

## SYLLABUS



CHE\*K111, CONCEPTS OF CHEMISTRY

SPRING 2018

THREE RIVERS COMMUNITY COLLEGE  
NORWICH, CONNECTICUT 06360

Lecture (CRN 10529), M 6:00pm-8:45pm, Room D224

Lab (CRN 10530), W 6:00pm-8:45pm, Room B216

Dr. D. David Pascal, Jr. Chemistry Instructor, Department of Natural Sciences

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Office Hours:      M,W 11:00-1:00; 4:30-5:30  
                            T, 11:00-12:00  
                            Also, by appointment

# Sexual Misconduct and Title IX Statements

## BOARD OF REGENTS FOR HIGHTER 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 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.”

### 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 incidences to:

Victoria A. Baker, Title IX Coordinator  
Office E110  
574 New London Turnpike, Norwich CT 06360  
860.215.9208 [VBaker@trcc.commnet.edu](mailto:VBaker@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:

Victoria Baker, Title IX Coordinator, Three Rivers Community College, 574 New London Turnpike, Norwich, CT 06360, Room E110, 860-215-9208, [VBaker@trcc.commnet.edu](mailto:VBaker@trcc.commnet.edu).

## Special Disabilities Notice

If you have a disability which may require classroom, lab and/or test-taking modifications, please meet with a Disability Service Provider (DSP) as soon as possible. Accommodations cannot be provided until written authorization is received from a DSP.

### College Disability Service Providers

Matt Liscum, Counselor  
(860) 215-9265  
Room A113

- Learning Disabilities
- ADD/ADHD
- Autism Spectrum
- Mental Health Disabilities
- 

Elizabeth Wilcox, Advisor  
(860) 215-9289  
Room A113

- Medical Disabilities
- Mobility Disabilities
- Sensory Disability

Course: Concepts of Chemistry / CHE K111

Credits: 4 hrs. credit (3hours of lecture and 3hours of lab each week)

Text: Introductory Chemistry, 6<sup>th</sup> edition, Nivaldo J. Tro; Publisher, Pearson.

Lab Manual: Concepts of Chemistry Laboratory Manual; Publisher, Hayden-McNeill

Other Required Materials: Chemical safety goggles, scientific calculator

Description of the Course:

A) Catalogue Description: This course offers a brief and comprehensive survey of the 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 intended for students with little or no background in chemistry who need this course as a prerequisite 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. **Prerequisites:** ENG\*K101 or ENG\*K101S placement or completion of ENG\*K096 with a "C#" grade or better; MAT\*137 or MAT\*137S with a "C" grade or better (or permission of the instructor on math requirement).

B) General Course Objectives (Course Mission Statements):

- 1) To aid the student in developing an understanding of the basic concepts of chemistry.
- 2) To encourage increase awareness as to how chemistry affects our lives daily.
- 3) To provide a useful body of knowledge for students studying chemistry, biology, fire science, environmental science, nursing and other allied health science areas.

Class Attendance Policy:

Attendance is expected. Absences are counted from the first meeting of class. More than four consecutive or more than six accumulative absences could result in a student receiving an "F" grade in this course. An explanation for the cause of all absences should be given to your instructor.

Academic and Classroom Misconduct:

The instructor has primary responsibility for control over classroom and/or 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 a "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.

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.

Tests:

There will be nine scheduled quizzes, some given at the beginning of class, others will be take-home). The two lowest quiz grades will be dropped. Three exams, two lab practical tests and a comprehensive final exam will also be given.

Grade Determination:

Quiz Average	12.5%
Exam No. 1	12.5%
Exam No. 2	12.5%
Exam No. 3	12.5%
Lab Practical No. 1	12.5%
Lab Practical No. 2	12.5%
Final Exam	<u>25.0%</u>
	100.0%

Grade Scale:

A	≥ 93
A-	90-92
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72
D+	67-69
D	63-66
F	≤ 59

Exemption Policy:

Students achieving an average of 93 or higher by the end of the semester will be exempted from taking the final exam.

