# **Syllabus/Course Outline**

# ***RCC Science Department***

# ***CHEM104(L,R) – Introduction to Chemistry w/ Lab and Recitation, 5 credits***

# ***2023/2024***

**Instructor:** Your name

**Email:** Your email

**Phone:** Your phone number

**High School:** Your high school name

**Length of RCC Course:**

**LECTURE PORTION: 3 credits:** A required State minimum of (30) and a standard RCC

delivery of (33) **lecture** hours

**LAB PORTION:** **1 credit:** A required State minimum of (30) and a standard RCC delivery of

(33) **lab** hours

**RECITATION:** **1 credit:** A required State minimum of (10) and a standard RCC delivery of (11) **lecture** hours

**Length of HS Course:**Length of your course (is. Semesters, trimesters, etc. If it takes 1 or 2

semesters to earn the RCC credit, please explain that here

**Prerequisites:** RD90, WR91 or designated placement score; MTH65 or MTH63 or

designated placement score

# **Course Description**

Designed for non-science majors. Introduces the essence of atoms and molecules, chemical bonds, chemical reactions, gases, acids, and bases. Prepares students for work in a laboratory that uses chemicals. Helps students recognize how cells and organisms function. Students must enroll in lecture, laboratory and recitation sections. All three sections must be taken concurrently.

# **Required texts**

List required textbooks here

# **Other materials/supplies**

List any other required materials or supplies

# **Institutional Learning Outcomes**

Institutional Learning Outcomes (ILOs) are skills that will contribute to your success in life beyond RCC. Rogue’s ILOs are: Communication, Critical Thinking, Equity, Diversity, Inclusion, and Global Consciousness, Information Literacy, and Quantitative Literacy and Reasoning. Why are they important? Employers call these soft skills or employability skills. They may help you get and keep a job. These are skills that will help you complete a 4-year degree. They are skills for success in your life as a family member, worker, citizen, life-long learner, and more.

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|  **Communication (COM)** | Students will engage in effective communication using active reading and listening skills and expressing ideas appropriately in oral, written, and visual work. |
|  **Critical Thinking (CT)** | Students will explore, reach, and support appropriate conclusions through the analysis, synthesis, and evaluation of information and varying opinions. |
|  **Equity, Diversity, Inclusion** **and Global Consciousness** **(EDI & GC)** | Students will recognize and identify equity, diversity, inclusion and global consciousness as it applies to people and the world today.  |
|  **Information Literacy (IL)** | Students will identify an information need and locate, evaluate, and use information effectively and ethically. |
|  **Quantitative Literacy and** **Reasoning (QL & R)** | Students will reason through and solve quantitative problems by collecting and interpreting data and applying mathematical/statistical techniques. |

# **Course Learning Outcomes**

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| **Course Learning Outcomes** | **ILO Key Indicators** |
| 1. Use the metric system, scientific notation, significant figures, and conversion factors to perform introductory chemistry calculations. |   |
| 2. Use the periodic table as a tool for solving problems in introductory chemistry. |  |
| 3. Use the International Union of Pure and Applied Chemistry (IUPAC) system to name and write formulas for introductory chemical compounds. |  |
| 4. Use Lewis structures, electronegativity values, and molecular shapes to draw conclusions about intermolecular forces and states of matter. |  |
| 5. Write and balance chemical reactions; use balanced equations to perform stoichiometry calculations. | Quantitative Literacy and Reasoning |
| 6. Use energy concepts to explain reaction rates and chemical equilibrium. |  |
| 7. Describe and calculate properties of aqueous solutions, including acids, bases, and salts. |  |
| LAB SECTION ADDITIONAL CLO’s |  |
| 8. Interpret laboratory data to draw conclusions about introductory chemistry experiments. | Quantitative Literacy and Reasoning |
| 9. Perform hazard assessment, SDS, and learn safety techniques. |  |

# **Learning Experiences**

*Describe what activities the students will engage in during class and outside of class to contribute to their learning; some examples: lecture, small-group work, reading, research, role play, etc.*

# **Grading Information**

*Include a description of the criteria for grading and the assessments that will comprise the grade for the course. Also include a statement about when students can expect to receive feedback on assignments, papers, tests, etc.*

# **RCC Grading**

Classes are graded A, B, C, D, F.

No tests can be retaken for the RCC grade that you receive for this class.

Courses taken for college credit will appear on a student’s permanent college transcript and will show the grade earned.

