

CAPILANO UNIVERSITY COURSE OUTLINE	
Term: FALL 2013	Course No. CHEM 110
Course: BONDING AND STRUCTURE	Credits: 4.0 Section:
INSTRUCTOR: TBA Office: TBA Tel: 604-986-1911 (Ext. TBA) email: tba@capilanou.ca web:	

COURSE FORMAT: Three hours of class time, three lab hours plus an additional hour of supplemental activity delivered through on-line or other activities for a 15 week semester, which includes two weeks for final exams.

PRE-REQUISITES: Chemistry 12 or CHEM 101 or BCHM 054 with a minimum "C+" grade; Math 12 or Pre-Calculus 12.

COURSE OBJECTIVES:

General:

The student will:

- gain a depth of understanding of basic chemistry, such that they will be thoroughly prepared for any subsequent chemistry course.
- learn to develop an awareness of the influence of science in our society and realise that science is not just a collection of isolated facts, but also a series of interconnecting and overlapping ideas.

Student Learning

Outcomes:

Upon successful completion of this course, the student should be able to:

- balance chemical equations and solve a variety of stoichiometric problems in solution and in the gas phase;
- demonstrate knowledge of atomic structure, periodicity, chemical bonding and molecular geometry;
- develop an understanding of the fundamental principles of organic chemistry; and
- solve a variety of chemical problems related to the course.

REQUIRED COURSE MATERIALS:

Textbook:

Chemistry 110, Custom Publication for Capilano University, Wiley, 2012.
Capilano University Chemistry 110 Laboratory Manual and Student Laboratory Guide.

Supplement:

Organic Chemistry model kit is recommended.

Term exam and extra problems guide is recommended.

COURSE CONTENT:

Topic	Chapter(s) in Text	Weeks
Introductory Material, Stoichiometry and Gases Most of the material in these chapters should be review and includes the chemical language, basic atomic structure, dimensional analysis, isotopes, the mole, properties of solutions, types of chemical reactions & stoichiometry, limiting reactants, the gas laws and their applications.	1 & 2 (Olmsted)	1, 2
Atomic Structure and Periodic Relationships Electromagnetic radiation and waves, quantum theory, photoelectric effect, emission spectroscopy, Bohr's theory, wave-particle duality, electron configurations, Hund's Rule, periodicity, atomic and ionic radii, ionization energy, and trends in properties in individual groups.	4 & 5 (Olmsted)	3 - 5
Chemical Bonding and Molecular Geometry Ionic and covalent bonding, the octet rule and Lewis structures, electronegativity, formal charge, resonance, VSEPR theory, dipole moments, valence bond theory and hybridization, molecular orbital theory (time-permitting).	6 & 7 (Olmsted)	6 - 8
Intermolecular Forces Dipole-dipole & dispersion attractions, hydrogen bonding, and their application to the physical properties of organic molecules.	3 (Brown)	9
Organic Chemistry Nomenclature of alkanes, alkenes and alkynes, including E/Z and R/S notation where relevant. Review of various functional groups. Constitutional, conformational, geometrical and optical isomers, ring flipping, axial and equatorial groups, electronic and steric effects. Benzene & aromaticity (time-permitting).	3, 4, 6 & 9 (Brown)	10 - 13
Final Exam period		14, 15

EVALUATION PROFILE:

Final grades for the course will be computed based on the following schedule:

Term Test 1	15%
Term Test 2	20%
Labs	20%
Final Exam	35%
Performance Evaluation	10%
TOTAL	100%

A pass grade of 50% or above is required on each of the laboratory and lecture portions of the course for the student to pass the course.

Please note that lab exemptions are granted at the discretion of the instructor.

PERFORMANCE EVALUATION:

In the absence of exceptional circumstances, which are at the instructor's discretion, the performance evaluation component of the final grade will be prorated to the rest of the grade. For example, a 10% performance evaluation component would be determined by dividing the remaining mark out of 90 by 9. The most common circumstance justifying an increased performance evaluation mark is a student's improved performance in the final examination relative to the midterm exam(s), which the instructor feels justifies an elevated letter grade.

SUPPLEMENTAL 4TH HOUR ACTIVITY:

Supplemental activity might be a scheduled tutorial, an on-line activity, a group meeting, or some other activity as indicated by your instructor.

GRADING PROFILE:

Letter grades will be assigned according to the following guidelines:

A+ 90 - 100%	B+ 77 - 79%	C+ 67 - 69%	D 50 - 59%
A 85 - 89%	B 73 - 76%	C 63 - 66%	F 0 - 49%
A- 80 - 84%	B- 70 - 72%	C- 60 - 62%	

Students should refer to the University Calendar for the effect of the above grades on grade point average.

OPERATIONAL DETAILS:***University Policies:***

Capilano University has policies on Academic Appeals (including appeal of final grade), Student Conduct, Cheating and Plagiarism, Academic Probation and other education issues. These and other policies are available on the University website.

Attendance:

The student is responsible for all information given in the lectures and laboratories, including times of examinations and assignment deadlines.

Missed Exams and Labs:

Normally, a score of zero will be given for a missed exam, test, quiz, lab, etc. In some exceptional situations, the student will

be permitted to write a make-up test, defer the lab to a later date or to replace the score by other marks.

The situations in which a score of zero may be avoided are those for which the student meets **all** of the following conditions:

1. Circumstances are beyond the control of the student which resulted in the exam, test, quiz, lab, etc. to be missed. Such circumstances include serious illness or injury, or death of close family member. They do **NOT** include forgetting about the test, lack of preparation for the test, work-related or social obligations.
2. The student has notified the instructor (or the Pure and Applied Sciences office staff, if the instructor is not available) about the missed exam, test, quiz, lab, etc. Such notification **MUST** occur in advance, if possible, or at the latest, on the day of the exam, test, quiz, lab, etc.
3. Proof of the circumstances must be provided. Proof of illness or injury requires a note from a doctor, who may also be consulted.
4. The student has been fully participating in the course up until the circumstances that prevented the writing of the exam, test, quiz, lab, etc. **Fully participating means attending almost all classes and turning in almost all assignments in the course.**

The options offered to the student who meets the four conditions are decided by the instructor. They will not necessarily meet the convenience of the student.

Final Exam Period:

Students should note that the final exam period is from **(date)** (*includes Saturday*), and that they can expect to write exams at any time during this period. Individual exam times will not normally be rescheduled because of holidays, work, or other commitments. While efforts are made to spread exams throughout the exam period, an individual's particular course combination may result in exams being scheduled close together, or spread widely through the entire exam period.

Cheating/Plagiarism:

Students caught cheating on a test will normally receive a grade of "F" on the course and may be expelled from the University. Plagiarism (including the copying of any part of assignments, laboratory reports, and essays) is a serious offence and is a form of cheating.

Incomplete Grades:

Incomplete grades ("I") are given only when special arrangements have been agreed upon with the instructor prior to the end of the semester. Since "I" grades are granted only in exceptional circumstances (usually health problems), their

occurrence is rare. A student receiving an "I" grade should see the instructor.

English Usage:

Students are expected to use correct standard English in their written and oral assignments, exams, presentations and discussions. Failure to do so may result in reduced grades in any part of the Evaluation Profile. Please refer to the guidelines provided in the Capilano Guide to Writing Assignments (available from the University bookstore).

Emergency Procedures:

Please read the emergency procedures posted on the wall of the classroom.