

Fall 2019 Concepts of Chemistry, CHE*K111

Three Rivers Community College, Norwich, CT

We will meet for lecture on:

Tuesdays and Thursdays at 9:30 – 10:45 in Room D128 (CRN 30087)

And for lab on **Tuesdays at 12:30 – 3:25 in Room B216 (CRN 30081)**

Instructor: Professor Vandana Basu

Office: C170

Office Phone: 860-215-9429

Email: vbasu@threeivers.edu

Office Hours:

Mondays: 11:00 – 12:00

Thursdays: 11:00 – 12:00

Fridays: 9:30 - 10:30

or by appointment M-F

Course Description:

This course offers a brief and comprehensive survey of important chemical theories and some of the applications of chemistry. Topics covered will include measurements in chemistry, atomic structure and chemical bonding, chemical reactions, states of matter, stoichiometry, theories of solution, and basic organic and biochemical concepts. Course Design: CHE* K111 is meant for students with little or no background in chemistry who need the course in preparation for General Chemistry, or for students who need to meet a pre-admission requirement for nursing or other allied health programs, or those who need a lab science course. **4 CREDIT HOURS**

Prerequisites: ENG K101 or ENG* K101S placement or completion of ENG* K096 with a "C#" grade or better; MAT* K137 or MAT* K137S with a "C" grade or better (or permission of the instructor on math requirement).*

Required Material:

Text: *Introductory Chemistry*, 6th ed., Tro. Publisher: Pearson.

Lab Manual: *Concepts of Chemistry Laboratory Manual*. Publisher: Hayden-McNeill.

Chemical safety goggles

Scientific Calculator (a cell phone can not be substituted for a calculator)

Optional Material: Mastering Chemistry access code (online service providing videos and practice problems). The access code to Mastering Chemistry can be purchased bundled with the textbook or directly from the publisher, Pearson. The course code for this course is:

MCBASU1851409

General Course Objectives:

1. To aid the student in developing an understanding of the basic concepts of chemistry.
2. To develop critical thinking and problem solving skills.
3. To increase appreciation for the role that chemistry plays in our daily lives.
4. To provide a useful body of knowledge for students studying chemistry, biology, fire science, environmental science, nursing, and other allied health science areas.

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@trcc.comnet.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).

Lab Attendance: Lab reports are not accepted if you did not attend the lab this semester. If you missed lab, it may be possible to attend another lab section during the same week if another instructor has space available and can accommodate you. If you miss a lab and are unable to make it up, it will not affect your final grade as long as it does not happen more than twice. Absence from more than three labs may result in failure of the course.

Special Accommodations:

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@threeivers.edu
- Students can also schedule make-ups via the school website, under student services/placement testing.

Course Withdrawal: Course withdrawals are recommended if you cannot complete the course and are accepted at the Registrar's office by November 5th. 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, however an 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 dishonesty erodes the legitimacy of every degree awarded by the College. In this class and in all the courses in your academic career, present only your own best work 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:

Learning Portfolio: All students are required to maintain an online learning portfolio in Digication that uses the college template.

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	<ul style="list-style-type: none"> • Learning Disabilities • ADD/ADHD • Autism Spectrum • Mental Health Disabilities
Elizabeth Willcox, Advisor (860) 215-9289 Room A113	<ul style="list-style-type: none"> • Medical Disabilities • Mobility Disabilities • Sensory Disability

Title IX Statement of Policy: “Title IX of the Education Amendments Act of 1972 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 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 educational programs and activities.”

Please Report Student Incidents to: Maria Krug, Title IX Coordinator, Three Rivers Community College, 574 New London Turnpike Norwich, CT 06360 Room C131, (860) 215-9208, mkrug@trcc.commnet.edu

Non-discrimination policy: 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 record.

The following person has been designated to handle inquiries regarding the non-discrimination policies: Ken Saad, Equity and Diversity Officer, Three Rivers Community College, 574 New London Turnpike Norwich, CT 06360, (860) 215-9319, KSaad@trcc.commnet.edu.