# **EXPECTATIONS FOR STUDENTS**

*Include any statements of expectations regarding homework, late work, etc.*

# **Attendance**

*Describe your policy on attendance and the consequences of missing class.*

* **Withdrawal from class:** A student may withdraw from a College Now class according to the schedule found on the College Now website:  <https://www.roguecc.edu/collegeNow/dualCredit_AcaCalendar.asp>. A grade of W will be assigned.  Students should be aware that withdrawing from a course may impact financial aid when they attend college after high school. To read about the impact withdrawing may have, please visit: <https://www.roguecc.edu/enrollmentServices/sap.asp>

# **Academic Integrity**

Academic Integrity is expected for all students at RCC. Learning is built on the qualities of honesty, fairness, respect, and trust. At RCC, academic integrity is a shared endeavor characterized by truth, personal responsibility, and high academic standards. An important aspect of academic integrity is academic honesty. Violations of academic honesty include, but are not limited to: plagiarism, collusion, inappropriate assistance, cheating, fabrication, falsification, alteration, unauthorized multiple submission, sabotage, tampering*, and sharing classroom documents, including test items, with other students or with online platforms*. All acts of academic dishonesty are regarded as serious offenses. Students who violate academic honesty or academic integrity will be subject to disciplinary action. Instructors have the right to act on any suspected acts of academic dishonesty. Depending on the nature of the offense, serious penalties may be imposed, ranging for loss of points to expulsion from the class or college.

# **Classroom Behavior**

Expectations for classroom behavior are outlined in the Standards of Student Conduct, available in the catalog, schedule, and online. Students may not engage in any activity which the instructor deems disruptive or counterproductive to the goals of the class. Instructors have the right to remove students from class for not following the Standards of Student Conduct or other specified classroom rules. Expectations for behavior in online classes are similar to what is required in the classroom.

**Student Evaluations of this Course**
Students enrolled in College Now courses will receive a course evaluation to complete towards the end of the term for the courses they are enrolled in. The course evaluations are anonymous and will provide valuable feedback to RCC about your experiences in, and your impressions of, the course.

# **Access and Disability Resources**

High schools and colleges operate under different guidelines for students with disabilities. Students enrolled in RCC’s various dual credit programs must meet the college requirements to be eligible for the college credit. Reasonable adjustments in teaching methods and/or assessment delivery that do not alter the essential content of a course may be possible, but all students must meet the student learning outcomes and the assessment rigor of the course to be eligible for college credit.

Services for students who experience disabilities:

* High school students taking College Now classes taught by high school teachers at the high school are to work with their high school for accommodations or adjustments.
* High school students who also take RCC courses at an RCC campus should contact RCC’s Access Office.

Redwood Campus

Phone: 541-956-7337; Oregon Relay Service: 7-1-1

Riverside and Table Rock Campuses

Phone: 541-956-7337; Oregon Relay Service: 7-1-1

For more information, go to Access and Disability Resources: <https://web.roguecc.edu/disability-services> or email AccessOffice@roguecc.edu.

# **Discrimination, Harassment and Sexual Violence Policies**

Rogue Community College does not discriminate in any programs, activities, or employment practices on the basis of race, color, religion, ethnicity, use of native language, national origin, sex, sexual orientation, gender identity, marital status, veteran status, disability, age, pregnancy, or any other status protected under applicable federal, state, or local laws.

RCC is committed to providing an academic and work environment free from all forms of discrimination and harassment. In accordance with federal and state law, RCC prohibits illegal discrimination and harassment, works to inform individuals of their right to be free from such behaviors, and promotes the safety of all at College sites and activities. RCC’s prohibition includes all forms of sex discrimination--including instances of sexual harassment such as sexual assault, domestic violence, gender-based stalking, and sexual violence--which are also prohibited by Title IX of the Education Amendments of 1972.

For further policy information and for a full list of regulatory specific contact persons visit the following webpage: <http://www.roguecc.edu/nondiscrimination>

For further information regarding Title IX at RCC, go to <https://www.roguecc.edu/titleIX>/

# **Student Handbook**

Students should read and understand the Dual Credit Handbook for Students. There is important information covering many topics and most questions will be answered by reviewing this handbook. <https://www.roguecc.edu/HS/Handbooks/StudentHandbook.pdf>

# **Important RCC College Now Dates and Times**

The deadline to add a class, withdraw from a class, term end/start dates, and the dates grades are available are listed at <https://www.roguecc.edu/collegeNow/dualCredit_AcaCalendar.asp>

