

# CHEM\*1050      Fall 2011

## Student Course Information

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<b>Course Instructor:</b>	
Dr. John D. Goddard                      MACN 340	jgoddard@uoguelph.ca
<b>Lecture Times and Location</b>	
M W F 12:30 to 01:20                      WMEM 001	

### 1. Course Materials

- (a) **Textbook.** General Chemistry, 9<sup>th</sup> ed. Ebbing and Gammon.
- (b) **Laboratory Manual** for CHEM\*1050. Purchased in the Department.  
Safety goggles (not safety glasses). Purchased in the Department.
- (c) **A lab coat** is required.
- (d) **Scientific calculator** with ln, exp or  $e^x$ ,  $\log_{10}$  and  $10^x$  functions. Calculators or notebook computers capable of storing text information are **NOT** allowed in examinations.
- (e) **Stapler** All lab reports must be stapled prior to being put into the Grey Boxes near MACN 128.
- (f) **Sapling Learning Access** To complete the optional online homework you will need to purchase access. One semester access can be purchased online (credit card or Paypal ) when you register for an account at [www.saplinglearning.ca](http://www.saplinglearning.ca) . The University Bookstore also offers one semester access cards.

**2. WET LABORATORY Begins in Week 1 which starts Monday September 12. Bring your lab manual.**

- (a) Students attend their wet chemistry labs according to their lab section number. Your course section number is made up of the lecture and lab section numbers. The first two numbers are the lecture section and the last two numbers the lab section. 0106 means lecture section 01 and lab section 06. If your lab section is an odd number (e.g. 0101 – Lab section 01) then you follow the Group A Student schedule. If your lab section is an even number e.g. 0106 Lab section 06 then you follow the Group B Student schedule. The laboratory is an integral part of the course and you **must** attend all wet laboratories.
- (b) **Laboratory Time and Authorization.**  
You must attend your first lab to receive mandatory safety training. This safety lab is a prerequisite for all subsequent labs. As proof that you are registered in a particular lab, you **must** bring a computer printout **dated Sept. 01, 2011 or later** of “My Class Schedule” from Web Advisor to your first lab.
- (c) **Pre Laboratory Quizzes**  
A pre-lab quiz will be given on Sapling for some of the wet labs. See the Laboratory Schedule for experiments which have pre-lab quizzes. These pre-lab quizzes count towards your wet laboratory grade and will usually be based on the experiment that you are about to perform.
- (d) **Laboratory Reports**  
Laboratory reports normally are handed in exactly one week after your lab period (and not an earlier day) and before 4:30 p.m. Put your **stapled** report in the appropriate Grey Box (labeled with your lab room number) located near MACN 128. If your report is not received a grade of zero will be assigned.
- (e) **Missed Wet Laboratory.**  
Refer to the Purple Page for Lab Absences in First-Year Chemistry on the CHEM\*1050 website.
- (f) **Laboratory Exemptions for students who are repeating CHEM\*1050.**  
DEADLINE: Tuesday, September 13.  
Students who obtained a lab grade of **at least 60 per cent** but who failed the course as a whole may apply for a laboratory exemption. The laboratory work must have been completed **during one of the three preceding semesters** in which the course was offered. Apply online at [www.chemistry.uoguelph.ca/labexemption](http://www.chemistry.uoguelph.ca/labexemption).  
Students who are granted a wet lab exemption **must complete the online dry computer labs** and can attend any Midterm Preparation Problems Lab in Week 5.

### 3. WEB SITE

The CHEM\*1050 website is an integral part of the course and must be accessed several times per week. All important announcements for the course will be made on the website. The CHEM\*1050 Wet Lab Component site contains lab policies and procedures and posted lab grades for all wet lab reports.

These web site can be accessed through the portal <http://www.uoguelph.ca/courselink/> Your Username is your Central Login (that part of your assigned University of Guelph e-mail address before the @ sign). Your **password** is your Central Login Account Password. The course website provides numerous resources such as a discussion board.

