Erin Spring

**EDUC 535.09 S01 Specialization II: Elementary
Science Fall 2025**

Land Acknowledgement: *The University of Calgary, located in the heart of Southern Alberta, both acknowledges and pays tribute to the traditional territories of the peoples of Treaty 7, which include the Blackfoot Confederacy (comprised of the Siksika, the Piikani, and the Kainai First Nations), the Tsuut'ina First Nation, and the Stoney Nakoda (including Chiniki, Bearspaw, and Goodstoney First Nations). The City of Calgary is also home to the Métis Nation of Alberta (Districts 5 and 6).*

Class Dates: Sept 3 – Oct 24, 2025

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 the Undergraduate Programs in Education office for questions related to pre-requisite courses.

Office Hours: Available before or after class or by appointment. Office hours will be held primarily in person unless otherwise requested to use zoom.

Email: Students are required to use a University of Calgary (@ucalgary.ca) email address for all correspondence. **Please, always add "[EDUC 535]" in the subject line of your e-mail so I can prioritize your communication (ex. "[EDUC535] Learning Task 1 question").**

COURSE THEME: METAPHORS, MYTHS, AND MISCONCEPTIONS IN SECONDARY SCIENCE TEACHING

COURSE DESCRIPTION:
The intent of the Specialization Seminar II is to deepen your understanding of the practical aspects of teaching within the specialization and to connect this practice with specific theoretical concepts. While this second specialization course focuses more on practical knowledge, you will also refine your knowledge of discourse and theory within the discipline and develop a deeper understanding of ways to enact this theory in a classroom context. You will additionally become familiar with any relevant Ministry documents associated with the Alberta Curriculum and draw on practical classroom observation from the field experience to participate in meaningful discussion and to connect these observations with a vision for your own teaching. The emphasis of the course is on designing for student learning (subject-specific; assessment to strengthen student learning and improve instruction; and designing for inclusion, differentiation, and inquiry).

Learner Outcomes:

Over the course of the semester, students will:

1) Further develop a deeper conceptual understanding of the historical, socio-cultural, political contexts of the *discipline of Science Education*, and relate this to curriculum planning in the specialization area;

2) Identify and critique the *key learning perspectives* (as outlined in the front matter of the Programs of Study) and *intentions* (learning objectives) across the units in a grade from the Alberta Programs of Studies;

3) Successfully apply theoretical knowledge to the design of a longer-term unit and assessment plan.

Extended Course Overview:

The intent of the Specialization Seminar II is to deepen students' understanding of the practical aspects of teaching within the specialization of science and to connect this practice with specific theoretical concepts and broader social contexts. In this course, students will be provided with opportunities to refine their knowledge of theories and pedagogies within the science classroom context.

Special emphasis will be placed in presenting concepts and models that can provide learners with an opportunity to learn how complex systems function and to understand that solutions to current global problems require a science that integrates an interdisciplinary approach accommodating multiple, and often divergent, perspectives.

Students will also become familiar with relevant Ministry documents associated with the Alberta Curriculum and draw on practical experiences of science education to participate in meaningful discussions and to connect these observations with a vision for their own teaching. The emphasis of the course is on designing for student learning in science (subject-specific; assessment to strengthen student learning and improve instruction; and designing for inclusion, differentiation, and inquiry).

Course Design and Delivery This course will be delivered face-to-face on campus with possible engagement in a D2L environment. The course will be delivered through a design-based and inquiry-focused approach where learning intent, expectations and assessment processes are made visible and transparent. Participation is crucial to the knowledge building in this course. Students will require access to a computing device that contains current software and hardware capable of running D2L, creating documents for learning tasks, and ability to run free programming platform software such as Scratch. If you do not own a personal device, there are computers available for student use in the Doucette library and the Taylor Family Digital Library.

After the *course is completed*, you may be invited to participate in research involved in this course. The instructors will not know whether you will be participating in the research.

