Student Course Information
General Chemistry II
CHEM*1050
Winter 2016

Course Calendar Description: F,W, (3-3) [0.50 credit] This course provides an introductory study of the fundamental principles governing chemical transformations: thermodynamics (energy, enthalpy, and entropy); kinetics (the study of rates of reactions); and redox/electrochemistry. Prerequisite: CHEM*1040

Course Coordinator: Prof. Dan THOMAS SSC 2504 dfthomas@uoguelph.ca

Lecturers	Lecture	Room	Days	Time
Prof. Lori Jones lojones@uoguelph.ca	1	War Mem Hall	Tuesday Thursday	1:00 – 2:20 P.M.
Prof. Lori Jones lojones@uoguelph.ca	2	ROZH 104	Tuesday Thursday	8:30 – 9:50 A.M.
Dr. Rick Delaat rdelaat@uoguelph.ca	3	War Mem Hall	Monday Wednesday Friday	3:30 – 4:20 P.M.

1. Course Materials

(a) **Textbook.** General Chemistry, 10th ed. Ebbing and Gammon, Houghton Mifflin (2013), which you purchased in the bookstore last semester. The 8th and 9th editions are also acceptable, though the numbering of end-of-chapter questions may be slightly different. Copies are also available in the Library on Course Reserve.

(b) **Laboratory Manual** for CHEM*1050. Purchased in the Department.

(c) **Safety Goggles** (not safety glasses). Can be purchased in the Department but are available elsewhere, including the Bookstore.

(d) **A lab coat** is required.

(e) **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.

(f) **Graphs**. You will need to create numerous graphs in both the wet and the dry labs this semester. You may use a spreadsheet graphing program such as Excel or Numbers to create your graphs. If you do create them by hand, you will need to purchase appropriate graph paper. You can find it at the Bookstore. Be sure it is the 10 lines/cm variety so that it has sufficient resolution. A pdf document of blank graph paper you can print is in Contents.

(g) **Sapling Learning Access** (optional). To complete the optional online homework you need to purchase access to a Sapling Learning account. Use the link on CourseLink (*Content* > *Course Resources* >*Sapling Homework* > *Sapling Registration*) to set-up your account. Sapling provides a brief grace period on payment, so one can explore the site prior to deciding to pay for access. Semester access ($32 USD) is purchased online (credit card, pre-paid credit card or Paypal account). Alternatively, you may have purchased two semester access last semester in CHEM*1040 ($48 USD). If so, your account should be ready for CHEM*1050.

(h) A**n iClicker Response Unit.** (optional) Is available from the University Bookstore. Students will use the clicker unit to register their responses to questions posed in class. A score will be awarded towards your final grade depending upon your level of participation in these activities. The grading scheme is described further on in this document.

2. WET LABORATORY

Begins in Week 1 which starts Monday January 11. Bring your lab manual.

(a) Students attend their wet chemistry labs according to their lab section number. If your lab section is an odd number (e.g. 0113 – Lab section 13) then you follow the Group A Student schedule. If your lab section is an even number (e.g. 0114 – Lab section 14) then you follow the Group B Student schedule. The schedules are listed later in this document. The laboratory is an integral part of the course and you **must** attend all wet laboratories.

(b) **Laboratory Time and Authorization. Bring "My Class Schedule."** You must attend your first lab to receive mandatory orientation and safety training. This lab is a prerequisite for all subsequent labs. As proof that you are registered in a particular lab, you must bring to your first lab a printout or an image on a cell phone, tablet, or laptop of "My Class Schedule" from Web Advisor dated January 1, 2015 or later. Lab times are listed on WebAdvisor.

(c) **Online Lab Safety Course.** You will need to complete the Lab Safety Course online. You will find the course in your list of CourseLink courses and it is entitled "Student Science Safety". You must complete this course with a grade of 90% or better before you undertake any labs in the course. When you complete it, you will receive an electronic badge in CourseLink which can be shown to your T.A. You will have an unlimited number of attempts to complete the safety course to obtain the passing grade.

