Syllabus

CHE*K111 Concepts of Chemistry

Three Rivers Community College Norwich, CT 06360

INSTRUCTOR INFORMATION:

Name: Dr. Lubabalo T. Bululu

email: lbululu@threerivers.edu

Phone: (860) 215-9502

Room: D 205W

Office hours: Tuesday 4:00-5:00 p.m.

Thursday 4:30-5:30 p.m.

Course Description: CHE* K111 - Concepts of Chemistry

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).*

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 structures 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.

Lecture (CRN 30929): Tuesday 6:30-9:15 p.m. Room D224

Lab (CRN 30930): Thursday 6:30-9:25 p.m. Room B216

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

MasteringChemistry course code, or, ID: **MCBULULU06591** and student email

Website: (https://www.masteringchemistry.com)

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

Other Required Materials: Chemical safety goggles, scientific calculator.

General Course Objectives:

• To aid the student in developing an understanding of the basic concepts of chemistry.

• To encourage awareness of how chemistry affects our lives daily.

• To provide a useful body of knowledge for students studying chemistry, biology, fire science, environmental science, nursing and other allied health science areas.

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

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

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 ensuring 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."

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: 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

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 the course of 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.

Class Attendance Policy: Attendance of all lecture and laboratory periods is required. Attendance is taken at each class meeting. Students should make every effort to arrive on time. However, if you are late for class it is your responsibility to notify me so you are not marked absent.

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 objectives or academic schedule contained in this syllabus as necessary.

Make-Ups: Make-ups are granted (*test must be taken within one week of the scheduled test date*) only if a test is missed due to extenuating circumstances such as illness, bereavement, work commitment, travel emergency, or other condition beyond the control of the student. Students must contact the instructor 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.

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.

Cell phones and other electronic devices: Electronic devices must be silenced at all times. Under no circumstances are phones to be answered in class. A cell phone is not permitted as a substitute for a calculator on exams and labs.

Grade Determination:

4 Lecture Exams.....50% of grade

Lab Final plus 9 lab reports.....30% of grade

Online homework assignments.....10% of grade

Online quizzes.....10% of grade

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 in 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.

Course Objectives:

The student will...

1. develop “critical thinking skills” and will learn to derive sound scientific conclusions by analyzing scientific data.

2. demonstrate knowledge of the scientific method through examples.

3. be able to define science.

4. be able to define chemistry, list and describe the various branches of chemistry.

5. be able to define matter.

6. be able to identify the three physical states of matter and describe their basic characteristics.

7. be able to distinguish between homogeneous and heterogeneous matter.

8. be able to explain the difference between pure substances, solutions, homogeneous mixtures, and heterogeneous mixtures.

9. learn the laws of conservation of energy and mass, and explain the interrelationship between these two laws.

10. learn the division of elements into metals and non-metals and will be able to describe their

chemical and physical properties.

11. learn the rules for identifying significant digits.

12. learn the correct use of significant digits in basic mathematical operations.

13. learn the metric system of measurements and its application in science.

14. be able to make conversions within the metric system.

15. be able to convert metric units to English units and vice versa.

16. learn the basic measures of matter.

17. learn the correct procedures for measuring mass (weight).

18. learn the correct procedures for measuring volume.

19. 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. be able to define the term atom, describe the structure of an atom and give the general characteristics of atoms.

21. be able to name the subatomic particles, explain their unique characteristics, and describe the arrangement of these particles in an atom.

22. be able to define the term isotope and explain how isotopes differ from each other.

23. be able to describe the unique characteristics of natural radioactive isotopes.

24. be able to understand the principle energy levels and their electron capacities in relationship to the Quantum Mathematical Model.

25. 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. be able to explain what is meant by valence electrons.

27. be able to explain ionic charge, valence, and oxidation numbers.

28. be able to explain electron arrangement as it relates to chemical bonding (ionic and covalent).

29. be able to define terms, ions (cation and anion), molecules and compounds.

30. learn to write chemical formulas for compounds.

31. be able to understand the structure of some representative compounds.

32. learn the general characteristics of the series and groups of elements in the periodic table.

33. learn how to use the periodic table of elements as one of the tools for studying chemistry.

34. learn the scientific methods for naming inorganic compounds.

35. learn to calculate formula weights of elements, ions, molecules and compounds.

36. learn to calculate the molar masses of elements, ions, molecules and compounds.

37. learn to calculate the percent composition of each element in a compound.

38. learn to calculate the empirical formula for compounds.

39. learn the basic concepts of chemical equations.

40. learn the terms and symbols used in writing a chemical equation, as well as their meanings.

41. learn the guidelines for balancing chemical equations.

