

**Rowan College at Burlington County**  
**(Science, Mathematics, and Technology Division)**

**Title of Course:** General Chemistry I  
**Course Code:** CHE115    **Credits:** 3

**Semester:** Spring 2018

**Prerequisites:** High school chemistry or CHE107/CHE108 and algebraic skills equivalent to MTH095

**Section Number:** 100

**Location of Class:** Mount Laurel, SB 218

**Day(s) and Time:** Mon/Wed 9:30 to 10:50

**Section Number:** 102

*Location of Class:* Mount Laurel, TEC 200

*Day(s) and Time:* Mon/Wed 12:30 to 1:50

**Professor:** Terrence P. Sherlock

**Contact Information:**

Email: tsherlock@rcbc.edu

Telephone: 2028

Office: TEC 211D

**Office Hours:** my current schedule can be found on [www.chemistry-solutions.com/](http://www.chemistry-solutions.com/)

**Course Content/Description**

**Description:** This course is a systematic study of fundamental principles and concepts including chemical measurement, atomic structure, periodicity, chemical bonding, thermo-chemical equations, stoichiometry of chemical reactions, the liquid, solid and gaseous states, and solution chemistry. Go to the following URL for additional information:

**Required Text/Materials:**

Chemistry The Central Science; Brown, Lemay, Bursten, Murphy, 14<sup>th</sup> edition

**Calculator:** A calculator is necessary for this course. A calculator capable of scientific notation (also called exponential notation) is suggested. Please bring a calculator to class. (TI-30XA is one example of a suitable calculator for CHE115.)

**Learning Outcomes:** Upon completion of the course, students will be able to:

- Perform calculations related to dimensional analysis, stoichiometry, thermodynamics, and ideal gas laws.
- Explain and restate basic theories of chemical bonding, quantum theory, periodicity, solution chemistry, and gas laws.
- Propose and interpret the properties of chemical compounds based on an understanding of their structure.

**General Educational Outcomes:**

Written and Oral Communication (Communication): Students will communicate meaningfully with a chosen audience while demonstrating critical thought.

Scientific Knowledge and Reasoning (Science): Students will demonstrate critical thinking skills in the analysis of scientific data.

**CHE115 Topical Outline:** Schedule, Unit Documents, PP presentations can be found on the link <http://www.chemistry-solutions.com/che-115/>

**Evaluation Process**

A. **The Grading Standard System** is explained in the RCBC College Catalog.

B. **Professor's Expectations of Students:** Students are expected to do the following:

1. Come to class prepared, be attentive and participate in the learning process.
2. Be accountable for your own results.
3. Get extra help in Office Hours and/or the Tutoring Center when you need it.
4. Complete all practice exams and assignments.

C. **Student Evaluation and Assessment**

There are 4 Unit Exams each comprising 25% of your grade. There may be other quizzes/projects assigned during the semester.

D. **Attendance Policy and Class Participation** – As stated in the college catalog, “Students are required to attend all class, clinical, laboratory, and studio sessions for the full duration of each such instructional session. Faculty are required to take attendance, and grade penalties for absence will be imposed when a student exceeds a ten percent absence rate, not to exceed 10% of the final grade.”

**College Policies**

In order for students to know their rights and responsibilities, all students are expected to review and adhere to all regulations and policies as listed in the College Catalog and Handbook.

Important policies and regulations include but are not limited to the following:

- Student Code of Conduct
  - Including Academic Dishonesty/Plagiarism and Civility
- Attendance
- Grading Standards

- Including Withdraw (W) and Incomplete Grades (I & X)
- Use of Communication and Information Technology
- **Student Success Services**  
RCBC offers a variety of free services for its students including those listed below. Descriptions of these services, as well as many others, can be found in the College Catalog and Handbook and on the RCBC website at <http://www.rcbc.edu/student-services> .
- Academic Advisement ( <http://www.rcbc.edu/advising> )
- Career Services ( <http://www.rcbc.edu/careers> )
- Educational Opportunity Fund (EOF) ( <http://www.rcbc.edu/eof> )
- Financial Aid ( <http://www.rcbc.edu/financialaid> )
- International Students Office ( <http://www.rcbc.edu/international> )
- Library/Integrated Learning Resource Center (ILRC) ( <http://www.rcbc.edu/library> )
- Office of Veteran Services ( <http://www.rcbc.edu/vets> )
- Student Support Counseling ( <http://www.rcbc.edu/cpit> )
- Tutoring Center ( <http://www.rcbc.edu/tutoring> )
- Test Center ( <http://www.rcbc.edu/testcenter> )
- Transfer Services ( <http://www.rcbc.edu/transfer> )

### **Office of Student Support and Disability Services**

RCBC welcomes students with disabilities into the college's educational programs. Access to accommodations and support services for students with learning and other disabilities is facilitated by staff in the Office of Student Support (OSS). To receive accommodations, a student must contact the OSS, self-identify as having a disability, provide appropriate documentation, and participate in an intake appointment. If the documentation supports the request for reasonable accommodations, the OSS will provide the student with an Accommodation Plan to give to instructors. For additional information, please contact the Office of Student Support. [disabilityservices@rcbc.edu](mailto:disabilityservices@rcbc.edu), or <http://www.rcbc.edu/studentssupport> .

