

SCIE 010A, Science 010*5 credits, 6 hours lecture*

This is a grade 10 equivalency science course that reviews basic concepts of math (for sciences) that are essential at the 025 level and covers concepts in chemistry, biology, physics and other sciences. It is designed to prepare students for entry into Biology 025, Chemistry 025, and Physics 025. The four units of study are: Energy and Matter in Chemical Change (Chemistry), Energy flow in Technological Systems (Physics), Cycling of Matter in Living Systems (Biology), and Energy Flow in Global Systems (Earth Science & Ecology).

Alberta Education Course Equivalency: Science 10

Prerequisite: Grade 9 program of studies or equivalent

Co-requisite: Math 10C or equivalent or permission from the program chair

Instructor

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Office Hours

Mondays	1:00 – 1:50 PM
Tuesdays	11:00 – 11:50 AM
Wednesdays	2:00 – 2:50 PM
Thursdays	11:00 – 11:50 AM & 3:00 – 3:50 PM

Hours of Instruction

Tuesday Lectures	3:00 - 4:50 PM	Room S207
Wednesday Lectures	11:00 - 12:50 AM	Room S207
Thursday Lectures	8:00 – 9:50 AM	Room S207

Required Supplies

Textbook: **Science Focus 10**, Gue et al., (2004) ISBN 0070890862

Basic Scientific Calculator – does not need to be a TI-83 or better.

* If you are a **new user**, please purchase a Texas Instrument calculator (TI – 30Xa). This is what I use and therefore I can help you use it correctly quickly. It is inexpensive and broadly available in stores.

Course Outcomes

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

- Understand the nature of scientific inquiry
- Recognize the main branches of science
- Describe the basic particles that make up the underlying structure of matter
- Recognize the development of atomic theories
- Describe the three subatomic particles which make up the atom.
- Explain the division of elements in the periodic table
- Identify and characterize of elements in groups and periods
- Explain the properties of ionic compounds and molecular substances
- Writing formulas for compounds
- Recognize the systematic chemical name of binary, ternary and higher compounds
- Describe acids and bases qualitatively
- Write balanced chemical equations
- Write numbers correctly according to sig. dig. Rules
- Recognize and classify the different types of chemical reactions
- Describe the Mole and Avogadro's Number
- Perform simple conversions between moles and mass as well as moles and particles
- Describe what is meant by thermal energy and work
- Find work through calculation and graphical means
- Draw graphs correctly in a variety of problems
- Describe the difference between distance, displacement, speed, velocity, and acceleration
- Compare two speeds graphically
- Compare and contrast velocity and acceleration
- Differentiate between potential and kinetic energy
- Describe and identify energy conversions and their efficiency
- Differentiate between animal and plant cells
- Describe cell theory and identify major contributors to cell theory
- Identify and describe functions of cell organelles
- Describe different biomes of the world
- Identify the different parts of the earth's structure and atmosphere
- Explain the difference between climate and weather and how seasons arise
- Discuss global warming in terms of changing weather patterns

Evaluation

Projects/Assignments	20 %
Quizzes	20 %
Midterm Exam (Chemistry / Physics - Part 1)	30 %
<u>Final Exam (Physics Part 2 / Biology)</u>	<u>30 %</u>
TOTAL	100 %

The minimum pre-requisite for progression is 1.7 (refer to Grading System below)

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
Poor	1.3	55 – 59
Minimum Pass	1.0	50 – 54
Failure	0.0	0 – 49

Proposed Schedule of Topics

Unit 1 – Energy and Matter in Chemical Change (CHEMISTRY)

- Introduction to chemistry, scientific method and branches of chemistry
- Basic concepts of chemistry: laws, physical states of matter, classification
- Properties of pure substances, elements and compounds
- Changes of pure substances
- Atomic theory and structure of the atom
- Electron dot diagrams
- Periodic table and trends in the table
- Writing chemical formulas for molecular and ionic compounds
- Chemical names for molecular and ionic compounds
- Properties of Acids and Bases
- Chemical equations: terms, symbols
- Balancing chemical equations
- Classifying and completing reactions

Unit 2– Energy Flow in Technological Systems (PHYSICS)

- Math review: significant digits, scientific notation, rearranging formulas
- Thermal Energy and work
- Calculating work and graphing examples of work
- Graphing
- Scalars vs. vectors
- Speed, velocity, distance, displacement, acceleration
- Kinetic and potential energy
- Energy conversions
- Efficiency between energy conversions

Unit 3 Cycling of Matter in Living Systems (BIOLOGY)

- Introduction to biology and ecology
- Cell theory & founding theorists
- Cells and functions of organelles
- Plant vs. animal cells
- Cell Membrane
- Plants

Unit 4 Energy Flow in Global Systems (BIOLOGY)

- Solar Energy
- Thermal Energy Transfer
- Seasons
- Biomes of the world
- Construction of climatographs
- Climate vs. weather
- Global warming
- Climate change
- Societal impacts of changing weather

Calendar of Important Events

Dates on the following calendar are tentative; shaded areas indicate no Science 10A classes.

