

CHEM 030A, Chemistry 30

5 Credits, 6 hours lecture + 2 hours lab

Chemistry 030 begins with a review of Chemistry 025, followed by a study of enthalpy changes and calorimetry; equilibrium Bronsted-Lowry acid-base theory and acid-base titrations; oxidation-reduction reactions and electrochemical cells, and organic chemistry, including organic reactions and nomenclature of hydrocarbons, aromatics and other functional groups.

Alberta Education Course Equivalency: Chemistry 30.

Prerequisite: CHEM 025 or equivalent or permission from the Program Chair

Instructor

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Office Phone: 780-791-8955
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Office Hours

Individual meetings are available **Fridays, 1:00 – 2:50 pm via Zoom** on a first come, first served basis. Students will be admitted into the Zoom “waiting room” until it is their turn for one-on-one attention.

Other times may be available Monday – Friday, between 9:00 am and 5:00 pm; please call or email to set up an appointment.

Hours of Instruction

Tuesdays	1:00 – 2:50 pm	Synchronous tutorial (group)
Wednesdays	9:00 – 10:50 am	Synchronous lab tutorial (group)
Thursdays	1:00 – 2:50 pm	Synchronous tutorial (group)
Fridays	1:00 – 2:50 pm	Office hours (individual)

Instruction is flexible; tutorials are meant to go over the previous day’s work and explain the new lesson

Required Resources

- ***Chemistry 030 Student Manual***, available in print from the Keyano Bookstore.
- Calculator, scientific or graphing
- **Computer** (laptop or desktop)—see pages 8 and 9 for details

Course Outcomes

Upon successful completion of the course, the student shall be able to:

- use balanced chemical equations to indicate the quantitative relationships between reactants and products involved in chemical changes.
- use stoichiometry in quantitative analysis.
- communicate, calculate, and interpret energy changes in chemical reactions.
- explore classes of organic compounds as a common form of matter.
- describe chemical reactions involving organic compounds.
- explain that there is a balance of opposing reactions in chemical equilibrium systems.
- determine quantitative relationships in simple equilibrium systems.
- describe acidic and basic solutions qualitatively and quantitatively.
- explain the nature of oxidation-reduction reactions.
- apply the principles of oxidation-reduction to electrochemical cells.
- analyze qualitative and quantitative laboratory data and make conclusions about its accuracy.

Evaluation

Assignments	60%
Lab Data Analyses	40%

A grade of 60% (1.7, or C-) is required for progression. The minimum standard for passing this course is a grade of 50% (1.0, or D).

Grading System

Descriptor	4.0 Scale	Percent
Excellent	4.0	96 – 100
	4.0	90 – 95
	3.7	85 – 89
Good	3.3	81 – 84
	3.0	77 – 80
	2.7	73 – 76
Satisfactory	2.3	69 – 72
	2.0	65 – 68
Minimum Prerequisite	1.7	60 – 64
Poor	1.3	55 – 59
Minimum Pass	1.0	50 – 54
Failure	0.0	0 – 49

Proposed Schedule of Topics**Units of Study****Lab Manual****Building Blocks of Chemistry (Review of Chemistry 025)****Exp #1**

1. Review of Inorganic Nomenclature
2. Review of Inorganic Reaction Types and Balancing Chemical Equations
3. Review of Simple Calculations and Significant Digits
4. Review of Stoichiometry

Introduction to Organic Chemistry**Exp #2**

1. Hydrocarbons: Nomenclature and Structural Diagrams
2. Hydrocarbon Derivatives: Nomenclature and Structural Diagrams
3. Structural Isomers
4. Organic Reaction Types (including petroleum refining)

Thermochemistry**Exp #3**

1. Thermochemical Terminology
2. ΔH notation and Energy Diagrams
3. Thermochemical Stoichiometry
4. Measuring ΔH using Calorimetry
5. Molar Enthalpy
6. Calculating ΔH using Hess' Law
7. Calculating ΔH using Enthalpies of Formation
8. Applications: Photosynthesis, Respiration, and Nuclear Energy

Acid-Base Equilibrium**Exp #4**

1. Review of Arrhenius Acid-Base Theory
2. Acid-Base Titrations: Stoichiometry and Titration Curves
3. The pH Scale and Calculations for Strong Acids and Bases
4. Introduction to Chemical Equilibrium
5. Equilibrium Disruption: Le Châtelier's Principle
6. Brønsted-Lowry Acid-Base Theory
7. Applications: Acid-Base Indicators and Buffers
8. Weak Acid-Base Calculations

Exp #5**Electrochemistry**

1. Review of Oxidation Number Rules
2. Reduction-Oxidation Terminology
3. Methods of Balancing Redox Equations
4. Predicting Redox Reactions using a Table of Reduction Strengths
5. Galvanic (Voltaic) Cells
6. Applications: Corrosion of Metals
7. Electrolytic Cells
8. Redox Stoichiometry: Faraday's Law and Redox Titration

Demo Lab**Exp #6**

Calendar of Important Events

Dates on the following calendar are tentative; shaded areas indicate no Chemistry 030 lessons.