Generative AI: In this course, our primary focus is to cultivate an equitable, inclusive, and accessible learning community that emphasizes individual critical thinking and problem-solving skills. As such, students are expected to complete Learning Tasks, tests, and other academic evaluations using their own knowledge and abilities. However, I will not be using any form of plagiarism detection or AI detection tools, so course participants may use artificial intelligence tools, including generative AI, to gather information, review concepts, and/or to help create Learning Task outlines as they see fit. However, (1) it is the student's responsibility to inform the instructor in writing of the intention to use such technology in advance of its use; (2) the student is ultimately accountable for the work they submit; (3) any content generated or supported by an artificial intelligence tool must be cited appropriately; and (4) the instructor reserves the right to deny any uses of generative AI determined to be harmful or against the goals of learning. It is the student's responsibility to be clear on the limitations on the use of generative AI tools for each task or assessment, on the expectations for citation and referencing, and on fact checking statements created by generative AI tools. If you are in doubt as to the use of generative AI tools in this course, please discuss your situation with the course instructor. Misuse of these tools will be considered academic misconduct and will be treated as such.

As a general guideline, I liked this excerpt of when using AI crosses the line from Daniel Stanford:

> *You should never include in your assignment anything that was not written directly by you without proper citation (including quotation marks and in-line citation for direct quotes). Including anything you did not write in your assignment without proper citation will be treated as an academic misconduct case.*
>
> *If you are unsure where the line is between collaborating with AI and copying from AI, we recommend the following heuristics:*
>
> - *Never hit "Copy" within your conversation with an AI assistant. You can copy your own work into your conversation, but do not copy anything from the conversation back into your assignment. Instead, use your interaction with the AI assistant as a learning experience, then let your assignment reflect your improved understanding.*
>
> - *Do not have your assignment and the AI agent itself open on your device at the same time. Similar to above, use your conversation with the AI as a learning experience, then close the interaction down, open your assignment, and let your assignment reflect your revised knowledge.*
>
> *This heuristic includes avoiding using AI assistants that are directly integrated into your composition environment: just as you should not let a classmate write content or code directly into your submission, so also you should avoid using tools that directly add content to your submission. Deviating from these heuristics does not automatically qualify as academic misconduct; however, following these heuristics essentially guarantees your collaboration will not cross the line into misconduct.*

Required Resources: All required resources can be found in the weekly schedule. Additional class readings and other support resources will be posted on the course shell in D2L prior to class. It is your responsibility to keep up with materials and announcements posted on D2L.

Learning Task Overview:

LT	DESCRIPTION OF LEARNING TASK	GROUPING	WEIGHT	DUE DATE
#1	Inquiry into Metaphor/Myth of Science Project	Individual	30%	Sept. 26
#2	Unit and Assessment Plan	Group & Individual	40%	Oct. 24
#3	Evolving Conceptual Understanding of Science	Individual	30%	Oct. 24

Tentative Schedule of weekly activities/readings (topics, activities, and readings subject to change)

Date	Topics/Themes	Readings and Learning Tasks
Week 1 - September 3 **Introductions, Class Information, Expectations, and General Overview**	Welcome & Introductions Course overview Students Understanding of Science Goals of Teaching Science in North American Schools	**Be generally familiar with:** 1. This document 2. The Alberta Science Programs of Study **Required Reading** 3. Rudolph, J. L. (2014). Dewey's "science as method" a century later: Reviving science education for civic ends. American Educational Research Journal, 51(6), 1056-1083. https://journals-sagepub-com.ezproxy.lib.ucalgary.ca/doi/full/10.3102/0002831214554277 4. Iwuanyanwu, P. N. (2019). What We Teach in Science, and What Learners Learn: A Gap That Needs Bridging. *Pedagogical Research*, *4*(2). https://www.pedagogicalresearch.com/download/what-we-teach-in-science-and-what-learners-learn-a-gap-that-needs-bridging-5780.pdf 5. Rennie, L. J. (2005). Science awareness and scientific literacy. *The Journal of the Australian Science Teachers Association 51(1)*, 10-14. https://espace.curtin.edu.au/handle/20.500.11937/31481 **Suggested Readings that might help with Learning Tasks** 6. Beach, R. (2023). Addressing the Challenges of Preparing Teachers to Teach about the Climate Crisis. *The*

