AB

EDUC 460.17: Specialization I - Secondary Science
Winter, 2024

Start date: January 8, 2024
Last Day of Classes: March 8, 2024
Term Break: February 18-24, 2024

Last Day to Add/Drop/Swap: Due to the non-standard dates associated with this program, please check your Student Centre for the important dates pertaining to your section.

Pre-requisite: Due to the multiple pathways in the Bachelor of Education, please consult Undergraduate Programs in Education for questions related to pre-requisite courses.

Office Hours: Available after class or by appointment. Please add course number to the subject line of your email.

Email: Students are required to use a University of Calgary (@ucalgary.ca) email address for all correspondence.

COURSE DESCRIPTION:
The intent of the Specialization I Seminar is to introduce students to the concepts, theory, and design planning related to teaching within the specialization of Science. Theory as connected to an understanding of practical classroom experiences will particularly inform the course curriculum and will be explored through course readings, analysis of teaching/learning artifacts, and through the design of discipline-based learning and assessment plans. Topics in teaching and learning will include teaching inclusively and addressing the needs of diverse learners, effective integration of technology, and discipline-based inquiry. Assignments will present the opportunity for students to develop an understanding of short-term instructional designs and to begin to examine curriculum shifts in the province.

LEARNER OUTCOMES: Students will be knowledgeable about:

1) Developing a foundational understanding of the nature of discourse in the discipline, as related to teaching and learning, including specialized language, concepts, and terminology;

2) Understanding teacher as designer of learning and assessment plans and use of the resources available for designing learning and assessment.

3) Exploring and applying introductory theory related to the teaching of the discipline with an emphasis on designing discipline-based tasks and assessment processes and creating an adaptive classroom learning environment to better meet the needs of today's diverse learners.

4) Successfully designing short-term learning and assessment plans to deepen understanding of key ideas/concepts within the discipline.

COURSE DESIGN AND DELIVERY:

This course is delivered through a problem-based and inquiry-focused approach. Student participation is crucial to the knowledge building in this course. While there are readings, they do not "contain" the knowledge of this course. Your learning will be primarily through applying concepts from student led workshops and course readings while you experience, design, and critique science learning activities. Students are expected to participate in whole-class and small-group discussions conversation and Desire2Learn (D2L) discussion forums that will include postings and responses in small-groups. Assessment is based on rubrics for the three Learning Tasks. For most class activities, you will need a device with reliable internet connectivity to access D2L, the library website, YouTube, etc.

LEARNING TASKS OVERVIEW:

The full assignment descriptions and assessment details will be discussed in class and posted to D2L. The descriptions in this syllabus should be treated as summaries or overviews, not the full and complete assignment requirements.

LEARNING TASK	DESCRIPTION OF LEARNING TASK	PERCENTAGE OF FINAL GRADE	GROUPING FOR TASK	DUE DATE
LT1	**Inquiry into the Teaching of Science: Presentation**	30%	Pairs	Jan. 26
LT2	**Creation of Short-term Learning and Assessment Plan**	45%	Individual	Mar. 4 (draft) Mar. 8 (final copy)
LT3	**Evolving Understanding of the Teaching of Science**	25 %	Individual	Mar. 8

Note: A and A+ are both worth 4.0. A+ is given at the instructor's professional discretion based on work of rare and exemplary quality.

WEEKLY COURSE SCHEDULE:

Dates	Topics/Themes	Readings and Assignments
Week 1	**Essential Question (EQ): What are the goals of EDUC 460?** • EDUC 460 Course Outline review – LT1, LT2, and LT3 • LT1: Partner Selection & Topic selection (D2L) • LT2: Chapter selection (D2L) **What does Alberta Education deem as curriculum?** Intro to LT1, workshop format, & 5Es. Intro to LT3 Intro to LT2 & chapter selection *(whole/part/whole)* In class time to work on LT1: refine your question.	**Review *Front Matter*** of the Science Programs of Study (PoS) *that supports your grade of interest either* gd. 7 – 8: p.1 – 10 or any of the gd. 10 – 12 courses: p. 1 – 12. • Alberta Education, (nd). Programs of Study. https://www.alberta.ca/programs-of-study.aspx **Assigned readings** for Weeks 2 to 7 **Reference for LT1:** Bybee, et al., (2006). The BSCS 5E Instructional Model: Origins, Effectiveness, and Applications. BSCS, 1–19. https://media.bscs.org/bscsmw/5es/bscs_5e_executive_summary.pdf **Assigned Chapter for LT2 see schedule in D2L:** Wiggins, G. J. & McTighe, J. (2005). Understanding by design (2nd Edition) https://ebookcentral-proquest-com.ezproxy.lib.ucalgary.ca/lib/ucalgary-ebooks/detail.action?docID=3002118

Week 2	**EQ:** • What are the goals of science teaching; "Learning **science**, learning about **science,** and doing **science"**? • What does it mean to be a teacher of science? • What is your understanding of scientific reasoning and inquiry? LT2: Stage 1. Identify Desired Results (foundational knowledge, attitudes & skills). In class time to work on LT1	**Readings for LT3** Feynman, R. P. (1969). What is science? *The Physics Teacher*, *7*(6), 313-320. https://aapt-scitation-org.ezproxy.lib.ucalgary.ca/doi/10.1119/1.2351388 Rennie, L. (2005). Science awareness and scientific literacy. https://espace.curtin.edu.au/handle/20.500.11937/31481 https://ezproxy.lib.ucalgary.ca/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=ehh&AN=18133950&site=ehost-live
Week 3	**EQ:** • What does it mean to facilitate and support a "constructivist classroom"? • Who are the learners? • Design thinking & Big Ideas • The "Instructional Core" • What does it mean to be a "designer" of learning? In class time to work on LT1 & LT2, Stage 1 LT#1: Workshops: schedule posted in D2L	**Readings for LT3:** Aikenhead, G.S., Orpwood, G., & Fensham, P. (2011). Scientific literacy for a knowledge society. In C. Linder, L. Ostman, D.A. Roberts, P-O. Wickman, G. Erickson, & A. MacKinnon (Eds.), Exploring the landscape of scientific literacy (28-44). New York: Routledge, Taylor and Francis Group. *****E-book UofC Library*** https://ebookcentral-proquest-com.ezproxy.lib.ucalgary.ca/lib/ucalgary-ebooks/reader.action?docID=592911&ppg=39 https://www-taylorfrancis-com.ezproxy.lib.ucalgary.ca/chapters/edit/10.4324/9780203843284-9/scientific-literacy-knowledge-society-glen-aikenhead-graham-orpwood Driver, et al., (1994). Constructing Scientific Knowledge in the Classroom. *Educational Researcher* p. 5-12. https://journals-sagepub-com.ezproxy.lib.ucalgary.ca/doi/abs/10.3102/0013189X023007005 https://www-jstor-org.ezproxy.lib.ucalgary.ca/stable/1176933 **Reading for LT2:** Harlen, W. (Ed.) (2010). *Principles and big ideas of science education*. p.21-23 https://www.ase.org.uk/bigideas **LT#1 Due: Friday, Jan. 26, 2:00 pm** LT#1: Workshops - Friday
Week 4	**EQ**: What does it mean to be a "designer" of learning? In class time to work on LT2, Stage 1	LT#1: Workshops

