

**LIBST 1102: Controversies in Science**

*3 credits, 3 hours lecture per week*

*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 BSc program.*

**Instructor**

Dr. Blaine Legaree

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**Office Hours**

Mon/Wed/Fridays	3:00–4:00 pm
Tues/Thursdays	9:30–10:30 am

**Hours of Instruction**

Wed/Fridays	10:30 – 11:50 am	Rm S110
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**Required Resources**

There is no required textbook for this course. Readings will come from a variety of sources including the primary literature, grey literature, websites and books. Required readings, notes, the course outline and other resources will be made available on **Moodle** (<http://learn.keyano.ca>).

### University Wide Learning Outcomes

Through all learning experiences, and continuing at successively higher levels across their university studies, Mount Royal University aims to provide students with the following:

- **Intellectual and practical skills** practiced extensively, across the curriculum, in the context of progressively more challenging problems, projects, and standards for performance
- **Integrative and applied learning** demonstrated through the application of knowledge, skills and responsibilities to new settings and complex problems
- **Knowledge of human cultures and the physical, natural and technological world** focused by engagement with relevant questions
- **Personal and social responsibility** anchored through active involvement with diverse communities and real-world challenges

### Course Outcomes

Upon successful completion of this course, the student 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

Case Study Assignments	50%	Will be detailed in class
Midterm	15%	Tues, Oct 8
Final Examination	35%	<i>Details TBD</i>

*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	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.
<b>Minimum Pass</b>	D	1.0	50 – 54.9	
Failure	F	0.0	< 50	Responses fail to demonstrate appropriate understanding or are fundamentally incomplete.

**Schedule of Topics**

1. The Process of Science
2. Review of Mathematical and Statistical Concepts and Tools
3. <b>Case Study 1</b> – COVID-19
4. <b>Case Study 2</b> – Genetically Modified Organisms (GMOs)
5. <b>Case Study 3</b> – Topic TBD
6. <b>Case Study 4</b> – Topic TBD

## 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 / 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 Plagiarism Certificate at [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 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](http://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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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><b>Minimum Requirements:</b></p> <p>A Windows 10 <b>computer/laptop</b></p> <ul style="list-style-type: none"> <li>• Minimum 4GB of RAM.</li> <li>• 10GB+ available hard drive storage.</li> <li>• Enough available hard drive space to install the Microsoft Office suite (approximately 3GB). <a href="#">Microsoft Office</a> software is free to all Keyano students and employees.</li> <li>• Microphone, webcam and speakers. A headset with a microphone is recommended.</li> <li>• System updates must be regularly installed.</li> <li>• Anti-Virus / Anti-Malware software</li> </ul>	<p><b>Minimum Requirements:</b></p> <p>A Macintosh (V10.14 and above) <b>computer/laptop</b></p> <ul style="list-style-type: none"> <li>• Minimum 4GB of RAM.</li> <li>• 10GB+ available hard drive storage.</li> <li>• Enough available hard drive space to install the Microsoft Office suite (approximately 3GB). <a href="#">Microsoft Office</a> software is free to all Keyano students and employees.</li> <li>• Microphone, webcam and speakers. A headset with a microphone is recommended.</li> <li>• System updates must be regularly installed.</li> <li>• Anti-Virus / Anti-Malware software</li> </ul>
<p><b>Recommended Requirements</b></p> <ul style="list-style-type: none"> <li>• 8GB of RAM</li> <li>• 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.</li> </ul>	<p><b>Recommended Requirements</b></p> <ul style="list-style-type: none"> <li>• 8GB of RAM</li> <li>• 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.</li> </ul>
<p>Chromebooks are <b>not</b> recommended as they are not compatible with testing lockdown browsers. A Microsoft Surface or iPad or iPad Pro may be possible alternatives in some program areas.</p>	

### Specific department requirements:

Business and OA programs require Windows 10. Other programs may utilize Windows based tools as well.

**Computer Software**

Students can access to Microsoft Office 365 for Free using Keyano Credentials by [clicking here](#).

**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](mailto:its.helpdesk@keyano.ca) or calling 780-791-4965.

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