

SOUTHERN MAINE COMMUNITY COLLEGE
South Portland, Maine 04106

Title:	Chemistry for Emergency Response w/Lab	Catalog Number:	CHEM 103
Credit Hours:	4 with required lab	Total Contact Hours:	45/30
Instructor:	Rob Lindstedt.	Email:	rlindstedt@smccme.edu
Office:	200 Howe Hall		
Office Hours:	By appointment		(O) 207-741-5750

Course Syllabus – Chemistry for Emergency Response w/Lab
Spring 2020

Co-requisite MATH 130 or 140, ENGL-075

COURSE DESCRIPTION

Course Description: This survey laboratory course is designed to acquaint the student with the broad principles of chemistry as they relate to application and hazards in the firefighting field. The survey includes basic chemical terminology, structure of matter, atomic bonding, molecular theory of matter, chemical and physical change, and the general states of matter, gases, liquids and solids. Discussion of the more common elements, compounds they form, and the resulting hazards and their uses, completes the course with attention to nuclear applications, pesticides and waste disposal. Labs will be conducted by the student independent of schedule class time. There will be specific lab demonstration times available for each week of the semester to assist the student with their independent learning.

Course Objectives

After successfully completing the course, the student will be able to:

- Have a conversant understanding of Chemical terminology
- Name an element name when given a chemical symbol.
- Identify a chemical symbol when given an element name.
- Explain the periodic table and its subdivisions.
- Describe the parts of an atom.
- Relate electron structure to chemical periodicity
- Identify the types of molecular bonding.
- Differentiate a compound as a salt or non-salt based on name or chemical formula.
- Classify salt and non-salt compounds based on sub-classification and associated hazards.
- Classify pure hydrocarbon and hydrocarbon derivative compounds with associated hazards when given chemical names or formulas.
- Identify chemical and physical properties of hazardous materials and their interrelationship.
- Evaluate compounds based on the chemical and physical properties.
- Learn typical skills associated with the handling, quantifying, and transferring of solids and liquids.
- Carry out chemical reactions while accurately noting and recording observations, make and report conclusions based on observations
- Graphically present data, and provide interpretation of the graphed data

Topical Outline of Instruction

1. Chemical Foundations
Scientific Method, and Classifying matter, hazard/risk assessment, and protective measures.
2. Atoms, Molecules, and Ions
Historical Chemistry, Atomic Structure, Molecules and ions, Periodic Table, Naming Compounds
3. Atomic Structure and Periodicity
Electromagnetic Radiation, Bohr Atom, Quantum Mechanics and Quantum Numbers, Atomic Orbitals, Electron Configuration, Periodic Trends.
4. Inorganic Chemistry: SALTS
Compounds, ions, cations, complex ions, nomenclature, bonding, hazards, Empirical Formulas
5. Inorganic Chemistry: NON-SALTS
Compounds, ions, cations, complex ions, nomenclature, bonding, hazards, Empirical Formulas
6. Gases
Gas Laws, Kinetic Molecular Theory of Gases
7. Bonding: General Concepts
Chemical Bonds, Electronegativity, Ionic and Covalent Bonds, Lewis Structures and the Octet Rule, Bond Resonance, the VSEPR Model.
9. Covalent Bonding: Orbitals
Hybridization of Orbitals, the Localized Electron Model, the Molecular Orbital Model.

Demonstrations of Lab Techniques: Each week a scheduled demonstration of the current lab will be conducted. All students are encouraged to attend the lab demonstrations. Attendance will not be recorded directly but participation is highly recommended as it will lead to more efficient and effective use of student time.

Required Materials:

- Text: FEMA Publications, Chemistry for Emergency Response 3rd Edition (This Text will be provided for you free of charge)
- _ Labpaq for Chemistry for Emergency Response (this is only available in the book store, but wait to purchase after our first class).

Attendance Policy:

Regular attendance to class is required. Excessive absences will result in you being dropped from the course. Maximum allowable absences will be three (3).