Week 5	**EQ:** What will you accept as evidence that student understanding took place? Stage 2. Determine what constitutes acceptable evidence of competency in the outcomes and results (assessment). In class time to work on LT2, Stage 2	LT#1: Workshops **Resources for LT2:** Clinchot, M., Ngai, C., Huie, R., Talanquer, V., Lambertz, J., Banks, G., ... & Sevian, H. (2017). Better formative assessment. *The Science Teacher, 84*(3), 69-75. https://ezproxy.lib.ucalgary.ca/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=sch&AN=121366392&site=ehost-live https://link.gale.com/apps/doc/A494100270/ITOF?u=ucalgary&sid=bookmark-ITOF&xid=d3716fae Crumrine, T., & Demers, C. (2007). Formative Assessment: Redirecting the Plan. *Science Teacher, 74*(6), 28-32. https://ezproxy.lib.ucalgary.ca/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=sch&AN=26377643&site=ehost-live https://link.gale.com/apps/doc/A169164630/AONE?u=ucalgary&sid=bookmark-AONE&xid=4b6ee11c Fowler, K., Windschitl, M., & Richards, J. (2019). Exit Tickets. *The Science Teacher, 86*(8), 18-26. https://ezproxy.lib.ucalgary.ca/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=sch&AN=135589034&site=ehost-live https://link.gale.com/apps/doc/A581990226/AONE?u=ucalgary&sid=bookmark-AONE&xid=93da2a16 Alberta Education. (2017). Competencies: Descriptions and indicators. https://education.alberta.ca/competencies/descriptions-indicators/
Week 6	**EQ**: How do you shift the responsibility of learning from the teacher to the students? Stage 3: Plan the Learning Experience and Instruction In class time to work on LT2, Stage 3	LT#1: Workshops **Resources for LT2:** Friesen, S. (2009). What did you do in school today? Teaching Effectiveness: A Framework and Rubric. Canadian Education Association. http://www.galileo.org/cea-2009-wdydist-teaching.pdf
	Term Break	
Week 7	**EQ**: What does it mean to be a teacher of diversity? Stage 4: Learner differentiation In class time to work on LT2, Stage 4	LT#1: Workshops **Readings for LT2:** Alberta Education. (2010). *Making a difference: Meeting diverse learning needs with differentiated instruction*: Chapter 13 (Science) http://education.alberta.ca/media/1234045/makingadifference_2010.pdf Alberta Education. (nd). Benchmarks, strategies and resources for teachers of English language learners. http://www.learnalberta.ca/content/eslapb/

Week 8	EQ: What does it means to be a reflective practitioner? Peer review of LT2 (Monday)	LT#1: Workshops **LT#2:** • **Draft due: Monday, March 4 (for peer review).** • **Final submission due: Friday, March 8** **LT#3: Due Friday, March 8**

CHANGES TO SCHEDULE:
Please note that changes to the schedule and readings may occur to meet the emerging needs and dynamics of the participants in the course.

LEARNING TASKS AND ASSESSMENT

LT1: Inquiry into the Teaching of Science (Group – pairs)

Due Date: Friday, January 26 @ 2:00 pm
Percentage of the Final Grade: 30%
Length: 45 minutes (30 min interactive workshop, 15 min. Q & A)

"A multitude of countries are interested in improving K-12 science education for the purposes of producing a scientifically literate citizenry and increasing student interest in science-oriented careers" (Witzig & Sickel, 2017, p. 1). EQs: *What does it mean to be scientifically literate in today's world? Why is this important? What is the role of teachers of science in this endeavor?*

The goal of this assignment is to further familiarize yourself with the Nature of Science (NOS) and to introduce the opportunities and challenges that science teachers face in translating curriculum documents, including the philosophy and rationale of the Programs of Study, into engaging instruction that leads to student understanding and development of related knowledge, skills, and attributes.

The intent of this learning task is for you to foster a professional conversation focused on pedagogical content knowledge within science education. You will develop and present an inquiry topic based on a key question to be explored within the teaching of science. Your questions should connect to class discussions, suggested readings, and the development of your lesson plan (LT 2).

During the course, you will present your work as a 45-minute Professional Development workshop for teachers, framed within the 5 E's Instructional Model. The 5 E's Instructional Model is based on the constructivist approach to learning and provides a model for how this strategy can be implemented for authentic, design-based, and inquiry-focused learning experiences. Each of the 5 E's will be discussed in the first week of class. Please refer to: https://lesley.edu/article/empowering-students-the-5e-model-explained

Your presentation should focus on how these "understandings" will influence our science specific pedagogical content practice.

The topics/questions and further explanations will be presented to you in our first class.