(d) **Laboratory Quizzes - completed on-line.** Pre-lab quizzes are worth 3% of your final grade and are based on the wet lab activity you will be completing during the coming week; refer to the Laboratory Schedule. Each pre-lab quiz will open on the Thursday before your particular wet lab and will close 60 minutes before the start of your lab period. You have two attempts at each quiz. To access, go to "Content > Course Resources > Links to Pre-lab Quizzes".

(e) **Laboratory Reports.** Reports will be submitted electronically as in CHEM*1040, and will be completed online through Chemistry's General Lab Marker System. During your lab period, you will collect your data and submit a copy to your T.A. before leaving. You then complete the lab report online and submit it online for grading. Lab reports are normally due 1 week after your lab by 11:55 P.M. on the day of your normal lab period. Marks are deducted for lateness. You must ensure that your report has been submitted by the deadline. Just saving it is insufficient, you must confirm the submission of your report for marking. To access, go to "Content > Course Resources > Submit Wet Labs Here".

Review your lab report as soon as the grading has been released. If you have any questions, you need to discuss the grading with your T.A. within 1 week of the graded report being released. If you still have grading concerns, apply for a regrade by submitting a detailed note given to your T.A. or to your class instructor. The request will be forwarded to the department who will assign someone to review the grading.

(f) **Missed Wet Laboratory.** Refer to the CHEM*1050 course website which has a link to a page to explain what to do when you miss or are planning to miss a lab due to illness, compassionate reasons, or for a school-sponsored event (varsity sports, graduation, etc.). To access, go to "Content > Course Resources > Missed/Going to Miss a Lab?"

(g) **Laboratory Exemptions for students who are repeating CHEM*1050.**

DEADLINE: Wednesday, January 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 (F15, W15, F14)** in which the course was offered. Apply online at www.chemistry.uoguelph.ca/labexemption.

Students who are granted a wet lab exemption **must nevertheless complete the online dry computer labs available on Courselink** and may attend any Exam Preparation Problems Lab in Weeks 6 and 12.

3. COURSE 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 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 practice quizzes and 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) Chemistry Learning Centre for Lecture and Lab Help

Assistance is available in the Chemistry Learning Centre in LIB 360 in the Science Commons on the third floor of the library. A graduate teaching assistant will be available to assist you with both lecture and laboratory material. The Chemistry Learning Centre schedule is posted on the CHEM*1050 course website. (Content > Course Resources > Chemistry Learning Centre)

(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 undergraduate 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) Course Web Site

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, and more.

(e) Lab T.A.s

Your lab T.A. will be able to help with most lab problems and should be the first person you approach with any marking concerns. All T.A.s have their email addresses on our CourseLink site. To access it, go to "Content > Course Resources > Lab T.A. Contact Information"

5. EVALUATION

(a) Online Homework - optional *(www.saplinglearning.ca)*

The online homework provides a means for you to test your learning weekly and is a way to keep up with the course and test your understanding. If you choose to complete the homework, then your mid-term and final exam weights will be decreased proportionally. If you choose to do the homework, there will be eleven assignments. Normally you will have one week to complete the assignments that are due by 11:55 P.M. on Wednesdays. The first homework assignment is due January 20. If an assignment is not attempted a grade of zero is assigned. There will be **eleven** assignments and **the top ten** will be used in calculating your final homework grade. Dropping one allows you to miss one without penalty. Don't use it up too soon in the semester. Better yet, do them all because of the learning advantage it provides. Further details are available on the course website. In addition, there is a Practice Assignment and a Math Review which are **not** for credit but which may be completed.