#### Make-ups:

Make-ups for missed quizzes or tests may be granted on an individual basis where extenuating circumstances apply, such as illness, bereavement, work commitments, travel emergencies or other conditions beyond the student's control. The student must contact the instructor as soon as possible before the next class meeting to explain the absence and arrange for a make-up. Labs can only be made up during the same week they are missed if arranged with the instructor of another lab section with available space.

#### Revisions to the Syllabus:

Students are responsible for learning all of the course objectives and material discussed in lecture and/or laboratory. The instructor reserves the right to revise the objectives or academic schedule contained in this syllabus as necessary.

#### Cell phones and other electronic devices:

Electronic devices must be silenced at all times. Under no circumstances are phones to be answered in class. When there are extenuating circumstances requiring that a student 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.**

#### Learning Portfolio:

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

#### 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.

Course Outcomes (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 convert 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, electronegativity, 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 suborbitals.
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 learn to calculate formula weights of elements, ions, molecules and compounds.
32. The student will learn to calculate the molar masses of elements, ions, molecules and compounds.
33. The student will learn to calculate the percent composition of each element in a compound.
34. The student will learn to calculate the empirical formula for compounds.
35. The student will learn the basic concepts of chemical equations.
36. The student will learn the terms and symbols used in writing a chemical equation, as well as their meanings.
37. The student will learn the guidelines for balancing chemical equations.
38. The student will be able to write and balance chemical equations.
39. The student will be able to do simple calculations involving chemical equations (Stoichiometry).
40. The student will be able to demonstrate knowledge of the unique characteristics of gases and the gas laws.
41. The student will be able to perform calculations involving the gas laws.
42. The student will demonstrate knowledge of the characteristics of water and other liquids.
43. The student will demonstrate knowledge of the characteristics of solids.
44. The student will be able to define the term solution, identify and give the characteristics of different types of solutions
45. The student will be able to explain solubility and list factors that affect solubility, as well as, factors that affect the rate of solubility.
46. The student will be able to explain the difference between saturated, unsaturated and supersaturated solutions.
47. The student will be able perform calculations involving solutions (percent mass, molal, molar, normal).
48. The student will be able to give various definitions of acids and bases, and explain their properties.
49. The student will be able to define pH.
50. The student will be able to define the term buffer and explain the process of neutralization.
51. The student will be able to distinguish between electrolytes and non-electrolytes.
52. The student will be able to understand oxidation-reduction reactions and balance Redox equations.
53. The student will be able to understand reaction rates and chemical equilibrium.
54. The student will be able to define organic chemistry.
55. The student will be able to give the chemical composition and the basic characteristics of carbohydrates, lipids, proteins, nucleic acids and amines (vitamins).
56. The student will be able to define the following terms: metabolism, anabolism and catabolism.
57. The student will learn the basic biochemical mechanisms of photosynthesis, DNA and RNA synthesis, protein synthesis, and cellular respiration.
58. The student will learn the characteristics and classification of the major groups of hydrocarbons.
59. The student will learn the IUPAC system for naming hydrocarbons.
60. The student will learn the chemical composition of some of the derivatives of the hydrocarbons.

**Chemistry 111 – Laboratory Outcomes (Objectives):**

1. The student will be able to identify, describe the location and name all permanent and portable safety equipment and devices in the laboratory and explain the appropriate use of each device.
2. The student will be able to identify and describe the proper use of common devices and equipment used in the chemistry lab for performing experiments.
3. The student will be able to describe the proper use of a centigrade quad-beam balance and an electronic balance in lab.
4. The student will be able to demonstrate the proper weighing techniques for both the quad-beam and electronic balance.
5. The student will be able to demonstrate the proper techniques for using graduate cylinders, pipettes, burettes and other devices that are used for measuring volumes.
6. The student will be able to demonstrate the proper procedures for setting up and carrying out laboratory experiments both accurately and safely.
7. The student will demonstrate the ability to choose the appropriate “Personal Safety Equipment” when performing various laboratory experiments.
8. The student will be able to calculate the theoretical yield for the products for the experiments on Percentages and Stoichiometry and compare the experimental yields with the theoretical yields.
9. The student will be able to collect and interpret data resulting for various experiments.
10. The student will be able to demonstrate the ability to write a lab report on various experiments.