Requirements:

- Specifics for presentation format: *consider how to best present your work to your colleagues (new teachers) as a professional learning experience.*
- List of resources/references used in the project. This must be presented in APA 7 citation format.
- A digital folder illustrating the evidence/support for your findings. Any workshop materials (i.e., handouts, slide presentations, etc.) should be included in the digital file. You can create these and/or share existing links or examples (where copyright permits). These must be placed in both *Discussions* and *Assignments* in D2L.
- In-class 'workshop' session that includes:
  - The personal and professional significance of the inquiry.
  - How the inquiry fits into our collaborative knowledge building related to science teaching and learning.
  - How the ideas generated from the inquiry may be achieved in planning, instruction, and student assessment with practical examples.
  - The implications for us as new teachers in developing our philosophical stance, professional identity, and practice.

CRITERIA FOR ASSESSMENT OF LEARNING TASK 1

Criteria	A to A+ Meets all and exceeds some requirements	A- to B+ Meets all requirements	B to B- Meets most requirements.
Quality & Meaningfulness of Inquiry Question			
Rationale: What and Why do you want to know "this" with respect to informing pedagogical practice?	The inquiry question is clearly stated, specific and addresses a significant need or problem that teachers encounter in the classroom. The rationale for choosing the question is supported with personal interests in professional growth in this area. Considers and/or challenges common assumptions in this area.	The inquiry question is appropriate and clearly stated but is either too general or too narrow, leading to a multitude of sub- question or ruling out new possibilities. The supporting rationale is generally well-written but not relevant to personal interest stemming from classroom experience or identification of professional growth areas.	The inquiry question is roughly sketched and in need of refinement. The supporting rationale is weakly developed and/or does not address personal interest or identification of professional growth areas.
How will it make a difference to your teaching of the discipline?	The question has the potential to hold professional interest over time. Direct links are made to how new knowledge in this area will support teaching in the service of learning.	The question has the potential to hold professional interest beyond this assignment. Weak links are made to how new knowledge in this area will support teaching in the service of learning.	The question has limited importance for on-going investigation. Few or no links are made to how this question will support teaching in the service of learning.
Critique & Critical Analysis			
What are the connections between theory and practice?	Well-developed depth of understanding of the topic shown through credible and respected referenced connections between theory and practice. Cites all academic content obtained from other sources. APA 7 citation style is accurate.	Sufficient depth of understanding of the topic shown through limited referenced connections between theory and practice. Cites most content obtained from other sources. APA 7 citation style is accurate.	Little depth of understanding of the topic with minimum referenced connections between theory and practice. Citations do not employ APA 7 citation style.
Overall Presentation of Findings			
How effective is the creation and development of conceptual ideas in contributing to our pedagogical content knowledge?	Careful and critical development of the conceptual ideas through an inquiry approach so participants will be able to develop and apply pedagogical information, concepts, and skills to new teaching situations.	Some development of the conceptual ideas through an inquiry approach so participants will be able to develop minimal pedagogical understanding. with implications for practice in classrooms.	Little development of the conceptual ideas through an inquiry approach, with little or no connection to pedagogical development and with no implications for practice in classrooms
How effective is the creation and development of the conceptual idea, in the presentation, in contributing to an individual's development of pedagogical content knowledge (use of the 5Es)?	Workshop design is creative, visually appealing, and is effectively supported by the oral presentation (deliberate use of the 5Es). Graphics (e.g., diagrams, picture, tables, figures, etc.) effectively enhance key ideas. Participants are provided with important resources or handouts for later consideration. Questions are handled professionally illustrating exemplary knowledge of the topic.	Workshop design is appealing and is supported by the oral presentation (some indications of the 5Es were used). Graphics enhance key ideas. Handouts and other resources provided may not directly relate to central topic. Participants are provided with support resources but may not have adequate information on their use. Questions are handled competently.	Workshop design is adequate but somewhat cluttered or disorganized. The oral presentation does not flow. Graphics are limited in enhancing the overall presentation. Content arrangement is somewhat confusing. Participants do not have the necessary access to resources to fully participate. Answers to questions are confusing or indicate insufficient knowledge of the topic.

