DEPARTMENT OF ACADEMIC UPGRADING

COURSE OUTLINE FALL 2014

CHEMISTRY 0120

Instructor	NANCY FRASER	**Phone**	539 – 2980
Office	J – 216	**E-mail**	nfraser@gprc.ab.ca
Office Hours	AS POSTED ON MY OFFICE DOOR.		

PREQUISITES/COREQUISITE(S): CH 0110 and MA 0110 or SC 0100/MA 0110
A minimum grade of 60 % in CH 0110 or SC 0110 and MA 0110 is recommended.

REQUIRED TEXT/RESOURCE MATERIAL:

*** **General Chemistry by Ebbing 10th Edition**

*** **Chemistry 0110 Review** if you were not in SC 0110 last semester.

- **CH 0120 lab manual**
- Lab coat
- Lab notebook (250 page coiled notebook is fine do not spend the money on a real lab notebook)
- **Non-**programmable calculator – this is the only electronic devise allowed during tests or exams.
- 10 quad to 1 cm graph paper are also required.

SUPPLEMENTARY TEXTS: *These textbooks are available in the reference section of the library*.

Chemistry 0110 Review by Fraser
Chemistry: A Study of Matter by Dorin
Introductory Chemistry: Zumdahl
Basic Chemistry by Seese and Daub 7th Edition
Chemistry: A Basic Introduction by Miller 4th Edition

CALENDAR

DESCRIPTION: This course is designed to provide the student with an understanding of the following chemical concepts: Bonding, Chemical Equations, Stoichiometry, Gas Laws, Solutions, Equilibrium, and Ph.

CREDIT/CONTACT HOURS: This is a 5 credit course and meets 6 hours per week (4 hour lecture and 2 hours lab).

DELIVERY MODE(S): Lecture will be the main method of delivery. There is also a large laboratory component in this course.

OBJECTIVES:

Assumed Background Knowledge: (These topics will **NOT** be reviewed in class)

Students should already:

1. be able to perform linear, quadratic, cubic, liquid-dry metric conversions.
2. know elementary atomic structure – what protons, electrons, and neutrons are and where they are in an atom.
3. be able to define atomic number, atomic mass number and how to use them to calculate the number of protons, neutrons, and electrons in an atom.
4. be able to classify of matter.
5. be able to distinguish between chemical and physical properties and changes.
6. be able to draw atomic structure diagram for the first 20 elements.
7. be able to define valence electrons and draw electron dot diagrams.

If you are unfamiliar with these topics see me. The Chemistry 0110 Review will explain these in detail. It is available in the bookstore. There is an answer key in A-205 and in the reference section of the library.

In addition to the above material: These will be briefly reviewed in class.

1. know nomenclature (naming compounds and writing formulae). ***Nomenclature is one of the most important topics that you will learn at the secondary level. It will NOT be reviewed at the post secondary level. If you are having trouble with this topic, get help IMMEDIATELY!!! See me!***
2. be able to balancing equations by inspection.

Students should

1. be able to do nomenclature **without** the use of a periodic table.
2. be able to solve a variety of stoichiometry problems.
3. be able to calculate the % composition of each element in a compound.
4. be able to define and find empirical formulae given % composition by mass of each element.
3. understand the kinetic molecular theory of gases.
4. know and define gas laws (Boyle's Law, Charles' Law, combined gas laws, the ideal gas law.) Volume of gases under STP conditions and SATP if time permits.
5. be able to define temperature, pressure, vapour pressure, and boiling point.
6. be able to define solubility, and state factors affecting solubility and the rate of solution.
7. be able define unsaturated, saturated, supersaturated solutions and interpret solubility curves.
8 be able to solve stoichiometry problems from chemical equations including determining the limiting reagent.
8. understand equilibrium, write equilibrium equations for given reactions and understand the effect of changing concentration.
9. be able to write solubility product expression for given compounds.
10. understand and define K_w and pH and to able to perform related calculations.
11. be able to write the electronic and orbital box diagrams for any element.

12. be able to compare the reactivity and radius based on atomic and electronic structures, ionization energy and electronegativities.
13. be able recognizes trends in the periodic table.
14. be able to draw the structural diagrams for various molecules etc. using VSEPR.
15. be able to distinguish between polar, nonpolar covalent and ionic bonds by calculating. the difference in electronegativities and observing the shapes of molecules.
16. be able to recognize and define a coordinate covalent bond.
17. be able to recognize and define polar, and nonpolar molecules from the diagrams.
18. be able to recognize and define hydrogen bonding, London forces and Van der Waal's force.

TRANSFERABILITY: ** 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: Regular attendance is expected of all students, and is crucial to passing this course. Students who miss classes will soon find themselves falling behind and failing. Lateness will **not** be tolerated as it interrupts the instructor and fellow classmates. As per Department Policy, if you miss more than 10 per semester of classes in any course, you may be debarred from the final exam for that course.