### **Educational Technology Statement**

Rowan College at Burlington County (RCBC) advocates the use of technology to enhance instruction. Students should assume that classroom and online technology will be used throughout their coursework at RCBC, as it will most certainly be used in their future education and careers. The College provides on-campus facilities for the convenience of the RCBC community. Various college departments, including the Office of Information Technology and the Office of Distance Education, provide technology training and assistance to faculty and students.

### **Additional information specific for this section of CHE115:**

**Objectives in each textbook chapter for CHE115:** A student should be able to

Chapter 1

1. Understand and employ the scientific method.
2. Understand dimensional analysis and perform unit conversions.
3. Understand the metric system and perform unit conversions.
4. Understand different temperature scales and perform unit conversions.

5. Understand precision, accuracy, significant figures, and rounding numbers. Perform calculations and obtain answers with the correct number of significant figures.
6. Perform calculations with density, mass, and volume.
7. Understand scientific notation.

#### Chapter 2

1. Predict combining ratios for compounds (subscripts in a formula).
2. Demonstrate an understanding of basic atomic structure.
3. Demonstrate an understanding of the organization of and information in the periodic table.
4. Calculate the average atomic mass given % abundance and mass of the isotopes of an element.
5. Name the molecular and ionic compounds when given the formulas.
6. Write the formulas of molecular and ionic compounds when given the names.

#### Chapter 3

1. Complete, identify types of, and balance basic chemical equations.
2. Calculate molecular weights, formula weights, and molar mass.
3. Perform calculations with moles, grams, and Avogadro's number.
4. Calculate the amount of reactant needed and the amount of product formed based on stoichiometry and limiting reactant.
5. Determine the limiting reactant.
6. Calculate the % theoretical yield.

#### Chapter 4

1. Perform calculations involving molarity, acids, bases, and salts.
2. Perform calculations involving solution concentrations, and perform titration calculations.
3. Define oxidation and reduction. Identify which element is oxidized and which element is reduced.
4. Complete and balance precipitation reactions, acid-base reactions, and redox reactions.
5. Understand and be able to use a solubility table and activity series table.

#### Chapter 5

1. Perform calculations involving enthalpy, heat, and specific heat.
2. Understand the definitions covered in lecture.

#### Chapter 6

1. Understand and perform calculations involving the frequency, wavelength, speed of light, and energy.
2. Relate an element's position in the periodic table to its electron configuration.
3. Understand quantum numbers, Hund's rule, the Pauli Exclusion Principle, and how they relate to electron configurations.

#### Chapter 7

1. Describe and predict periodic trends in atomic radii, ionization energy, reactivity, metallic character.
2. Describe and understand periodic table group trends, metal characteristics, and nonmetal characteristics.

#### Chapter 8

1. Understand electronegativity and its trend.
2. Draw Lewis structures for atoms, ions, and molecules.
3. Demonstrate an understanding of the octet rule, ionic bonding, covalent bonding, polar bonds, nonpolar bonds, and multiple bonds.

#### Chapter 9

1. Demonstrate an understanding of the VSEPR theory.
2. Predict the electron-domain and molecular geometries of molecules and ions.
3. Predict the polarity of polyatomic molecules.
4. Demonstrate an understanding of hybridized orbitals.
5. Understand Pi and Sigma bonds.
6. Understand electron delocalization and resonance.

#### Chapter 10

1. Understand the general characteristics of a gas.
2. Be able to calculate pressure, volume, temperature, or moles using the ideal gas equation (or some variation of the equation).
3. Be able to calculate partial pressures, total pressures, and mole fractions.

#### Chapter 11

1. Understand the qualitative differences between a gas, liquid, and solid.
2. Understand heating curves and phase diagrams.
3. Define and understand viscosity, surface tension, vapor pressure, and capillary action.
4. Be able to calculate the energy required for a given phase change.
5. Understand effects of intermolecular forces on physical properties, such as boiling point, melting point, viscosity, surface tension, and vapor pressure.

#### Chapter 12

1. Understand the terminology and chemistry involved with forming polymers.

#### Chapter 13

1. Understand the solution process and the role of intermolecular forces.
2. Understand the factors affecting solubility.
3. Understand the various concentration expressions.
4. Understand the colligative properties.