### 4. COURSE HELP

(a) **Your Lecturer.**

Your professor will be available at certain times for consultation and help. Office hours will be arranged at the first class meeting.

(b) **Lecture and Lab Help.**

Assistance is available in the Science Commons Chemistry Learning Centre. A graduate teaching assistant will be available to assist you with both lecture and laboratory material. The Learning Centre location and schedule are posted on the CHEM\*1050 website.

(c) **Supported Learning Groups (SLGs)**

SLGs are regularly scheduled small group study sessions. Attendance is voluntary and open to all students enrolled in the course. The study groups are facilitated by successful senior students who have recently taken the course. Students who attend SLG sessions have an opportunity to apply and demonstrate their understanding of course concepts in a safe practice environment. The group study format exposes students to various approaches to learning, problem-solving, and exam preparation. The session times and locations will be available at the SLG web site. There is a link to the SLG page on the CHEM\*1050 website.

(d) The CHEM\*1050 website contains a variety of materials to assist you with the course. There are practice quizzes and examinations, examples of problems with full solutions, a question of the week, and much more.

### 5. Evaluation

(a)	Scheme 1	Scheme 2
Midterm Examination	28%	32%
Final Examination	40%	48%
Wet Laboratories & Pre Lab Quizzes	15%	15%
Online Dry Laboratories (course website)	5%	5%
Sapling Homework	12%	0%

The Sapling Homework provides a means for you to test your learning week by week. You may choose not to complete the online homework and the weights of the midterm and final examinations will be increased (Scheme 2). Your final grade will be based on the scheme which produces the highest grade.

(b) **Online Sapling Homework**

Eleven homework assignments are delivered through Sapling. Homework assignments are due 11:55 p.m. on Wednesdays. You normally will have one week to complete each assignment. The first homework assignment is due Sept. 21. If an assignment is not attempted a grade of zero will be assigned. All eleven assignments will be used in calculating your final homework grade. There are a Practice Assignment and a Math Review (not graded) in week 1.

- (c) **Online Dry Laboratory Work (courselink.uoguelph.ca)**  
Each of the three computer labs consists of three parts. - an information page, the Experiment and a Marking Module. All are delivered on the course website. The Experiment can be done as many times as you wish. Each time you repeat the experiments you will be given different conditions. After you are satisfied with your results and have completed all calculations **only then** open the Marking Module to submit your results.
1. Online Computer Lab 1 Bomb Calorimeter.  
It is to be completed between Sept. 19 and Oct. 02 .  
Your results must be submitted to the Marking Module by Oct. 02 11:55 p.m.
  2. Online Computer Lab 2  $\Delta G^0$ ,  $\Delta H^0$ ,  $\Delta S^0$   
This lab is based on Experiment 3 in your CHEM\*1050 Laboratory Manual.  
It is to be completed between Oct. 03 and Oct.30.  
Your results must be submitted to the Marking Module by Oct.30 at 11:55 p.m.
  3. Online Computer Lab 3 Electrolysis.  
This lab is based on Experiment 6 in your CHEM\*1050 Laboratory Manual.  
It is to be completed between Oct. 31 and Nov. 13.  
Your results must be submitted to the Marking Module by Nov. 13 at 11:55 p.m.
- (f) **Midterm Examination Saturday, October 15, 12:00 noon to 01:30 p.m.**  
Room assignments will be posted on the CHEM\*1050 website.  
This examination covers the material from Weeks 1 to 5.  
**Midterm Conflict:** Send an email from your uoguelph account to your professor by Friday Oct. 7 giving the reason for your conflict. The room, date, and time for an alternate midterm will be posted on the website.
- (g) **Final Examination: Tuesday, December 06, 11:30 a.m. to 01:30 p.m.**  
The final examination covers the entire course.
- (h) All examinations will be closed book, with **no** written or printed materials of **any** kind permitted. Computers or calculators capable of storing text information or formulas are **not allowed**.