Week	Monday	Tuesday	Wednesday	Thursday	Friday
1	Aug 31 Orientation Day	Sept 1 First day; review of elements/compounds	2	3 Nomenclature Review	4 Office Hours
2	7 Labour Day Holiday	8 Chemical Reactions	9 Exp #1 Lab Analysis Details	10 Simple Calculations	11 Office Hours Lab Analysis #1 due
3	14	15 Stoichiometry & LR Review	16	17 Organic Intro & Alkanes	18 Office Hours Ass't #1 due
4	21	22 Alkenes & Alkynes	23 Exp #2 Lab Analysis Details	24 Isomers & Aromatics	25 Office Hours
5	28	29 Hydrocarbon Derivatives	30	Oct 1 Organic Reactions	2 Office Hours Lab Analysis #2 due
6	5	6 Thermo Intro & Stoich	7 Exp #3 Lab Analysis Details	8 Calorimetry	9 Office Hours Ass't #2 due
7	12 Thanksgiving Day Holiday	13 Hess' Law	14	15 Enthalpies of Formation	16 Office Hours Lab Analysis #3 due
8	19	20 Acid-Base Intro & Titrations	21 Exp #4 Lab Analysis Details	22 pH review & calc's: strong acids & bases	23 Office Hours Ass't #3 due
9	26	27 Chemical Equilibrium	28	29 Le Chatelier's Principle	30 Office Hours Lab Analysis #4 due
10	Nov 2	3 Bronsted-Lowry Acids and Bases	4 Exp #5 Lab Analysis Details	5 Bronsted-Lowry Systems	6 Office Hours Lab Analysis #5 due
11	9	10 pH Calculations: weak acids & bases	11 Remembrance Day Holiday	12 Reading Day	13 Reading Day
12	16	17 Electrochemistry Intro & Oxidation #'s	18	19 Redox Balancing Methods	20 Office Hours Ass't #4 due
13	23	24 Using Redox Tables for Predicting Rxns	25 Demo Lab Details	26 Galvanic Cells	27 Office Hours Demo Lab Analysis Due
14	30	Dec 1 Electrolytic Cells	2 Exp #6 Lab Analysis Details	3 Redox Stoich & Faraday's Law	4 Office hours
15	7 EXAMS	8 EXAMS Ass't #5 due	9 EXAMS	10 EXAMS Lab Analysis #6 due	11 EXAMS
16	14 EXAMS	15 EXAMS	16 EXAMS	17 EXAMS	18 EXAMS

Please Note: Date and time allotted to each topic is subject to change.

Final exams are scheduled by the College. Do not book travel until December 19, 2020 for courses with final exams.

Deferred exams will NOT be approved for travel, even if the travel was booked prior to enrolling in the course.

Course Specifics

Remote delivery: Chemistry 030A is designed as an **asynchronous, remote delivery course**. Prepare to devote **2-4 hours each day a lesson is given** to self-directed study and completion of assessments. With this format, success is improved by keeping up with the material on a daily basis and asking questions.

Each lesson date, you are expected to do the following:

- check your Keyano email.** This is how the College, and I, will get in touch with you. Always use your Keyano email to get in touch with me.
- check Moodle by logging into ilearn.keyano.ca.** Check the following areas each weekday: Calendar (daily lessons), Assessments (assignments and unit quizzes), and Announcements.
- complete the coursework, in the order in which it is covered.** You will need your textbook, the Student Course Package, and the electronic resources on Moodle.

Synchronous **ZOOM tutorials** will be provided on scheduled days to serve as a check-in place where you can virtually meet with me and your classmates to ask questions and discuss items from recent self-directed lessons. **Regular attendance** at ZOOM tutorials will help with staying motivated and feeling connected to your community of scholars ☺. Click **Link to ZOOM tutorials** when you're on Moodle.

ZOOM tutorials may also be used as presentation dates for assignments. On these dates, attendance is mandatory.

Electronic devices: please refer to pages 8 and 9 for detailed hardware and software requirements. For the best experience in ZOOM tutorials and one-on-one meetings, a **headset or earbuds with a microphone is recommended**.

