RARITAN VALLEY COMMUNITY COLLEGE
ACADEMIC COURSE OUTLINE

CHEM 104 – GENERAL CHEMISTRY II

I. Basic Course Information

A. Course Number and Title: CHEM 104 – General Chemistry II

B. New or Modified Course: Modified Course

C. Date of Proposal: Semester: Fall Year: 2024

D. Effective Term: Fall 2025

E. Sponsoring Department: Science and Engineering

F. Semester Credit Hours: 4

G. Weekly Contact Hours: 6 Lecture: 3
Laboratory: 3
Out of class student work per week: 7.5

H. ☒ Prerequisite (s): General Chemistry I (CHEM- 103) and Precalculus I (MATH-112)

☐ Corequisite (s):

I. Additional Fees**:** None

II. Catalog Description

Prerequisite: CHEM 103 General Chemistry I and MATH 112 Precalculus I. This course is a continuation of General Chemistry I. Emphasis is placed on kinetics, equilibrium behavior, thermodynamics, acids and bases, solubility equilibria, and electrochemistry.

III. Statement of Course Need

A. It is required in the Biology, Chemistry, Environmental Science, Pre-Medicine, Pre-Pharmacy track options of the Science and Mathematics Associate of Science degree program, General Science and the Engineering Science Program.
B. The course has a lab component to provide students with additional learning opportunities by using hands-on experimentation
C. This course generally transfers as a chemistry program requirement and/or free elective and/or general education course dependent upon transfer institution.

IV. Place of Course in College Curriculum

A. Free Elective
B. This course serves as a General Education course in Science with Lab.
C. This course meets a program requirement in the Biological Sciences, Chemistry, Engineering, and Environmental Science AS programs. It serves as a program option in the Information Systems & Technology, Mathematics, and Physics AS programs.
D. 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

1. Properties of solutions
2. Solution stoichiometry
3. Rates of chemical reactions
4. Thermodynamics
5. Gaseous equilibria
6. Acids, bases, and buffers
7. Solubility equilibria
8. Electrochemistry

VI. A. 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 chemistry. (GE-3*)
2. Apply the scientific method to analyze a problem and draw conclusions from data and evidence. (GE-3*)
3. Solve quantitative chemistry problems. (GE-2,3*)
4. Apply laboratory techniques to perform chemistry experiments and use proper instrumentation and technology to collect and analyze data (GE-3,4*)
5. Communicate the results of laboratory work in a clear and efficient manner. (GE-1) (* embedded critical thinking)

B. Assessment Instruments

1. Semester examinations
2. Cumulative final examination
3. Quizzes
4. Prelaboratory assignments, laboratory notebooks and reports

VII. Grade Determinants

1. Semester exams
2. Cumulative Final exam
3. Quizzes and/or graded homework
4. Prelaboratory assignments, Laboratory experiments, including a laboratory notebook

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

A. Lecture/discussion
B. Laboratory
C. Student collaboration
D. Small group work
E. Computer-assisted instruction

VIII. Texts and Materials

OpenStax Chemistry Atoms First, OER Textbook online
Knewton Alta Online Homework Subscription

B. Other suggested materials
   • Carbon-Copy Laboratory Notebook
   • Safety Glasses
   • Scientific Calculator

(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. General Chemistry Laboratory

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