**TENTATIVE ACADEMIC SCHEDULE**  
**CHE 111 CONCEPTS OF CHEMISTRY**  
**Spring 2018**

**Lecture (CRN 10529): M 6:00-8:45pm, Room D224**

**Lab (CRN 10530): W 6:00-8:45pm, Room B216**

**Week 1**

1/15 Classes not in session

1/17 Lec: Orientation

Ch 1 The Chemical World

**Week 2**

1/22 Lec: Ch 2, Measurement and Problem Solving

1/24 Lab: Preface, Laboratory Safety

**Week 3**

1/29 Lec: Quiz 1(Ch 1, 2)

Ch 3, Matter and Energy

Ch 4, Atoms and Elements

2/1 Lab: Experiment 1, Measurements

**Week 4**

2/5 Lec: Quiz 2 (Ch 3)

Ch 4 Atoms and Elements

Ch 9, Electrons in Atoms and the Periodic Table

2/7 Lab: Experiment 2, Penny Chemistry

## **Week 5**

2/12 Lec: Ch 9, Electrons in Atoms and the Periodic Table  
Ch 5, Molecules and Compounds

2/14 Lab: Quiz 3 (Ch 4, 9)  
Experiment 3, Percent Water in a Hydrate

## **Week 6**

2/19 Classes not in session – Presidents Day

2/21 Lab: Experiment 4, Ionic Compounds: Nomenclature and Bonding

## **Week 7**

2/26 Lec: Ch 6, Chemical Composition  
Ch 10, Chemical Bonding

2/28 Lab: Experiment 5, Covalent Bonding and Molecular Structure  
TH Quiz 4 (Ch 5, 6) due

## **Week 8**

3/5 Lec: Lab Practical No. 1  
Review for Exam 3

3/7 Lab: Exam 1 (Room TBA)

## **Week 9**

SPRING BREAK – NO CLASSES

## **Week 10**

3/19 Lec: Ch 7 Chemical Reactions  
Ch 8 Quantities in Chemical Reactions

3/21 Lab: Experiment 6, Stoichiometry

## **Week 11**

- 3/26 Lec: Ch 8 Quantities in Chemical Reactions  
Ch 14, Acids and Bases
- 3/28 Lab: Problem Solving Session I (Ch 13, Solutions)  
TH Quiz 5 (Ch 7, 8) due

## **Week 12**

- 4/2 Lec: Ch. 11, Gases
- 4/4 Lab: Experiment 7, Acids, Bases and Electrolytes  
Lec: TH Quiz 6 (Ch 14, 13) due

## **Week 13**

- 4/9 Lec: Exam 2
- 4/11 Lab: Experiment 8, Solution Stoichiometry  
Lec:

## **Week 14**

- 4/16 Lec: TH Quiz 7 (Ch 11) due  
Ch 15, Chemical Equilibrium  
Ch 16 Oxidation and Reduction  
Ch 17 Radioactivity and Nuclear Chemistry
- 4/18 Lab: Problem Solving Session II

## **Week 15**

- 4/23 Lec: TH Quiz 8 (Ch 15, 16) due  
Ch 18, Organic Chemistry
- 4/25 Lab: Experiment 9, Titration of Vinegar

## **Week 16**

- 4/30 Lec: TH Quiz 9 (Ch 17,18) due  
Ch 19, Biochemistry
- 5/2 Lab: Lab Practical No. 2

## **Week 17**

5/7 Lec: Exam 3

5/9 Lab: Review

## **Week 18**

5/14 Final Exam