General Chemistry 1, CHE*K121

Three Rivers Community College, Norwich, CT

Spring 2018

We will meet for:
Lecture on **Tuesdays and Thursdays at 2:00 - 3:15 in Room D122 (CRN 13907)**
Lab on **Tuesdays at 9:30 – 12:15 in Room B222 (CRN 13908)**

Instructor: Vandana Basu

Office: C170

Office Phone: 860-215-9429

Email: vbasu@threerivers.edu

Office Hours:

Wednesdays: 10:15 – 12:15

Fridays: 10:00 – 11:00

or by appointment M-F

Course Description: CHE* K121 - General Chemistry I
4 CREDIT HOURS
Prerequisites: ENG K101 or ENG* K101S placement∞ or completion of ENG* K096 with a "C#" grade or better; MAT* K172 and high school chemistry or CHE* K111 all passed with a "C" grade or better; or permission of the instructor or department chairperson.*
Corequisite: MAT K186.*
In this course, students will study the fundamental principles, theories, and laws of chemistry. Topics include atomic theory and the structure of the atom, the aggregated states of matter, kinetic molecular theory, chemical bonding, stoichiometry and periodicity, solutions, and colloids. Three- hour lecture; one three-hour laboratory period.

Required Material:

- Text: *Chemistry The Central Science*, 14th ed., Brown, LeMay, et.al. Pearson.
- Lab Manual: *CHE 121 General Chemistry I Laboratory Exercises*, 3rd ed., Carta. Academx.
- Other Required Materials: Chemical safety goggles, scientific calculator.

Optional Material: Mastering Chemistry (online service providing videos and practice problems) The course code for this course is **MCBASU47691.**

General Course Objectives:

- 1. To provide students with a solid understanding of the fundamental concepts of chemistry.
- 2. To encourage students to apply problem-solving skills toward chemical calculations.
- 3. To educate students in the language and nomenclature of chemistry.
- 4. To help students relate chemical concepts to practical applications.

TENTATIVE COURSE SCHEDULE*

Week of 1/18
Lecture: Ch.1: Matter, Energy and Measurement

Week of 1/23 – 1/25
Lecture: Ch.1: Matter, Energy and Measurement
Ch.2: Atoms, Molecules and Ions
Lab: Safety lecture

Week of 1/30 – 2/1
Lecture: Ch.2 Atoms, Molecules and Ions
Ch.3 Chemical Reactions and Reaction Stoichiometry
Lab: #1 Measurements and Density

Week of 2/6 – 2/8
Lecture: Ch. 3 Chemical Reactions and Reaction Stoichiometry
Ch 4 Reactions in Aqueous Solution
Lab: #2 Formula of a Hydrate

Week of 2/13 – 2/15 **Friday, 2/16 – all classes cancelled @ TRCC**
Lecture: ***Unit Test 1: Thursday, 2/15, covering chapters 1-3**
Ch 4 Reactions in Aqueous Solution
Lab: #3 Stoichiometry

Week of 2/20 – 2/22 **Monday, 2/19 - TRCC closed**
Lecture: Ch. 10 Gases
Lab: #4 Acid-Base Titration, part 1

Week of 2/27 – 3/1
Lecture: Ch. 5 Thermochemistry
Lab: #4: Acid-Base Titration, part 2

Week of 3/6 – 3/8
Lecture: *** **Unit Test 2: Thursday, 3/8, covering chapters 4, 10, 5**
Ch. 6 Electronic Structure of Atoms
Lab: #5: Gas Stoichiometry

Spring Break – 3/12 – 3/16 – TRCC closed

Week of 3/20 – 3/22
In Lecture: Ch. 6 Electronic Structure of Atoms
Ch. 7 Periodic Properties of the Elements
Lab: ***Lab Midterm, Tuesday, 3/20, covering labs #1 - #5**

Week of 3/27 – 3/29 **TRCC Closed, Friday, 3/30, Day of Reflection**

Lecture: Ch. 7 Periodic Properties of the Elements
Ch 8 Basic Concepts of Chemical Bonding
Lab: #6 Calorimetry

Week of 4/3 – 4/5

Lecture: Ch. 8 Basic Concepts of Chemical Bonding
Ch 9 Molecular Geometry and Bonding Theories
Lab: #7 Qualitative Analysis

Week of 4/10 – 4/12

Lecture: Ch. 9 Molecular Geometry and Bonding Theories
Ch 11 Liquids and Intermolecular Forces
Lab: #10 Determination of Molar Mass by Vapor Density

