Course Outline

College & Career Preparation

Winter, 2023

CHEM 025A, Chemistry 025
6 credits, 6 hours lecture

Chemistry 025 begins with an introduction to elements and the Periodic Table, followed by atomic theory and periodicity, chemical bonding and types of compounds, chemical nomenclature, and chemical reactions. The remainder of the course focuses on calculations involving measurements in chemistry, the metric systems (SI), and scientific notation as applied to gases, solutions (including acids and bases), and stoichiometry.

Alberta Education Course Equivalency: Science 10 (Chemistry unit) and Chemistry 20
Co requisite: MATH 010C

Instructor

Patricia Collins
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Office Hours

Tuesday	12:00 p.m. – 1:50 p.m.
Thursday	10:00 a.m. – 11:50 a.m.
Friday	10:00 a.m. – 10:50 a.m.

Hours of Instruction

Monday	1:00 p.m. –	2:50 p.m.	Room S112
Wednesday	1:00 p.m. –	2:50 p.m.	Room S112
Thursday	1:00 p.m. –	2:50 p.m.	Room S112

Required Resources

- ***Chemistry 025 Student Manual***, available in print from the Keyano Bookstore
- **Calculator**, scientific or graphing
- **Pencil crayons**, or other colouring tools
- **Computer** (laptop or desktop)—see page 7 for details

Course Outcomes

Upon successful completion of this course, students will be able to:

- Recognize the main branches of Science and explain the scientific method
- List the five branches of Chemistry
- Describe the basic particles that make up the underlying structure of matter
- Explain the Atomic Theories leading to the modern structure of the atom (Dalton, Thomson, Rutherford and Bohr)
- Describe the three subatomic particles that make up the atom.
- Explain the division of elements in the periodic table
- Identify and characterize of elements in groups and periods
- Explain the chemical bonding and properties of compounds
- Classify and explain the structure of compounds.
- Write names and formulas for compounds
- Apply VSEPR theory to predict molecular shapes for molecules
- Explain the types of intermolecular forces
- Recognize the systematic chemical name of binary, ternary and higher compounds
- Recognize the difference between precision vs accuracy, types of errors and significant digits
- Employ the measurement system for unit conversion and density problems.
- Apply the mole concept for calculation of molar mass, moles of elementary units, and molar volume of gas
- Explain molecular behavior, using models of the gaseous state of matter.
- Investigate solutions, describing their physical and chemical properties
- Describe molar concentration, molar concentration of ions in solution, and dilutions
- Describe acidic and basic solutions qualitatively and quantitatively
- Explain how balanced chemical equations indicate the quantitative relationships between reactants and products involved in chemical changes.
- Use stoichiometry in quantitative analysis.

Evaluation

Quizzes and Assignments	30%
Projects and Lab	30%
Midterm Exam (Units 1 - 3)	20%
Final Exam (Units 4 - 6)	20%

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
	4.0	96 – 100
Excellent	4.0	90 – 95
	3.7	85 – 89
	3.3	81 – 84
Good	3.0	77 – 80
	2.7	73 – 76
	2.3	69 – 72
Satisfactory	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

Unit I—Matter and Atomic Structure
- Section A: Introduction to Chemistry
- Section B: Basic Concepts of Matter
- Section C: The Structure of the Atom
- Section D: Introduction to the Periodic Table

Unit II—Structure of Compounds
- Section A: The Structure of Compounds
- Section B: Writing Formulas for Ionic and Molecular Compounds
- Section C: Intermolecular Forces

Unit III—Chemical Nomenclature
- Section A: Valence and Oxidation Numbers
- Section B: Chemical Nomenclature

MIDTERM EXAM (Units I – III)

Unit IV—Calculations in Chemistry as applied to Gases
- Section A: Mathematics in Chemistry
- Section B: Measurements in Chemistry
- Section C: The Mole Concept
- Section D: Gas Laws

Unit V—Calculations in Chemistry as applied to Solutions
- Section A: Characteristics of Solutions
- Section B: Preparing Solutions
- Section C: Acids and Bases

Unit VI—Chemical Reactions and Stoichiometry
- Section A: Writing and Balancing Chemical Equations
- Section B: Stoichiometry

FINAL EXAM (Units IV – VI)

Calendar of Important Events: shaded areas indicate no Chemistry 025 lectures.

