Chemistry 1154, Spring 2012

Instructor Information

Instructor: Dr. Patrick Duffy
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Office Hours: Mondays from 5 – 6 (my office) and Tuesdays from 1 – 2 (my office)

General Course Information

Credits: 4, transferable to SFU, UBC, and UVic (see course calendar for details)

Prerequisites: Chemistry 1105 (C or better grade) or Chem 12 (C+ or better grade). Either Principles of Math 12 (B or better grade) or Math 1112 (C or better grade) are also required.

Instruction Format: Two lectures per week (two hours each) and one lab per week (three hours).

Required Material: Chemistry 1154 lab manual, one laboratory notebook, and a lab coat
Contact lenses may not be worn in the laboratory. Glasses are therefore required for people who normally wear contact lenses.
Calculator (for all term tests and final exam): Aurex SC-6136 or Sharp EL-531H (either available from the bookstore)
Chemistry (Canadian Edition), by Olmsted, Williams, and Burk (2010 looseleaf edition) – textbook

Evaluation (Percent of total)

Lecture		Laboratory	
Three Exams	40	**Pre-lab Assignments**	2[1]
Final Exam	30	**Labs and Unknowns**	20
		Lab Exam	8

If you have taken Chemistry 1154 previously, you may be entitled to a lab exemption. Please check with me *before the first lab* to verify that you are entitled to an exemption.
Any in-class exam not written by the student will be assigned a grade of zero unless the student can produce a medical note or other relevant documentation supporting the necessity of their absence. **Doctors' notes *must* indicate that the student was too sick to write the exam.** If such documentation is produced, the weights of the other exams will be increased so that the student will not be penalized for missing the exam. If the student is unable to write an exam, he or she must notify the instructor *before the scheduled exam time.* Labs missed without a valid excuse will result in an incomplete grade being assigned to the laboratory portion of the course. **More than three weeks of lab work missed for *any reason* will result in an incomplete grade being assigned to the laboratory portion of the course.**

Important Dates

January 15 (Sunday):	Last day to add a course or to drop a course without a "W" appearing on your transcript
February 1 (Wednesday):	Exam #1
February 29 (Wednesday)	Exam #2
March 3 (Saturday)	Last day to drop a course ("W" will appear on your transcript)
March 28 (Wednesday)	Exam #3
April 9 (Monday)	No class (Easter Monday)
April 16 (Monday)	Final chemistry 1154 class
April 18 – 26	Final exam period
April 25 (Wednesday)	Final exam, 7 – 10 PM, room 3310

[1] Prelabs are to be submitted by or before noon on the Wednesday before the associated lab is to be performed. They will be returned at the start of the lab period.

Grade Guidelines

What follows are the guidelines used to determine your final grade in Chemistry 1154. Please note the restrictions placed on your grade by both the lab component of the course and your performance on the final exam.

To get a(n):	Your total mark (including final and lab) must be:	Within that, your final exam mark must be at least:	And in the Lab:
A+	90 – 100%	80%	All work must be complete, and
A	85 – 89%	70%	you must have an overall
A-	80 – 84%	65%	lab mark of at least 65%
B+	76 – 79%	60%	All work must be complete, and
B	72 – 75%	60%	you must have an overall
B-	68 – 71%	55%	lab mark of at least 60%
C+	64 – 67%	50%	All work must be complete, and
C	60 – 63%	40%	you must have an overall
C-	56 – 59%	40%	lab mark of at least 50%
D	50 – 55%	N/A	N/A
F	<50%	N/A	N/A

Tentative Schedule and Outline of Course Topics

Note: Only odd-numbered problems have answers at the back of the book, so you need only attempt odd-numbered problems in the lists of problems given below.

Chapter 1 **STOICHIOMETRY**: Molar mass, empirical and molecular formula determination, chemical equations, stoichiometric calculations including limiting reagents and percent yield, stoichiometric calcualtions including volumetric analysis. *(4 lectures)*

Problems: 23, 25, 31 – 43, 55 – 75, 85 – 89, 93, 97 – 109, 115

Chapter 2 (omit 2.5, 2.8) **GASES**: Measurement of properties of gases, effects of temperature and pressure on gases, ideal gas equation and STP conditions, gas mixtures and partial pressures, kinetic theory of gases, Graham's law of effusion, diffusion, real gases and the van der Waals equation. *(2 lectures)*

Problems: 1 – 29, 45, 47, 53 – 61, 67, 69, 79, 87, 93 – 97, 101 – 109, 113 – 121

Chapters 13 and 15.4 (omit 13.3) **CHEMICAL EQUILIBRIUM**: Equilibrium in chemical reactions, Le Chatelier's principle and effects of pressure, volume and temperature, K_c and K_p, calculations for gaseous systems, solubility products. *(2 lectures)*

