DEPARTMENT OF SCIENCE

COURSE OUTLINE – WINTER 2012

CH1010 INTRODUCTORY UNIVERSITY CHEMISTRY I – 3(3-1-3) 105 HOURS

INSTRUCTOR: A3 John Agak **PHONE:** 780 539 2876
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OFFICE HOURS: Tuesday 1:00 – 3:00; Wednesday 10:00 – 12:00, Friday 10:00 – 12:00

PREREQUISITE(S)/COREQUISITE: Chemistry 30 or equivalent

TEXT/RESOURCE MATERIALS: Recommended textbook is Chemistry 8th Edition by Steven S. Zumdahl and Susan A. Zumdahl; required Lab manual is Introductory University Chemistry I (Chem 101 and 103), published by the University of Alberta, 2011/2012 edition.

CALENDAR DESCRIPTION: Lectures include stoichiometry, atomic structure and bonding, states of matter and intermolecular forces, chemistry of the elements.

CREDIT/CONTACT HOURS: 3 credits; 3 hours lecture +1 hour seminar + 3 hours laboratory per week; 105 hours in total

DELIVERY MODE(S): Lecture style presentation of material followed by practice problems/discussion in seminar. Laboratory provides hands-on experience.

OBJECTIVES (OPTIONAL): Students are introduced to the structure, bonding, and reactivity of chemical substances, focusing in particular on main-group elements. By drawing and naming 3-D molecules, and then based on structure, geometry, and forces students will be able to predict reactivity and properties in the gaseous, liquid, and solid phases. Students will gain an appreciation for the influence of chemistry in our lives and think critically about chemical issues.

TRANSFERABILITY: CH1010 to U of Alberta CHEM 101, 3 credits

CH1010+CH1020 to U of Calgary CHEM 201/203, 6 credits

For other transfer agreements, go to http://www.acat.gov.ab.ca/

**** Grade of D or D+ may not be acceptable for transfer to other post-secondary institutions. Students are cautioned that it is their responsibility to contact the receiving institutions to ensure transferability**

GRADING CRITERIA:

GRANDE PRAIRIE REGIONAL COLLEGE			
GRADING CONVERSION CHART			
Alpha Grade	4-point Equivalent	Percentage Guidelines	Designation
A^+	4.0	90 – 100	EXCELLENT
A	4.0	85 – 89	
A^-	3.7	80 – 84	FIRST CLASS STANDING
B^+	3.3	77 – 79	
B	3.0	73 – 76	GOOD
B^-	2.7	70 – 72	
C^+	2.3	67 – 69	SATISFACTORY
C	2.0	63 – 66	
C^-	1.7	60 – 62	
D^+	1.3	55 – 59	MINIMAL PASS
D	1.0	50 – 54	
F	0.0	0 – 49	FAIL
WF	0.0	0	FAIL, withdrawal after the deadline

EVALUATIONS: Two term exams will be held (one in October weighted at 15%, one in November weighted at 20%); a final exam is scheduled by Student Services in December and weighted at 38%; weekly quizzes/assignments are weighted at 5%; laboratory reports are weighted at 12%; laboratory exam is weighted at 10%. A student must pass the laboratory portion to receive a passing grade in this course

STUDENT RESPONSIBILITIES: Assignments will be electronically distributed on a roughly weekly basis. Complete solutions will be available a short while later. Solutions to quizzes will be posted a few days after the quiz is completed. Attendance to all lectures and seminars is strongly recommended. Laboratory attendance to each specific experiment is compulsory. A doctor's medical note is required for all excused absences.
Students must maintain an overall average of 50% or better to pass this course. You are encouraged to participate in class discussions and ask questions. Help is available outside the classroom.

STATEMENT ON PLAGIARISM AND CHEATING:

Refer to the Student Conduct section of the College Admission Guide at http://www.gprc.ab.ca/programs/calendar/ or the College Policy on Student Misconduct: Plagiarism and Cheating at www.gprc.ab.ca/about/administration/policies/**

**Note: all Academic and Administrative policies are available on the same page.

COURSE SCHEDULE/TENTATIVE TIMELINE:

Matter and Stoichiometry (Chapters 1, 2, 3, 4, and 20; Pages 1 – 179, and 907 – 952) *2 – 3 lectures*

- Units, dimensional analysis
- Periodic table
- Naming simple compounds
- The mole
- Empirical and molecular formula of a compound
- Calculations involving a limiting reagent
- Aqueous solutions and molarity
- Precipitation, acid/base, redox reactions

Atomic Structure (Chapters 2 and 7; Pages 39 – 57 and Pages 284 – 338) *6 – 8 lectures*

- Introduction to Atomic Structure
- Electromagnetic radiation
- Atomic spectra and the Bohr model
- Quantum mechanics and the atom
- Orbital shapes and energies
- Many-electron atoms
- Building of the periodic table
- Trends in atomic properties

Chemical Bonding (Chapters 8 and 9; Pages 339 – 437) *6 – 8 lectures*

- Types of chemical bonds and electronegativity
- Ionic bonding
- Lattice energy
- Covalent bonding
- Bond energies and chemical reactions
- Lewis structures; octet rule; resonance, formal charge, exceptions
- VSEPR theory and molecular shape
- Hybridization
- Molecular orbital theory

States of Matter (Chapters 5 and 10; Pages 180 – 234 and Pages 438 – 496) *4 – 6 lectures*

- Intermolecular forces
- Gases
- Liquids, solutions
- Solids
- Changes of state, phase diagrams

Chemistry of the Main Group Elements (Chapter 20; Pages 907 – 952) *1 – 2 lectures*

- Metals vs. Non-metals
- Acid base properties of oxides
- Oxidizing and reducing agents