CHE 115 SYLLABUS

Rowan College at Burlington County

Fall 2021
STEM Division

CHE115-185	General Chemistry I
Credits and Contacts:	3 Credits, 3 Contact hours per week
Prerequisites:	High school chemistry or CHE107/CHE108 and algebraic skills equivalent to MTH012
Day/Time/Location:	*Mon/Wed, 12:30 to 1:50, VIRTUAL BLACKBOARD COLLABORATE*
Instructor Name:	Terrence Sherlock, Assistant Professor Office location TEC 211D
Contact Information:	Email: tsherlock@rcbc.edu (Email replies will be sent within 48 hours.) Website:www.chemistry-solutions.com
Office Hours:	see your blackboard page and my website

SECTION 1: Course Information

Course Description This course is a systematic study of fundamental principles and concepts including: dimensional analysis, atomic structure, periodicity, chemical bonding, thermochemical equations, stoichiometry of chemical reactions, the liquid, solid and gaseous states, and solution chemistry.

Text and other Materials
Chemistry; Burdge, Julia, 5th edition
(The link to the e-book is called BryteWave, located in Blackboard.)

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

Blackboard: Blackboard is a Learning Management System that RCBC supplies to all students. You will have access to Blackboard by the first day of the semester. **It is recommended that you attend the real time BB Collaborate sessions. If you can't attend in real time it is required that you watch the recorded session. Exams must be taken online during the period that they are posted on BB.**

Proctoring Software for DLC, VLC sections: Proctoring software will be required for all exams given online, in Blackboard. This software will be supplied by RCBC. More information will be given before the first exam. There isn't a video component to this software.

Course 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.

Core Course Content

- Dimensional Analysis
- Atomic Structure and Periodicity
- Chemical Bonding
- Stoichiometry
- Thermochemistry (Introduction to Thermodynamics)
- Chemical Reactions
- Solid, Liquid, and Gaseous States of Matter
- Aqueous Solutions

SECTION 2: COURSE STRUCTURE

Course and Classroom Policies

It is expected that you will attend all virtual classes, take good notes, work hard and be accountable for your own success or failure. Get help in office hours and/or Tutoring when you need it.

Objectives in each textbook chapter for CHE115

A student should be able to:

Chapter 1

1. Understand and employ the scientific method.
2. Understand and employ scientific notation.
3. Understand the metric system and perform unit conversions.
4. Understand different temperature scales and perform unit conversions.
5. Perform calculations with density, mass, and volume.
6. Understand precision, accuracy, significant figures, and rounding numbers. Perform calculations and obtain answers with the correct number of significant figures.
7. Understand dimensional analysis and perform unit conversions.

Chapter 2

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

Chapter 3

1. Calculate molecular weights, formula weights, and molar mass.
2. Understand and calculate percent composition of compounds
3. Interpret, complete, identify types of, and balance basic chemical equations.
4. Perform calculations with moles, grams, and Avogadro's number.
5. Determine empirical formulas and molecular formulas
6. Calculate the amount of reactant needed and the amount of product formed based on stoichiometry and limiting reactant.
7. Determine the limiting reactant.
8. Calculate the % theoretical yield.

Chapter 4

1. Understand and interpret the general properties of aqueous solutions
2. Complete and balance precipitation reactions, acid-base reactions, and redox reactions.
3. Understand and be able to use a solubility table and an activity series table.
4. Define oxidation and reduction. Identify which element is oxidized and which element is reduced.
5. Perform calculations involving molarity, acids, bases, and salts.
6. Perform calculations involving solution concentrations, dilutions, and titrations.

Chapter 5

1. Understand the definitions pertaining to thermochemistry.
2. Perform calculations involving enthalpy, heat, and specific heat.
3. Perform calculations using the Hess's Law.

Chapter 6

1. Understand and perform calculations involving the frequency, wavelength, and energy.
2. Understand the concept of atomic line spectra and atomic orbitals.
3. Understand quantum numbers, Hund's rule, the Pauli Exclusion Principle, the Aufbau Principle, and electron configurations.
4. Relate an element's position in the periodic table to its electron configuration.

Chapter 7

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

Chapter 8

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

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 the valence bond theory and hybridized orbitals.
5. Understand Pi and Sigma bonds.
6. Understand electron delocalization and resonance.

Chapter 10

1. Understand the general properties of a gas.
2. Be able to calculate pressure, volume, temperature, or moles using the ideal gas equation or combined gas law equation.
3. Be able to calculate partial pressures, total pressures, and mole fractions.

Chapter 11

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

Chapter 12 (As time permits)

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 various concentration expressions.
3. Understand the factors affecting solubility.
4. Understand the colligative properties.

