

**LIBST 1102 – Controversies in Science**

*3 credits, 3 hours lecture*

**Course description:**

This course provides an introduction to scientific knowledge, its role in society, and the relationship between scientific inquiry and mathematics. Students will learn about the scientific method, the role of mathematics and statistics as reasoning tools, and how to research, evaluate, and write about science. Science controversies will be used as case studies with an emphasis on developing critical thinking skills.

*Prerequisite/Co-requisite – entrance into Environmental Science program.*

**Instructor**

Dr. Danna Schock

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**Office Hours**

Monday – Friday            1:00 – 1:50 pm    S209c

Or by appointment

**Hours of Instruction**Lecture

Monday            3:00 – 4:20 pm            Room CC267

Wednesday      3:00 – 4:20 pm            Room S110

**Required Resources**

1. Moodle (<http://ilearn.keyano.ca>). The course outline, lecture notes, required readings and other resources will be made available on Moodle. It is your responsibility to check Moodle frequently and stay informed about resources posted there.

2. Keyano College email address. I will not correspond with students using their personal email addresses. Check your Keyano email DAILY.

3. You are not required to purchase a textbook or course pack for this class. Readings will come from a variety of sources including the primary literature, grey literature, websites and books.

### Course Outcomes

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

- 1) Explain how scientific knowledge is developed and the role of science in society by:
  - a) Studying the development of a scientific theory – how a theory originates and evolves;
  - b) Considering the social, economic, and political impacts of developments in science and technology;
  - c) Understanding the roles and responsibilities of scientists;
  - d) Recognizing that not all problems have scientific or technological solutions.
  
- 2) Explain the scientific process, including the ability to:
  - a) Explain how inductive and deductive reasoning are used, including examples;
  - b) Differentiate between qualitative and quantitative data;
  - c) Demonstrate the importance of reproducibility through the use of examples;
  - d) Demonstrate that correlation is not causation through the use of examples;
  - e) Distinguish between genuine scientific argument and statements that are not supported by scientific evidence;
  - f) Recognize biases in arguments.
  
- 3) Apply mathematics and statistics as reasoning tools, including:
  - a) Evaluating how statistics are used to present and interpret data, including misrepresentation;
  - b) Identifying ways in which surveys can yield unreliable conclusions;
  - c) Explaining what probabilistic statements mean;
  - d) Demonstrating the importance of time scales, orders of magnitude, and rates of change in comparison to human frames of reference.
  
- 4) Research, evaluate, and write about science, including the ability to:
  - a) Use information literacy skills to find relevant sources;
  - b) Analyze scientific articles from various points of view;
  - c) Apply the scientific knowledge and statistical skills acquired in the course;
  - d) Use effective oral and written skills to communicate essential information about a reading or topic.

### Evaluation

Assignment	Percentage	Due Date
Midterm	15%	Monday 1 Oct
Case Study 1 assignment	10%	Friday 5 Oct @ 4 pm
Case Study 2 assignment	15%	Will be discussed in class
Case Study 3 assignment	10%	Friday 16 Nov @ 4 pm
Case Study 4 assignment	15%	Will be discussed in class
Final Exam (cumulative)	35%	Set by Registrar

*A grade of C- is required for progression or transfer.*

**Grading System**

<b>Descriptor</b>	<b>Alpha Grade</b>	<b>4.0 Scale</b>	<b>Percent</b>	<b>Rubric for Letter Grades</b>
Excellent	A+	4.0	> 92.9	Work shows in-depth and critical analysis, well developed ideas, creativity, excellent writing, clarity and proper format.
	A	4.0	85 – 92.9	
	A-	3.7	80 – 84.9	
Good	B+	3.3	77 – 79.9	Work is generally of high quality, well developed, well written, has clarity, and uses proper format.
	B	3.0	74 – 76.9	
	B-	2.7	70 – 73.9	
Satisfactory <b>Progression</b>	C+	2.3	67 – 69.9	Work has some developed ideas but needs more attention to clarity, style and formatting.
	C	2.0	64 – 66.9	
	C-	1.7	60 – 63.9	
Poor <b>Minimum Pass</b>	D+	1.3	55 – 59.9	Work is completed in a general way with minimal support, or is poorly written or did not use proper format.
	D	1.0	50 – 54.9	
Failure	F	0.0	< 50	Responses fail to demonstrate appropriate understanding or are fundamentally incomplete.