(b) i>Clicker Questions in Class - optional

Participation in classroom discussions and interacting with your class colleagues is an important aspect to successful learning. One proven approach has been the use of i>Clicker response systems. If you really want to learn and succeed in the class, you will want to participate in the questions posed by your lecturer during the class. The learning value with these devices lies not so much in getting the right answer - in fact, the best questions are those in which you get the wrong answer - but rather in confronting an unknown situation and being forced to think through it. This is really when new learning occurs (in learning theory this is called cognitive dissonance). For this reason, we will not be giving marks for correct answers - correct answers are for the exams. Rather, we need to have you honestly participate in the class using these clickers. We know of many ways students can get around doing the hard work of thinking. But we hope that you will avail yourself of this learning tool and work with your colleagues and the instructor. To this end, we will provide 3% of your grade to be calculated as follows. There will be many days throughout the semester in which clicker questions will be posed. If you respond to the majority of the questions on a given day, then it will be taken that you have participated in the i>Clicker questions that day. If you participate in clicker questions for at least 85% of the days on which questions are asked, you will receive 3 marks towards your final grade. If you participate for at least 60% of the days, you will get 2 marks; at least 35% will earn you 1 mark. If you choose to not participate at all, then that 3% will be added to your exams. We expect that the class will divide into those who fully participate and receive 3% towards their final grade, and those who do not and have that weighting add to their exams. We know that students will do better on their exams if they participate in this learning activity and we feel it is important to offer this to those who are willing to make the effort. Be sure to register your i>Clicker on the university's website http://www.uoguelph.ca/courselink/iclickers.html; this is how we will be able to tie your participation to your i>Clicker and give you your grade.

(c) On-line Dry Laboratory Work (courselink.uoguelph.ca) – required

Each of the four computer labs consists of three parts - experimental information in your Lab Manual, the Experiment itself, and a Marking Module. You will be able to link to all experiments through 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 and will, therefore, collect different data with a different unknown number. Be sure to use the correct unknown number with the data you end up submitting. After you are satisfied with your results and have completed all calculations **only then** open the Marking Module to submit your results.

1. On-line Computer Lab A: Bomb Calorimeter. It is to be completed between Jan. 18 and Jan. 29. Your results must be submitted to the Marking Module by Jan. 31, 11:55 p.m.

2. On-line Computer Lab B: ΔG°, ΔH°, ΔS°

It is to be completed between Feb. 1 and Feb. 12. Your results must be submitted to the Marking Module by Feb. 28 at 11:55 p.m.

3. On-line Computer Lab C: Electrolysis.

It is to be completed between Feb. 29 and Mar. 11. Your results must be submitted to the Marking Module by Mar. 13 at 11:55 p.m.

4. On-line Computer Lab D: Catalytic Hydrolysis of Salacin.

This lab is completed differently as it is done inside the General Lab Marker System. It is to be completed between Mar. 14 and Mar. 27. Your results must be submitted to the Marking Module by Mar. 29 at 11:55 P.M.

(d) Wet Laboratories and Laboratory Quizzes - required unless exempted

As mentioned above, the wet labs and the associated lab quizzes (on-line) are required unless you are allowed a lab exemption having successfully completed the lab portion in an earlier course attempt. Be sure to apply on-line for the lab exemption by January 13 (see earlier in this document for details).

(e) Midterm Examination Saturday, February 27, 12:30 to 2:00 P.M. - required Room assignments will be posted on the CHEM*1050 website. This examination covers the material from Weeks 1 to 5.
Midterm Conflict: Go to www.chemistry.uoguelph.ca/alternateexam, select this course and indicate the reason for needing the alternate exam time. Having another exam nearby - even on the same day - is not an acceptable reason for taking the alternate exam time, unless the exams actually overlap in time. The alternate exam time is Thursday, February 25 from 5:30 to 7:00 P.M. The location will be announced later.

(f) Final Examination: Thursday, April 14, 7:00 to 9:00 P.M. - required
The final examination covers the entire course. The rooms will be assigned by the registrar and you will be able to find your room assignment by checking *www.uoguelph.ca/registrar/scheduling/index.cfm?exam_winter* prior to the final exam period.

(g) 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**.

