

**EDUC 460.23: Specialization I - Science
Summer, 2023**

Section	Instructor	Class Time	Location	Email
S01	Dr. Jeff Turner	Mon - Fri 9:00 – 11:50	EDC 171	turnej@ucalgary.ca

Start date: Monday, July 10, 2023

Last Day of Classes: Friday, July 21, 2023

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 will be delivered face-to-face on campus with some engagement in a D2L environment. 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 the 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	Friday, July 14, 9:00 am
LT2	Creation of Short-term Learning and Assessment Plan	45%	Individual	Friday, July 21, 9:00 am
LT3	Evolving Understanding of the Teaching of Science	25%	Individual	Monday, July 24

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.

DAILY COURSE SCHEDULE:

Day 1	Topics/Themes	Readings and Assignments
	Essential Question (EQ): What are the goals of EDUC 460? <ul style="list-style-type: none"> 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?	Review <i>Front Matter</i> of the Science Programs of Study (PoS) <i>that supports your grade of interest either</i> gd. 1-6: p.A-1 -A4, gd. 7 – 8: p.1 – 10 or any of the gd. 10 – 12 courses: p. 1 – 12. <ul style="list-style-type: none"> Alberta Education, (nd). Programs of Study. https://www.alberta.ca/programs-of-study.aspx

Day 2	<p>EQ:</p> <ul style="list-style-type: none"> 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? <p>Intro to LT1, workshop format, & 5Es.</p> <p>Intro to LT3</p> <p><i>In class time to work on LT1: refine your question.</i></p>	<p>Readings for LT3 (assigned on day1):</p> <p>Feynman, R. P. (1969). What is science? <i>The Physics Teacher</i>, 7(6), 313-320. http://dx.doi.org.ezproxy.lib.ucalgary.ca/10.1119/1.2351388</p> <p>Rennie, L. (2005). Science awareness and scientific literacy. https://espace.curtin.edu.au/handle/20.500.11937/31481</p> <p>https://ezproxy.lib.ucalgary.ca/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=ehh&AN=18133950&site=ehost-live</p> <p>PISA 2018 Assessment and Analytical Framework, Scientific Literacy pp. 97-108 https://www.oecd-ilibrary.org.ezproxy.lib.ucalgary.ca/education/pisa-2018-assessment-and-analytical-framework_b25efab8-en</p> <p>Reference for LT1: Bybee, et al., (2006). The BSCS 5E Instructional Model: Origins, Effectiveness, and Applications. BSCS, 1–19. https://media.bsos.org/bsosmw/5es/bscs_5e_executive_summary.pdf</p>
Day 3	<p>EQ:</p> <ul style="list-style-type: none"> 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? <p>Intro to LT2 & UBD chapter selection (<i>whole/part/whole</i>)</p> <p><i>In class time to work on LT1</i></p>	<p>Readings for LT3:</p> <p>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.), <i>Exploring the landscape of scientific literacy</i> (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</p> <p>https://www.taylorfrancis-com.ezproxy.lib.ucalgary.ca/chapters/edit/10.4324/9780203843284-9/scientific-literacy-knowledge-society-glen-aikenhead-graham-orpwood</p> <p>Driver, et al., (1994). Constructing Scientific Knowledge in the Classroom. <i>Educational Researcher</i> p. 5-12. http://www.jstor.org.ezproxy.lib.ucalgary.ca/stable/117693</p> <p>Reading for LT2:</p> <p>Harlen, W. (Ed.) (2010). <i>Principles and big ideas of science education</i>. p.21-23 https://www.ase.org.uk/bigideas</p> <p>Assigned Chapter for LT2 for next class:</p> <p>Wiggins, G. J. & McTighe, J. (2005). <i>Understanding by design</i> (2nd Edition) https://ebookcentral-proquest-com.ezproxy.lib.ucalgary.ca/lib/ucalgary-ebooks/detail.action?docID=3002118</p>
Day 4	<p>LT2 Introduction: Stage 1. Identify Desired Results (foundational knowledge, attitudes & skills).</p> <p>LT2: Wiggins & McTighe - Jigsaw Chpt. 3 to 10</p> <p><i>In class time to work on LT1</i></p>	