Week of 4/17 – 4/19

Lecture: *****Unit Test #3, Thursday, 4/19, covering Ch 6, -9**
Ch.11 Liquids and Intermolecular Forces
Lab: #9 Molecular Models and Lewis Structures I

Week of 4/24 – 4/26

Lecture: Chapter 12 Solids and Modern Materials
Lab: #8 The Chemistry of Copper

Week of 5/1– 5/3

Lecture: Ch 13 Properties of Solutions

Week of 5/8 – 5/10
Lecture: Review (5/8)
*****Unit Test #4, Thursday, 5/10, covering Ch 11, 12, 13**
Lab: **Lab Final covering labs #6 - #11**

***Revisions to the Syllabus:** Students are responsible for learning all of the course objectives and material discussed in lecture and lab. The instructor reserves the right to revise the academic schedule contained in this syllabus as necessary. However, if revisions affect a scheduled unit test, a 48 hour notice will be given for the new test date.

Tips for how to succeed in this course:

- The material in this course is cumulative, dedicate time every week to review new material.
- Do the assigned homework problems and check your answers with those at the back of the book. If you have problems, come to office hours, or ask during lab time.
- If you don't understand something during class, ask a question. Probably, the whole class will benefit.
- Come to class having read the Chapter we will be covering.
- If you miss a class catch up on the material before the next class, so you will be able to follow along.
- **You will get as much out of this course as you put in to it.**

IMPORTANT CLASS POLICIES

Make-ups:
Make-ups on tests and lab practical exams are only granted if the exam is missed due to extenuating circumstances such as illness, bereavement, work commitment, travel emergency, or other conditions beyond the control of the student. **Students must contact the instructor (email: vbasu@threerivers.edu or leave a message at 860-215-9429) as soon as possible, prior to the next class meeting to explain the absence and arrange for a make-up.**
Labs can only be made up during the same week if another instructor can accommodate the student.

Class Attendance: Attendance of all class activities in lecture and lab is required. Attendance is taken at each class meeting, usually at the start of class. Students should make every effort to arrive on time. However, if you are late for class it is your responsibility to talk to me after class to make sure you are not marked absent. An explanation of the cause of any absence should be provided prior to the next class meeting (or in advance if it applies).

Special Accomodations:
NOTE: Students with documented testing accommodations should schedule tests well in advance to ensure seat availability.

- Testing Center: Room A117. Phone 860-215-9061. Email: testing@threerivers.edu
- Students can also schedule make-ups via the school website, under student services/placement testing

COURSE GRADING

Grade Determination: Total points for the course: 1000 points

Class Points: 750 points total
There are 4 Unit Tests, each worth 185 pts, Tests total: 740 points
10 points for attendance/class participation

Lab Points: 250 points total

Lab Reports	**110 points**
Lab MidTerm 1	**70 points**
Lab Final	**70 points**

Lab Reports: There are 11 lab reports, each worth 10 points for a total of 110 points.

I will post all course grades on Blackboard so you can always calculate how you are doing in the course.

How to calculate your grade throughout the semester*: To determine your grade throughout the course it is best to set up a table with two columns. In the first column, list the total points available for each assignment/test/quiz completed so far and in the next column, list the points you have earned for each of those assignments/tests/quizzes. Next, add all the available points together. Then, add the earned points together. Your grade is determined by dividing the points you have earned by the total number of points available.

Example:

Assignment	Points available	Points earned
Lab Report 1	10	7
Lab Report 2	10	9
Unit Test 1	187	165
Sum	207	181

How am I doing in the course? : 181/207 x 100% = 84.7 % = B

Grade Scale:

A ≥ 94	B+ 87-89	C+ 77-79	D+ 67-69
A- 90-93	B 84-86	C 74-76	D 64-66
	B- 80-83	C- 70-73	D- 60-63
			F ≤ 59

Course Withdrawal: Course withdrawals are recommended if you cannot complete the course and are accepted up until the week before classes end. Specific deadline dates are posted on the academic calendar and are strictly enforced. A grade of "W" will be assigned after you formally withdraw. **If you stop attending classes without withdrawing, a grade of "W" will not be automatically assigned. Neglecting to withdraw may result in a grade of "F".** It is strongly advised that you speak with your instructor before withdrawing. Instructor signature is not required to withdraw.
Once you withdraw from the course you are no longer eligible to attend class or take any remaining quizzes or tests.