The course grade will be calculated according to the following schemes, depending upon whether or not you chose to participate in the optional homework and iClicker activities. The scheme that gives you the highest final grade will be used.

Evaluation Activity	Scheme 1	Scheme 2	Scheme 3	Scheme 4
Mid-Term Exam	24%	29%	25%	30%
Final Exam	38%	43%	40%	45%
Pre-Lab Quizzes	3%	3%	3%	3%
Wet Laboratories	12%	12%	12%	12%
Dry Laboratories (on-line)	10%	10%	10%	10%
Sapling Homework (optional)	10%	0%	10%	0%
i>Clicker (optional)	3%	3%	0%	0%

6. POLICY ON MISSED WORK

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 sent to your instructor or the course coordinator. 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 weighting 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 as soon as possible. Official documentation is required within five working days after the exam. A link to Program Counsellors: www.uoguelph.ca/uaic/programcounsellors

Missed Wet Labs. Refer to the Lab Absences in First-Year Chemistry page on the CHEM*1050 course website.

Other Missed Work. Provide a written explanation to either the course co-ordinator or your instructor with your name, ID#, and email address. If a valid excuse is received, your work will be re-evaluated. Otherwise, a grade of zero is assigned.
See the Undergraduate Calendar for information on regulations and procedures for Academic Consideration
www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml

7. LECTURE SCHEDULE

Weeks/Dates	Topics	Textbook
Weeks 1 - 5 January 11 - February 12	Energy, Heat, Enthalpy, Work, Thermochemical Equations, Calorimetry, Hess's Law, Standard Enthalpies of Formation. Bond Enthalpies, Ionic Compounds Entropy, Free Energy, Thermodynamics and Equilibrium. Bioenergetics.	Sections 6.1 - 6.9 Section 18.1 Sections 9.1 and 9.11 Sections 18.2 - 18.7
February 15 - February 19	Winter Break - No Classes	
Week 6 February 22 - February 26	Redox processes, half-reactions, balancing redox reactions.	Section 19.1
Saturday February 27 12:30 P.M.	Mid-Term Examination. Includes material from weeks 1 – 5 (no redox, only thermochemistry and thermodynamics)	
Weeks 7 - 9 February 29 – March 18	Voltaic Cells, Cell notation, Electromotive Force, Standard Cell Potentials, Standard Electrode Potentials, Equilibrium Constants from Cell Potentials, the Nernst Equation, Commercial Cells, Electrolysis	Sections 19.2 - 19.11
Weeks 10 - 12 March 21 - April 8	Reaction Rates, Experimental Kinetics, Rate and Concentration, rate Laws, Temperature and rate, Arrhenius Equation, Reaction Mechanisms, Catalysis. Radioactive Decay	Sections 13.1 - 13.9 Section 20.4
Thursday April 14 7:00 P.M. (19h00)	Final Examination. Covers all course material, but with emphasis on material covered since the mid-term (Electrochemistry and Reaction Kinetics).	