You will also need to know how to create and upload electronic documents to Moodle (PDF or Word format), and be prepared to create and upload audio PowerPoints (MP4) and videos (MP4) for some assignments. *Students can download MS Office, for Windows or Mac, for free through Moodle.*

Late Work: your **assignments** and **lab data analyses** will receive

- the earned grade in full when received by the due date and time. ☺
- the earned grade, **minus 20%**, for **each** additional day late, during the 2-day marking period.
- a mark of **zero** if submitted after the 2-day marking period.

Laboratory Component: we will not be offering the hands-on laboratories as outlined in the Lab Manual. However, you will still be able to analyze data given to you in written format and through videos of laboratory procedures posted to Moodle.

****Please note:** there will be no alternative, "make-up", or "extra credit" assignments provided.**

Performance Requirements

Student Responsibilities

It is your responsibility as a student to contact the Office of the Registrar to complete the forms for Withdrawal or Change of Registration, and any other forms. Please refer to the list of important dates as noted in the Academic Schedule in the [Keyano College credit calendar](#). The Keyano College credit calendar also has information about Student Rights and Code of Conduct. It is the responsibility of each student to be aware of the guidelines outlined in the Student Rights and Code of Conduct Policies.

Student Attendance

Class attendance is useful for two reasons. First, class attendance maximizes a student's learning experience. Second, attending class is a good way to keep informed of matters relating to the administration of the course (e.g., the timing of assignments and exams). Ultimately, you are responsible for your own learning and performance in this course.

It is the responsibility of each student to be prepared for all classes. Students who miss classes are responsible for the material covered in those classes and for ensuring that they are prepared for the next class, including the completion of any assignments and notes that may be due.

Academic Misconduct

Students are considered to be responsible adults and should adhere to principles of intellectual integrity. Intellectual dishonesty may take many forms, such as:

- Plagiarism or the submission of another person's work as one's own;
- The use of unauthorized aids in assignments or examinations (cheating);
- Collusion or the unauthorized collaboration with others in preparing work;
- The deliberate misrepresentation of qualifications;
- The willful distortion of results or data;
- Substitution in an examination by another person;
- Handing in the same unchanged work as submitted for another assignment; and
- Breach of confidentiality.

The consequences for academic misconduct range from a verbal reprimand to expulsion from the College. More specific descriptions and details are found in the Student Rights and Code of Conduct section of the Keyano College credit calendar. It is the responsibility of each student to be aware of the guidelines outlined in the Student Rights and Code of Conduct Policies.

In order to ensure your understanding of the concept of plagiarism, [you must successfully complete the online tutorial found on ilearn.keyano.ca. Then print the certificate, sign it, and show it to each of your instructors.](#) Your course work may not be graded until you show this signed certificate.

Specialized Supports

The Student Services department is committed to Keyano students and their academic success. There are a variety of student supports available at Keyano College. Due to the continuing situation with the Covid-19 pandemic, the offered support services will be implemented differently this semester by being provided mostly virtually. In-person service can be requested as needed. All Alberta Health Services guidelines will be followed for in-person appointments—wear a mask, maintain two meters of physical distance, use hand sanitizer, and stay home if you are unwell.

All student services are available during Keyano business hours: Monday to Friday, 8h30-16h30. The Library has evening and weekend hours. Please check keyano.ca/library for current hours.

Accessibility Services: provides accommodations for students with disabilities. Students with documented disabilities, or who suspect a disability, can meet with a Learning Strategist to discuss

their current learning barriers and possible accommodations. Students who have accessed accommodations in the past are encouraged to contact us to request them for the semester. Please note that requesting accommodations is a process and requires time to arrange. Contact us as soon as you know you may require accommodations. For accessibility services supports and to book a virtual appointment, please contact accessibility.services@keyano.ca.

Accessibility Services also provides individual and group learning strategy instruction for all students, as well as technology training and supports to enhance learning. Meet with a Learning Strategist to learn studying and test-taking strategies for online classes. Schedule an appointment with the Assistive Technology Specialist to explore technology tools for learning. Book an appointment today by emailing accessibility.services@keyano.ca

Academic Success Coaching: offers you support and access to resources for your academic success to help you to find the Keys to your Success. The Academic Success Coach will work with you to develop an academic success plan, develop your study and time management skills, and connect you with the right resources here at Keyano. Academic.success@keyano.ca is the best way to access resources during virtual service delivery.

