ALES 391

CRITICAL THINKING AND ADVANCED COMMUNICATION IN SCIENCE

In Winter 2025, ALES 391, Critical Thinking and Advanced Communication in Science, is being offered at Yukon University as part of the Northern Environmental and Conservation Sciences, B.Sc. Program. All students registered in ALES 391 must adhere to the requirements outlined in this course syllabus. University of Alberta students must also be aware of, and adhere to, the University's Code of Student Behaviour, referenced in the outline.

INSTRUCTOR: Kathryn Aitken, Ph.D.

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and

Adjunct Professor, Dept. of Renewable Resources, U of Alberta

OFFICE HOURS: Tuesdays, 1:30 – 2:30 pm (or by appointment)

OFFICE LOCATION: A2509

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CLASS DAYS & TIMES: Tuesdays, 10:30-11:50 am

CLASS LOCATION: A2605

COURSE DESCRIPTION

This course will focus on the skills necessary to successfully generate, communicate, and

evaluate scientific information. Students will learn about various approaches to scientific inquiry, how to develop scientific questions and explanations, and practice reading and thinking critically about science. Developing competency in scientific writing will form a large component of the course. Students will learn the importance and purpose of scientific writing, compare and critique journals in their field of study, organize ideas in a structured way to prepare for writing, critically review and edit articles and manuscripts, and understand what is needed to prepare a well-written journal article, report, or thesis.

COURSE REQUIREMENTS

Registration in Yukon University/University of Alberta B.Sc. in Environmental and Conservation Sciences degree program.

LEARNING OUTCOMES

Upon successful completion of this course students will:

- Be able to construct clear, convincing scientific arguments and questions, and critically evaluate published scientific literature.
- Understand the approaches to scientific inquiry, including inductive versus deductive reasoning, the scientific method, and hypothesis testing.
- Understand the fundamentals of writing a scientific paper, including appropriate grammar, word choice, and style.
- Critically compare key journals in their area of research or employment
- Review, edit and improve the fluency of scientific reports and articles

COURSE FORMAT

Delivery format

The course consists of one 1.5-hour in-person class per week, and approximately 1.5 hours of additional reading, activities, and material on the class site online. While only 1.5 hours per week are spent in in-person lectures, students should expect to put in work equivalent to a regular 3-hour per week lecture-based course.

Most of the course material will be delivered during the first half of the course; the second half of the course is focused primarily on writing and peer review.

EVALUATION

The course grade will be determined as follows:

	Percent
Exercises	20%
Introduction draft (due Mar. 4)	15%
Proposal draft (due Mar. 18)	20%
Abstract draft (due Apr. 1)	5%
Final research proposal (due Apr. 15)	25%
Peer reviews (3)	15%
Total	100%

Assignments

WRITING PROJECT

Over the course of the term, students will produce a research proposal (or, on approval, a research paper or literature review). This project will be completed in several stages, together worth 65% of the total course grade (see below for breakdown of components and percentages). The stages include:

1. Introduction to the paper. 15% of course grade. Due Mar. 4.
2. Draft of full paper. 20% of course grade. Due Mar. 18.
3. Draft abstract. 5% of course grade. Due Apr. 1.
4. Final revised version of paper, including a cover letter detailing their responses to the reviewers' comments on their draft. 25% of course grade. Due Apr. 15.

PEER REVIEW (15% total)

Students will perform reviews of three pieces of their fellow students' writing (draft introduction, draft abstract, draft full paper). Together, these reviews will be worth 15% of the course grade.

SHORT EXERCISES (20% total)

Students will submit short exercises that focus on synthesizing, applying, and refining the skills discussed in the lecture material. Exercises and relevant materials will be distributed

via the class site on Moodle.

Students must adhere to the citation style used by the Council of Science Editors (CSE) in all written assignments (several links with information on CSE style are available here: http://guides.library.ualberta.ca/citing/cse).

Exams

There are no exams in this course.

Due Dates and Late Assignments

Because the submission of assignments for peer review and the submission of peer reviews affect the ability of your peer review partners to progress in the class, please do not request extensions unless it is absolutely necessary. Unless otherwise specified, assignments are due by 11:59 pm Yukon time on the date that they are due. Late assignments will lose 5% of their mark per day that they are late unless the student has obtained prior consent for an extension from the instructor. Requests for extensions must be submitted to the instructor in writing, prior to the deadline at which the assignment is due.

Assignment of grades

The total numerical score will be converted to a grade using the following system:

Percent	Letter grade	Percent	Letter grade
95-100	A+	67-70	C+
90-94	A	64-66	C
85-89	A-	60-63	C-
79-84	B+	55-59	D+
75-78	B	50-54	D
71-74	B-	0-49	F

COURSE WITHDRAWAL INFORMATION

Students should refer to the UAlberta calendar for important dates (calendar.ualberta.ca).

