

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

This course is a grade 10 equivalency general science course designed to prepare students for entry into Biology 025, Chemistry 025, Physics 025, or Science 30. It is especially recommended for those who have been away from high school science for 3 or more years. The course reviews basic concepts of math and science which are essential for success in further science studies, including the metric system and the scientific method, while fostering a positive attitude toward the study of science and math.

Prerequisites/Co-requisites: Grade 9 program of studies or equiv. or AFL 009 & AFM 009

Instructor

Linda Milette
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Office Hours

Mondays 9:00 – 9:50 AM
Tuesdays 3:00 – 3:50 PM
Wednesdays 9:00 – 9:50 AM & 12:00 – 12:50 PM
Thursdays 3:00 – 3:50 AM

Hours of Instruction

Monday Lectures	10:00 - 11:50 AM	Room S207
Wednesday Lectures	10:00 - 11:50 AM	Room S207
Friday Lectures	11:00 –11:50 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

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 %
Final Exam (Physics Part 2 / Biology)	30 %
TOTAL	100 %

* as per the Classroom Policies and Procedures posted on the Moodle Course page: late assignments/projects will receive a grade deduction or a zero grade if submitted after assignments are returned to the class. Quizzes cannot be written at a later date.

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	September 4 <i>Labour Day - College Closed</i>	5 Orientation Day	6 Introduction <i>First day of Science Class</i>	7	8 Atomic Structure /Periodic Table
2	11 Atomic Structure /Periodic Table	12	13 Electron Dot/Bohr Diagrams	14	15 Names, Formulas, Properties
3	18 Names, Formulas, Properties	19	20 Names, Formulas, Properties	21	22 Acids/Bases
4	25 Acid/Bases/Water	26	27 Chemical Reactions	28	29 Chemical Reactions
5	October 2 Chemical Reactions <i>*Atom Projects Due</i>	3	4 Mole Concept	5	6 Math Review
6	9 <i>Thanksgiving Day - College Closed</i>	10	11 Math Review	12	13 Thermal Energy/ Work
7	16 Thermal Energy / Work	17	18 Energy of Motion Kinetic Energy	19	20 Energy of Motion Gravitational Potential Energy
8	23 MIDTERM EXAM	24	25 Energy in Motion - Velocity	26	27 Energy in Motion - Velocity
9	30 Energy in Motion - Velocity	31	November 1 Energy in Motion - Velocity	2	3 Energy in Motion - Acceleration
10	6 Energy in Motion - Acceleration	7	8 Energy in Motion - Acceleration	9 <i>Reading Day - No Classes</i>	10 <i>Reading Day - No Classes</i>
11	13 <i>Remembrance Day (in lieu of) - College Closed</i>	14	15 Biology Intro	16	17 Cell Structures
12	20 Cell Structures	21	22 Biomes	23	24 Biosphere/climate
13	27 Biosphere / climate	28	29 Climate Change	30	December 1 Climate Change/
14	4 <i>An Inconvenient Truth</i>	5	6 <i>*Biome Presentations</i>	7 Last Day of Classes	8
15	11 Final Exams	12 Final Exams	13 Final Exams	14 Final Exams	15 Final 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 16th, 2017.

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.

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.

Laboratory Safety

In the science laboratories, safety is important.

Students must complete the *WHMIS for Students* online training course on Moodle before entering the science laboratories.

Students must comply with the mandatory laboratory safety rules for this course as provided in the laboratory manual. Failure to do so will result in progressive discipline such as a verbal warning, refused entry into the laboratory, or suspension from the College.

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

Counselling and Accessibility Services

Counselling Services provides a wide range of specialized counselling services to prospective and registered students, including personal, career and academic counselling.

SKILL Centre

The SKILL Centre is a learning space in the Clearwater Campus at Keyano College where students can gather to share ideas, collaborate on projects and get new perspectives on learning from our tutorial staff.

The SKILL Centre, through a variety of delivery methods, provides assistance in skill development to Keyano students. Assistance is provided by instructors, staff and student tutors. Individuals wishing to improve their mathematics, writing, grammar, study, or other skills, can take advantage of this unique service.

Authorization

This course outline has been reviewed and approved by the Program Chair.

Linda Milette, Instructor

Lisa Turner, Chair

Date Authorized

Vincella Thompson, Dean

Date Authorized

Signed copies to be delivered to:

Instructor
Registrar's Office