Week	Monday	Tuesday	Wednesday	Thursday	Friday
1	*Jan 2* *College Closed (in lieu of New Year's Day)*	*3*	*4*	*5* *First day of Chem 025!*	*6*
2	*9*	*10*	*11*	*12*	*13*
3	*16*	*17*	*18*	*19*	*20*
4	*23*	*24*	*25*	*26* **VSEPR Model Lab**	*27*
5	*30*	*31*	*Feb 1*	*2*	*3*
6	*6* **Chemical Show-and-Tell Presentations**	*7*	*8*	*9*	*10*
7	*13*	*14*	*15* **MIDTERM EXAM**	*16*	*17*
8	*20* *Family Day Holiday College Closed*	*21* *Reading Day— No Classes*	*22* *Reading Day— No Classes*	*23* *Reading Day— No Classes*	*24* *Reading Day— No Classes*
9	*27*	*28*	*Mar 1*	*2*	*3*
10	*6*	*7*	*8*	*9*	*10*
11	*13*	*14*	*15*	*16*	*17*
12	*20* **Kitchen Chemistry Demo Project Presentations**	*21*	*22*	*23*	*24*
13	*27*	*28*	*29*	*30*	*31*
14	*Apr 3*	*4*	*5*	*6*	*7* *Good Friday Holiday College Closed*
15	*10* *Easter Monday College Closed*	*11*	*12* *Last day of classes*	*13*	*14*
16	*17* *FINAL EXAMS*	*18* *FINAL EXAMS*	*19* *FINAL EXAMS*	*20* *FINAL EXAMS*	*21* *FINAL EXAMS*
17	*24* *FINAL EXAMS*	*25* *FINAL EXAMS*	*26* *FINAL EXAMS*	*27*	*28*

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 April 29, 2023 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 Specific Policies

1. **Attendance:** Chemistry 025 is designed as a ***face-to-face course***. Extended or frequent absences *for any reason* can impact your overall mark. Suggestions for handling occasional absences include:

   a. **finding a "classroom buddy"** whom you can contact for details regarding what you have missed.

   b. **using Moodle**: log into ilearn.keyano.ca to check the Calendar and see slide notes and pre-recorded audio PowerPoint lessons.

   c. **using OneNote:** this is the class notebook where I record daily lesson outlines and homework. Search your Keyano email during the first week of classes for an invitation from SharePoint, or use your Keyano credentials to log into onenote.com

   d. **using your Keyanomail** to get in touch with me. You will receive responses during office hours.

2. **Electronic devices:** some students find usage of tablets and laptops very helpful during lectures, so you are welcomed to bring these to class. Sounds on all devices should be turned off during class and if you need to take an important call, please leave the room to avoid disrupting others. *Please do not use electronic devices to record the class in any way (audio, video, photos, etc.).*

3. **Late Work:** for full marks, assigned work must be received in hard copy and in person, in class, on the due date. If you need extra time to get an assignment completed, it will receive

   a. the earned grade, minus 5%, if received after class on the due date.

   b. the earned grade, minus 20%, for each additional day late.

   c. a mark of zero if received after I have returned them, OR if pushed under my office door.

4. **Laboratory:** there is no laboratory component for Chemistry 025.

5. Other:

   a. Any work showing evidence of copying or plagiarism will receive a mark of zero. (see page 6)

   b. Chemistry 025 has in-class quizzes and Moodle quizzes (see Moodle Calendar). Moodle quizzes are completed online, in one attempt, during a limited timeframe—**see Moodle for quiz opening and closing dates**. *Extensions and "make-ups" will not be granted for any quizzes..*

   c. A missed exam may be written at an alternate time only under certain exceptional circumstances, ***at the instructor's discretion***. The instructor must be contacted within 24 hours of the scheduled exam, and documentation (e.g. a doctor's note) must be provided.

   d. The final exam will be written on the date scheduled by the College; otherwise, the procedure for "Deferred Final Examination" in the Credit Calendar is to be followed.

   e. There will be no alternative, "make-up", or "extra credit" assignments provided for this course.

Performance Requirements and Student Services

Student Responsibilities

As a student, it is your responsibility to contact the Office of the Registrar to complete the required forms, including the Withdraw Course or Program or a Change of Registration form. Please refer to the important dates listed in the Academic Schedule in the Keyano College credit calendar. The Keyano College credit calendar also has information about Student Rights and the Code of Conduct. It is the responsibility of each student to be aware of the guidelines outlined in the Student Rights and the Code of Conduct Policies.

Student Attendance

Class attendance is helpful for two reasons: First, class attendance maximizes a student's learning experience. Second, attending class is an excellent way to keep informed of matters relating to the course administration (e.g., the timing of assignments and exams). Ultimately, you are responsible for your learning and performance in this course. It is the responsibility of each student to be prepared for all classes. Absent students are responsible for the material covered in those classes, and students must ensure they are ready for their next class, including completing any missed assignments and notes.

Academic Misconduct

Students are considered responsible adults and should adhere to the principles of intellectual integrity. Intellectual dishonesty takes many forms:

- Plagiarism or the submission of another person's work as their 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,
- Submitting unchanged work 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. To ensure your understanding of plagiarism, you may be required to complete the online Understanding Plagiarism tutorial and submit the certificate of completion.

Online Learning

Technology and internet connectivity will impact your online learning experience. You may be required to watch online videos, take online quizzes, or participate in live online classes. Live/virtual courses will be hosted in Microsoft Teams or Zoom. For all course delivery types, you will access your course resources on Keyano's learning management system: Moodle (iLearn). Login in using your Keyano username and password. Keyano College operates in a Windows-based environment and having access to the correct tools for online learning is essential.

