Course: **Introductory University Chemistry I. Chem 101 section A1 – Fall 2010***

Instructor: Dr. Y. Apelblat

Lectures: MWF 10:00–10:50 in CCIS 1440

Office: Chemistry W4–67B

Office hours: Open. But MWF 14:30–16:00 and TR 10:30–12:00 recommended

Not available: MWF 09:00–11:00, 12:00–14:30

Tel: 780 248–1500 **Email:** yoram.apelblat@ualberta.ca *include Chem 101 in the subject field !*

Web page: http://www.chem.ualberta.ca/~apelblat/A1/A1index.html

Chem 101 is the first course of the introductory chemistry courses. The course pre-requires a basic knowledge of chemistry equivalent to the Alberta Chemistry 30 high school curriculum. You should prepare yourself for this course through a review of the prerequisite material. Students who do not have the required prerequisite should: a) apply for a waiver from the course coordinator and b) not expect supplementary professorial tutoring.

Objective:

You will learn about the structure, bonding, and reactivity of chemical substances, focusing in particular on the main-group elements. You will learn how to draw and name 3-D molecules and based on the structure, geometry and forces will be able to predict their reactivity and properties in the gaseous, liquid and solid phases. Whatever your ultimate academic career may be, you will gain an appreciation for the influence of chemistry in your life and you will be able to think critically about chemical issues.

Required materials:

1. "Chemistry" by Silberberg, 5th Ed., McGraw Hill, and student's solution manual.
2. "Introductory University Chemistry I Laboratory Manual (Chem 101/103)" (2010 – 2011 edition).
3. Safety glasses for the laboratory. A lab coat is recommended.

Lectures and problem sets:

Learning chemistry requires hard work. It is important that you keep up with the material; cramming before exams is a poor learning strategy. To succeed in this course you should:

1. **Attend lectures**. Past experience suggests that students who miss lectures, for no particular reason, do not fare well in the course.
2. **Read** the assigned sections in the textbook **before** the lecture. You are responsible for all assigned material.
3. **Take notes in class**. Taking notes in class is an active form of learning that reinforces understanding!

   Be aware that the lecture notes that I will post are meant as a service for students, who legitimately missed a lecture, and as such will be brief to generally reflect what was covered in class.
4. Try as many of the relevant problems in the textbook.
5. Problem sets will be posted regularly (~ every 10 days) on the website. They will consist of problems from the textbook and from the instructor. It is **highly recommended** that you work them out on your own as the level of difficulty on exams will be similar. The solutions will be posted about a week later on the website.

*** Policy about course outlines can be found in section 23.4(2) of the University Calendar.**

Examinations and Marks:

1. Grade distribution:

Item	Chem 101
Term exam #1	10%
Term exam #2	20%
Lab reports/exam*	25%
Final exam	45%
Total	100%

* Chem 101 – labs 14.5% (but not all labs have equal weight), exam 10.5%.

2. Exam schedule:

Term Exam #1 – Wednesday, September 29, 2010, written during class in CCIS 1440

Term Exam #2 – Monday, November 1, 2010, written during class in CCIS 1440

Final Exam* – Friday, December 17, 2010, 09:00 – 12:00, location TBA by the Registrar's office.

* WARNING: Students must verify this date on Bear Tracks when the Final Exam Schedule is posted

3. The grade distribution is set according to guidelines given in Section 61.3 (University of Alberta Marking and Grading Guidelines) of the General Faculties Council Policy Manual, with the class average typically set to about 2.6 for first-year courses.

Descriptive	Letter grade	Grade point
Excellent	A+	4.0
	A	4.0
	A–	3.7
Good	B+	3.3
	B	3.0
	B–	2.7
Satisfactory	C+	2.3
	C	2.0
	C–	1.7
Pass	D+	1.3
Poor	D	1.0
Fail	F or F4	0.0

4. All exams are closed book. A data sheet will be provided by the instructor. Non–programmable calculators are allowed. Calculators with extensive alphanumeric capabilities, laptop computers, cell phones or any other electronic devices are NOT permitted. Please bring your student ID cards to examinations.

5. All exams are cumulative. Sample past exams and solutions will be posted on the course website a week before each examination.

6. Absences: See Section 23.5 of the University Calendar. Excused absence is a privilege, not a right, and is granted at the discretion of the instructor (term exams) or the Faculty (final exam). Permissible excuses include (but are not limited to) **incapacitating** illness, severe domestic affliction, or other compelling reasons (including religious conviction).

Midterm exams: No makeup exam is given. An excused absence will transfer the weight of the missed exam to the **final exam** without exception. Excuses with appropriate documentation (UofA medical form, Doctor's note, UofA coach's letter, Statutory Declaration, etc.) must be presented to me within 48 hours of the exam. An unexcused absence from an exam will result in a score of zero for that exam.