**Please Note:**

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 and Mount Royal University Credit Calendars.

**Schedule of Topics**

DATE	ACTIVITY
	<b>First Day of Classes Wed 5 Sept, last day of classes Thur 6 Dec</b>
Week of 3 Sept	Course orientation, clarification of expectations
Week of 10 Sept	The process of science
Week of 17 Sept	Review of mathematical and statistical concepts and tools
Week of 24 Sept	<b>Case Study 1</b> – Genetically Modified Organisms (GMO's): Introduction to topic including key aspects that create controversy, Case Study 1 readings
Week of 1 Oct	<b>Case Study 1</b> – GMO's cont: examination of primary literature, social media and non-government organization sources for content, intentions, biases, consideration of conflicts of interest, and ramifications.
Week of 8 Oct	<b>Case Study 2</b> – Class's choice of topic Student lead introduction to topic including key aspects that create controversy. Case Study 2 readings and assignment, student-led discussions + papers.
Week of 15 Oct	<b>Case Study 2</b> – Class's choice of topic cont Student lead examination of primary literature, social media and non-government organization sources for content, intentions, biases, consideration of conflicts of interest, and ramifications.
Week of 22 Oct	<b>Case Study 2</b> – Class's choice of topic cont Student lead examination of primary literature, social media and non-government organization sources for content, intentions, biases, consideration of conflicts of interest, and ramifications.
Week of 29 Oct	<b>Case Study 3</b> –Traditional Ecological Knowledge and Western Science Introduction to topic including key aspects that create controversy, Case Study 3 readings and research assignment
Week of 5 Nov	<b>Case Study 3</b> – Examination of primary literature, social media and non-government organization sources for content, intentions, biases, consideration of conflicts of interest, and ramifications.
Week of 12 Nov	<b>Case Study 3</b> – Guest lecture, examination of sources of information cont.
Week of 19 Nov	<b>Case Study 4</b> – Class's choice of topic Student lead introduction to topic including key aspects that create controversy. Case Study 4 readings and assignment, student-led discussions + papers.
Week of 26 Nov	<b>Case Study 4</b> – Class's choice of topic cont Student lead examination of primary literature, social media and non-government organization sources for content, intentions, biases, consideration of conflicts of interest, and ramifications.
Week of 4 Dec	<b>Case Study 4</b> – Class's choice of topic cont Student lead examination of primary literature, social media and non-government organization sources for content, intentions, biases, consideration of conflicts of interest, and ramifications.

**Please Note:**

Date and time allotted to each topic is subject to change.

## 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.

### Student Attendance

Attendance will be taken in accord with department policy.

This will be accomplished by **sign-in sheets** distributed at the beginning of class/lab. Each student must enter their own information on the sign-in sheet. Failure to record your information on the sign-in sheets will be recorded as an absence.

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.

PowerPoint presentations that get posted to Moodle should be thought of as study guides; you must take additional notes in class to do well.

### 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.

### Exams and Assignments

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

It is YOUR responsibility to make sure you know when assignments are due, and when exams take place. Major exam dates are listed in this course outline. Assignments will be announced in class/lab.

You will have at least 1 week to complete assignments.

Late assignments will be penalized 20% per day late, including weekends and holidays, and will not be accepted if more than 5 days late.

Material presented by guest lecturers and material presented during student presentations will be included on exams.

Students who arrive more than 15 minutes late on presentation days will not be allowed to present and will receive a grade of zero on their presentations. Be on time.

The final exam will be cumulative.

Travel plans are NOT valid excuses for missing a final exam. Do not make plans to travel during the final lecture exam period. Exams missed under these circumstances will not be accommodated and therefore completion of the course is not possible.

For information on Deferred Exams, Supplemental Exams and other general College-wide policies pertaining to exams, students should consult: <http://www.keyano.ca/Academics/Examinations>

### **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](http://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.**