I. Basic Course Information

A. Course Number and Title: CHEM 212 - Organic Chemistry II

B. New or Modified Course: Modified

C. Date of Proposal: Semester: Fall Year: 2018

D. Effective Term: Fall 2019

E. Sponsoring Department: Science & Engineering

F. Semester Credit Hours: 5

G. Weekly Contact Hours: 8
   - Lecture: 4
   - Laboratory: 4
   - Out of class student work per week: 12

H. Prerequisites: Chem 211 – Organic Chemistry I

I. Laboratory Fees: Yes

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

II. Catalog Description

Prerequisite: CHEM 211 – Organic Chemistry I

This course is a continuation of Organic Chemistry I. Topics include the study of reaction mechanisms, organic syntheses, UV spectroscopy, the chemistry of aromatic compounds, alcohols, phenols, ethers, carbonyl compounds, amines, and an introduction to organometallic chemistry.
III. Statement of Course Need

A. This is the second 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 continue to develop important skills in the laboratory, such as recrystallization, liquid-liquid extraction, distillation, titration, thin-layer chromatography, gas chromatography, infrared spectroscopy, nuclear magnetic resonance, melting point determination, and qualitative organic analysis.

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 meets a program requirement for the following AS programs: Biology, Chemistry, Pre-Medical Professional, and Pre-Pharmacy.

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. Retrosynthetic Analysis
B. Alcohols and Phenols
C. Ethers
D. Ultraviolet Spectroscopy
E. Conjugated Dienes
F. Aromatic Compounds
G. Aldehydes and Ketones
H. Carboxylic Acids and Nitriles
I. Carboxylic Acid Derivatives
   1. Acid Halides
   2. Acid Anhydrides
   3. Esters
   4. Amides
J. Carbonyl Alpha-Substitution and Condensation Reactions
K. Amines
L. Introduction to Organometallic Reactions (new)
VI. General Education and Course Learning Outcomes

Outcomes (the term here is synonymous with instructional objectives and learning objectives) are specific statements about knowledge, competencies, attitudes and/or skills to be acquired by the student upon the completion of the course. The student learning outcomes (SLOs) should be measurable and include an appropriate range of levels from the appropriate domains (cognitive, affective, and psychomotor) described in Benjamin Bloom's Taxonomy of Educational Objectives.

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*)
3. Apply basic laboratory techniques to the performance of a variety of organic chemistry experiments. (GE-NJ 1, 3)
4. Communicate the results of laboratory work in an appropriate professional writing style. (GE-NJ 1)
   (*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. Use their knowledge of the reactivity of functional groups to predict the products of organic reactions and design rational syntheses of selected compounds.
3. Write detailed mechanisms of selected reactions.
4. Interpret infrared, ultraviolet, mass, and nuclear magnetic resonance spectra.
5. Employ content knowledge and proper laboratory techniques and instrumentation to carry out experiments, confirm the identity of products, and determine the structures of unknown compounds.
6. Prepare and maintain an accurate laboratory notebook, for data recording and analysis.
C. **Assessment Instruments**

A. Semester examinations  
B. Cumulative final examination  
C. Quizzes  
D. Laboratory notebooks and reports  
E. Identification of unknown compounds

VII. **Grade Determinants**

A. Semester examinations  
B. Cumulative final examination  
C. Quizzes  
D. Laboratory notebooks and reports, including identification of unknown compounds

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

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

VIII. **Texts and Materials**

A. Suggested textbooks

B. Other suggested materials
   - Laboratory notebook (carbon-copy capable)  
   - Safety glasses  
   - 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**

A. Organic Chemistry Laboratory (currently SC253)  
B. Instrument Room (currently SC254)

X. **Honors Options**: none