Final: Only the student's Faculty can defer final examinations. Applications for deferrals must be initiated within two working days of the missed examination. Misrepresentation of Facts to gain a deferred examination is a serious breach of the *Code of Student Behaviour*. Upon obtaining a deferral, the student must write a deferred final examination. The deferred final examination for Chem 101 is scheduled for Tuesday, January 18, 2011, from 1:00pm – 4:00pm, in Chemistry E3–25.

Laboratory:

1. Failure to register in and attend the laboratory will result in a Fail grade in the course. To apply for a formal laboratory exemption, see the lab coordinator Dr. Gee in Chemistry E2–34B, phone (780) 492–3438.
2. Safety glasses for laboratory are mandatory. You must also comply with all other laboratory regulations as specified in the laboratory manual.
3. Labs begin the week of September 27. Check for your lab section and starting times and date. These assignments will be posted, as soon as phone registration closes, outside E2–34 and on the lab web page.
4. **Read the instructions in the manual before attending the first lab**, which will include check-in (bring ID, safety glasses and lab manual) and submission of a pre-lab assignment.

Seminars and help

The seminars you have registered in are tutorial help sessions. These are not structured classes. You would go to these only if you need help and **you may go there at any time** (see next paragraph "who to talk to" sec, 3).

Who to talk to:

1. **Questions about lectures, exams, or problem sets:** See Dr. Apelblat.
2. **Questions about registration changes and scheduling for lectures and laboratories:** See Dr. Gee.
3. **Help with lab reports and exam, lecture topics and homework assignments:** See Teaching Assistants MTWRF 09:30–17:00 in Room E2–34A. Additional Lecture Help sessions may run on Sundays (TBA).

Students with disabilities

Students who require accommodation in this course due to a disability are advised to discuss their needs with Specialized Support & Disability Services (2-800 Students' Union Building).

Academic Support Centre

Students who require additional help in developing strategies for better time management, study skills or examination skills should contact the Academic Support Centre (2-703 Students' Union Building)

Academic Integrity

The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Code of Student Behaviour (www.ualberta.ca/secretariat/appeals.htm) and avoid any behaviour which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the university.

All forms of dishonesty are unacceptable at the University. Any offense will be reported to the Senior Associate Dean of Science who will determine the disciplinary action to be taken. Cheating, plagiarism and misrepresentation of facts are serious offenses. Anyone who engages in these practices will receive at minimum a grade of zero for the exam or paper in question and no opportunity will be given to replace the grade or redistribute the weights. As well, in the Faculty of Science the sanction for **cheating** on any examination will include **a disciplinary failing grade** (no exceptions) and senior students should expect a period of suspension or expulsion from the University of Alberta.

Chemistry 101 Course Outline (Fall 2010)

This schedule is tentative and subject to changes and modifications. Numbers in parentheses (e.g. 5.3) refer to sections of the textbook.

1. Atomic Structure Chapters 1, 2, 7, and 8 (~9 lectures)

- Chapter 1 is assumed high school knowledge!
- Early models of the atom and fundamental laws. Elements, isotopes and the periodic table (2.1 – 2.6)
- Nature of light, atomic spectra, Bohr model (7.1 – 7.2)
- Nature of matter, quantum mechanics (7.3 – 7.4)
- Hydrogen atom, shapes and energies of orbitals (7.4)
- Many–electron atoms, shielding, electron spin, electron configurations (8.1 – 8.3)
- Periodic trends and properties (8.4 – 8.5)

2. Bonding Chapters 2, 3, 9,10 and 11 (~12 lectures)

- Most of chapters 2, and 3 is assumed high school knowledge!
- Compounds: types of bonding, bond energy and nomenclature (2.7, 2.8, 9.1 – 9.4)
- *Review: moles, molar masses, formulas, stoichiometry* (3.1 – 3.5)
- Electronegativity, bond polarity (9.5)
- Lewis structures (10.1)
- 3D structures (VSEPR) (10.2 – 10.3)
- Valence bond theory, hybridization (11.1 –11.2)
- Multiple bonding, bond strength (11.2, 9.4)
- Molecular orbital theory (11.3)

3. States of Matter Chapters 5, 12 and 13 (~12 lectures)

- Ideal and real gases, kinetic molecular theory (5.1 – 5.7)
- Atmospheric chemistry
- Intermolecular forces (12.3)
- Liquids (12.4, 12.5)
- Solids (12.6, 12.7)
- Changes of state (12.1, 12.2)
- Intermolecular forces in solutions (13.1)

4. Chemistry of the Elements Chapter 14 and interchapter (preceding chapter 14) (~2 lectures)

- Metals vs. nonmetals, acids and bases, oxidizing and reducing agents. (inter topics 3 – 5)
- Properties and reactions of various elements will be incorporated as examples in the preceding 3 units