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UNDERGRADUATE PROGRAMS IN EDUCATION

LT2: Designing an Annotated Discipline-based Learning and Assessment Plan
(Individual submission – work in pairs/triads to develop sequential lessons)

Due Date: Monday, March 4, 2:00 pm (for peer editing), Final submission: Friday, March 8

Percentage of the Final Grade: 45%

Intent of LT2: The intent of LT2 is to design and **annotate** a short-term learning and assessment plan.

Expectations of LT3:

- You may work collaboratively (pairs/triads) but must submit individual learning plans. Each student will design a short-term learning and assessment plan. The plan will be comprised of ONE lesson plan for an 80-minute class (for Senior High School) or one lesson plan of 60 minutes (for Middle/Junior High).

- The learning plan must follow a clear and comprehensive **design for learning focused template** that promotes deep understandings of a key concept or competency of your discipline. Using the rubric on the next page, as a guide, your plan must include the 10 aspects of McTighe and Wiggins' framework.

- You will record/annotate (making your thinking visible), using **mark-ups** on the lesson design, the reasons for the choices you have made including: (i) how this reflects a design approach (UbD), (ii) how this lesson plan fits into the broader context of a unit, (iii) the intended pedagogical content knowledge choices you have made. **Use the following rubric to guide your annotation.**

Resources:

Alberta Assessment Consortium: https://aac.ab.ca/ Username: teachers Password: master

Doucette Library – Library guide for lesson planning: http://libguides.ucalgary.ca/lesson_planning_resources

Wiggins, G. J. & McTighe, J. (2005). Understanding by design (2nd Edition) https://ebookcentral-proquest-com.ezproxy.lib.ucalgary.ca/lib/ucalgary-ebooks/detail.action?docID=3002118

Criteria For Assessment of Learning Task 2

Criteria	Does not meet requirements	B to B- Meets most requirements	A- to B+ Meets all requirements	A to A+ Meets all and exceeds some requirements
Stage 1 - Lesson Rationale: To what extent does the design focus on building understanding of targeted content based on an Alberta Education Program of Studies?				
Curricular Outcomes	Has identified general understandings of curricular outcomes	Has identified targeted understandings of curricular outcomes and sometimes incorporates them into inquiry-based learning.	Has identified targeted understandings of curricular outcomes that are based on transferable big ideas of the discipline.	Has identified targeted understandings of curricular outcomes that are truly enduring, based on transferable big ideas at the heart of the discipline, and in need of uncovering.
Targeted Understandings	The targeted understandings are framed by broad questions used to deliver instruction.	The targeted understandings are framed by questions that could be incorporated into inquiry-based learning.	The targeted understandings are framed by some essential questions that adequately make connections for inquiry-based learning, deep thought, and encourage transfer of learning.	The targeted understandings are framed by essential questions that spark meaningful connections, provoke genuine inquiry and deep thought, and encourage transfer of learning.
Misconceptions	No or inappropriate misconception identified.	Some misconceptions are identified, but not targeted.	Some misconceptions are identified and targeted.	Misconceptions are relevant and targeted.
Stage 2 - Assessment Evidence: To what extent do the assessments provide fair, valid, reliable, and sufficient measures of the desired results?				
Balanced Assessment	Assessment is exclusively summative and occurs after learning. Lack of formative assessment to improve learning or to inform teaching practices.	Assessment is primarily summative with limited or irregular use of formative assessment to improve teaching and learning.	Balanced assessment is used on a regular basis and is part of the teaching and learning. Some criterion-based scoring tools are used to evaluate student products and performances.	Balanced assessment is integral to the learning and woven into the day-to-day fabric of teaching and learning. Appropriate criterion-based scoring tools are used to evaluate student products and performances.
Learning Outcomes	Assessment criteria does not match learning outcomes from Lesson Rationale.	Limited match between assessment criteria and learning outcomes from Lesson Rationale.	Assessment criteria closely matches the learning outcomes from Lesson Rationale.	Assessment criteria is directly matched to learning outcomes from Lesson Rationale.
Assessment Through Authentic Performance Tasks	Limited assessment provides an incomplete picture of student learning.	Limited number of assessment data provides a partial picture of student learning.	Students have limited opportunities to exhibit their understanding through authentic performance tasks to provide general evidence of learning.	Students are asked to exhibit their understanding through authentic performance tasks to provide additional evidence of learning.