Week	Monday	Tuesday	Wednesday	Thursday	Friday
1	Sept 3 Labour Day Holiday	4 Welcome Day	5 Introduction <i>First day of classes</i>	6 Safety, Matter, Theories	7
2	10	11 Atomic Structure/PTOE	12 Electron Dot/Bohr Diagrams Atom Project	13 Names, Formulas/Properties	14
3	17	18 Names, Formulas/Properties	19 Names, Formulas/Properties	20 Names, Formulas/Properties	21
4	24	25 Acids/Bases	26 Acids/Bases/Water	27 Chemical Reactions	28
5	Oct 1	2 Chemical Reactions	3 Chemical Reactions	4 Mole Concept Atom Project Due	5
6	8 Thanksgiving Day Holiday	9 Math Review	10 Math Review	11 Thermal Energy /Work	12
7	15	16 Thermal Energy / Work	17 Energy of Motion <i>Gravitational Potential Energy</i>	18 Midterm Review	19
8	22	23 MIDTERM EXAM	24 Energy of Motion <i>Kinetic Energy</i>	25 Energy in Motion Velocity	26
9	29	30 Energy in Motion Velocity	31 Energy in Motion Velocity	Nov 1 Energy in Motion Velocity / Acceleration	2
10	5	6 Energy in Motion Acceleration	7 Energy in Motion Acceleration	8 READING DAY	9 READING DAY
11	12 Remembrance Day Holiday (in lieu)	13 Energy in Motion Acceleration	14 Biology Introduction	15 Biomes Project	16
12	19	20 Cell Structures	21 Cell Structures	22 Biosphere / Climate	23
13	26	27 Biosphere / Climate	28 Climate Change	29 Climate Change	30
14	Dec 3	4 An Inconvenient Truth (Documentary)	5 Biome presentations	6 Final Review <i>Last day of classes</i>	7
15	10 EXAMS	11 EXAMS	12 EXAMS	13 EXAMS	14 EXAMS
16	17 EXAMS	18 EXAMS			

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

***Final exam dates are scheduled by the College.**

Do not book travel before December 19th, 2018.

Course Specific Policies

1. **Attendance Policy:** Science 010 Section A is designed as a **face-to-face course**, so success is improved by being on time and regularly attending. Extended or frequent absences *for any reason cannot* be accommodated and can impact your overall mark. Some suggestions for handling occasional lecture absences include:
 - a. checking the Calendar of Events, News Forum and slide notes by logging into ilearn.keyano.ca
 - b. finding a “classroom buddy” whom you can contact for details regarding what you have missed.
 - c. check your Keyano email frequently, as notices posted to the ilearn forum automatically go there.
2. **Electronic devices policy:**
 - a. Texting and personal web browsing in **NOT** permitted during class time.
 - b. Some students find usage of tablets and laptops to follow slides very helpful during lectures, so you are welcomed to bring these to class **for instructional purposes only**.
 - c. Sounds on all cell phones should be turned off during class and if you need to take an important call please leave the room to avoid disrupting others. **Please note that using electronic devices to record the class in any way (audio, video, photos, etc.) is not permitted.**
3. **Late Work Policy:** assigned work must be received in hard copy and in person. It will receive
 - a. full marks when received in person on the due date.
 - b. the earned grade, minus 10%, for each day late.
 - c. a mark of zero if received after I have returned the assignment. I do not accept work pushed under my office door.
 - d. No late work will be accepted for “Completion Checks”.
4. **Other Course Policies and Procedures:**
 - a. **work submitted by non-attending students may not be marked.**
 - b. Any work showing evidence of copying or plagiarism will receive a mark of zero. (see “Student Rights and Responsibilities” in the Credit Calendar).
 - c. in-class quizzes cannot usually be rewritten, as these are meant to give you immediate feedback on your progress. A missed quiz can be omitted for *documented* medical reasons only.
 - d. 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) provided.
 - e. 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.

Should you have trouble logging into ilearn.keyano.ca, please contact Keyano College Information and Technology Services (its.helpdesk@keyano.ca or 780-791-4965).

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.

More specific details are found in the Student Rights and Student 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 Student 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 / or 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
- 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 Student 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 Student 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 will not be graded until you show this signed certificate.

Specialized Supports

The Student Academic Support Services (SASS) department: Accessibility Services, Skill Centre and Wellness Services, work together to support student success at Keyano College.

Accessibility Services (CC167) supports student success through group and individualized instruction of learning, study and test taking strategies, and adaptive technologies. Students with documented disabilities, or who suspect a disability, can meet with the Learning Strategists to discuss accommodation of the learning barriers that they may be experiencing. Students who have accessed accommodations in the past are encouraged to visit our office at their earliest opportunity to discuss the availability of accommodations in their current courses. Individual appointments can be made by calling 780-791-8934

Skill Centre (CC119) provides a learning space where students can gather to share ideas, collaborate on projects and get new perspectives on learning from our tutorial staff. Students visiting the centre have access to one-to-one or group tutoring, facilitated study groups, and assistance in academic writing. The Skill Centre's Peer Tutor program provides paid employment opportunities for students who have demonstrated academic success and want to share what they have learned. Tutoring is available free to any students registered at Keyano College on a drop in basis, from 9:00 am to 5:00 pm Monday through Friday. Additional evening hours are subject to tutor availability and are posted in the Skill Centre.

Wellness Services (CC260) 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. The Mindfulness Room in CC260 is available as a quiet space for students to relax during regular office hours. Wellness Service welcomes students to participate in any of the group sessions offered throughout the academic year addressing such topics as Mindfulness and Text Anxiety. Individual appointments can be made by calling 780-791-8934.

Please watch your Keyano email for workshop announcements from our Student Academic Support Services team.