Day 5	<p>EQ: What does it mean to be a “designer” of learning?</p> <p>Stage 1. Identify Desired Results (foundational knowledge, attitudes & skills).</p> <p>LT#1: Workshops: schedule posted in D2L</p> <p>In class time to work on LT2, Stage 1</p>	<p>LT#1 Due: Friday, 9:00 am</p>
Day 6	<p>EQ: What does it mean to be a “designer” of learning?</p> <p>Stage 1. Identify Desired Results (foundational knowledge, attitudes & skills).</p> <p>LT#1: Workshops</p> <p>LT2: Wiggins & McTighe - Jigsaw Chpt. 3 to 5</p> <p>In class time to work on LT2, Stage 1</p>	<p>Resources for LT2: Alberta Education. (2017). Competencies: Descriptions and indicators. https://education.alberta.ca/competencies/descriptions-indicators/</p>
Day 7	<p>EQ: What will you accept as evidence that student understanding took place?</p> <p>Stage 2. Determine what constitutes acceptable evidence of competency in the outcomes and results (assessment).</p> <p>LT#1: Workshops</p> <p>LT2: Wiggins & McTighe - Jigsaw Chpt. 6 to 8</p> <p>In class time to work on LT2, Stage 2</p>	<p>Resources for LT2: Clinchot, M., Ngai, C., Huie, R., Talanquer, V., Lambertz, J., Banks, G., ... & Sevan, H. (2017). Better formative assessment. <i>The Science Teacher</i>, 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. <i>Science Teacher</i>, 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. <i>The Science Teacher</i>, 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</p>

Day 8	<p>EQ: How do you shift the responsibility of learning from the teacher to the students?</p> <p>Stage 3: Plan the Learning Experience and Instruction</p> <p>LT#1: Workshops</p> <p>LT2: Wiggins & McTighe - Jigsaw Chpt. 9 to 10</p> <p>In class time to work on LT2, Stage 3</p>	<p>Resources for LT2: Friesen, S. (2009). What did you do in school today? Teaching Effectiveness: A Framework and Rubric. Canadian Education Association.</p> <p>http://www.galileo.org/cea-2009-wdydist-teaching.pdf</p>
Day 9	<p>EQ: What does it mean to be a teacher of diversity?</p> <p>Stage 4: Learner differentiation</p> <p>LT#1: Workshops</p> <p>In class time to work on LT2, Stage 4</p>	<p>Resources for LT2: Alberta Education. (2010). <i>Making a difference: Meeting diverse learning needs with differentiated instruction</i>: Chapter 13 (Science)</p> <p>http://education.alberta.ca/media/1234045/makingadifference_2010.pdf</p> <p>Alberta Education. (nd). Benchmarks, strategies and resources for teachers of English language learners.</p> <p>http://www.learnalberta.ca/content/eslapb/</p>
Day 10	<p>EQ: What does it mean to be a reflective practitioner?</p> <p>Peer review of LT2</p>	<p>LT#2: Due: Friday, July 21, 9:00 am (for peer review). Final draft Monday, July 24</p> <p>LT#3: Due Monday, July 24</p>

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 Presentation (Group – pairs)**Due Date:** Friday, July 14 @ 9:00 am**Percentage of the Final Grade:** 30%**Length:** 45 minutes (30 min interactive workshop, 15 min. Q & A)

Intent of LT1: 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 should also be connected to 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 describes a phase of learning: Engage, Explore, Explain, Elaborate, and Evaluate. Please refer to: <https://lesley.edu/article/empowering-students-the-5e-model-explained>

Your presentation should focus on how these “understandings” will influence our pedagogical practices. Specifics for presentation format will be at the discretion of the presenter. A brief written component (i.e., speaking notes, PowerPoint presentation, or some other record of the ideas presented) along with references (APA 7th ed.) must be submitted to both **D2L-Discussion** and **D2L-Dropbox**.

