring Department: Science & Engineering

F. Semester Credit Hours: 4

G. Weekly Contact Hours: 4
Lecture: 4
Laboratory: 0
Out of class student work per week: 8

H. Prerequisites: Chem 104 – General Chemistry II

I. Laboratory Fees: No

J. Name and Telephone Number or E-Mail Address of Department Chair and Divisional Dean at time of approval: Ed Carr, Edward.carr@raritanval.edu ; Sarah Imbriglio, Sarah.Imbriglio@raritanval.edu.

II. Catalog Description

Prerequisite: CHEM 104 General Chemistry II

This course is an intensive survey of the modern chemistry of carbon-based compounds. Emphasis is placed on the role of structure, reaction mechanisms, stereochemistry, spectroscopy and synthetic methods. The chemistry of alkanes, alkenes, alkynes, alkyl halides, nucleophilic substitution and elimination reactions, as well as spectroscopic and spectrometric methods (IR, NMR, MS) are covered in detail.

III. Statement of Course Need

A. This is the first course in a two-semester sequence (Organic Chemistry I and II) that may be required by some transfer institutions.

B. An Organic Chemistry I Laboratory course is required in most programs. Students using this course to fulfill a RVCC program should take CHEM 211 which includes the lab component, or the lab unit must be taken at a transfer institution.

C. This course generally transfers as a program requirement and/or a free elective.

IV. Place of Course in College Curriculum

A. Free Elective

B. This course does not meet any RVCC program requirements.

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, Synthesis, and Reactions for
    a. Alkanes
    b. Alkenes
    c. Alkynes
    d. Alkyl Halides
H. Nucleophilic Substitution and Elimination Reactions of Alkyl Halides
I. Organic Synthesis

VI. General Education and Course Learning Outcomes

A. General Education 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. Solve quantitative and conceptual problems appropriate to the course material. (GE-NJ 2, 3*)

*(*embedded critical thinking)*

B. Course Learning Outcomes:

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

1. Name organic compounds according to the IUPAC nomenclature system and draw molecular structures from the systematic IUPAC names.
2. Determine the geometric structure of organic compounds using knowledge of atomic structure, hybridization, covalent bonding, stereochemical and conformational analysis.
3. Use the knowledge of reactivity in functional groups to predict the products of organic reactions and to design rational syntheses of selected compounds.
4. Write detailed mechanisms of selected reactions.
5. Interpret infrared, nuclear resonance, and mass spectra to solve structure determination problems.

C. Assessment Instruments

A. Semester assessments
B. Cumulative final examination
C. Quizzes

VII. Grade Determinants

1. Semester examination
2. Cumulative final examination
3. Quizzes

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

A. Lecture/discussion
B. Student collaboration
C. Small group work

VIII. Texts and Materials

A. Suggested textbooks
- Klein, David R*, Organic Chemistry*, latest edition (print or electronic), Wiley.

B. Other suggested materials
- Molecular Visions Kit by Darling Models

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: None

X. Honors Options: None