KEYANO COLLEGE
THE ESSENTIAL ELEMENT

Course Outline

UNIVERSITY STUDIES

CHEMISTRY 102
Introductory University Chemistry II
Winter 2013

3 CREDITS
4 hours lecture, 3 hours laboratory

INSTRUCTOR: DR. SORIN NITA

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PHONE NUMBER: (780) 715-3924

E-MAIL: sorin.nita@keyano.ca

OFFICE NUMBER: S209F

OFFICE HOURS:

Tuesday	9:00 AM – 12:00 PM
Wednesday	10:00 AM – 12:00 PM

HOURS OF INSTRUCTION:

Tuesday	2:00 PM – 3:50 PM	Room 228
Thursday	12:00 PM – 12:50 PM	Room 228
Friday	8:00 AM – 8:50 AM	Room 228

LABORATORIES:

Wednesday	2:00 PM – 4:50 PM	Room 236	CHEM 102X
Thursday	2:00 PM – 4:50 PM	Room 236	CHEM 102Y

COURSE DESCRIPTION:

Rates of reactions, thermodynamics and equilibrium, electrochemistry, modern applications of chemistry.

PRE-REQUISITE(S):

Chemistry 101

COURSE OUTCOMES:

The student will be able to:

1. Perform analytical and chemical kinetics experiments using laboratory equipment, and use proper laboratory safety procedures
2. Explain chemical processes using physical chemistry methods, either employing the kinetics approach or the thermodynamics approach
3. Analyze chemical equilibrium using Le Châtelier's principle, and perform equilibrium calculations using an ICE table for acid-base equilibria, solubility equilibria, and complex ion equilibria
4. Explain electronic configurations of coordination compounds using Crystal Field Theory, and correlate it with their properties like color and paramagnetic-diamagnetic character
5. Understand how the electrochemical cells operate, calculate their standard potential, and correlate the potential to the ionic concentrations in each half cell using Nernst equation

REQUIRED RESOURCES:

1. **General Chemistry: Principles & Modern Applications**; Petrucci, Herring, Madura, Bissonnette; Pearson Canada Inc., Toronto, Ontario, 2011 (10th edition).
   The 9th edition of this textbook is also acceptable.
2. **Chemistry 102/105 Laboratory Manual**; Keyano College (2012/2013 edition).
   The old editions of the lab manual are not acceptable.
3. **Student Lab Notebook with Permanent Binding**; Plymouth, Michigan: Hayden-McNeil, LLC
4. A non-programmable scientific calculator (**Sharp EL-531**, used for exams, is recommended).
5. Extra long lab coat.

TOPICS TO BE COVERED:

Please Note:
This course outline may be modified to facilitate unforeseen time constraints. Date and time allotted to each topic is subject to change.

1. CHEMICAL KINETICS

	textbook chapters
Reaction rates and rate laws	14.1-14.3
Integrated rate laws	14.4-14.6
Arrhenius model and reaction mechanism	14.7-14.10
Catalysis	14.11

2. EQUILIBRIUM

Gas-phase equilibria	15.1-15.2
ICE table and equilibrium calculations	15.3-15.5
Le Chatelier's principle	15.6-15.7
Acid–base equilibria	16.1-16.9
Buffers, Indicators	17.1-16.6
Solubility, precipitation, and complex ion equilibria	18.1-18.9

3. COORDINATION CHEMISTRY

Coordination compounds and isomers	24.1-24.4
Localized electron model and Crystal field theory	24.5-24.9
Importance of coordination compounds	24.10-24.11

4. THERMODYNAMICS

First law: energy, heat and work	7.1-7.5
Enthalpy, bond energies and calorimetry	7.3-7.6
Hess' law and standard enthalpies of formation, Sources of Energy	7.7-7.9
Second and third laws: entropy and spontaneity	16.1-16.3, 16.5
Free energy, work and equilibrium	16.4, 16.6-16.9

5. ELECTROCHEMISTRY

Voltaic cells, reduction potentials and cell potentials	20.1-20.2
Free energy and electrical work	20.3
The Nernst equation	20.4
Applications of electrochemistry: batteries, corrosion and electrolysis	20.5-20.8

MOODLE

Go to http://ilearn.keyano.ca

This course is supported through Moodle. Assignments, readings and handouts will be posted on Moodle. Login information will be provided by your instructor. For further instructions please see the Moodle handout.