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| **Tutoring Center** Tutoring Centers provide free tutoring service if you are registered in credit courses at Rogue Community College. The primary areas of tutoring are math, writing and science; however, tutors are prepared to cover most subjects. There is also online tutoring available. Please visit the tutoring center webpage for more details: <https://www.roguecc.edu/dept/academicSuccess/tutor.asp> |

# **Course Outline**

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| **Week** | **Chapter(s)** | **Assignment/ Due date** |
| Week 1 |  |  |
| Week 2 |  |  |
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**\*\*Additionally, all students must complete a Rogue Community College Course Evaluation for the class. \*\***

# **TYPICAL COURSE CONTENT:**

# **Typical Sequence of CHEM104 Lecture Topics:**

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| **Matter** States of Matter Classification of Matter | Describing, defining, classifying and giving examples of the states and categories of matter (solid, liquid, gas, element, compound, mixture, pure substance) |
| **Measurement** Significant Figures Scientific Notation Unit Conversions | Using the metric system, scientific notation, significant figures, and conversion factors to perform calculations involving length, mass, volume, time, temperature, density, moles, molar mass, energy, pressure, concentration, and pH |
| **Atomic Theory** Subatomic Particles Isotopes Ions Electron Configuration Valence Electrons Periodic Table Periodic Trends | Using the periodic table as a tool to classify elements, describe atomic structure, write electron configurations, draw electron dot symbols, and recall periodic trends |
| **Ionic Compounds** Properties Octet Rule Naming Formula Writing Polyatomic Ions | Distinguishing between ionic and covalent bonding in the context of features, properties, naming rules, formula writing, classification, and examples; using the octet rule (and its exceptions) to determine the charges within ionic compounds and to draw Lewis structures for covalent compounds; using VSEPR to determine the shapes of molecules and polyatomic ions; using shape and electronegativity differences to determine molecular polarity |
| **Covalent Compounds** Octet Rule Exceptions Naming Formula Writing Lewis Structures Electronegativity Molecular Shape Polarity |
| **Chemical Reactions** Reactants and Products Balanced Equations Moles Avogadro's Number Stoichiometry Percent Yield  Limiting Reactants Oxidation & Reduction | Describing, defining, and classifying chemical reactions, balancing chemical equations, performing stoichiometry calculations (including moles, molar mass, Avogadro’s number, theoretical yield, percent yield, and limiting reactant), and analyzing redox reactions |
| **Energy, Rate & Equilibrium** Endo- and Exothermic Energy Diagrams Collision Theory Catalysts Equilibrium Le Chatelier's Principle | Understanding, describing, defining and using the concepts of bond strength, dissociation energy, enthalpy change, endothermic process, and exothermic process; using and interpreting energy diagrams to explain the effects of temperature, pressure, and catalysts on the rate of a chemical reaction; using the concepts of equilibrium and Le Chatelier’s principle to explain changes in chemical and biological systems |
| **States of Matter (Gas)** Gas, Liquid, Solid Kinetic Mol. Theory Gas Laws | Understanding, describing, defining, and calculating using gas laws from the following individuals: Boyle, Charles, Gay-Lussac, Avogadro, Dalton; distinguishing between direct and inverse proportions; combining several gas laws into a single equation: PV = nRT |
| **Solid and Liquid States** Intermolecular Forces Changes of State Heating Curves Cooling Curves | Using intermolecular forces to explain properties of liquids and solids such as: melting point, boiling point, vapor pressure, viscosity, and surface tension; comparing and contrasting changes of state; interpreting heating and cooling curves; describing and giving examples of the four categories of crystalline solids: network, molecular, ionic, metallic |
| **Solutions** Saturated Solutions Unsaturated Solutions Supersat’d Solutions Solubility Rules Solution Concentration Dilution Colligative Properties | Describing, defining, and calculating properties of solutions, including solvent, solute, solubility, saturation, electrolyte, dilution, colligative properties |
| **Acids, Bases, and Salts** Arrhenius  Bronsted-Lowry Acid Strength (Ka)  Base Strength (Kb) Conj. Acid-Base Pairs pH and Buffers Titration | Describing, defining, and calculating properties of acids and bases, including the prediction of reaction products, relative strengths of acids, Ka, Kw, pH scale, pH properties of salts, titration, and buffers |

**Typical Sequence of CHEM104 Laboratory Assignments**:

Measurement and Mixtures

Significant Figures and Unit Conversions

Atomic Structure and the Periodic Table

Ionic Compounds

Covalent Compounds/Lab Practicum #1

Chemical Reactions

Moles and Chemical Formulas

Energy

Solutions and Solubility

Acids, Bases and Buffers

Lab Practicum #2