

COURSE OUTLINE		
<b>TERM: FALL 2018</b>	<b>COURSE NO: CHEM 101</b>	
<b>INSTRUCTOR:</b>	<b>COURSE TITLE: Fundamentals of Chemistry</b>	
<b>OFFICE: LOCAL:</b> <b>E-MAIL: @capilanou.ca</b>	<b>SECTION NO(S):</b>	<b>CREDITS: 4</b>
<b>OFFICE HOURS:</b>		
<b>COURSE WEBSITE:</b>		

Capilano University acknowledges with respect the Lil'wat, Musqueam, Squamish, Sechelt, and Tsleil-Waututh people on whose territories our campuses are located.

### **COURSE FORMAT**

Three hours of class time, two 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.

### **COURSE PREREQUISITES:**

Chemistry 11 or CHEM 030 or CHEM 130 or BCHM 044; and Foundations of Math 11 or Pre-calculus 11 or Pre-calculus 12 or BMTH 054 or MATH 097 or MATH 105 as a pre- or corequisite or Math Placement Test (Precalculus MPT)

### **CALENDAR DESCRIPTION**

This course introduces to the fundamental principles of chemistry including the concepts of nomenclature, stoichiometry, states of matter, chemical bonding, thermochemistry, equilibria, and nuclear science.

### **COURSE NOTE**

CHEM 101 is an approved Science and Technology course for Cap Core requirements.  
 CHEM 101 is an approved Quantitative/Analytical course for baccalaureate degrees.  
 CHEM 101 is an approved Science course.  
 CHEM 101 is an approved Laboratory Science course.

### **REQUIRED TEXTS AND/OR RESOURCES**

Chang, R. and Goldsby, K. Chemistry 101 – Custom Publication. 11<sup>th</sup> ed.  
 New York: McGraw-Hill, 2012.  
 Capilano University Chemistry 101 Laboratory Manual and Student Laboratory Guide.  
 Optional: Term Tests and Final Exam Booklet

### **COURSE STUDENT LEARNING OUTCOMES**

**On successful completion of this course, students will be able to do the following:**

- solve problems using scientific notation and dimensional analysis;
- balance chemical equations, solve stoichiometric problems in both solution and gas phases;
- explain the energy relations involved in chemical changes;
- solve problems in calorimetry;
- describe the features of basic nuclear reactions; and solve problems in radioactive dating;
- demonstrate proficiency in chemical experimental techniques including acid-base titrations and calorimetry;
- conduct laboratory experiments both individually and in groups, critically analyze data, draw conclusions from the data, and clearly and concisely report the observations and conclusions drawn from the laboratory experiments.

**Students who complete this Science and Technology course will be able to do the following:**

- Apply numerical and computational strategies to solve problems.
- Demonstrate how a problem, concept, or process can be modelled numerically, graphically, or algorithmically.
- Explain how scientific inquiry is based on investigation of evidence and evolves based on new findings.
- Participate in scientific inquiry and communicate the elements of the process, including making careful and systematic observations, developing and testing a hypothesis, analysing evidence, and interpreting results.

**COURSE CONTENT**

Topic	Weeks (approx)
<b>Introductory Material</b> Basic definitions; matter; measurement and error; scientific notation, significant figures; dimensional (unit) analysis.	1-2
<b>Atoms, Molecules &amp; Ions</b> Structure of the atom; atomic and mass number; isotopes; atomic mass; Avogadro's constant and the mole; chemical bonding; molecules, formulae, molar mass; ions and ionic compounds; percent composition; inorganic nomenclature.	2-3
<b>Chemical Reactions</b> Chemical equations; stoichiometry; solution concentrations; dilutions; limiting reactant; theoretical yield and percent yield.	4-5
<b>Reactions in Aqueous Solutions</b> Aqueous solutions; precipitation reactions and net ionic equations; acid-base reactions; oxidations states and balancing redox reactions.	6-7
<b>Gases</b>	8-9

Properties of gases; gas laws; the ideal gas equation and its use in calculations; gas stoichiometry problems and a brief examination of Dalton's Law of partial pressures.	
<b>Thermochemistry</b> Energy changes in chemical reactions; enthalpies of reaction and calorimetry; thermochemical equations and Hess's Law.	10-11
<b>Nuclear Chemistry</b> The student will look at different types of radioactive decay, dating of objects and examine nuclear stability. We will also briefly look at nuclear fission and fusion and the effects of radiation.	12-13
<b>Final Exam Period</b>	14,15

### EVALUATION PROFILE

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

Term Work	40%
Laboratory Work	15%
Performance Evaluation	5%
Final Examination	40%
TOTAL	100%

Term work will consist of tests, quizzes and/or assignments. No single component of term work will be worth more than 25%. Laboratory work will consist of quizzes, laboratory reports and/or in-lab assessments. The weight of individual tests, quizzes and assignments etc. are assigned by the instructor and will be announced in class in advance.

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

### Final Exam

Students should note that the final exam period includes exams scheduled on Saturdays 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.

### PERFORMANCE EVALUATION:

In the absence of exceptional circumstances, which are evaluated at the instructor's discretion, the performance evaluation component of the final grade will be pro-rated 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 term work, which the instructor feels justifies an elevated letter grade.