EVALUATION:

Assignment	Percentage	Due Date
In-class assignments	**10%**	N/A
Lab Reports	**25%**	N/A
Midterm	**20%**	Tuesday, February 19th, 2013
Final Examination	**45%**	*During the final examination period*

GRADING SYSTEM:

Letter Grade	Description	Grade Points
A+		**4**
A	Excellent	**4**
A-		**3.7**
B+		**3.3**
B	Good	**3**
B-		**2.7**
C+		**2.3**
C	Satisfactory	**2**
C-		**1.7**
D+		**1.3**
D	Minimal Pass	**1**
F	Failure	**0**

Students intending to transfer to other institutions require a 'C-' as a minimum grade.
Transfer information on each course is available at the Alberta Council on Admission and Transfers.

In the chemical laboratory, students **must** use a lab coat and a pair of safety goggles (if you normally wear contact lenses, you should switch to regular glasses for lab work). *You should never wear contact lenses in a lab.*

Students who do not complete all the required work should not expect to pass the course.
Students should consult:

http://www.keyano.ca/current_students/examinations/index.htm

IMPORTANT DATES:

January 18th, 2013	Courses dropped after this date will be designated "W". (A withdrawal (W) is not reflected in your GPA)
March 8th, 2013	Courses dropped after this date will be designated "WF". (A withdrawal failure (WF) counts as a 0 in your GPA)
April 19th, 2013	Last day of classes
April 22nd-30th, 2013	Final Exams

COLLEGE POLICIES

Equality, Equity and Respect

The Keyano College is committed to providing an environment of equality, equity and respect for all people within the College community. All members of this community are considered partners in developing teaching and learning contexts that are welcoming to all. Faculty, staff, and students are encouraged to use inclusive language to create a classroom atmosphere in which students' experiences and views are treated with equal respect and valued in relation to their gender, ethnic and cultural background, and sexual orientation.

Students should consult:
http://www.keyano.ca/Committees/IRA/Individual_Rights_Policy.asp

Plagiarism and Cheating

Every student expects to be treated and evaluated fairly in a course. Plagiarism and cheating robs everyone of this right.

No student may submit words, ideas or data of another student or person as his or her own in any writing, project, assignment, quiz, electronic presentation, exam etc. Any work used that is not the student's own must be clearly cited as belonging to someone else. There are penalties for using other's work and not citing it. The Student's Rights & Responsibilities document clearly outlines these penalties and the appeal process.

- No learner can obtain information from another student during an exam.
- No learner can bring unauthorized information (paper or electronic) into an exam or quiz.
- No student can submit work done in another course for grading in this course without the written prior approval of the course instructor.
- No student can submit copyright protected or commercially produced materials as part or all of an assignment without proper citation & permission.

Student Rights & Responsibilities

Students should consult the Keyano College Credit Calendar or online at:
http://www.keyano.ca/Media/Collections/Calendars/Keyano.Calendar1112-10-full.pdf

Specialized Supports and Duty to Accommodate

Disability Support Services: Learner Assistance Program

If you have a documented disability or you think that you would benefit from some assistance from a Disabilities Counsellor, please call or visit the Disability Supports Office 780-792-5608 to book an appointment (across from the library). Services and accommodations are intended to assist you in your program of study, while maintaining the academic standards of Keyano College. We can be of assistance to you in disclosing your disability to your instructor, providing accommodations, and supporting your overall success at Keyano College.

Specialized Supports and Duty to Accommodate

Specialized Support and Duty to Accommodate are aligned with the office of Disability Support Services: Learner Assistance Program (LAP) guided by federal and provincial human rights legislation, and defined by a number of Keyano College policies. Keyano College is obligated by legislation to provide disability-related accommodations to students with identified disabilities to the point of undue hardship.

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CHEMISTRY 102
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Winter 2013

3 CREDITS
4 hours lecture, 3 hours laboratory

_____ _____
Dr. Sorin Nita, Instructor **Date**

Reviewed and approved by:

_____ _____
Louis Dingley, Chairperson **Date**

_____ _____
Guy Harmer, Dean **Date**