Topical Outline of Independent Labs

Week	Lab title	Demonstration Time/location
Week 1	Laboratory techniques and measures	
Week 2	The Scientific Method	
Week 3	Math and Graph Preparation	
Week 4	Melting points	
Week 5	States of Matter	
Week 6	Separation of a mixture	
Week 7	Solubility and solubility curves	
Week 8	Naming Ionic and molecular compounds	
Week 9	Molecular modeling and Lewis Structures	
Week 10	Anions, Cations and Ionic Reactions	
Week 11	Boyle's Law	
Week 12	Naming Organic Compounds	
Week 13	Energy Comparison of Fuels	
Week 14	Oxidation Reduction Activity Series	
Week 15	PH of Common Materials	
Week 16	Acid Base Chemistry	

Alternative Labs (possible)		
Chemical Reactions		
ID of Gasses		
Synthesis and Analysis of Soap		
Using Buffers		
Ultraviolet Radiation and Sunscreen		

Grading

Your final grade for this course will be based on the following:

1. Laboratory Lab reports – 20%
2. Two examinations – 30%

Exam 1: On or about Week 8

Exam 2: On or about Week 16

Exam dates are estimates. These exams will be cumulative, material included will be announced in class before the exam. Each exam will be one class period long. Make up exams will be given only in extreme situations and with specific permission from the instructor. No more than one exam may be taken as a make-up during the semester.

3. Chapter Quizzes – 20%

There will be 6 to 7 major announced quizzes. These will be given in class.

4. Weekly Quizzes- 10%

The professor reserves the option to give additional announced or unannounced smaller weekly quizzes. These Quizzes will be based on Guided Pre-class Note Taking Guides (open note). The weeks where there are no quizzes the quiz graded will be based on the degree the student was able to complete the assigned guide. Generally, quizzes may not be made up, but the lowest weekly quiz grade will be dropped.

5. Case Study Reports-20%

Throughout the semester students will be asked to do some fundamental research related to Emergency response and Chemistry.

6. Attendance

Regular attendance is required, and critical for successful completion of the course. Unavoidable absences should be discussed with me in advance. **Extended, unexcused absences (3) will result in you being dropped from the class.**

Grading Synopsis:

Labs:	20%
Exams(2):	30% (15% each)
Chapter Quizzes:	20%
Weekly Quizzes/G-PCNTG:	10%
Reports:	20%

EXPECTATIONS

Attendance is expected at all assigned classes. Attendance will be recorded. SMCC requires instructors to report the names of students to the registrar's office who stop attending class. For the purpose of this class, students will be reported as no longer attending after two consecutive absences from the class. A report of last date of attendance to the registrar's office results in a grade of Administrative Failure (AF) being recorded for the student. For more information, please refer to the SMCC Student Handbook. Students are expected to notify the instructor, in advance, concerning absences. Students are responsible for all material missed during absences, excused or

unexcused. If you must miss class for some reason, please notify your instructor immediately. Considering the nature of the material presented during this course, missing class time can have significant negative consequences. Absences and late arrivals will reduce a student's final grade earned in this class. More than three absences will be grounds for course failure. All classroom activities conducted on the date of absence will be given a grade of (0) zero. Any assignments due the day of an absence will be considered as being late. All late work will be given a grade of no more than 50% of available credit. No work will be accepted if it is a week or more late. Attendance is expected at all scheduled classes unless otherwise noted. Attendance will be recorded and will affect the class participation grade.

- Reading of assigned materials prior to class is expected. Weekly quizzes will be given over the assigned readings.
- Notetaking is necessary during each class. Notes and handouts should be organized in a binder.
- Respect the classroom, fellow students, faculty
- Active participation and critical thinking is necessary for knowledge sharing and to get the most from practice opportunities.
- No pagers, or cell phones during class time
- No food or tobacco of any kind used in the classroom
- No hats worn during class time

Early Warning Letters: After students have completed week 5 of the course, early warning letters will be sent home to students with unsatisfactory performance. Unsatisfactory performance is determined by a combination of grades and attendance.

End-of-Course Evaluation

In order to gain access to final course grades, students must complete evaluations for each course attended at SMCC. Evaluations are submitted online and can be accessed through the student portal site. Students can access the course evaluation report beginning two weeks before the end of classes. The deadline for submission of evaluations occurs 24 hours after the last day of classes each semester. Instructors will announce when the online course evaluation is available.