Course Objectives: Chemistry 111 – Concepts of Chemistry

1. The student will develop “critical thinking skills” and will learn to derive sound scientific conclusions by analyzing scientific data.
2. The student will demonstrate knowledge of the scientific method through examples.
3. The student will be able to define science.
4. The student will be able to define chemistry, list and describe the various branches of chemistry.
5. The student will be able to define matter.
6. The student will be able to identify the three physical states of matter and describe their basic characteristics.
7. The student will be able to distinguish between homogenous and heterogeneous matter.
8. The student will be able to explain the difference between pure substances, solutions, homogeneous mixtures, and heterogeneous mixtures.
9. The student will learn the laws of conservation of energy and mass, and explain the interrelationship between these two laws.
10. The student will learn the division of elements into metals and non-metals and will be able to describe their chemical and physical properties.
11. The student will learn the rules for identifying significant digits.
12. The student will learn the correct use of significant digits in basic mathematical operations.
13. The student will learn the metric system of measurements and its application in science.
14. The student will be able to make conversions within the metric system.
15. The student will be able to covert metric units to English units and vice versa.
16. The student will learn the basic measures of matter.
17. The student will learn the correct procedures for measuring mass (weight).
18. The student will learn the correct procedures for measuring volume.
19. The student will be able to define and/or describe the distinguishing characteristics of the following terms: mass, weight, energy, calorie, joule, Newton of force, specific heat, density, and specific gravity.
20. The student will be able to define the term atom, describe the structure of an atom and give the general characteristics of atoms.
21. The student will be able to name the subatomic particles, explain their unique characteristics, and describe the arrangement of these particles in an atom.
22. The student will be able to define the term isotope and explain how isotopes differ from each other.

23. The student will be able to describe the unique characteristics of natural radioactive isotopes.
24. The student will be able to understand the principle energy levels and their electron capacities in relationship to the Quantum Mathematical Model.
25. The student will be able to demonstrate the arrangement of electrons in the principle energy levels, the arrangement of electrons in the sub-levels and the arrangement of electrons in the orbitals.
26. The student will be able to explain what is meant by valence electrons.
27. The student will be able to explain ionic charge, valence, and oxidation numbers.
28. The student will be able to explain electron arrangement as it relates to chemical bonding (ionic and covalent).
29. The student will be able to define terms, ions (cation and anion), molecules and compounds.
30. The student will learn to write chemical formulas for compounds.
31. The student will be able to understand the structure of some representative compounds.
32. The student will learn the general characteristics of the series and groups of elements in the periodic table.
33. The student will learn how to use the periodic table of elements as one of the tools for studying chemistry.
34. The student will learn the scientific methods for naming inorganic compounds.
35. The student will learn to calculate formula weights of elements, ions, molecules and compounds.
36. The student will learn to calculate the molar masses of elements, ions, molecules and compounds.
37. The student will learn to calculate the percent composition of each element in a compound.
38. The student will learn to calculate the empirical formula for compounds.
39. The student will learn the basic concepts of chemical equations.
40. The student will learn the terms and symbols used in writing a chemical equation, as well as their meanings.
41. The student will learn the guidelines for balancing chemical equations.
42. The student will be able to write and balance chemical equations.
43. The student will be able to do simple calculations involving chemical equations (Stoichiometry).
44. The student will be able to demonstrate knowledge of the unique characteristics of gases and the gas laws.
45. The student will be able to perform calculations involving the gas laws.
46. The student will demonstrate knowledge of the characteristics of water and other liquids.
47. The student will demonstrate knowledge of the characteristics of solids.
48. The student will be able to define the term solution, identify and give the characteristics of different types of solutions.
49. The student will be able to explain solubility and list factors that affect solubility, as well as, factors that affect the rate of solubility.
50. The student will be able to explain the difference between saturated, unsaturated and supersaturated solutions.
51. The student will be able perform calculations involving solutions (percent mass, molal, molar, normal).
52. The student will be able to give various definitions of acids and bases, and explain their properties.