**GRADING PROFILE:**

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.

**Incomplete Grades**

Grades of Incomplete "I" are assigned only in exceptional circumstances when a student requests extra time to complete their coursework. Such agreements are made only at the request of the student, who is responsible to determine from the instructor the outstanding requirements of the course.

**Late Assignments**

Assignments are due at the beginning of the class on the due date listed. If you anticipate handing in an assignment late, please consult with your instructor beforehand.

**Missed Exams/Quizzes/Labs/Assignments**

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 clearly beyond the control of the student caused the exam, test, quiz, lab or assignment deadline 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 School of STEM 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 may be required.
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 of the 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. Make-up exams, tests and/or labs or extensions on assignment due dates are given at the discretion of the instructor. They are generally

given only in medical emergencies or severe personal crises. Some missed labs or other activities may not be able to be accommodated. Please consult with your instructor.

**Attendance**

Students are expected to attend all classes and associated activities. If classes are missed, it is the student's responsibility to become aware of all information given out in the classes or tutorials, including times of examinations and assignment deadlines.

**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).

**Electronic Devices**

Students may use electronic devices during class; however an instructor may ask for devices to be put away if they become a distraction to other students or interfere with classroom learning.

**On-line Communication**

Outside of the classroom, instructors will (if necessary) communicate with students using either their official Capilano University email or Moodle; please check both regularly. Official communication between Capilano University and students is delivered to students' Capilano University email addresses only.

**UNIVERSITY OPERATIONAL DETAILS****Tools for Success**

Many services are available to support student success for Capilano University students. A central navigation point for all services can be found at: <http://www.capilanou.ca/services/>

**Capilano University Security: download the [CapU Mobile Safety App](#)**

**Policy Statement (S2009-06)**

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

**Academic Integrity (S2017-05)**

Any instance of academic dishonesty or breach of the standards of academic integrity is serious and students will be held accountable for their actions, whether acting alone or in a group. See policy S2017-05 for more information: <http://www.capilanou.ca/about/governance/policies/Policies/>

Violations of academic integrity, including dishonesty in assignments, examinations, or other academic performances, are prohibited and will be handled in accordance with the Student Academic Integrity Procedures.

**Academic dishonesty** is any act that breaches one or more of the principles of academic integrity. Acts of academic dishonesty may include but are not limited to the following types:

**Cheating:** Using or providing unauthorized aids, assistance or materials while preparing or completing assessments, or when completing practical work (in clinical, practicum, or lab settings), including but not limited to the following:

- Copying or attempting to copy the work of another during an assessment;
- Communicating work to another student during an examination;
- Using unauthorized aids, notes, or electronic devices or means during an examination;
- Unauthorized possession of an assessment or answer key; and/or,
- Submitting of a substantially similar assessment by two or more students, except in the case where such submission is specifically authorized by the instructor.

**Fraud:** Creation or use of falsified documents.

**Misuse or misrepresentation of sources:** Presenting source material in such a way as to distort its original purpose or implication(s); misattributing words, ideas, etc. to someone other than the original source; misrepresenting or manipulating research findings or data; and/or suppressing aspects of findings or data in order to present conclusions in a light other than the research, taken as a whole, would support.

**Plagiarism:** Presenting or submitting, as one's own work, the research, words, ideas, artistic imagery, arguments, calculations, illustrations, or diagrams of another person or persons without explicit or accurate citation or credit.

**Self-Plagiarism:** Submitting one's own work for credit in more than one course without the permission of the instructors, or re-submitting work, in whole or in part, for which credit has already been granted without permission of the instructors.

**Prohibited Conduct:** The following are examples of other conduct specifically prohibited:

- Taking unauthorized possession of the work of another student (for example, intercepting and removing such work from a photocopier or printer, or collecting the graded work of another student from a stack of papers);
- Falsifying one's own and/or other students' attendance in a course;
- Impersonating or allowing the impersonation of an individual;
- Modifying a graded assessment then submitting it for re-grading; or,
- Assisting or attempting to assist another person to commit any breach of academic integrity.

### **Sexual Violence and Misconduct**

All Members of the University Community have the right to work, teach and study in an environment that is free from all forms of sexual violence and misconduct. Policy B401 defines sexual assault as follows:

Sexual assault is any form of sexual contact that occurs without ongoing and freely given consent, including the threat of sexual contact without consent. Sexual assault can be committed by a stranger, someone known to the survivor or an intimate partner.

Safety and security at the University are a priority and any form of sexual violence and misconduct will not be tolerated or condoned. The University expects all Students and Members of the University Community to abide by all laws and University policies, including [B.401 Sexual Violence and Misconduct Policy](#) and [B.401.1 Sexual Violence and Misconduct Procedure](#).

**Emergencies:** Students are expected to familiarise themselves with the emergency policies where appropriate and the emergency procedures posted on the wall of the classroom.

## **DEPARTMENT OR PROGRAM OPERATIONAL DETAILS**

### **Professionalism**

Students are expected to demonstrate a professional attitude and behaviour: reliability, respect for and cooperation with colleagues, willingness to work calmly and courteously, respect for equipment and systems, and constructive response to criticism.