Wellness Services: offers a caring, inclusive, and respectful environment where students can access free group and individual support to meet academic and life challenges. Mental Health Coordinators offer a safe and confidential environment to seek help with personal concerns. All individual appointments will continue virtually.

Wellness Services welcomes students to participate in any of the virtual group sessions offered throughout the academic year addressing topics including mindfulness and test anxiety.

Individual virtual appointments can be made by emailing wellness.services@keyano.ca.

Library Services: provides students with research and information supports as they engage in their studies. Library staff are available to support you both virtually and in person during the fall semester. For library service supports and inquiries, please email askthelibrary@keyano.ca.

Individual support with the Information Librarian will be provided virtually. Appointments can be requested by email or by placing a [Book a Librarian](#) request using the online form found [here](#).

Research and Subject Guides are helpful resources when conducting research or addressing your information needs. To view a subject or course specific guide, use the following [Subject Guides link](#)

To access additional research resources, including Citation Guides (APA, MLA, Chicago, or IEEE), go to the [Research Help Library page](#).

Skill Centre: provides academic support services to students registered in credit programs at Keyano College in the form of tutoring, writing support groups, facilitated study groups, workshops and study space. Tutoring services are **free** to Keyano students. Tutoring is available for Math, Writing, English, and Science subject areas.

While most courses are being offered online, the Skill Center will be offering mostly virtual tutoring services and in-person sessions as requested. Please email Skill.centre@keyano.ca to get in contact with our tutoring staff.

For the most up to date information on how to book a tutoring session, please view the [Keyano Skill Centre homepage](#).

E-Learning

Technology and internet will impact your online learning experience. It's important that you are able to watch an online video and other course materials, take online quizzes, and participant in a live class with your instructor and other students.

Keyano College operates in a Windows based environment and having the correct tools for online learning is important. Here's a list of recommended system requirements for Fall 2020.

Internet Speed

Minimum Internet speeds of 5 Mbps.

Recommended Internet speeds of 25 Mbps (especially if you are sharing your internet at home).

Check your internet speed with Fast.com.

System requirements:

Microsoft Windows	Apple
<p>Minimum Requirements:</p> <ul style="list-style-type: none"> • A Windows 10 computer/laptop <ul style="list-style-type: none"> • Minimum 4GB of RAM. • 10GB+ available hard drive storage. • Enough available hard drive space to install the Microsoft Office suite (approximately 3GB). <u>Microsoft Office</u> software is free to all Keyano students and employees. • Microphone, webcam and speakers. A headset with a microphone is recommended. • System updates must be regularly installed. • Anti-Virus / Anti-Malware software 	<p>Minimum Requirements:</p> <ul style="list-style-type: none"> • A Macintosh (V10.14 and above) computer/laptop <ul style="list-style-type: none"> • Minimum 4GB of RAM. • 10GB+ available hard drive storage. • Enough available hard drive space to install the Microsoft Office suite (approximately 3GB). <u>Microsoft Office</u> software is free to all Keyano students and employees. • Microphone, webcam and speakers. A headset with a microphone is recommended. • System updates must be regularly installed. • Anti-Virus / Anti-Malware software.
<p>Recommended Requirements</p> <ul style="list-style-type: none"> • 8GB of RAM • A method of backing up/synchronizing to local or cloud-based storage such as OneDrive is highly recommended. This is included if you complete the setup of KeyanoMail and download MS Office using your Keyano email for free. 	<p>Recommended Requirements</p> <ul style="list-style-type: none"> • 8GB of RAM • A method of backing up/synchronizing to local or cloud-based storage such as OneDrive is highly recommended. This is included if you complete the setup of KeyanoMail and download MS Office using your Keyano email for free.
<p>Chromebooks are not recommended as they are not compatible with testing lockdown browsers.</p> <p>A Microsoft Surface or iPad or iPad Pro may be possible alternatives in some program areas.</p>	

Computer Software

Students will be able to get access to Microsoft Office 365 for Free using Keyano Credentials through Moodle; the link is <https://www.keyano.ca/en/student-services/software.aspx>

Recording of lectures and Intellectual Property

Students may only record a lecture if explicit permission is provided by the instructor or by Accessibility Services. Even if students have permission to record a lecture or lecture materials, students may not publish any of the lectures or lecture materials, this includes any recordings, slides, instructor notes, etc. on any platform. Thus no student is allowed to publish or sell instructor notes without formal written permission. It is important to recognize that the Canadian Copyright Act contains provisions for intellectual property.

ITS Helpdesk

If you are having issues with your student account, you can contact the ITS Helpdesk by emailing its.helpdesk@keyano.ca or calling 780-791-4965.