## 6. **POLICY ON MISSED EXAMINATIONS.**

A grade of zero will be assigned for any missed examination except for valid medical or compassionate reasons.

**Missed Midterm Exam.** For a missed midterm examination, documentation must be given to your professor in person. There is no need to consult a doctor to obtain a note. However, if you have consulted a medical practitioner because of illness or injury, the doctor's note is acceptable documentation. In the case of a missed midterm, if a valid reason for missing the midterm is received, the percent value of the midterm will be added to the final examination.

**No make-up midterm will be given.**

**Missed Final Exam.** Consult the Undergraduate Calendar and your Program Counsellor.

## 7. Lecture Schedule

Please read the appropriate sections in the text before lectures.

Weeks / Dates	Topics	Text
Weeks 1-5 Sept 12 – Oct. 14.	Energy, Heat, Enthalpy, Work, Thermochemical Equations, Calorimetry, Hess Law, Standard Enthalpies of Formation, Fuels.  Bond Enthalpies. Energetics of ionic compounds.  Entropy and Free Energy, Thermodynamics and Equilibrium. Bioenergetics.	Ch 6, 6.1-6.9 Ch. 18, 18.1  Ch 9, 9.11 Ch.9, 9.1  Ch 18, 18.2-18.5 Ch.18, 18.6-18.7
Saturday Oct. 15	<b>Midterm Exam</b> <b>Material from weeks 1 to 5.</b>	
Weeks 6 - 9 Oct. 17 – Nov. 11	Redox processes, half-reactions, balancing redox reactions. Voltaic cells, Cell notation, Electromotive force (emf), Standard Cell emfs, Standard Electrode Potentials, Equilibrium constants from emfs, The Nernst equation, Commercial Voltaic cells, Electrolysis.	Ch 19, 19.1  Ch 19, 19.2-19.3 Ch 19, 19.4-19.5  Ch 19, 19.6 Ch 19, 19.7 Ch 19, 19.8 Ch 19, 19.9-19.11
Weeks 10-12 Nov. 14 - Dec. 01	Reaction Rate, Experimental Kinetics, Rate and Concentration, Rate Laws, Temperature and Rate, Arrhenius, Reaction Mechanisms. Catalysis. Radioactive decay	Ch 13, 13.1-13.2 Ch.13, 13.3-13.4 Ch.13, 13.5-13.6 Ch.13, 13.7-13.8 Ch.13, 13.9 Ch 20, 20.4

**Midterm Examination, Saturday, Oct. 15, 12:00 noon - 1:30 p.m.**

This examination covers material from Weeks 1 to 5.

**Final Examination, Tuesday, Dec. 06, 11:30 a.m. to 1:30 p.m..**

The final examination covers the entire course.

## 8. Lab Schedule Fall 2011.

	<b>Group A Students</b>	<b>Group B Students</b>
Week 1 Sept.12-16	Check in and Safety Arrive at regular starting time.	Check in and Safety Arrive 90 minutes <b>after</b> regular starting time.
Week 2 Sept. 19-23	Expt.1 Enthalpy of Formation Prelab QUIZ on WHMIS and Expt. 1	<i>Online Computer lab 1 – Bomb Calorimeter</i>
Week 3 Sept. 26-30	<i>Online Computer lab 1 – Bomb Calorimeter</i>	Expt. 1 Enthalpy of Formation Prelab QUIZ on WHMIS and Expt. 1

*Online computer lab 1 results must be submitted by both groups by Sunday Oct.2 11:55 p.m.*

