Yukon University	School of Health, Education, and Human Services
	ESCI 310 Science Education (K to 5)
	Winter 2025 Number of Credits: 3
Course Outline	

INSTRUCTOR: Norma Shorty, PhD
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Thursday: 9:00 AM – 11:50
Dates: 09 January 2025 – 10 April 2025
Classroom

COURSE DESCRIPTION

Science remains a core subject area in the curriculum. This course grounded in the pan-Canadian Science Curriculum Framework, the foundation for Canadian science curricula, will satisfy basic requirements for teaching elementary school science in Canadian provinces and territories.

This course is designed and will be delivered primarily experientially. Course participants will be engaged as active learners and given weekly opportunities to facilitate local Yukon First Nation understandings of science education. Various learning environments, including the forest, the river, the outdoor classroom, the night skies, and more, may be accessed in the delivery of this course.

COURSE REQUIREMENTS

EQUIVALENCY OR TRANSFERABILITY

Receiving institutions determine course transferability. Find further information at:
https://www.yukonu.ca/admissions/transfer-credit

LEARNING OUTCOMES

Students will be able to understand

- The role and purpose of science in the (elementary) school curriculum
- The nature of science (and technology) in relation to society and the environment.
- How children/adolescents construct meaning, develop understanding, and make sense of the world
- How children learn science. Basic concepts and processes of science in relation to their everyday lives
- The philosophy, goals, and organization of the K-12 school science curriculum
- Practice understanding of curriculum, instruction, and assessment strategies
- Design and implementation of learning environments in the elementary school (learning to teach science)
- Basic science classroom management and safety procedures

COURSE FORMAT

Participants are expected to be prepared to learn inside and outside in winter weather. From time to time, we will have classes at Roddy's Camp. Announcements will be made for these outings.

Weekly breakdown of instructional hours

The nature of science

- https://www.nsta.org/nstas-official-positions/nature-science
- Indigenous science beliefs and philosophies

Biology

- plants & medicines
- ecosystems
- photosynthesis & cellular respiration
- anatomy & physiology

Chemistry

- fermentation
- curing and brines
- dyes and paints

Forces & Motion, Energy
Earth Science & Weather

Delivery format

This course will be delivered in a blended format. Students will be required to attend some face-to-face sessions on campus and complete various synchronous and asynchronous online activities.

EVALUATION

Participation	20	Apr 2025
Project 1 – research and peer teach protocols and laws for working with local Indigenous knowledge or define the nature of science for grade 5 and apply local Indigenous ways of knowing	20	Jan 30th
Project 2 – research and peer teach categories in biology and apply local Indigenous ways of knowing	20	Feb 13th
Project 3 – research and peer-teach categories in chemistry and apply local Indigenous ways of knowing	20	Mar 6th
Project 4 – research and peer teach forces & motion, energy or earth science & weather and apply local Indigenous ways of knowing	20	Mar 27th
Total	100	

Project 1 – Due Thursday, January 30
Research and peer teach protocols and laws for working with Indigenous culture and people **or** what is the nature of science and what is local Indigenous knowledge in the realm of science.
Project 2 – Due Thursday, February 13th
Research and peer teach categories in biology and apply local Indigenous ways of knowing.
Project 3 – Due Thursday, March 6
Research and peer teach categories in chemistry and apply local Indigenous ways of knowing.
Project 4 - Due Thursday, March 27th
Research and peer teach forces & motion, energy or earth science & weather, and apply local Indigenous ways of knowing.

In all projects, 10 marks are assigned for the written portion and 10 marks for the peer teaching of your work.

In all projects, you will connect to a local place-based story, and you will apply science concepts (see the weekly breakdown of instructional hours, above) towards teaching elementary school science.

COURSE WITHDRAWAL INFORMATION

Refer to the YukonU website for important dates.

TEXTBOOK

Aikenhead, G. et. Al (2014). Enhancing School Science with Indigenous Knowledge: What We Know from Teachers and Researchers. Saskatoon Public Schools.

LEARNING MATERIALS

Blog At Worldpress.com, Place-Based Science, Siwal Si'wes Digital Library. https://swswlibrary.com/positive-learning-experiences/place-based-science/

Buxton, C., Provenzo, E. (2012). Place-Based Science Teaching and Learning: 40 activities for k-12 classrooms. Sage Publications, Inc.

Herman, M,, et. Al (2008). Learning Indigenous Science from Place. Aboriginal Education Research Centre, University of Saskatoon. Retrieved from https://aerc.usask.ca/downloads/Learning-Indigenous-Science-From-Place.pdf

Stephens, S. (2000). Handbook for Culturally Responsive Science Curriculum. Alaska Science Consortium and the Alaska Rural Systemic Initiative. Retrieved from http://ankn.uaf.edu/publications/handbook/

UBC LIBRARY, 2024, Indigenous Education K-12. https://guides.library.ubc.ca/indigenous_ed_k12/science

ACADEMIC INTEGRITY

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 Academic Regulations & Procedures for further details about academic standing and student rights and responsibilities.

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 for resources or to arrange academic accommodations: access@yukonu.ca.

TOPIC OUTLINE

- Science as a way of knowing
- Cross-cultural teachings and their implications for school learning environments
- Discourses of assessment and evaluation and their implications for teaching and learning science
- The place and positioning of science in the broader school curriculum – issues of appropriation, inclusion, social justice, equity, diversity, and literacy
- The meaning of science experiences in personal and social development
- The role of language in science learning and teaching
- The ways science is constructed interactionally among participants in science learning (communities)
- Designing teaching situations in the elementary/middle/high school