Criteria for Grade Determination

The Grading Standard System *is explained in the current RCBC College Catalog, located at http://www.rcbc.edu/files/PDFFiles/publications/Catalog/RCBC1516Catalog-081015.pdf*

Assessment Methods

The course grade is determined from the average score of 4 exams. The exams will be delivered and graded as per schedule on Blackboard. *All exams will be given on Blackboard during class time.*

The letter grade for this course is determined by the numerical course % using the following table:

Numerical Course %	*Course Letter Grade*
(89.5-100%)	*A*
(85.5-89.4%)	*B^+*
(79.5-85.4%)	*B*
(75.5-79.4%)	*C^+*
(69.5-75.4%)	*C*
(59.0-69.4%)	*D*
(<59.0%)	*F*

Note: There is no extra credit work available. Exams cannot be retaken.

Deadlines/Due Dates:Missed Exams:

*If a student has a conflict with an exam date, they should make arrangements to take the exam **before** the scheduled date. PLEASE NOTE THAT RESPONDUS PROCTORING SOFTWARE IS INTENDED TO BE USED DURING ONLINE EXAMS.*

Academic Integrity:

To help maintain the college's policy on academic integrity, any student found cheating on an exam or assignment will receive a grade of zero for that exam or assignment.

Course Schedule or Calendar

See your blackboard and/or www.chemistry-solutions.com

SECTION 3: COLLEGE RESOURCES

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. These documents can be accessed at http://www.rcbc.edu/publications. Important policies and regulations include, but are not limited, to the following:

- Grading Standards
  - Withdraw (W) and Incomplete Grade (I)
  - Withdrawal date for this semester is November 2, 2021
- Student Code of Conduct
- Use of Communication and Information Technology
- College Attendance Policy
  - 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 record student attendance, and grade penalties for absence will be imposed when a student exceeds a ten percent non-excused absence rate, not to exceed 10% of the final grade.
  - For all on-campus courses, including hybrid and hybrid-mixed-mode on-campus meeting days, excused absences include: suspected COVID-19 related illness (i.e., exhibiting symptoms), tested positive for COVID-19, or demonstrated need to quarantine. For all VLC courses and hybrid and hybrid-mixed-mode virtual meeting days, excused absences include: suspected COVID-19 related illness (i.e., exhibiting symptoms that prevent the student from participating online).
  - Students are responsible for informing their instructor as soon as the situation is known and following all other guidelines as outlined by the college. Failure to do so may lead to the absence not being excused. Students are also responsible for communicating with instructors to make reasonable arrangements for the completion of course requirements not completed due to absence.

- Academic Dishonesty/Plagiarism
  - Specifically, the term “plagiarism” includes, but is not limited to, the use by paraphrase direct quotation, of the published or unpublished work or sections of a work of another person without full and clear acknowledgement, whether intentional or not. This includes any material copied directly or paraphrased from the internet. Plagiarism also constitutes the unacknowledged use of materials prepared by another person or agency engaged in the selling of a term papers or other academic materials, including material taken from or ordered through the Internet. For more information on academic dishonesty/plagiarism see Board Policy #903-C.

Office of Student Support and Disability Services
In accordance with Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act (ADA) and the ADA Amendments Act, the Student Support Services Office's mission is to ensure all students with disabilities are provided access to educational and extracurricular activities while on college premises through support in the form of reasonable accommodations such as adaptive technology, counseling, note-taking assistance, and American Sign Language interpreters. Students who have disabilities must self-identify, provide documentation of disability(ies), attend an intake appointment, and sign a Disability Release Form (rcbc.edu/studentsupport) prior to the start of the semester to ensure reasonable accommodations. For more information please contact the Office of Student Support at ext. 1208. For additional information on this policy please refer to the current catalog.

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.

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 https://www.rcbc.edu/students.

- **Academic Advising (**https://www.rcbc.edu/advising**)**
- **Struggling Personally or Academically** (https://rcbc.edu/need-help-now)
- **Career Services (**https://www.rcbc.edu/careers**)**
- **EOF (**https://www.rcbc.edu/eof**)**
- **Financial Aid (**https://www.rcbc.edu/financial-aid**)**
- **International Students Office (**https://www.rcbc.edu/internationall**)**
- **ESL Advising & Support (**https://rcbc.edu/esl)
- **Library (**https://www.rcbc.edu/library**)**
- **Office of Veteran Services (**https://www.rcbc.edu/vets**)**
- **RCBC Foundation -Scholarship information (**https://www.rcbc.edu/foundation**)**
- **RCBC bookstore (**https://www.rcbc.edu/bookstore**)**
- **Rowan University Partnership (**https://www.rcbc.edu/rowan**)**
- **Student Support Counseling (**https://www.rcbc.edu/counseling)
- **Tutoring (**https://www.rcbc.edu/tutoring**)**
- **Test Center (**https://www.rcbc.edu/test-center)

- **Transfer Services (**https://www.rcbc.edu/transfer**)**

This syllabus is subject to change at the instructor's discretion.