53. The student will be able to define pH.
54. The student will be able to define the term buffer and explain the process of neutralization.
55. The student will be able to distinguish between electrolytes and non-electrolytes.
56. The student will be able to understand oxidation-reduction reactions and balance Redox equations.
57. The student will be able to understand reaction rates and chemical equilibrium.
58. The student will be able to define organic chemistry.
59. The student will be able to give the chemical composition and the basic characteristics of carbohydrates, lipids, proteins, nucleic acids and vitamins.
60. The student will be able to define the following terms: metabolism, anabolism and catabolism.
61. The student will learn the basic biochemical mechanisms of photosynthesis, DNA and RNA synthesis, protein synthesis, and cellular respiration.
62. The student will learn the characteristics and classification of the major groups of hydrocarbons.
63. The student will learn the IUPAC system for naming hydrocarbons.
64. The student will learn the chemical composition of some of the derivatives of the hydrocarbons.

TENTATIVE COURSE SCHEDULE

Date	Tuesday, Thursday class 9:30 – 10:45 in D128	Tuesday Lab 12:30 – 3:25 in B216
Aug 27 - 29	We will cover syllabus & Ch 1 & 2	No lab —
Sept 3 - 5	We will cover Ch 2 & 3	We will cover lab safety and more practice problems in lab. <u>Please bring your calculator and notes to lab.</u>
Sept 10 - 12	We will cover Ch 4 & Ch 9 Due: Quiz 1 on 9/12 (Thurs)	We will complete Lab #1: Measurements*
Sept 11 - 19	We will cover Ch 9 & Ch5A Due: Quiz 2 on 9/19 (Thurs)	We will complete Lab #2: Penny Chemistry* Due: Measurements lab report
Sept 24 - 26	We will cover Ch 10A **Unit Test 1 on 9/26 (Thurs) <u>Covering Ch 1, 2, 3, 4 & 9</u>	We will complete Lab #3: Percent Water in a Hydrate* Due: Penny Chemistry lab report
Oct 1 - 3	We will cover Ch 6 Due: Quiz 3 on 10/3 (Thurs)	We will complete Lab #4: Ionic Compounds* <u>Please read 5.5 – 5.7 in text before lab</u> Due: % Water in Hydrate lab report
Oct 8 - 10	We will cover Ch 7A & Ch 16A Due: Quiz 4 on 10/10 (Thurs)	We will complete Lab #5: Covalent Compounds* <u>Please read 10.5 – 10.7 in text before lab</u> Due 2 labs: Ionic Compounds & Covalent Compounds
Oct 15 - 17	We will cover Ch 8 Due: Quiz 5 on 10/17 (Thurs)	Lab Test 1 covering Labs 1, 2, 3, 4 & 5
Oct 22 - 24	10/22—practice problems 10/24 – We will cover Ch 12	Practice problems in lab (Reading Day)
Oct 29 – 31	<u>**Unit Test 2 on 10/29</u> <u>Covering Ch 5A, 10, 6, 7 & 16A</u> 10/31 - We will cover Ch 12 Due: Quiz 6 on 10/31 (Thurs)	Lab #6: Paper Chromatography
NOTE: Nov 5	Last day to withdraw from classes	
Nov 5 - 7	We will cover Ch 13 Due: Quiz 7 on 11/7 (Thurs)	We will complete Lab #7 Stoichiometry* Due: Paper Chromatography lab due