Clear criteria are established	Performance task and assessment criteria are shared after the work has been graded.	Performance task and assessment criteria are not fully explained to students before the work begins.	Performance task and assessment criteria are communicated, and students will understand the learning expectations	Performance task and assessment criteria are communicated at the start of the lesson and reflect authentic real-world standards for high quality work.
Self and Peer Assessment	No evidence of self or peer assessment.	Students have limited opportunities to self-assess and peer-assess.	Students have opportunities to self-assess and peer-assess.	Students are encouraged to self- assess and peer-assess.
Stage 3: To what extent is the learning plan effective and engaging?				
Design Is Informed by Pedagogical Content Knowledge	Selects activities that emphasize subject matter acquisition which deal with acquiring information, facts and formulas.	Designs learning activities that are organized around subject matter and occasionally brings discipline experts into the classroom to talk about the work they do.	Designs learning experiences that are organized around disciplinary ideas and core concepts and requires that students make connections between exiting and new ideas to build understanding.	Designs learning experiences that engage the students in doing work that require distinct ways of thinking about and acting in the world that disciplines embody to make meaningful connections and build deep understanding.
Authentic Performance Task	The work students undertake requires them to acquire and recall static, inert facts.	The work students undertake has some connection to the world outside the classroom.	The work students undertake requires them to engage in productive collaboration with each other and with discipline and other experts around matters that are central to the discipline and the broader community outside of school.	The work students undertake requires them to engage in productive collaboration with each other and with discipline and other experts around real problems, issues, questions or ideas that are of real concern and central to the discipline, to the students and to the broader community outside of school.

Work Fosters Deep Understanding	The work students undertake builds habits of mind that emphasize groupthink by requiring a simplistic solution and/or absolute conclusion attributed to an external authority with no consideration of implications.	The work students undertake requires that they demonstrate industrial habits of mind that present conclusions relative to each other, with simplistic solutions, and a cursory examination of implications.	The work students undertake fosters disciplined habits of mind. Students are asked to: • Formulate plausible solutions, • Articulate assumption, • Formulate reasoned judgment and conclusions based on evidence, and, • Consider implication that reach beyond the immediate situation.	The work students undertake fosters strong habits of mind, innovation, and creativity. Students are routinely asked to: • Formulate plausible, coherent working theories, • Formulate well-reasoned judgment and conclusions based on evidence with an examination of different viewpoints, • Analyze assumptions, • Discuss how things might be otherwise, i.e. supposition, • Thoroughly examine implications, • Consider ambiguities • Work across a variety of contexts, and, • Make connections between and among concepts
Stage 4: Reflection on who the learners are?				
Learner Differentiation	There is no evidence of a variety of teaching methods used to engage all students.	A limited variety of teaching methods are used to engage all students. Inclusion of technology, Indigenous, multicultural, and inter-disciplinary activities are restricted.	A variety of inclusive learning strategies are incorporated into the design to address the learning interests and needs of all students. Inclusion of technology, Indigenous, multicultural, and inter-disciplinary activities are evident.	A variety of effective and inclusive learning strategies are incorporated into the design to address the learning interests and needs of all students. Inclusion of technology, Indigenous, multicultural, and inter-disciplinary activities are highly evident.
ESL Benchmarks (Level 3) reflected in the Performance Task	Inappropriate or missing selected ESL benchmark objectives for level 3 students.	Selected ESL benchmark objectives for level 3 students or rationale for performance task not clearly articulated	Appropriately selected ESL benchmark objectives for level 3 students with general rationale for performance task.	Appropriately selected ESL benchmark objectives for level 3 students with specific rationale for performance task.
Resources	Sources and materials not stated or unclear. improperly referenced.	Sources consulted are referenced. Materials identified.	Appropriate sources consulted and referenced (APA). Some lesson specific materials identified	A variety of appropriate sources consulted and accurately referenced (APA). Appropriate lesson specific materials identified.

