

CHEMISTRY 206

SUMMARY INFORMATION - Summer 2007

Required Text: *Chemistry & Chemical Reactivity*, J.C. Kotz and P.M. Treichel, (Thomson, 6th Ed.).

Required Lab Manual: *Dept. of Chem. and Biochem., Chem 206, General Chemistry II*, (Concordia).

(The individual experiments can also be downloaded over the internet: see the General Information sheets.)

Required Lab Equipment:

- Lab coat and safety glasses (N.B. You will not be allowed into the labs without these.)
- Scoopula
- Rubber bulb

Labs and tutorials begin the week of May 7th, 2007.

Seminars on ethical use of information sources ("Chem 101") will be offered in the second week of term. If you have not already done so, you **must** attend one of them. See the web site (below) for more information.

Please, read the information sheets you are given carefully. Every year a few students get an R grade (repeat) as a result of not complying with the rules about labs and tutorials. Don't be one of them!

Attached Information Sheets

- General Information
- Laboratory and Tutorial Information
- Laboratory and Tutorial Schedule
- Tutorial Question List
- Course Outline
- Lab Report Receipt

Web Sites

- Main Course web site: <http://artsandscience.concordia.ca/facstaff/a-c/bird/c206>
- Prof. Bird's site: <http://artsandscience.concordia.ca/facstaff/a-c/bird/c206/notes.html>
- Prof. Rogers' site: <http://artsandscience.concordia.ca/facstaff/p-r/rogers/>
- "Chem 101" web site:
 - Guest access until after you have attended the seminar: <http://moodle.concordia.ca/moodle>
 - After the seminar: access is via the myConcordia Portal; websites powered by Moodle
- Library research tips: <http://library.concordia.ca/help/tutorial/>

CHEM 206 – GENERAL INFORMATION – Summer 2007

Please note: the labs/tutorials will start the week of May 7th, 2007.

All students must go to the lab first. See the lab/tutorial information sheet for details.

Lecture Section	Professor
50: Tues., 18:00 – 20:15 Loyola Campus, CC 112	Dr. Michael McClory, Office: SP-201.06 Phone (514) 848-2424 ext. 5834 E-mail: michaelmcclory@ca.inter.net Office Hours: to be announced in class
Tutorials Loyola Campus, AD 510	TAs to be announced – refer to website
The Course Coordinator (for lab/tutorial administrative questions) is Dr. Carrie Rogers.	

FREQUENTLY ASKED QUESTIONS – General FAQ

- **What textbook do I need?**
 - Required text: *Chemistry & Chemical Reactivity*, J.C. Kotz, P.M. Treichel & G.C. Weaver, 6th Edition, (Thomson, 2006). It is available at Concordia's Loyola Campus Bookstore, in a package with a study guide, solutions manual, and interactive CD.
 - Older editions of Kotz & Treichel (e.g., 5th) may be available on the used market, but make sure you find the correct end-of-chapter problems for use in the tutorials: refer to the 6th edition (on reserve at Vanier library) and to the cross-referencing table on Dr. Rogers' website <http://artsandscience.concordia.ca/facstaff/p-r/rogers/> (click on Teaching, then the course name, then scroll to the bottom of the page to find the links to the tutorial problems).
 - Other general chemistry textbooks you might find helpful are on reserve at the Vanier library (e.g., Zumdahl & Zumdahl, and Gilbert/Kirss/Davies).
- **What books and equipment are required for the labs?**
 - Lab manual: *Dept. of Chem. and Biochem., Chem 206, General Chemistry II*, (Concordia).
 - You must read the yellow section devoted to safety issues before coming to the first lab. You will be required to sign a form stating that you have done so.
 - The individual experiments can also be downloaded from the [internet](#). Many of the figures appear with better resolution, and in colour, on the web version.
 - Required at all times in lab: lab coat, safety glasses, lab manual or downloaded procedures.
 - Recommended equipment: scoopula, rubber bulb
 - Lab manuals and equipment are available at the Concordia Loyola Campus Bookstore.

- **What is the course grading scheme?**

<i>Tutorial quizzes</i>	10%
<i>Midterm exam(s)</i>	20%
<i>Final exam</i>	50%
<i>Lab reports</i>	20%

- To pass Chem 206, you must pass the theory part and practical parts separately:
 - Theory (pass = 40/80): average of tutorial quizzes, midterm exam(s), final exam.
 - Practical (pass = 12/20): laboratory reports.
- Students who earn <12/20 on labs will receive an R (repeat) grade.
- Students who earn <40/80 on theory will receive an F or R grade, depending on how low their grade is, at the discretion of the professor.
- ***Attendance at labs & tutorials is mandatory; >3 absences results in an R (repeat) grade.***
- Students will earn an INC notation and a lower grade than they deserve if they do not complete Chem 101.

