Department of Chemistry

CHEM 3640 Fall 2015

Chemistry of the Elements I

Lecturer: Marcel Schlaf MACN 339, x 53002, mschlaf@uoguelph.ca

Lab-coordinator: Robert Reed SCI 3108, x 53805, rwreed@uoguelph.ca

Lab-demos: TBA

Prerequisites: CHEM 2060 and CHEM 2070

Objective of the course:

This course aims to give a comprehensive introduction to concepts used by inorganic chemists to describe the structure, properties and reactivity of compounds of the main group elements. The most important of these concepts that the course will cover are: Electronic Structure of Atoms, Symmetry, MO theory, Acids & Bases, Structure of Solids, Trends in the Periodic System. In addition a brief overview of the substance chemistry and some technical and industrial application of the main group elements will be discussed.

In the lab portion of the course, students will then have the opportunity to observe some of these concepts "in action".

Course Materials: **YOU MUST HAVE A PERIODIC TABLE AND LEARN IT BY HEART IN THE FIRST TWO WEEKS!**

Lecture notes, problem sets, old exams and additional lecture notes will be made available on the Schlaf Group Server. (Login and Password required).

Recommended textbook:
"Shriver & Atkins Inorganic chemistry, 6th Edition" by Shriver, Atkins, Overton, Rourke, Weller and Armstrong.
W. H. Freeman and Company, 2010, N.Y.
(*There is also a solutions manual available for this book*).

Other materials:

Course 2 h reserve list: (Note: The books available in the library are not necessarily the same edition as listed here.)

1) Advanced inorganic chemistry : a comprehensive text
Author: Cotton, F. Albert (Frank Albert), 1930-2007. Wilkinson, Geoffrey, 1921-1996.

2) Inorganic chemistry
Author: Weller, Martin, Dr., author. Overton, Tina, author.; Rourke, Jonathan, author.; Armstrong, F. A. (Fraser A.), author.

3) Inorganic chemistry
Author: Shriver, D. F. (Duward F.), 1934- Atkins, P. W. (Peter William), 1940-

4) Inorganic chemistry
Author: Wiberg, Egon. Wiberg, Nils

5) Inorganic chemistry
Author: Housecroft, Catherine E., 1955- Sharpe, A. G.

(… good alternative to the recommended textbook)

6) Inorganic chemistry
Author: Purcell, Keith F 1932- Kotz, John C joint author.

(… good alternative to the recommended textbook)

7) Chemical applications of group theory
Author: Cotton, F. Albert (Frank Albert), 1930-2007.

(… the classic text on symmetry – a bit more advanced …)

8) Chemistry of the Elements (2nd Edition)
Author: Greenwood, N. N, (Norman Neill) Earnshaw, A

9) Concepts and Models of Inorganic Chemistry
Author: Douglas, Bodie Eugene, 1924 Mcdaniel Darl Hamilton,

10) Inorganic chemistry
Author: Miessler, Gary L., 1949- Tarr, Donald A. (Donald Arthur), 1932

(… good alternative to the recommended textbook)

11) Inorganic chemistry : principles of structure and reactivity 4th ed.
Author: Huheey, James E. Keiter, Ellen A.; Keiter, Richard L.

12) Molecular symmetry and group theory
Author: Carter, Robert L., 1944-

(… very good and readable intro to symmetry …)

13) Molecular symmetry and group theory : a programmed introduction to chemical applications 2nd ed.
Author: Vincent, Alan, 1938-.

14) Organometallics 3rd, completely rev. and extended ed.
Author: Elschenbroich, Christoph, 1939-

There are many other textbooks that cover inorganic chemistry – look around. Very good articles on many of the topics covered in the course can also be found in the *Journal of Chemical Education*. Also: why not just type in a keyword on the topic of your interest in your favorite browser – who knows what's out there…

Lecture & Lab times and dates:

Lecture: MWF 09:30-10:20 h, MCKN 234
Lab: … check Web-Advisor for your schedule !!!

Start: Friday, September 11th 2015
End: Friday, December 4th 2015
Monday, October 12: Holiday--NO CLASSES SCHEDULED

Total 36 lecture (12 weeks)

Exams and Deadlines:

Midterm 1: TBA – in class.
Midterm 2: TBA – in class.
Final: Tuesday, December 8th 2015, 1130-1330 h, location TBA

Dr. Schlaf's office hours: Please book an appointment with me by sending me a brief email. Feel free to stop by my office without prior notice, but please be aware that I may be busy and ask you to come back later.

You can also ask questions by e-mail (mschlaf@uoguelph.ca) and I will respond at the earliest possible convenience.

Evaluation:

Theoretical part (70 % of total mark):

Midterm 1: 21 % (= 30 % of lecture portion)
Midterm 2: 21 % (= 30 % of lecture portion)
Final: 28 % (= 40 % of lecture portion)

Laboratory (30 % of total mark):

Lab and lab report marks 30 %

Note: You must achieve 50 % in each of the course segments separately to pass the course, i.e., you must have a minimum of 15 % of your total course marks from the lab and a minimum of 35 % of total course marks from the lecture portion of the course !

THIS MEANS THAT EVEN IF YOU ACHIEVE 50 % OF THE TOTAL MARKS BY ANOTHER COMBINATION YOU WILL STILL FAIL THE COURSE !!!

The LEGAL STUFF:

The course will be conducted in compliance with all policies and regulations laid out in the published University of Guelph Academic Calendar, specifically:

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

When You Cannot Meet a Course Requirement
When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. See the undergraduate calendar for information on regulations and procedures for Academic Consideration.

Drop Date
The last date to drop one-semester courses, without academic penalty, is Friday, November 6th 2015. For regulations and procedures for Dropping Courses, see the Undergraduate Calendar.

Copies of out-of-class assignments
Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

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.

For more information, contact CSD at 519-824-4120 ext. 56208 or email csd@uoguelph.ca or see the website: http://www.uoguelph.ca/csd/

Academic Misconduct
The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need

to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. 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.

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.

Resources

The 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.