Nov 12 - 14	We will cover Ch 11 Due: Quiz 8 on 11/14 (Thurs)	We will complete Lab #8: Acids and Bases* Due: Stoichiometry lab due
Nov 19 - 21	We will cover Ch 14 **Unit Test 3 on 11/21 (Thurs) <u>Covering Ch 8, 12 & 13</u>	We will complete Lab #9: Solution Stoichiometry Due: Acids & Bases lab due
Nov 26	We will cover Ch 14 Due: Quiz 9 on 11/26 (Tues)	No lab this week Thanksgiving Break 11/27-11/28
Dec 3 – 5	We will cover Ch 15, 18/19 in class / Due: Quiz 10 on 12/5 (Thurs)	We will complete Lab #10: Titration of Vinegar Due: 2 labs Solution Stoichiometry & Titration of Vinegar
Dec 10 - 12	We will cover Ch 18/19 in class **Unit Test 4 on 12/12, Thurs <u>Covering Ch 11, 14, 15, 18/19</u>	Lab Final covering experiments 6, 7, 8, 9, & 10

* Please read procedure before coming to lab

Revisions to the Syllabus: Students are responsible for learning all 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 a new test date.

Reading Day: Reading Days are to be used as study days, and/or optional make-up class time at the discretion of faculty members. No student shall be penalized for not attending any activities/classes on a reading day.

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 you missed before the next class, so you will be able to follow along.
- Exchange contact information with classmates and form a study group.
- **You will get as much out of this course as you put in to it.**

COURSE GRADING**Grade Determination: Total points for the course: 1000 points****Class Points: 750 points total**

Unit Test 1	163 points	(contributes 16.3% to your grade)
Unit Test 2	163 points	(contributes 16.3% to your grade)
Unit Test 3	163 points	(contributes 16.3% to your grade)
Unit Test 4	163 points	(contributes 16.3% to your grade)
Quizzes*	98 points	(contributes 9.8% to your grade)

Lab Points: 250 points total

Lab Reports	100 points	(contributes 10% to your grade) (each 10 points)
Lab Practical 1	75 points	(contributes 7.5 % to your grade)
Lab Practical 2	75 points	(contributes 7.5 % to your grade)

***Quizzes** – There are 10 quizzes, but I will only consider your 7 highest quiz grades in calculating your final grade. This way, if you are unable to complete a quiz on time, or are absent from class and cannot turn in your quiz on time, it will not drop your grade unless it happens on more than three occasions. (10 quizzes, each worth 14 points, but since only the seven highest quiz grades are considered, the quiz total that factors into grading is only 98 points, (7 x 14 = 98).

All course grades will be posted 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:	<u>Assignment</u>	<u>Points available</u>	<u>Points earned</u>	<u>%</u>
	Lab Report 1	10	9	(90%)
	Lab Report 2	10	9	(90%)
	Quiz 1	14	12	(86%)
	Quiz 2	14	14	(100%)
	<u>Unit Test 1</u>	<u>163</u>	<u>114</u>	<u>(70%)</u>
	Sum	211	158	

How am I doing in the course? $158/211 \times 100\% = 74.9\% = C$

Grade Scale:

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

(Remember: Once quizzes 8, and 10 have been graded, use only your 7 highest quiz scores when calculating your grade.)

Extra Credit: There are two options available for earning up to 20 extra credit points in the course. The extra credit is **worth a maximum of 2% of your course grade.** (The total number of points in the course are 1000, so 20/1000 is only 2%.) **Extra Credit will only be graded at the end of the semester.**

Extra Credit Option 1: Through online access to Mastering Chemistry (purchased either as a bundle with the textbook, or directly through Pearson Publishers) complete assignments labeled as “Extra Credit” for each Chapter. Assignments for each chapter are available once we begin them in the course, but I will only grade the extra credit at the end of the semester. To access these assignments, you will need the following course code: **MCBASU1851409**. In addition to these “extra credit” assignments, there are assignments labeled “Optional video/activity” that are posted for each chapter. I do not grade the optional video/activity assignments, but have provided them to you, because you may find them useful.

Extra Credit Option 2: If you do not purchase Mastering Chemistry, you may still earn up to 20 extra credit points, by completing assigned even-numbered problems from the end of each chapter. I will collect and grade these extra credit problems only at the end of the semester.

Course Withdrawal: Course withdrawals are recommended if you cannot complete the course and are accepted at the Registrar’s office by **November 5th**. 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, however an 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.*