- **Where can I get extra help with the course material?**

- Teaching assistants: You can see any TA, not just your own, for help with lecture, tutorial or laboratory material during their office hours ([see website](#)). However, don't expect them to give away the answers!
- Professors: Contact your professor to determine their policy on office hours and to talk about study strategies.
- Private tutors: The Course Coordinator may be able to help you find a private tutor if you would like regularly scheduled extra help.

- **What is Chem 101, and what happens if I don't do it?**

- Chem 101 is a one-hour seminar on the ethical use of information sources (*i.e.*, how to avoid practices that might be construed as plagiarism or academic dishonesty when writing reports, using the library/web, and working together). Afterwards, you must pass an on-line quiz.
- The seminar is offered several times at the start of each term. For further information, go to the associated Moodle course web site (Chem 101), accessible [as a guest](#).
- Only after attending the seminar, you will be able to access the on-line quiz through the [myConcordia Portal](#). It must be completed (with a grade of 100%) before the end of lectures to count for that term.
- ***All students taking any course in the Department of Chemistry & Biochemistry must complete the Chem 101 requirements ONCE during their studies at Concordia.***
- Failure to complete Chem 101 will result in your grade(s) being reported one division lower than you earned, with an *incomplete* notation (*e.g.*, C+/INC when you really earned a B-).
- For information about how to remove an INC notation, refer to the FAQ on the Moodle course web site for Chem 101 [as a guest](#) or through the [myConcordia portal](#).

- **Where can I find sample exams?**

- See the main course website for links to sample exams:
<http://artsandscience.concordia.ca/facstaff/a-c/bird/c206>

- **What should I do if I miss a midterm or final exam?**
 - Missed midterm exam: Contact your professor. If you have a valid medical or employment excuse, bring your documentation to your professor. Accommodations will be made at your professor's discretion.
 - Missed final exam: Contact the Exams Office as soon as possible.

- **What should I do if religious holidays coincide with a midterm exam, lab or tutorial?**
 - Contact your professor in advance, preferably at the start of term, to make arrangements.
 - For final exams, conflicts must be dealt with through the Exams Office.

- **What are my options if I fail the course?**
 - With an F grade:
 - You can repeat the course. If you performed the labs within the past year, contact the Course Coordinator at the start of term to request an exemption from the lab; if satisfactory, your previous lab grade may be used again. *All repeating students must repeat the tutorials.*
 - You can apply to take a Supplemental Exam (see Birks Student Centre) if you are in good academic standing. If passed, the supplemental exam grade would be used in combination with your previous tutorial and lab grades to calculate a second grade for the course. Your transcript would show a second attempt at the course.
 - With an R grade:
 - You are required to repeat the course. Contact your professor for details.
 - With a DNW grade:
 - F/DNW: You should contact the Exams Office, before the deadline (see the [Undergraduate Calendar](#)), to apply for a deferred final exam. The grade from this Replacement/Deferred exam will be used along with your midterm exam, tutorial and lab grades to calculate your final grade.
 - R/DNW: You will have to repeat the course. Contact your professor for details.

CHEM 206 FREQUENTLY ASKED QUESTIONS

Labs and Tutorials FAQ

Questions? See Course Coordinator: Dr. Carrie Rogers, SP-201.17, crogers@alcor.concordia.ca, Ext. 5838.

- **When do labs and tutorials start, and how does the schedule work?**

- Labs & tutorials alternate weeks, which is why they appear to be scheduled at the same time.
- Labs/tutorials start the 2nd week of classes: May 7th-11th, 2007.
- That week:
 - At the time labeled either lab or tutorial on your personal course schedule, go to the lab (SP-232).
 - Be prepared to do the first lab experiments (*i.e.*, with lab coat & glasses, & prelab done)
 - This term, all students follow the same schedule; everyone stays in the lab this week.
- Subsequent weeks: labs & tutorials alternate weeks; follow your Group's [schedule](#).
- Attendance at labs and tutorials is mandatory; you will fail if you miss more than 3 sessions.