Problems: Chapter 13: 1, 9 – 13, 27 – 37, 45, 49 – 57, 61, 67, 71 – 83
Chapter 15: 31 – 41, 55, 63, 65, 69, 73, 81 – 87

Chapters 14 and 15.1 - 15.3 (Omit 14.6)	**ACIDS AND BASES**: Review of acid-base fundamentals, weak acids and bases, buffers, hydrolysis, indicators, titration curves. *(3 lectures)*
Problems:	Chapter 14: 3, 9 – 17, 21 – 43, 51 – 55, 59 – 63, 67 – 73, 77, 81 – 85 Chapter 15: 1 – 29, 53, 57 – 61, 67, 71, 75, 77, 91 – 95, 101, 103
Chapter 3 (Omit 3.6)	**HEAT, WORK & ENERGY**: Thermodynamic terms and concepts, heat and PV work, First Law of Thermodynamics, heats of reactions, calorimetry and Hess' law. *(3 lectures)*
Problems:	11 – 25, 29 – 45, 51 – 57, 63, 65, 69 – 77, 81, 83, 87 – 93, 97, 99, 103, 105
Chapters 11 and 13.3 (Omit 11.6)	**ENTROPY AND FREE ENERGY**: Reversible and irreversible processes, disorder, entropy and the Second Law of Thermodynamics, Third Law of Thermodynamics and entropy changes, Gibbs free energy and equilibrium, temperature dependence of equilibrium constant. *(3 lectures)*
Problems:	Chapter 11: 11 – 17, 21, 23, 27, 31 – 47, 55 – 65, 69, 71, 75 – 85, 89, 95, 101 – 109 Chapter 13: 7, 17 – 23, 59, 65, 69
Chapter 16 (Omit 16.1 and 16.2)	**ELECTROCHEMISTRY**: Fundamentals of electrochemical cells, thermodynamics of electrochemical cells, application of Galvanic cells, electrolysis, corrosion. *(3 lectures)*
Problems:	1 – 5, 17, 25, 33, 37 – 41, 45 – 61, 65, 67 – 75, 79 – 97, 101
Chapters 8 and 9 (Omit 8.5)	**LIQUIDS AND SOLUTIONS**: Properties of liquids, phase changes and phase diagrams of one-component systems, properties of solutions and concentration units, colligative properties for non-electrolyte and electrolyte solutions, Raoult's law and distillation. *(3 lectures)*
Problems:	Chapter 8: 3, 11, 15, 27, 45 – 53, 57, 59, 65, 71, 77, 79, 83, 85, 91, 93, Chapter 9: 3 – 19, 27, 33, 35, 39 – 47, 55, 59 – 63, 67, 73 – 79
Chapter 8.5	**SOLIDS**: Unit cells and crystal lattices, metallic crystals, ionic crystals. *(2 lectures)*
Problems:	37, 41, 73

PLAGIARISM AND CHEATING POLICY

Introduction

1. **DEFINITIONS**

   Cheating, which includes plagiarism, occurs when a student or group of students uses or attempts to use unauthorized aids, assistance, materials or methods. Cheating is a serious educational offense.

   Plagiarism occurs when a student represents the work or ideas of another person as his or her own.

Policy

Kwantlen Polytechnic University condemns all forms of cheating.

If it is determined that a student has cheated, the University College will proceed with discipline in the following manner:

1. for most first offences, a grade of zero will be awarded for the affected assignment, test, paper, analysis, etc.;

2. for most second offenses, a failing grade will be assigned in the affected course;

3. depending upon the circumstances surrounding a first or second offense, a more severe level of discipline may be imposed by the University College;

4. Where deemed appropriate in the circumstances, for any third offence, the matter ***must*** be referred to the University College President under Policy No. C21 Student Conduct for the assignment of discipline, which may include suspension or expulsion from the University College.

5. Any student who contributes to an act of academic dishonesty by another student may face disciplinary action.

This policy must be communicated in all course presentations.

Procedural Guidelines

1. When an invigilator, instructor, or Dean's designate, after obtaining the student's explanation, determines that a student has cheated, he or she will immediately gather the available evidence, assign a grade of zero to the affected assignment, test, paper, etc., and report the incident, with documentation, to the Dean under whose jurisdiction the course falls.

2. The Dean will assign any additional disciplinary action which may be in order under the policy described above, and will inform the Registrar.

3. The Registrar will maintain a record of each offense in the student's file.

4. The affected student has the right at any time to consult with a University College counsellor and/or the student ombudsperson.

5. Except in circumstances where the matter has been referred to the President under Policy No. C.21 Student Conduct, a student may appeal a decision or penalty under this policy to the Kwantlen Polytechnic University Appeals Committee (C.5 Appeals of Academic or Admissions Decisions).