A certificate (a doctor's or a note from the funeral home) will be required to make up the midterm or final exam. **You will receive a grade of F if you miss the final.** Call if you are going to miss a test. There may be a deduction of 10% for test rewrites.

***Very important:** **Laboratory attendance to each specific experiment is compulsory; a passing grade in the laboratory component is required to pass the course.** There are **NO** 'make up' labs in this course. Being absent from an experiment will result in a grade of **ZERO** for that experiment.

Lab reports must be submitted on the required date and at the **required time**.
Assignments may not be accepted after the assignment has been returned to the class. I am usually a speedy marker and usually return papers the next day.
Penalties for late **assignments** are as follows: (Assuming that I have not returned the marked assignments)
1 day late – 20%, 2 days late – 50%, 3 days late – 100%

Penalties for late **lab reports** are as follows:
5 minutes – 10%, 24 hours – 20%, after that – 100%

Marking Scheme:

Lab Reports and Assignments:	25%
Tests:	15%
Major test:	20%
Final Exam:	40%
Total	100%

GRANDE PRAIRIE REGIONAL COLLEGE			
GRADING CONVERSION CHART			
Alpha Grade	**4-point Equivalent**	**Percentage Guidelines**	**Designation**
A^+	**4**	**90 – 100**	**EXCELLENT**
A	**4**	**85 – 89**	
A^-	**3.7**	**80 – 84**	**FIRST CLASS STANDING**
B^+	**3.3**	**77 – 79**	
B	**3**	**73 – 76**	**GOOD**
B^-	**2.7**	**70 – 72**	
C^+	**2.3**	**67 – 69**	**SATISFACTORY**
C	**2**	**63 – 66**	
C^-	**1.7**	**60 – 62**	
D^+	**1.3**	**55 – 59**	**MINIMAL PASS**
D	**1**	**50 – 54**	
F	**0**	**0 – 49**	**FAIL**
WF	**0**	**0**	**FAIL, withdrawal after the deadline**

****

It is recommended that you have a grade of 60 % or better to continue to CH 0130.

****

STUDENT RESPONSIBILITIES:

Students will:

– review material that is prerequisite to this course quickly so it does not slow you down. (See Assumed Background Knowledge on pages 2 & 3. Especially the section on nomenclature.)

– be at class regularly and on time. (If you miss more than 10 per semester of classes in any course, you may be debarred from the final exam for that course.)

- complete all pre class and pre-lab assignments before arriving in class.
- keep up with course material.
- if experiencing difficulties with course get help immediately.
- catch up on missed material before the next class.
- provide documentation for missed midterms or finals.
- be aware of penalty for failing the lab component and not writing the final.

STATEMENT ON PLAGIARISM AND CHEATING:

Refer to the College Policy on Student Misconduct: Plagiarism and Cheating at
https://www.gprc.ab.ca/files/forms_documents/Student_Misconduct.pdf
**Note: all Academic and Administrative policies are available at
https://www.gprc.ab.ca/about/administration/policies/

	Time	**Chemistry 0110 Review (Fraser)**	Chemistry: A Study of Matter (Dorin) 4th Edition	**General Chemistry (Ebbing) 10th Edition**	Introductory Chemistry (Zumdahl) 5th Edition	Basic Chemistry (Seese and Daub) 7th Edition	Chemistry: A Basic Introduction Miller 4th Edition
SI units	On your own time	19 – 30	16 – 22	**18 – 28**	18 – 22	16 – 18	19 – 23
Scientific Notation	On your own time	31 – 37	50 – 53		15 – 18	27 – 33	236 – 38
Understand and use Significant Figures	1 day	37 – 51	26 – 37 54 – 58	**15 – 18**	22 – 28	21 – 27	33 – 26 38 – 42
Chemical Definitions and Classification of matter	On your own time	14 – 18	63 – 77	**6 – 12**	56 – 64	52 – 61	79
WHMIS	On your own time	5 – 10					
Review Atomic Structure	On your own time	56 – 69	109 – 123 top of 764	**41 – 52**	214 – 216 91 – 97	80 – 89	60 – 72 90 – 102
Review Valence Electrons & Electron Dot Diagrams	On your own time	70 – 71				**89 – 90**	

	Time	**Chemistry 0110 Review (Fraser)**	Chemistry: A Study of Matter (Dorin) 4th Edition	**General Chemistry (Ebbing) 10th Edition**	Introductory Chemistry (Zumdahl) 5th Edition	Basic Chemistry (Seese and Daub) 7th Edition	Chemistry: A Basic Introduction Miller 4th Edition
Review Nomenclature	2 days	79 – 150	151 – 168	**57 – 59** **62 – 70**	122 – 142	165 – 180	81– 82 188 – 183 197 – 206
*Review Balancing Equations by Inspection	On your own time	152 – 167	206 – 223	**72 – 76**	154 – 165	216 – 235	233 – 240
Solubility			437 – 438	**488 – 490**			
Solutions: Saturated. Unsaturated, Supersaturated Solution.	1 day		433 – 446	**496 – 498** **505, 509**		363 – 370 370 – 371	350 – 357
Factor Affecting Rates of Solution			442 – 439	**478 – 488**		363 – 370	357 – 363
Solutions: Concentrated and Dilute Solutions			446 – 447	**156**		379 – 381	