- **What happens at labs?**

- Before the lab:
 - Carefully read the experimental procedures & complete the prelaboratory exercises.
 - Plan ahead: food, drinks, bare legs & open shoes are not permitted in the laboratory.
- At the lab:
 - Late entry is not permitted; see the Course Coordinator if you have problems.
 - Hand in your prelab exercises & have the TA sign your [Lab Report Receipt Record](#).
 - You cannot enter the lab without a completed prelab.
 - Your TA will check answers critical to the success of the experiments, but they will not return your prelab until they have also marked your lab report. Make sure your prelab is properly done, and keep a copy of any information you may need to do the lab efficiently, such as your summary of the procedures.
 - Put on your lab coat & safety glasses, and leave them on at all times in the lab. You are not permitted to remain in the lab without them.
 - Listen to the TA's prelab lecture, & carefully read the procedures before starting.
 - Perform the experiment(s) with your partner:
 - Work together but do not split the work; you must each learn everything.
 - You must each prepare your own data sheets and write separate lab reports.

- **When are lab reports due?**

- Lab reports are due at the beginning of your next scheduled lab session, *i.e.*, two weeks after performing the experiment.
 - Have your TA sign your [Lab Report Receipt Record](#) when you hand in your report.
 - Marked lab reports will be available for your inspection at the lab session following their due date. However, your TA will keep your marked reports.
- Late penalties: –10% per working day, so 1 week late = –50%, 2 weeks late = –90%.
- If you miss a lab session:
 - Your previous week's lab report due date is NOT extended. Hand it in to your TA or Dr. Rogers as soon as possible (*e.g.*, during office hours) to avoid late penalties.
- You may have less than two weeks to complete your final lab report; refer to the [lab/tutorial schedule](#) on the website.

- **What happens at tutorials?**

- Tutorials are mandatory problem-solving sessions led by a teaching assistant (TA).
- At each tutorial, you will:
 - Give your TA your 10 solved “hand-in” problems, to earn a bonus point on your quiz.
 - See the [lab/tutorial schedule](#) each week for the list of hand-in problems.
 - Your solutions will be inspected by the TA but not graded; your effort earns you the bonus point (note: answers are available; see below).
 - Receive a ~10 min review lecture by your TA, covering today’s tutorial topics.
 - Use this week’s list of assigned problems on the [lab/tutorial schedule](#) as a guide to the topics that may be covered. Study these in advance, and practice.
 - Work *in groups* (assigned by your TA) on two multi-concept exam-style problems provided to you at the tutorial, to develop your problem-solving strategies.
 - Have the opportunity to review the previous week’s quiz & ask questions about the current material.
 - At the end: write a 30 min quiz (*e.g.*, problems, short-answers, *etc*) on **today’s** topics.
- Attendance will be taken at the start of the tutorial. If you miss the problem-solving session, a penalty will be applied to your quiz grade:

Quiz grade	10	9	8	7	6	≤ 5
Recorded as	10	8	6	4	2	0

- Tutorials keep pace with the slowest lecture section so might be a little behind your class. Do not ask the TA to cover material that has not been seen in class by everyone in the tutorial. You can visit the TAs or professor during office hours if you have further questions.
- The numerical solutions to the assigned tutorial problems are posted on Dr. Rogers’ website: <http://artsandscience.concordia.ca/facstaff/p-r/rogers/> click on Teaching, then the course name, then scroll to the bottom of the page to find the links to the solutions.

- **What happens if I miss a lab or tutorial session?**

- If you miss a lab/tutorial due to illness or employment, you may be excused if you bring a valid medical or employer’s note to the Course Coordinator. It will still count as an absence, but you will not lose marks (*i.e.*, your percent grade will be calculated out of a smaller total).
- Any inexcusable absences will result in a grade of zero on the missed lab or tutorial quiz.
- If you miss a lab session:
 - Your previous week’s lab report due date is NOT extended. Hand it in to your TA as soon as possible to avoid late penalties.
 - Missed labs cannot be made-up, and you cannot hand in a report for a missed lab.
 - See the Course Coordinator in advance if you have a scheduling problem.
- **IMPORTANT:** If you miss more than 3 lab/tutorial sessions, for any reason, you will automatically fail the course and receive an R (repeat) grade. If this happens, you should drop the course; if the drop deadline has passed and you feel you have a legitimate case, contact an academic advisor at the Arts and Science Student Services Centre, AD 202, to apply for a Late Withdrawal.

CHEMISTRY 206 - COURSE OUTLINE – Summer 2007

References are to: "*Chemistry & Chemical Reactivity*", J.C. Kotz, P.M. Treichel & G.C. Weaver, 6th Ed.