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

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 Research Question			
Rationale: What and Why do you want to know “this” with respect to informing pedagogical practice?	The research 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 research 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 research 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)?	Presentation design is creative, highly engaging, and effectively supports the research question. All elements of the presentation effectively enhance key ideas (deliberate use of the 5Es in the design of the presentation). Audience provided with important resources for later consideration.	Overall presentation design is appealing and supports the basic development of conceptual ideas. Elements of the presentation adequately enhance key ideas (some indications of the 5Es were used in the design of the presentation). Handouts and other resources provided may not directly relate to central topic.	Design of the presentation is adequate but somewhat limited in the development of conceptual ideas. Content arrangement is somewhat confusing and does not adequately assist the participant in understanding order without further narration and support.

LT2: Designing an Annotated Discipline-based Learning and Assessment Plan
(Individual submission – work in pairs/triads to develop sequential lessons)**Due Date:** Friday, July 21, 9:00 am (for peer editing), Final submission, Monday, July 24**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 on a series of sequential lessons (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 grade 10 -12
 - a 60-minute class for grade 7 – 9
 - a 30 - 40-minute class for K- 6
- 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 resources and rubric to guide your annotation.**

Resources:Alberta Assessment Consortium: <https://aac.ab.ca/> Username: teachers Password: masterDoucette Library – Library guide for lesson planning: http://libguides.ucalgary.ca/lesson_planning_resourcesWiggins, 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
For each of the criteria below, your annotation will be part of the assessment. You must clearly state why/how this point in the plan reflects the criteria's critical element within the design approach (UbD).				
Making your thinking visible: Why are you doing what you are doing?	Annotations display little understanding of the role of planning in lesson design and lacks analysis.	Annotations display some understanding of the role of planning in lesson design but lacks analysis.	Annotations display a competent understanding, if not analysis, of the role of planning in lesson design.	Annotations display a sophisticated and elegant understanding and analysis of the role of planning in lesson design.
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? (20%)				
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 fabric of teaching and learning. Appropriate criterion-based scoring tools are used to evaluate student products and performances.
Learning Outcomes	Assessment does not match learning outcomes from Lesson Rationale.	Limited match between assessment and learning outcomes from Lesson Rationale.	Assessment closely matches the learning outcomes from Lesson Rationale.	Assessment is directly matched to learning outcomes from Lesson Rationale.

Clear criteria are established	Assessment criteria are shared after the work has been graded.	Assessment criteria are developed by the teacher and fully explained to students before the work begins.	Assessment criteria are collaboratively designed with students to ensure that everyone has input and understands the learning expectations	Assessment criteria are collaboratively designed with students and mediated by or added to by experts or expertise within the discipline to 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? (20%)				
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 existing 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 the discipline embodies, making meaningful connections and building deep understandings.
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 the discipline and other experts around real problems, issues, questions or ideas that are of actual 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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? (20%)				
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: Monday, July 24

Percentage of the Final Grade: 25%

Format: 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 course and personal experience in learning science.

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	Insights and understandings are introduced, clearly communicated, and the focus is strongly maintained for the purpose of knowledge building.	Insights and understandings are clear, and the focus is maintained for the purpose of knowledge building.	Insights and understandings are generally clear, but the focus may be insufficiently sustained for the purpose of knowledge building.	Insights and understandings 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, readings, conversations, and personal experiences to open new possibilities in understanding. Demonstrates skillful use of high quality, credible, relevant sources to develop ideas that are appropriate for the discipline. Cites all content obtained from other sources. APA 7 citation style is accurate.	Demonstrates consistent use of information from LT1 with credible, relevant sources to support ideas that are situated within the discipline. Cites most content obtained from other sources. APA 7 citation style is accurate.	Demonstrates an attempt to use information from LT1 with credible and/or relevant sources to support ideas that are appropriate for the discipline. Cites some content obtained from other sources. Citation style is either inconsistent or incorrect.	Does not use information from LT1 with credible and/or relevant sources to support ideas that are appropriate for the discipline. Does not cite sources.

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.
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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>

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](https://www.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 Claire Gillis, esa@ucalgary.ca.

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