Internet Speed

Minimum download and upload speeds of 10 Mbps. Recommended download speeds of 25 Mbps and upload speeds of 10 Mbps (if you are sharing your internet at home). You can check your internet speed with Speedtest by Ookla.

Computer System Requirements

Keyano College software are Windows based.

Minimum Requirements and Recommended Upgrades for Windows (preferred system) and Apple devices These minimum standards are required for a Windows computer/laptop (OS 10 or 11) and a MacIntosh (OS 10.14 or above.
1. Windows 10 Operating System or above 2. 4GB of RAM. Recommended upgrade to 8GB of RAM. 3. 10GB+ available hard drive storage space. Note installing Microsoft Office 365 requires 3GB of available hard drive space. a. Install the Microsoft Office 365 suite (~3GB) ***** 4. Microphone, webcam, and speakers (All modern laptops have these three accessories built-in. However, a headset or earbuds with a microphone is also recommended. 5. Windows has built-in anti-virus/malware software. It is essential to install system updates to keep your device secured regularly. *****Microsoft Office 365 is free to Keyano students.
Tablets, iPads, and Chromebooks are **not** recommended: they may not be compatible with the testing lockdown browsers and Microsoft Office 365.

Computer Software

Students have access to Microsoft Office 365 and Read & Write for free using Keyano credentials.

See Recommended Technology for more information.

Recording of Lectures and Intellectual Property

Students may only record a lecture if explicit permission is provided by the instructor or Accessibility Services. Even if students have permission to record a lecture or lecture materials, students may not share, distribute, or publish any of the lectures or course materials; this includes any recordings, slides, instructor notes, etc., on any platform. Thus, no student is allowed to share, distribute, publish or sell course-related content without permission. It is important to recognize that the Canadian Copyright Act contains provisions for intellectual property. The Academic Integrity Policy provides additional information on Keyano College's expectations from students as members of the intellectual community.

ITS Helpdesk

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

Specialized Supports

The Student Services Department is committed to Keyano students and their academic success. There is a variety of student support available at Keyano. All student services are available during Keyano business hours: Monday to Friday, 8:30 a.m. to 4:30 p.m. The College is closed on statutory holidays. If you require support outside of regular business hours, please inform the support service team, and they will do their best to accommodate your needs.

Accessibility Services provides accommodations for students living with disabilities. Students with documented disabilities or who suspect a disability can meet with an Access Strategist to discuss their current learning barriers and possible accommodations. Students who have accessed accommodations in the past are encouraged to contact the department to request accommodations for the following semester. Please note that requesting accommodations is a process and requires time to arrange. Contact the department as soon as you know you may require accommodations. For accessibility supports and disability-based funding, please book an appointment by emailing us at: accessibility.services@keyano.ca.

Accessibility Services also provides individual and group learning strategy instruction for all students and technology training and support to enhance learning. You can meet with an Access Strategist to learn studying and test-taking strategies. In addition, you can schedule an appointment with the Assistive Technology Specialist to explore technology tools for learning. Book an appointment today by emailing: accessibility.services@keyano.ca

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 provide a safe and confidential environment for you to seek help with personal concerns. Our Wellness Navigator offers support with basic needs such as housing, financial and nutritional support, and outside referrals when needed. Wellness Services welcomes students to participate in group sessions that address topics including mindfulness and test anxiety throughout the academic year. Individual appointments can be made by emailing wellness.services@keyano.ca.

Library Services provides students with research, information, and educational technology supports as they engage in their studies. Library staff are available to help you online and in person throughout the semester. Librarians offer individual and small group consultations booked using the online Book A Librarian calendar. The library also provides virtual research and subject guides to help you with your studies. Find the guide that supports your course-related research by viewing the complete list of online Subject Guides. To start your research and access citation guides (APA, MLA, Chicago, or IEEE), visit the Research Help page. The library's collections (including print and online materials) are searchable using OneSearch. The library offers a Loanable Technology collection to support students accessing and using technology. For an up-to-date list of technology available for borrowing, visit the library's Loanable Technology webpage. For a detailed list of library resources and services, go to www.keyano.ca/library. For all inquiries, please email askthelibrary@keyano.ca or chat with us online.

The **Academic Success Centre** at Keyano College (CC-119) provides **free** academic support services to registered students, such as tutoring, writing support, facilitated study groups, workshops, and study space. Academic Content Specialists are available in Mathematics, Science, Trades, Power Engineering, Upgrading/College Prep, Human Services, English, Humanities, and more. Students are encouraged to visit the Academic Success Centre to discuss study strategies and academic concerns. For additional information, please email Academic.Success@keyano.ca.

The **Academic Success Coach** is located in the Academic Success Centre and works with students to develop academic success plans, time management skills, study strategies, and homework plans. For additional information, please email Academic.Success@keyano.ca.