Week 4 Oct. 03-07	Expt. 2 Equilibrium Constant Prelab QUIZ	<i>Online Computer lab 2 – <math>\Delta G^0</math>, <math>\Delta H^0</math>, <math>\Delta S^0</math></i>
Week 5 Oct. 11-14	Midterm Preparation. Problems Lab Arrive at regular starting time.	Midterm Preparation. Problems Lab Arrive 90 minutes <b>after</b> regular starting time.
Week 6 Oct.17-21	<i>Online Computer lab 2 – <math>\Delta G^0</math>, <math>\Delta H^0</math>, <math>\Delta S^0</math></i>	Expt. 2 Equilibrium Constant Prelab QUIZ Arrive at regular starting time.
Week 7 Oct.24-28	Expt. 5 Voltaic Cells Prelab QUIZ	<i>Online Computer lab 3 - Electrolysis</i>

*Online computer lab 2 results must be submitted by both groups by Sunday Oct. 30 11:55 p.m.*

Week 8 Oct.31-Nov.4	<i>Online Computer lab 3 – Electrolysis</i>	Expt. 5 Voltaic Cells Prelab QUIZ Arrive at regular starting time.
Week 9 Nov.7-11	Expt. 7 Chemical Kinetics	<i>Independent learning</i>

*Online computer lab 3 results must be submitted by both groups by Sunday Nov. 13 11:55 p.m.*

Week 10 Nov.14-18	<i>Independent learning</i>	Expt. 7 Chemical Kinetics Arrive at regular starting time.
Week 11 Nov. 21-25	Clean up. Arrive at regular starting time.	Clean up. Arrive 90 minutes <b>after</b> regular starting time.
Week 12 Nov.28-Dec.01	Tuesday and Wednesday Arrive at regular starting time.	Tuesday and Wednesday Arrive 30 minutes after regular starting time.

Tuesday and Wednesday groups. Check grades in lab.  
Thursday labs. Check grades in Chemistry Learning Centre.

## 9. END of CHAPTER PROBLEMS

Problems are assigned to reinforce the principles covered in lectures, to help you to develop problem-solving skills, and to check your own knowledge. Work done on the problems is not graded, but there is a good correlation between mastering the problems on a week-by-week basis and performance in the course as a whole.

**Work the problems in the week that the material is covered in lectures.**

A common reason why students fail first year Chemistry is that they fall so far behind with the material that they never catch up. Lectures become harder to comprehend without the reinforcement of constant practice.

**Work the problems first then look at the solutions.** Working from the solutions is **not** useful for learning.

### **Solutions to problems**

The detailed solutions to the problems are in the Student Solutions Manual. Several copies of the Student Solutions Manual will be on two-hour reserve in the library along with several copies of the text.

### **I Thermochemistry, Bond Enthalpies, Entropy and Free Energy, Thermodynamics and Equilibrium. Weeks 1 to 5.**

**Text:** 6.35, 6.39, 6.51, 6.55, 6.61, 6.67, 6.69, 6.71, 6.75, 6.79, 6.81, 6.93, 6.95, 6.103, 6.109, 6.117, 6.139.  
18.23, 18.25, 18.27, 18.29, 18.31, 9.85, 18.35, 18.39, 18.43, 18.47, 18.51, 18.61, 18.65, 18.69, 9.101, 9.109, 18.73, 18.75, 18.83, 18.85, 18.89, 18.97, 18.101, 9.110, 18.121.

### **II Electrochemistry. Weeks 6 to 9.**

**Text:** 19.39, 19.41, 19.101, 19.25, 19.33, 19.43, 19.45, 19.47, 19.51, 19.53, 19.55, 19.59, 19.61, 19.63, 19.67, 19.71, 19.75, 19.79, 19.83, 19.85, 19.87, 19.91, 19.93, 19.95, 19.105, 19.111, 19.113, 19.117, 19.119, 19.123, 19.141.

### **III Chemical Kinetics. Weeks 10 to 12.**

**Text:** 13.31, 13.33, 13.41, 13.45, 13.49, 13.53, 13.55, 13.57, 13.59, 13.63, 13.69, 13.71, 13.75, 13.79, 13.81, 13.85, 13.99, 13.101, 13.105, 13.107, 13.117, 13.119, 13.125, 13.143.  
20.27, 20.61, 20.63, 20.67, 20.75.