	Time	**Chemistry 0110 Review (Fraser)**	Chemistry: A Study of Matter (Dorin) 4th Edition	**General Chemistry (Ebbing) 10th Edition**	Introductory Chemistry (Zumdahl) 5th Edition	Basic Chemistry (Seese and Daub) 7th Edition	Chemistry: A Basic Introduction Miller 4th Edition
Stoichiometry							
Define & Calculate Molecular Mass, Gram Molecular Mass, Mole, Avogadro's Number Mole – Mass Relationship Mole – Molecule Relationship Mole-Volume of gas at STP Relationship	4 days		175 – 195 175 – 189 175 – 189	**89 – 95** **104 – 114** **188**	211 – 213 216 – 226 246 – 258	188 – 197	210 – 219
% Composition	1 day		190 – 191	**95 – 96**	226 – 228	199 –205	219 – 223
**Empirical Formula	1 day		192 – 195	**99 – 104**	228 – 237		223 – 229
Kinetic Molecular Theory of Gases	1 day		201 – 202	**201 – 202**		277 – 278	280 – 281
Gas Laws: Boyle's Law, Charles' Law and Ideal Gas Law	2 days		297 – 313 326 – 328	**179 – 193**		279 – 288 285 – 297	285 – 302
Volume of Gases under SATP Conditions (If time permits)	1 day		297 – 313 326 – 328	**Not in text**			303 – 308

	Time	**Chemistry 0110 Review (Fraser)**	Chemistry: A Study of Matter (Dorin) 4th Edition	**General Chemistry (Ebbing) 10th Edition**	Introductory Chemistry (Zumdahl) 5th Edition	Basic Chemistry (Seese and Daub) 7th Edition	Chemistry: A Basic Introduction Miller 4th Edition
Concentration (Molarity) (Molality)	1 day		449 – 451 452 – 453	**156 – 164** **501**		377 – 379 384 – 386	353 – 368 372 – 373
Equation Stoichiometry & Limiting Reagents	4 days		233 – 252	**103 – 112**	259 – 265	249 – 256 259 – 265	240 – 253
% Yield	if time			**111 – 112**	265 – 266	257 – 259	253 – 253
Equilibrium Constant	1 day		513 – 517 518 – 523	**585 – 586**		477 – 479	427 – 433
Le Chatelier Principle			524 – 527	**591 – 596**		480	433 – 440
Solubility Product (K_{sp})			533 – 537	**710 – 715**		490 – 493	440 – 444
K_w				**647 – 648**			
Arrhenius Acids, Bases, pH, & pOH (Strong acids and bases only) Neutralization Reactions Indicators	2 day		550 – 552 558 – 559 574 – 580 581 – 583	**138 – 146** **635 – 636** **671** **652 – 653**	185 – 188	406 – 407 418 – 422	389 – 390 397 – 409

	Time	**Chemistry 0110 Review (Fraser)**	Chemistry: A Study of Matter (Dorin) 4th Edition	**General Chemistry (Ebbing) 10th Edition**	Introductory Chemistry (Zumdahl) 5th Edition	Basic Chemistry (Seese and Daub) 7th Edition	Chemistry: A Basic Introduction Miller 4th Edition
Atomic Structure, Orbitals (s, p, d, f) Pauli Exclusion Principle & Hund's Rule	3 days		335 – 353	**285 – 290** **300 – 315**		91 – 98	102 – 116
Ionization Energy & Electronegativity	2 days		369 – 373	**320 – 323**		119 130 – 132	136 – 139 140 – 142
Electronegativity	0.5 day			**351, 352**			
***Trends in the Periodic Table	3 days		359 – 369 380 – 382	**51 – 53** **311 – 316** **318 – 321**			120 – 148
Ionic Bonding	0.5 days		391 – 394	**335, 346**		124 – 127	156 – 160
Covalent Bonding	0.5 days		396 – 402	**346 – 349**		128 – 135	161 – 164, 174
VSEPR Polar Molecules				**351 – 358** **383 – 385**			

	Time	**Chemistry 0110 Review (Fraser)**	Chemistry: A Study of Matter (Dorin) 4th Edition	**General Chemistry (Ebbing) 10th Edition**	Introductory Chemistry (Zumdahl) 5th Edition	Basic Chemistry (Seese and Daub) 7th Edition	Chemistry: A Basic Introduction Miller 4th Edition
Hydrogen Bonding	0.5 days		416 – 419	**448 – 440** **443**			
London Forces Van der Waal Force	0.5 days		421 – 422	**445 – 447** **453**			
Metal-Metal Bonding Sea of Electrons (If time permits)	0.5 days		419 – 420	**454**			155 – 156

* Test 1

**Test 2

Major test

***Test 3