LT3: Evolving Understanding of the Teaching of Science (Individual)

Due Date: Friday, March 8
Percentage of the Final Grade: 25%
Format: **Post** For this assignment you will respond to the questions below as way of reflecting thoughtfully on the contexts and challenges within science education today. Your response may take several forms. It could be a conventional academic essay, an imagined Socratic dialogue between a teacher and student, an illustrated story, an animation, a short video or a podcast. Length: 700 words, 5 minutes.

Intent of LT3: The purpose of the assignment is to provide a response to the following question: *How is your conceptualization of teaching Science changing, being modified, or reinforced throughout the course?* Your response will be in the form of a self-reflection, writing from a personal perspective that allows you to connect directly with course material, other courses and personal experience in learning science.

Further details and explanations will be presented to you in class.

Criteria For Assessment of Learning Task 3

Criteria	A to A+ Meets all and exceeds some requirements	B+ to A- Meets all requirements	B- to B **Meets most requirements**	Does not meet requirements
Articulates a clear, insightful, and growing understanding of teaching concepts	Responses are introduced, clearly communicated, and the focus is strongly maintained for the purpose of knowledge building within the teaching of science.	Responses are clear, and the focus is maintained for the purpose of knowledge building within the teaching of science.	Responses are generally clear, but the focus may be insufficiently sustained for the purpose of knowledge building.	Responses are unclear and not clearly developed for the purpose of knowledge building.
Relevant evidence from LT1 and other sources to support responses	Build upon content from LT1 presentations, class readings, class conversations, and personal experiences to open new possibilities in understanding the teaching of science. Demonstrates skillful use of high quality, credible, relevant sources to develop ideas that are appropriate for the discipline. citation style is accurate.	Demonstrates consistent use of information from LT1 presentations, class readings, class conversations, and personal experiences to support ideas that are situated within the science discipline.	Demonstrates an attempt to use information from presentations, class readings, class conversations, and personal experiences that are both specific appropriate for the science discipline.	Does not use information from LT1 presentations, class readings, class conversations, and personal experiences to support ideas that are appropriate for the science discipline.
Organization: structure for communicating understandings	Submission is very well and clearly organized. Structure and transitions support effective communication of understandings.	Submission is organized. Structure and transitions for the most part support communication of understandings.	Submission has limited structure that interferes with clear communications of understandings.	Submission lacks clear structure and significantly interferes with clear communications of understandings.

The Expectation of Excellence in Professional Work

Please review the Academic Calendar carefully. It describes the program and provides detailed schedules and important dates. It contains information on expectations for student work and professional conduct. In addition, procedures are described regarding concern about student performance in the program. Please pay especially careful attention to details and descriptions in the following topic areas:

- *The Importance of Attendance and Participation in Every Class*

As this is a professional program, experiences are designed with the expectation that all members will be fully involved in all classes and in all coursework experiences. As you are a member of a learning community your contribution is vital and highly valued, just as it will be when you take on the professional responsibilities of being a teacher. We expect that you will not be absent from class with the exception of documented instances of personal or family illness or for religious requirements.

- *Engagement in Class Discussion and Inquiry*

Another reason for the importance of attendance and participation in every class is that the course involves working with fellow students to share ideas and thinking. For example, each class you will work with a small group to engage fellow students in discussions on work being considered in class. You will also help other groups by providing ideas for scholarly inquiry in assignments. If you find that you are experiencing difficulties as a group collaborating, please inform the instructor.

Expectations for Writing

All written assignments (including, to a lesser extent, written exam responses) will be assessed at least partly on writing skills. Writing skills include not only surface correctness (grammar, punctuation, sentence structure, etc.) but also general clarity and organization. Sources used in research papers must be properly documented. If you need help with your writing, you may use the writing support services in the Learning Commons. For further information, please refer to the official online University of Calgary Calendar, Academic Regulations, E. Course Information, E.2: Writing Across the Curriculum: http://www.ucalgary.ca/pubs/calendar/current/e-2.html

Students are expected to create their own content for all assignments and writing should be of their own work. AI-generated text is permitted as long as the text is appropriately cited with respect to which program generated the text and how the text was generated (e.g., keyword prompts) with a reference list using APA 7 format and appendix with full transcript.