8. LABORATORY SCHEDULE

	Group A Students (Odd Section Number)	Group B Students (Even Section Number)
Week 1: January 11 - January 15	Check In and Safety. Arrive at regular starting time.	Check In and Safety. Arrive 90 minutes AFTER regular starting time.
Week 2: January 18 - January 22	Experiment #2: Equilibrium Constant. Prelab Quiz.	On-line Computer Lab A: Bomb Calorimeter.
Week 3: January 25 - January 29	On-line Computer Lab A: Bomb Calorimeter.	Experiment #2: Equilibrium Constant. Prelab Quiz. Arrive at regular start time.
On-line Computer Lab A results must be submitted by both groups by Sunday, January 31, 11:55 P.M.		
Week 4: February 1 - February 5	Experiment #1: Enthalpy of Formation. Prelab Quiz on WHMIS and Experiment #1.	On-line Computer Lab B: ΔG°, ΔH°, and ΔS°.
Week 5: February 8 - February 12	On-line Computer Lab B: ΔG°, ΔH°, and ΔS°.	Experiment #1: Enthalpy of Formation. Prelab Quiz on WHMIS and Experiment #1. Arrive at regular start time.
February 15 - February 19	Winter Break	Winter Break
Week 6: February 22 - February 26	Mid-Term Exam Preparation Problems Lab. Arrive at regular starting time.	Mid-Term Exam Preparation Problems Lab. Arrive 90 minutes AFTER regular starting time.
On-line Computer Lab B results must be submitted by both groups by Sunday, February 28, 11:55 P.M.		
Week 7: February 29 - March 4	Experiment #3: Voltaic Cells. Prelab Quiz.	On-line Computer Lab C: Electrolysis.
Week 8: March 7- March 11	On-line Computer Lab C: Electrolysis.	Experiment #3: Voltaic Cells. Prelab Quiz. Arrive at regular start time.
On-line Computer Lab C results must be submitted by both groups by Sunday, March 13, 11:55 P.M.		
Week 9: March 14 - March 18	Experiment #4: Chemical Kinetics. Prelab Quiz.	On-line Computer Lab D: Catalytic Hydrolysis of Salacin
Documentation, submitted to the Lab Submission site, is due March 18 for experiments #1, #2, or #3 lab absences.		
Week 10: March 21- March 25	On-line Computer Lab D: Catalytic Hydrolysis of Salacin	Experiment #4: Chemical Kinetics. Prelab Quiz. Arrive at regular start time.
On-line Computer Lab D results must be submitted by both groups by Sunday, March 27, 11:55 P.M.		
Week 11: March 28 - April 1	Clean Up. Arrive at regular starting time. Attendance will be taken.	Clean Up. Arrive 30 minutes AFTER regular starting time. Attendance will be taken
Week 12: April 4 - April 8	Final Exam Preparation Problems Lab. Arrive at regular starting time.	Final Exam Preparation Problems Lab. Arrive 90 minutes AFTER regular starting time.
April 8 is absolutely the last day to resolve any lab grade questions, first with your T.A. and also to submit an application for a lab regrade. It is also the last day to submit documentation for lab absences for all labs.		

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.

Topic I: Thermodynamics. Weeks 1 to 5.

6.35, 6.37, 6.41, 6.53, 6.55, 6.59, 6.61, 6.67, 6.69, 6.79, 6.81, 6.85, 6.99, 6.103, 6.115, 6.117, 6.155 9.85, 9.107, 9.109

18.23, 18.25, 18.27, 18.29, 18.31, 18.35, 18.39, 18.43, 18.45, 18.55, 18.61, 18.65, 18.69, 18.73, 18.75, 18.83, 18.85, 18.89, 18.97, 18.108, 18.121.

Topic II: Electrochemistry. Weeks 6 to 9.

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.

Topic III: Chemical Kinetics. Weeks 10 - 12:

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.

10. UNIVERSITY POLICIES

a) **E-mail Communication** – As per university regulations, all students are required to check their uoguelph.ca e-mail account regularly: e-mail is the official route of communication between the University and its students.

b) **Accessibility** – The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the Centre for Students with Disabilities as soon as possible.at 519-824-4120 ext. 56208 or email csd@uoguelph.ca or see the website: http://www.csd.uoguelph.ca/csd/

c) **Academic Misconduct Policy** –The University of Guelph is committed to upholding the highest standards of academic integrity and enjoins all members of the University community to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor. The Academic Misconduct Policy is detailed in

the Undergraduate Calendar:
http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml

d) **Recording of Materials** – Presentations which are made in relation to course work – including lectures – cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

e) **Resources** – Academic Calendars are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs:
http://www.uoguelph.ca/registrar/calendars/index.cfm?index

i. **Drop Date**: The last date to drop one-semester courses, without academic penalty, is March 11. For regulations and procedures for dropping courses, see the Undergraduate Calendar:
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml

ii. **Schedule of Dates**:
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c03/c03-wintersem.shtml