Academic Integrity: Academic Integrity is essential to a useful education. Failure to act with academic integrity severely limits a person's ability to succeed in the classroom and beyond. Furthermore, academic dishonestly erodes the legitimacy of every degree awarded by the College. In this class and in the courses in your academic career, present only your own best work; clearly document the sources of the material you use from others; and act at all times with honor.

Academic and Classroom Misconduct: The instructor has primary responsibility for control over classroom and laboratory behavior and maintenance of academic integrity, and can request the temporary removal or exclusion from the classroom or laboratory of any student engaged in conduct that violates the general rules and regulations of the institution, or any student engaged in conduct deemed hazardous in the laboratory. Extended or permanent exclusion from lecture or laboratory activities or further disciplinary action can only be effected through appropriate procedures of the institution. Plagiarism, cheating on quizzes or tests, or any form of academic dishonesty is strictly prohibited. Students guilty of academic dishonesty directly or indirectly will receive a zero for the exercise or quiz or test and may receive an "F" grade for the course in addition to other possible disciplinary sanctions which may be imposed through the regular institutional procedures. Any student that believes that he or she has been erroneously accused may appeal the case through the appropriate institutional procedures if their grade was affected.

Cell phones and other electronic devices: Electronic devices must be silenced at all times. When there are extenuating circumstances requiring a student to be available by phone, the student must notify the instructor prior to class, so that together they can arrive at an agreement. *A cell phone is not permitted as a substitute for a calculator for quizzes and tests.*

IMPORTANT COLLEGE-WIDE POLICIES:

Disabilities Notice: If you have a disability that may affect your progress in this course, please meet with a Disability Service Provider (DSP) as soon as possible. Please note that accommodations cannot be provided until you provide written authorization from a DSP.

College Disabilities Service Providers	
Matt Liscum, Counselor (860) 215-9265 Room A113	• Learning Disabilities • ADD/ADHD • Autism Spectrum • Mental Health Disabilities
Elizabeth Willcox, Advisor (860) 215-9289 Room A113	• Medical Disabilities • Mobility Disabilities • Sensory Disability

Non-Discrimination Policy Statement:

Three Rivers Community College does not discriminate on the basis of race, color, religious creed, age, sex, national origin, marital status, ancestry, present or past history of mental disorder, learning disability or physical disability, sexual orientation, gender identity and expression, or genetic information in its programs and activities. In addition, the College does not discriminate in employment on the basis of veteran status or criminal records. The following person has been designated to handle inquiries regarding the non-discrimination policies:

Victoria Baker
Interim Title IX Coordinator
860-215-9208, Room E110
vbaker@trcc.commnet.edu

Sexual Misconduct Policy:

Three Rivers Community College strongly encourages all students to report any incidents of sexual misconduct, which includes, but it not limited to, sexual harassment, intimate partner violence, and sexual assault. Students have the right to the prompt and fair resolution of all claims, and the College will preserve the confidentiality of all who report to the fullest extent possible and allowed by law. College employees will explain the limits of confidentiality before information about the incident is revealed. To report sexual misconduct, or to learn more about your options, please contact the Title IX Coordinator. **If you need immediate, confidential assistance, please call the Sexual Assault Crisis Center of Eastern Connecticut hotline at 860-456-2789.**

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Sexual Assault Crisis Center of Eastern CT
Hotline: 860-456-2789
Office: 860-442-0604
78 Howard Street, 2nd Floor
New London, CT 06320

Board of Regents for Higher Education and Connecticut State Colleges and Universities Policy Regarding Sexual Misconduct Reporting, Support Services and Processes Policy:

Statement of Policy for Public Act No. 14-11: An Act Concerning Sexual Assault, Stalking and Intimate Partner Violence on Campus:

"The Board of Regents for Higher Education (BOR) in conjunction with the Connecticut State Colleges and Universities (CSCU) is committed to insuring that each member of every BOR governed college and university community has the opportunity to participate fully in the process of education free from acts of sexual misconduct, intimate partner violence and stalking. It is the intent of the BOR and each of its colleges or universities to provide safety, privacy and support to victims of sexual misconduct and intimate partner violence."

UNITED STATES DEPARTMENT OF EDUCATION AND OFFICE OF CIVIL RIGHTS TITLE IX STATEMENT OF POLICY:

"Title IX of the Education Amendments of 1972 (Title IX) prohibits discrimination based on sex in education programs and activities in federally funded schools at all levels. If any part of a school district or college receives any Federal funds for any purpose, all of the operations of the district or college are covered by Title IX.