ADA Statement

Southern Maine Community College is an equal opportunity/affirmative action institution and employer. For more information, please call [207-741-5798](tel:207-741-5798). **If you have a disabling condition and wish to request accommodations in order to have reasonable access to the programs and services offered by SMCC, you must register with the Disability Services Coordinator, Sandra Lynham, who can be reached at 741-5923.** Further information about services for students with disabilities and the accommodation process is available upon request at this number. Course policies about online testing are modified to suit each individual's accommodations.

SMCC Pay-for-Print Policy

This policy identifies the cost per page for black and white as well as color printing in varying page sizes. Specifics of the policy are outlined below:

Per Page Costs

Each semester students receive a \$20 printing credit. The balance resets at the end of the semester and any remaining credits are removed. The cost varies depending upon page size and whether printing is done in black and white or color.

- a. There is a \$0.10 per page fee for standard 8.5” by 11” black and white documents.
- b. The reverse sides of duplex (double-sided) documents are free.
- c. There is a \$.50 per page fee for standard 8.5” by 11” color documents.
- d. There is a \$.20 per page fee for 8.5” by 14” (legal) or 11” by 17” (tabloid) black and white documents.
- e. There is a \$1.00 per page fee for 8.5” by 14” (legal) or 11” by 17” (tabloid) color documents.

Duplex charges (printing on both sides of a page) work in the following fashion: One page is \$0.10, two pages are \$0.10, three pages are \$0.20, and four pages are \$0.20, *etc.* The flipsides are free, but another sheet of paper is \$0.10. Please be aware that a document with any color at all (when printed to a color printer) will by default be printed in color. You are responsible for setting the print job to print black and white if you do not need color. For directions, please go to the IT Help tab in My SMCC.

How does it work?

The College’s pay-for-print system monitors printing on all printers (including those in general access labs, library printers, the Academic Achievement Center, Noisy Lounge and technology labs). Students can check the number of pages they have printed by using the Printing Balance tool available on SMCC computers (located in the lower right corner of the screen, near the clock). Departments with work study students who need to print documents for the department should contact the HelpDesk at 741-5696 to have a special account set up.

Refunds

Print jobs are eligible for a refund in the event of mechanical or electronic error on the part of the printer, print server, or software used to submit the job. Jobs are not eligible for a refund in cases where the job was not set up correctly, was submitted multiple times, or the student is not satisfied with the result. To request a refund, please bring the offending print to the IT Department in the basement of the Ross Technology Center. Refunds will be granted in the form of a credit to the student’s account.

Why is SMCC charging for printing?

The pay-for-print system is an effort to control escalating printing costs. Charging for printing helps offset the increasing cost of supplies and encourages students to conserve resources. To find ways to reduce your printing charges, please go to the IT Help tab on My SMCC. If you have questions about the pay-for-printing policy or your printing charges, please contact the HelpDesk at 741-5696 or send an email to helpdesk@smccme.edu.

Add-Drop Policy

Students who drop a course during the one-week “add/drop” period in the fall and spring semesters and the first three days of summer sessions receive a 100% refund of the tuition and associated fees for that course. Please note any course that meets for less than the traditional semester length, i.e., 15 weeks, has a pro-rated add/drop period. There is no refund for non-attendance.

Withdrawal Policy

A student may withdraw from a course only during the semester in which s/he is registered for that course. The withdrawal period is the second through twelfth week of the fall and spring semesters and the second through ninth week of twelve-week summer courses. This period is pro-rated for shorter-length courses. To withdraw from a course, a student must complete and submit the appropriate course withdrawal form, available at the Enrollment Service Center (no phone calls, please). The designation “W” will appear on the transcript after a student has officially withdrawn. A course withdrawal is an uncompleted course and may adversely affect financial aid eligibility. Failure to attend or ceasing to attend class does not constitute withdrawal from the course. There is no refund associated with a withdrawal.

Plagiarism Statement

Adherence to ethical academic standards is obligatory. Cheating is a serious offense, whether it consists of taking credit for work done by another person or doing work for which another person will receive credit. Taking and using the ideas or writings of another person without clearly and fully crediting the source is plagiarism and violates the academic code as well as the Student Code of Conduct. If it is suspected that a student in any course in which they enrolled has committed such a violation, the faculty member should refer the matter to the College’s Disciplinary Officer and appropriate action will be taken under the Student Code of Conduct. Sanctions may include suspension from the course and a failing grade in the course. Students have the right to appeal these actions to the Disciplinary Committee under the terms outlined in the Student Code of Conduct.