Chapter 6: Energy and Chemical Change

Energy: Some Basic Principles. Specific Heat Capacity and Heat Transfer. Energy and Changes of State. The First Law of Thermodynamics. Enthalpy Changes for Chemical Reactions. Calorimetry. Hess's Law. Standard Enthalpies of Formation. Product or Reactant Favoured Reactions and Thermochemistry.

Chapter 9: Bonding and Molecular Structure: Fundamental Concepts

Bond Properties (specifically Bond Energy).

Chapter 19: Principles of Reactivity: Entropy and Free Energy

(This chapter will be covered in less detail than in the textbook; focus on the level of detail covered in class.)

Spontaneous Change and Equilibrium. Heat and Spontaneity. Dispersal of Energy and Matter. Entropy and the Second Law of Thermodynamics. Entropy Changes and Spontaneity. Gibbs Free Energy. ΔG° , K and Product Favorability. Thermodynamics, Time and Life.

Chapter 13: Intermolecular Forces, Liquids and Solids

(Only part of this chapter will be covered.)

States of Matter and the Kinetic-Molecular Theory. Intermolecular Forces. Hydrogen Bonding. Summary of Intermolecular Forces. Properties of Liquids.

Chapter 14: Solutions and their Behaviour

Units of Concentration. The Solution Process. Factors Affecting Solubility: Pressure and Temperature. Colligative Properties: Depression of Vapour Pressure, Elevation of Boiling Point, Depression of Freezing Point, Osmotic Pressure. Colloids.

Chapter 15: Principles of Chemical Reactivity: Chemical Kinetics

Rates of Chemical Reactions. Reaction Conditions and Rate. Effect of Concentration on Reaction Rate. Concentration – Time Relationships: Integrated Rate Laws. A Microscopic View of Reaction Rates. Reaction Mechanisms.

Chapter 16: Principles of Reactivity: Chemical Equilibria

Nature of the Equilibrium State. Equilibrium Constant and Reaction Quotient. Determining an Equilibrium Constant. Using Equilibrium Constants in Calculations. More About Balanced Equations and Equilibrium Constants. Disturbing a Chemical Equilibrium. Applying the Principles of Chemical Equilibrium.

Chapter 17: Principles of Reactivity: The Chemistry of Acids and Bases

Acids, Bases and the Equilibrium Concept. The Brønsted-Lowry Concept of Acids and Bases. Water and the pH Scale. Equilibrium Constants for Acids and Bases. Equilibrium Constants and Acid-Base Reactions. Types of Acid-Base Reactions. Calculations with Equilibrium Constants. Polyprotic Acids and Bases. Lewis Concept of Acids and Bases. Molecular Structure, Bonding, and Acid-Base Behaviour.

Chapter 18: Principles of Reactivity: Other Aspects of Aqueous Equilibria.

(Only part of this chapter will be covered.)

The Common Ion Effect. Controlling pH: Buffer Solutions. Acid-Base Titrations. Solubility of Salts. Precipitation Reactions.

Chem 206 – LAB AND TUTORIAL SCHEDULE – Summer 2007

Each week, the on-line schedule will be updated (items marked TBA will be filled in). Last update: Mon. April 30th

At tutorials, submit full solutions to the “Hand in” problems (see schedule) & receive 1 bonus mark on quiz.

IMPORTANT - NEW FORMAT: tutorial quizzes will cover the *current* week’s material!

DATES	ACTIVITY (Section 50 Wednesday night; Section 01 Thursday afternoon)
<i>May 02, 03</i>	<i>First lecture on Tuesday, May 01. No labs or tutorials this week.</i>
May 09, 10	Check-in and Experiments 1A, 1B, 1C: Gases
May 16, 17	Tutorial 1: Work on topics similar to problems : Ch.6 up to #45 (<i>may be updated in class</i>). Hand in: TBA. Quiz on: topics covered in today’s tutorial and hand-in problems.
May 23, 24	Experiment 2: Calorimetry - Thermodynamics of Oxidation of Acetone by Hypochlorite
May 30, 31	Tutorial 2: Work on topics similar to problems : TBA. Hand in: TBA. Quiz on: topics covered in today’s tutorial and hand-in problems.
June 06, 07	Experiment 3: Determination of Molar Mass by Freezing-Point Depression.
<i>June 13, 14</i>	<i>No lecture this week. No labs or tutorials this week.</i>
<i>June 20, 21</i>	<i>Mid-term Break – No lectures, labs or tutorials this week.</i>
June 27, 28	Tutorial 3: Work on topics similar to problems : TBA. Hand in: TBA. Quiz on: topics covered in today’s tutorial and hand-in problems.
July 04, 05	Experiment 4: A Kinetic Study - The Reaction of Crystal Violet with Sodium Hydroxide.
July 11, 12	Tutorial 4: Work on topics similar to problems : TBA. Hand in: TBA. Quiz on: topics covered in today’s tutorial and hand-in problems.
July 18, 19	Experiment 5: Experiments in Chemical Equilibrium - Part I
July 25, 26	Tutorial 5: Work on topics similar to problems : TBA. Hand in: TBA. Quiz on: topics covered in today’s tutorial and hand-in problems.
August 01, 02	Experiment 5: Experiments in Chemical Equilibrium - Part II
August 08, 09	Tutorial 6: Work on topics similar to problems : TBA. Hand in: TBA. Quiz on: topics covered in today’s tutorial and hand-in problems.
<i>Thurs., Aug. 16</i>	<i>Last day to hand in lab reports (late penalty applies if past your two-week deadline.)</i>

