Concepts in Chemistry, CHE*K111

Three Rivers Community College, Norwich, CT

Spring 2018

Everyone will meet for Lecture on
Mondays and Wednesdays at 1:30 – 2:45 in Room B125 (CRN 10230)
Some of you meet for Lab on **Mondays at 9:30 – 12:15 in Room B216 (CRN 13090)**
Some of you meet for Lab on **Fridays at 11:00 – 1:45 in Room B216 (CRN 10231)**

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:
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 (online service providing videos and practice problems)
The course code for this course is **MCBASU29730**

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.

TENTATIVE COURSE SCHEDULE*

Week of 1/17 – 1/19

Lecture: Chapter 1: The Chemical World
Chapter 2: Measurement and Problem Solving
Lab: No lab this week

Week of 1/22 – 1/26

Lecture: Chapter 2: Measurement and Problem Solving
Chapter 3: Matter and Energy
Chapter 4: Atoms and Elements
Lab: Safety lecture and practice problems

Week of 1/29 – 2/2

Lecture: ****Quiz 1, Wednesday, 1/31 covering Chapter 2 and 3**
Chapter 4: Atoms and Elements
Chapter 5A*: Molecules and Compounds (*sec 5.1 – 5.5, 5.11)
Lab: #1 Measurements

Week of 2/5 – 2/9

Lecture: ****Quiz 2, Wednesday, 2/7 covering Chapters 4 and 5A**
Chapter 9: Electrons in Atoms and the Periodic Table
Chapter 10A*: Chemical Bonding (*sec 10.1-10.4, 10.8)
Lab: #2: Penny Chemistry

Week of 2/12 – 2/14 **No Lab on Friday, 2/16 – all classes cancelled @ TRCC**

Lecture: *****Unit Test 1: Wednesday, 2/14, covering Ch. 2, 3, 4, 5A**
Chapter 10A*: Chemical Bonding (*sec 10.1-10.4, 10.8)
Lab: Monday, 2/12: #3: Percent Water in a Hydrate &
#4: Ionic Compounds (Ch. 5, section 5.6 - 5.7)

Week of 2/21 – 2/23 **No Lecture & Lab on Monday, 2/19, TRCC closed**

Lecture: ****Quiz 3, Wednesday, 2/21, covering Ch 9 and 10A**
Chapter 6: Chemical Composition: The Mole
Lab: Friday, 2/23: #3: Percent Water in a Hydrate &
#4: Ionic Compounds (Ch. 5, section 5.6 - 5.7)

Week of 2/26 – 3/2

Lecture: Chapter 6: Chemical Composition: The Mole
Chapter 7A*: Chemical Reactions (sec. 7.1 – 7.4, 7.10)
Lab: #5: Covalent Bonding (Ch.10, sec 10.5 – 10.7, Ch.5 sec 5.8 – 5.9)

Week of 3/5 – 3/9

Lecture: ****Quiz 4, Wednesday, 3/7, covering Chapter 6**
Chapter 7A*: Chemical Reactions (sec. 7.1 – 7.4, 7.10)

Chapter 16A*: Oxidation/Reduction Reactions (sec. 16.1 – 16.3)
Chapter 8: Stoichiometry
Lab: *****Lab Practical 1, in Lab (Monday or Friday) covering labs #1-3**

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

Week of 3/19 – 3/23

In Lecture: **** Quiz 5, Wednesday, 2/21, covering Chapters 7 & 16A**
Chapter 8: Quantities in Chemical Reactions (Stoichiometry)
Chapter 11: Gases
Lab: #6: Stoichiometry

Week of 3/26 – 3/30 **College Closed, Friday, 3/30, Day of Reflection**

Lecture: **** Unit Test 2, Wednesday (2/28) covering 9, 10, 6, 7, and 16A**
Chapter 11: Gases
Lab: no lab

Week of 4/2 – 4/6

Lecture: **** Quiz 6, Wednesday, 4/4 covering Chapter 8 and 11**
Chapter 13: Solutions
Lab: #7: Acids and Bases

Week of 4/9 – 4/13

Lecture: **** Quiz 7, Wednesday, 4/11 covering Chapter 13**
Chapter 14: Solutions: Acids and Bases
Lab: #8: Solution Stoichiometry

Week of 4/16 – 4/20

Lecture: **** Quiz 8, Wednesday, 4/18 covering Chapter 14**
Chapter 12: Liquids and Solids
Lab: Problem Session,

Week of 4/23 – 4/27

Lecture: ***** Unit Test 3, Wednesday, 4/25 covering Chapters 11-14**
Chapter 15: Equilibrium
Lab: #9: Titration of Vinegar

Week of 4/30 – 5/4

Lecture: Snapshots from Chapters 18 & 19
Final Review
Lab: **Lab Practical 2, Monday (4/30) or Friday (5/4) covering labs #5 - 9**

Final Exam: Either: Monday, May 7th from 9:30 – 12:30
Or: Friday, May 11th from 11:00 – 2:00

***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

Unit Test 1	**160 points**	**(contributes 16% to your grade)**
Unit Test 2	**160 points**	**(contributes 16% to your grade)**
Unit Test 3	**160 points**	**(contributes 16% to your grade)**
Quizzes*	**120 points**	**(contributes 12% to your grade)**
Final Exam (cumulative)	**150 points**	**(contributes 15% to your grade)**

Lab Points: 250 points total

Lab Reports	**90 points**	**(contributes 9% to your grade) (each 10 points)**
Lab Practical 1	**80 points**	**(contributes 8% to your grade)**
Lab Practical 2	**80 points**	**(contributes 8 % to your grade)**

***Quizzes – There are 8 quizzes, but I will only factor in the 6 highest quiz grades and drop the 2 lowest quiz grades.** 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 two occasions. **(8 quizzes, each worth 20 points, but since two lowest quiz grade are dropped, quiz total that factors into grading is only 120 points, (6 x 20 = 120).**

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
Quiz 1	20	18
Lab Practical I	80	67
Sum	120	101

How am I doing in the course? : 101/120 x 100% = 84.2 % = B

**** Please note: I will drop the two lowest quiz grades, so if you are calculating your grade later in the semester and you have completed more than 6 quizzes, you need to look at all the quiz scores and only use the 6 highest quiz scores.**

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

Extra Credit: There are two options available for earning up to 20 extra credit points in the course. The extra credit is **only 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.**

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: **MCBASU29730.** 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.

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 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 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.*

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

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:

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Interim Title IX Coordinator
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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.