"Quoted material" (OpenAI, 2023; see Appendix A for the full transcript).

Reference

OpenAI. (2023). *ChatGPT* (Sept 22 version) [Large language model].

https://chat.openai.com/chat

LATE SUBMISSIONS

All late submissions of assignments must be discussed with the instructor **prior to the due date.** Students may be required to provide written documentation of extenuating circumstances (e.g. statutory declaration, doctor's note, note from the University of Calgary Wellness Centre, obituary notice). A deferral of up to 30 days may be granted at the discretion of the Associate Dean of Undergraduate Programs with accompanying written evidence.

ISSUES WITH GROUP TASKS

With respect to group work, if your group is having difficulty collaborating effectively, please contact the instructor immediately. If a group is unable to collaborate effectively or discuss course materials online in a timely manner, the instructor may re-assign members to different groups or assign individual work for completion.

GRADING

Grade	GPA Value	%	Description per U of C Calendar
A+	4.0	95-100	Outstanding
A	4.0	90-94	Excellent – Superior performance showing comprehensive understanding of the subject matter
A-	3.7	85-89	
B+	3.3	80-84	
B	3.0	75-79	Good - clearly above average performance with knowledge of subject matter generally complete
B-	2.7	70-74	
C+	2.3	65-69	
C	2.0	60-64	Satisfactory - basic understanding of the subject matter
C-	1.7	55-59	
D+	1.3	52-54	Minimal pass - Marginal performance
D	1.0	50-51	
F	0.0	49 and lower	Fail - Unsatisfactory performance

Students in the B.Ed. program must have an overall GPA of 2.5 in the semester to continue in the program without repeating courses.

Academic Accommodation
It is the student's responsibility to request academic accommodations according to the University policies and procedures listed below. The student accommodation policy can be found at: https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Student-Accommodation-Policy.pdf. Students needing an accommodation because of a disability or medical condition should communicate this need to Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities: ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Accommodation-for-Students-with-Disabilities-

Procedure.pdf. Students needing an accommodation in relation to their coursework based on a Protected Ground other than Disability, should communicate this need, preferably in writing, to their Instructor.

Academic Misconduct
For information on academic misconduct and its consequences, please see the University of Calgary Calendar at http://www.ucalgary.ca/pubs/calendar/current/k.html

Attendance/ Prolonged Absence
Students may be asked to provide supporting documentation for an exemption/special request. This may include, but is not limited to, a prolonged absence from a course where participation is required, a missed course assessment, a deferred examination, or an appeal. Students are encouraged to submit documentation that will support their situation. Supporting documentation may be dependent on the reason noted in their personal statement/explanation provided to explain their situation. This could be medical certificate/documentation, references, police reports, invitation letter, third party letter of support or a statutory declaration etc. The decision to provide supporting documentation that best suits the situation is at the discretion of the student.

Falsification of any supporting documentation will be taken very seriously and may result in disciplinary action through the Academic Discipline regulations or the Student Non-Academic Misconduct policy.

https://www.ucalgary.ca/pubs/calendar/current/n-1.html

The Freedom of Information Protection of Privacy Act prevents instructors from placing assignments or examinations in a public place for pickup and prevents students from access to exams or assignments other than their own. Therefore, students and instructors may use one of the following options: return/collect assignments during class time or during instructors' office hours, students provide instructors with a self-addressed stamped envelope, or submit/return assignments as electronic files attached to private e-mail messages.

For additional resources including, but not limited to, those aimed at wellness and mental health, student success or to connect with the Student Ombuds Office, please visit https://www.ucalgary.ca/registrar/registration/course-outlines

Education Students Association (ESA) President for the academic year is Claire Gillis, esa@ucalgary.ca.

Werklund SU Representative is Elsa Stokes, educrep@su.ucalgary.ca.