CHEM 206 – TUTORIAL QUESTIONS – Summer 2007

Problems assigned are from Kotz, Treichel & Weaver's *Chemistry & Chemical Reactivity*, 6th Ed.

NOTES:

- 1) The lists of assigned problems on the lab/tutorial schedule (see website) reveal which topics will be covered in each tutorial. You should study and practice these problems before going to the tutorial. In addition, the “hand-in” problems are selected from this list.
- 2) Although the answers to the questions below are posted on Dr. Rogers’ web site, during tutorials your tutor will work through problems with you and help you learn how to attack them. For practice, refer to the similar even-numbered problems labeled in blue in the textbook; for those, see the textbook's appendix for answers and the Student Solutions Manual (on reserve in the library) for complete solutions.
- 3) The General Questions are representative of the types of problems you will see on tests and examinations. Note, however, that particular emphasis will be placed on solving problems with obvious real-world context.

TOPIC	CHAPTER	ASSIGNED PROBLEMS from end of chapter
Thermodynamics	6	4, 8, 10, 14, 18, 20, 26, 28, 32, 36, 40, 44, 46, 52, 58, 62, 64, 66, 76, 78, 80, 82, 88/87, 92, 96, 108
	9	56, 58
	19	2, 8, 12, 16, 18, 22, 26, 30, 32, 38, 42, 48, 62, 64, 74, 80, 82, 86, 87
Solutions	13	2, 4, 6, 8, 12, 18, 20, 22, 40, 43, 44, 47, 52, 60, 72, 76, 86
	14	2, 6, 12, 14, 18, 20, 22, 24, 26, 32, 34, 36, 40, 42, 48, 50, 52, 60, 64, 66, 72, 76, 78, 80, 82, 86, 88, 90, 92, 94, 98, 102
Kinetics	15	4, 10, 12, 14, 16/, 18, 22, 24, 28, 30, 36, 38, 42, 44, 46, 48, 50, 52, 54, 62, 66, 70, 72, 73, 76, 79, 82, 84, 88, 90, 94, 98
Equilibrium	16	2, 4, 6, 8, 10, 14, 16, 18, 20, 24, 26, 28, 30, 32, 34, 36, 40, 44, 46, 48, 50, 54, 56, 57, 60, 63, 66, 68, 70, 72
	19	34, 36, 50, 60, 68
Acids & Bases	17	2, 4, 8, 10, 16, 22, 28, 32, 36, 38, 42, 46, 50, 52, 56, 60, 64, 66, 70, 74, 76, 78, 82, 84, 86, 92, 94, 96, 98, 102, 110, 112, 114, 116
Buffers, Titrations & Solubility Equilibria	18	2, 4, 8, 10, 14, 16, 22, 24, 26, 30, 32, 36, 38, 42, 44, 46, 50, 52, 54, 58, 60, 64, 66, 74, 76, 78, 80, 82, 86, 90, 92, 98, 102, 104

Prepared by: C.W. Rogers, July 2006; modified April 2007.

CHEMISTRY 206 - Lab Report Receipt Record

Important

Do not lose this sheet – staple it to the cover of your lab manual. You must have your teaching assistant sign this sheet for each group of labs you hand in. No arguments of the type: "The T.A. lost my lab report" will be investigated without this proof that your T.A. received the report(s).

C.W.Rogers, Course Coordinator

Experiment	Prelab		Lab Report	
	T.A. Signature	Date	T.A. Signature	Date
Experiment 1A				
Experiment 1B				
Experiment 1C				
Experiment 2				
Experiment 3				
Experiment 4				
Experiment 5 – Part I				
Experiment 5 – Part II	Handed in with Part I	N/A		