42. be able to write and balance chemical equations.

43. be able to do simple calculations involving chemical equations (Stoichiometry).

44. be able to demonstrate knowledge of the unique characteristics of gases and the gas laws.

45. be able to perform calculations involving the gas laws.

46. demonstrate knowledge of the characteristics of water and other liquids.

47. demonstrate knowledge of the characteristics of solids.

48. be able to define the term solution, identify and give the characteristics of different types of solutions.

49. be able to explain solubility and list factors that affect solubility, as well as, factors that affect the rate of solubility.

50. be able to explain the difference between saturated, unsaturated and supersaturated solutions.

51. able perform calculations involving solutions (percent mass, molal, molar, normal).

52. be able to give various definitions of acids and bases, and explain their properties.

53. be able to define pH.

54. be able to define the term buffer and explain the process of neutralization.

55. be able to distinguish between electrolytes and non-electrolytes.

56. be able to understand oxidation-reduction reactions and balance Redox equations.

57. be able to understand reaction rates and chemical equilibrium.

58. be able to define organic chemistry.

59. be able to give the chemical composition and the basic characteristics of carbohydrates, lipids, proteins, nucleic acids and vitamins.

60. be able to define the following terms: metabolism, anabolism and catabolism.

61. learn the basic biochemical mechanisms of photosynthesis, DNA and RNA synthesis, protein synthesis, and cellular respiration.

62. learn the characteristics and classification of the major groups of hydrocarbons.

63. learn the IUPAC system for naming hydrocarbons.

64. learn the chemical composition of some of the derivatives of the hydrocarbons.

Tentative Academic Schedule: CHE*K111 Concepts of Chemistry Fall 2018:

Lecture (30929): Tuesday 6:30-9:15 p.m. Room D224

Lab (30930): Thursday 6:30-9:25 p.m. Room B216

Week 1

Tue: Aug 28 Ch 1- The Chemical World and Ch 2- Measurement and Problem Solving.

Thur: Aug 30 Ch 3- Matter and Energy

Week 2

Tue: Sep 4 Ch 4- Atoms and Elements.

Thur: Sep 6 *Lab Safety and Orientation; introduction to measurements.*

Week 3

Tue: Sep 11 Ch 9- Electrons in Atoms and the Periodic Table.

Thur: Sep 13 *Measurements (exp #1).*

Week 4

Tue: Sep 18 **Test 1** (Chs 1-4,9); Ch 5- Molecules and Compounds.

Thur: Sep 20 *Penny Chemistry (exp #2).*

Week 5

Tue: Sep 25 Ch 5 continued; Ch 6- Chemical Composition.

Thur: Sep 27 *Percent Water in a Hydrate (exp #3).*

Week 6

Tue: Oct 2 Ch 6 continued; Ch 10- Chemical Bonding

Thur: Oct 4 *Ionic Compounds: Nomenclature and Bonding (exp #4);* Ch 10 continued.

Week 7

Tue: Oct. 9 Ch 7- Chemical Reactions.

Thur: Oct. 11- *Covalent Bonding and Molecular Structure (exp #5);*

Ch 16- Oxidation & Reduction (secs. 16.1, 16.2, 16.3, 16.5).

Week 8

Tue: Oct 16 **Reading day**

Thur: Oct 18 Ch 8- Quantities in Chemical Reactions.

Week 9

Tue: Oct 23 **Test 2** (Chs 5-7,10,16); Ch 11- Gases

Thur: Oct 25 Ch 11 continued; Ch 12- Liquids, Solids, and Intermolecular forces.

Week 10

Tue: Oct 30 Ch 12 continued, Ch 13- Solutions

Thur: Nov. 1 *Stoichiometry (exp #6).*

Week 11

Tue: Nov 6 Ch 13 continued; Ch 14- Acids and Bases

Thur: Nov. 8 *Acids, Bases, and Electrolytes (exp #7).*

Week 12

Tue: Nov 13 **Test 3** (chapters 8,11-14); Ch 14 continued

Thur: Nov 15 *Solution Stoichiometry (exp #8).*

Week 13

Tue: Nov 20 Ch 15- Equilibrium (and kinetics).

Thur: Nov 22 Thanksgiving

Week 14

Tue: Nov 27 Ch 17- Nuclear Chemistry.

Thur: Nov 29 *Vinegar Titration (exp #9).*

Week 15

Tue: Dec 4 Ch 18- Organic Chemistry

Thur: Dec 6 Ch 19- Biochemistry

Week 16

Tue: Dec 11 **Test 4** (chapters 15,17-19)

Thur: Dec 13 **Lab Final**