TEXTBOOKS AND LEARNING MATERIALS

There is no required textbook for this course. Readings will be posted on the class site on Moodle and/or distributed in class.

All students must have a valid Yukon University student computing account. Information is available here: https://www.yukonu.ca/student-life/technical-resources (scroll down to the section "Accessing your Office 365 & Moodle account").

Note that YukonU students can download for free the full suite of Microsoft Office applications (Word, Excel, PowerPoint, OneNote, Outlook) and other Internet-based services (OneDrive, Sway, etc). See information at the YukonU Technical Resources web page linked above.

COURSE WEBSITE

Material for the course will be available on the ALES 391 class site on Yukon University's Moodle system (https://moodle.yukonu.ca/). Lecture slides, announcements, assignments, reading, and other material will be available there for download or viewing.

ACADEMIC INTEGRITY

Yukon University Academic Standards and Regulations

Students are expected to contribute toward a positive and supportive environment and are required to conduct themselves in a responsible manner. Academic misconduct includes all forms of academic dishonesty such as cheating, plagiarism, fabrication, fraud, deceit, using the work of others without their permission, aiding other students in committing academic offences, misrepresenting academic assignments prepared by others as one's own, or any other forms of academic dishonesty including falsification of any information on any Yukon University document.

Please refer to YukonU Academic Regulations & Procedures for further details about academic standing and student rights and responsibilities.

University of Alberta Academic Integrity and Code of Student Behaviour

The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic

honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Code of Student Behaviour (online at www.governance.ualberta.ca) and avoid any behaviour which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.

All students at the University of Alberta are subject to the Code of Student Behaviour, as outlined at: https://www.ualberta.ca/en/governance/resources/policies-standards-and-codes-of-conduct/code-of-student-behaviour.html Please familiarize yourself with it and ensure that you do not participate in any inappropriate behavior as defined by the Code. Key components of the code include the following statements.

30.3.2(1) No Student shall submit the words, ideas, images or data of another person as the Student's own in any academic writing, essay, thesis, project, assignment, presentation or poster in a course or program of study.

30.3.2(2) c. No Student shall represent another's substantial editorial or compositional assistance on an assignment as the Student's own work.

USE OF AI SOFTWARE

The purpose of this course is to help students learn appropriate scientific writing style and format. Writing and peer review are critical components of this course. Therefore, the use of ChatGPT and similar artificial intelligence applications is not permitted in this course. While these can be useful tools, they are not an appropriate substitution for learning to write and critically think on your own. Copying the output from Chat GPT or other AI applications and submitting this output as your own work will be considered plagiarism. Furthermore, appropriate referencing is expected in submitted work. References to primary, peer reviewed scientific sources must be included in your work, as appropriate.

PROFESSIONALISM AND CLASSROOM RULES OF ENGAGEMENT

Students are expected to attend all lectures and labs, be engaged and courteous in all course activities, and to be on time for class. Please do not use cellular phones during class. Laptops are permitted for note taking and in-class work; however, please do not use laptops in class for non-class-related activities. While in computer labs, students are expected to refrain from using the computers to engage in non-class-related activities (e.g.,

Facebook, etc.).

RECORDING OF LECTURES, LABS, ETC.

Audio or video recording, digital or otherwise, of lectures, labs, seminars or any other teaching environment by students is allowed only with the prior written consent of the instructor or as a part of an approved accommodation plan. Student or instructor content, digital or otherwise, created and/or used within the context of the course is to be used solely for personal study, and is not to be used or distributed for any other purpose without prior written consent from the content author(s).

Please note that some classes in the B.Sc. Northern ENCS Program may be recorded using web conferencing software, and links to recordings may be posted on the class website.

ACCESSIBILITY AND ACADEMIC ACCOMMODATION

Yukon University is committed to providing a positive, supportive, and barrier-free academic environment for all its students. Students experiencing barriers to full participation due to a visible or hidden disability (including hearing, vision, mobility, learning disability, mental health, chronic or temporary medical condition), should contact Accessibility Services (https://www.yukonu.ca/student-life/learning-matters/accessibility-services) for resources or to arrange academic accommodations: access@yukonu.ca.

TOPIC OUTLINE

- Scientific literature – what it is, how to evaluate its credibility
- Reading and evaluating scientific papers
- Rhetorical goals for scientific writing
- Generating content (interpreting study data; synthesizing study outcomes; constructing and evaluating scientific arguments)
- Writing and revising (paragraph unity, topic sentences, coherence, and cohesion; sentence logic, clarity, style, and structure; grammar, word choice, punctuation)
- Abstracts

Full lecture schedule will be distributed separately.