Title IX protects students, employees, applicants for admission and employment, and other persons from all forms of sex discrimination, including discrimination based on gender identity or failure to conform to stereotypical notions of masculinity or femininity. All students (as well as other persons) at recipient institutions are protected by Title IX – regardless of their sex, sexual orientation, gender identity, part-or full-time status, disability, race, or national origin-in all aspects of a recipient's educational programs and activities."

If any student experiences sexual misconduct or harassment, and/or racial or ethnic discrimination on Three Rivers Community College Campus, or fears for their safety from a threat while on campus, please contact Edward A. Derr, the Diversity Officer and Title IX Coordinator:

Victoria Baker
Interim Title IX Coordinator
860-215-9208, Room E110
vbaker@trcc.commnet.edu

Course Objectives:

1. The student will be able to convert English to metric units and vice versa.
2. The student will learn how to report a result to the correct number of significant figures.
3. The student will learn the difference between elements, compounds, solutions and heterogeneous mixtures.
4. The student will be able to determine the number of protons, neutrons and electrons in atoms or ions of a given isotope.
5. The student will be able to distinguish between metallic and nonmetallic properties.
6. The student will be able to distinguish between mass and weight.
7. The student will become familiar with the SI units of mass, volume, length, area, pressure, density, force and energy.
8. The student will learn the proper use of volumetric equipment in the laboratory.
9. The student will learn proper use of balances to measure mass.
10. The student will be able to determine the number of atoms, ions or molecules in a given mass of substance.
11. The student will become familiar with the terms cation, anion and polyatomic ion.
12. The student will be able to determine oxidation numbers.
13. The student will learn both systematic and common naming conventions for inorganic compounds.
14. The student will learn how to determine empirical formula.
15. The student will learn the concept of structural formula and how to write Lewis structures.
16. The student will learn how to determine molecular formula from empirical formula and molar mass.
17. The student will be able to work with the following concentration units: molarity, molality, % by mass, % by volume, parts per million.
18. The student will be able to write and balance chemical equations.
19. The student will be able to distinguish between various reaction types such as synthesis, decomposition, displacement, oxidation-reduction and acid-base neutralization.
20. The student will be able to perform stoichiometric calculations to determine limiting reagent, theoretical and percent yield.
21. The student will understand the differences between acids and bases, including the concept of pH.
22. The student will learn how to interpret the periodic table and be able to predict periodic properties.
23. The student will be able to perform calculations involving the gas laws.
24. The student will be able to understand the basic energy relationships in endothermic and exothermic processes and be able to perform calculations involving energy changes, including calorimetry.
25. The student will be able to understand basic atomic theory including early models of the atom.
26. The student will be able to understand the concept of atomic orbitals and the rules of orbital filling.
27. The student will learn how to write electron configurations using the periodic table.
28. The student will be able to understand the definition of quantum numbers and how they relate to electronic structure.
29. The student will be able to define ionization energy and electron affinity.
30. The student will be able to understand the basic concepts of chemical bonding including electronegativity, valence electrons and electrostatic forces.

31. The student will be able to define ionic and covalent bonds and distinguish between ionic and covalent (molecular) compounds.
32. The student will learn the concept of resonance.
33. The student will be able to understand the concept of bond dipoles and determine polarity of molecules.
34. The student will learn how to predict molecular geometry using valence shell electron-pair repulsion theory (VSEPR).
35. The student will be able to distinguish between sigma and pi bonds.
36. The student will be able to understand the concept of orbital hybridization.
37. The student will be able to understand molecular orbital theory, including bonding and antibonding orbitals.
38. The student will learn the basic properties of liquids and solids.
39. The student will be able to differentiate between intramolecular and intermolecular forces.
40. The student will learn the difference between hydrogen bonds, dipole-dipole forces, ion-dipole forces and dispersion forces.
41. The student will be able to understand phase changes and phase diagrams.
42. The student will learn the basics of crystal structure.
43. The student will learn the properties of solutions, including solution terminology and electrolyte behavior.
44. The student will learn how to use the dilution equation ($M_iV_i = M_fV_f$) to prepare various solutions.
45. The student will be able to define colligative properties.
46. The student will learn how to calculate freezing point depression and boiling point elevation.
47. The student will be able to define the term colloid and understand the different types of colloids.
48. The student will be able to understand the concept of real vs. ideal solutions and Raoult's law.

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