		Teacher Educator, 1-16. https://www-tandfonline-com.ezproxy.lib.ucalgary.ca/doi/full/10.1080/08878730.2023.2175401 7. Rudolph, J. L. (2024). Scientific literacy: Its real origin story and functional role in American education. *Journal of Research in Science Teaching, 61*(3), 519-532. https://onlinelibrary-wiley-com.ezproxy.lib.ucalgary.ca/doi/full/10.1002/tea.21890
Week 2 - September 10 **Metaphors of Science** **Guest Lecture by Dr. Glenn Dolphin**	Social Nature of Science Teaching Intentional Language in Teaching Science	**Required Reading** 1. Beger, A., & Olaf, J. Ã. (2015). The cognitive role of metaphor in teaching science: Examples from physics, chemistry, biology, psychology and philosophy. Philosophical Inquiries, 3(1), 89-112. https://philinq.it/index.php/philinq/article/view/116 *[WARNING: Section 4.2 Evolutionary Psychology is a bit of a shock moment as it is all about metaphors in reproductive science. I have chosen to keep it in because part of being a science teacher/elementary teacher is talking about reproduction, but just did not want to leave you without a bit of a heads up!]* 2. Amin, T. G. (2020). Coordinating metaphors in science, learning and instruction. How metaphors guide, teach and popularize science, 6, 73. https://library.oapen.org/bitstream/handle/20.500.12657/63290/external_content.pdf?sequence=1 **Suggested Readings that might help with Learning Tasks** 3. Taber, K. (ND). Science metaphors. Science Education Research. https://science-education-research.com/teaching-science/constructivist-pedagogy/making-the-unfamiliar-familiar/science-metaphors/ 4. New York Science Teacher Common Science Misconceptions https://newyorkscienceteacher.com/sci/pages/miscon/subject-index.php

| Week 3 - September 17

Science is Grounded in Context and History

Field Trip to the Foothills Drainage Pond | Place-Based Learning and Experiential Learning

Field Activities in Teaching Science

Threading Indigenous Science Throughout Science Teaching | **Required Reading**
1. Sobel, D. (2004). Place-based education: Connecting classroom and community. *Nature and listening*, *4*(1), 1-7. Reprinted in *Green Living: A Practical Journal of Mindful Living* (Winter 2012-2013) https://www.greenlivingpdx.com/place-based-education/
2. Canadian Commission for UNESCO. (2021, June 21). *Land as teacher: Understanding indigenous land-based education*. Canadian Commission for UNESCO. https://en.ccunesco.ca/idealab/indigenous-land-based-education
3. Kimmerer, R. W. (2013). Asters and Goldenrod. In *Braiding sweetgrass: Indigenous wisdom, scientific knowledge and the teachings of plants*. Milkweed editions. https://ebookcentral-proquest-com.ezproxy.lib.ucalgary.ca/lib/ucalgary-ebooks/detail.action?docID=1212658
4. Zangori, L., Forbes, C., & Biggers, M. (2012). This Is Inquiry... Right?. Science and Children, 50(1), 48-53. https://ezproxy.lib.ucalgary.ca/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=sch&AN=79310878&site=ehost-live

Suggested Readings that might help with Learning Tasks
5. Sutherland, D., & Swayze, N. (2012). The importance of place in indigenous science education. Cultural Studies of Science Education, 7, 83-92. https://link-springer-com.ezproxy.lib.ucalgary.ca/article/10.1007/s11422-011-9371-1 |
| **Week 4 - September 24**

Unit Planning in High School Science | Designing a Unit and Assessment Plan

Identify and Critique Key Learning Perspectives in the | **Learning Task 1 Due Friday, September 26th - 30%**

Required Reading
1. 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 |

	Alberta Program of Studies	2. Wiggins, G. (2005). Understanding by design: Overview of UbD & the design template. https://wpvip.edutopia.org/wp-content/uploads/2022/10/stw-normal-park-normal-understanding-by-design.pdf 3. Enger, S. K., & Yager, R. E. (2009). Assessing student understanding in science: A standards-based K-12 handbook. Corwin Press (Chapter One, pages 1-11). https://ebookcentral-proquest-com.ezproxy.lib.ucalgary.ca/lib/ucalgary-ebooks/reader.action?docID=1104962&ppg=16 4. *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* 5. Alberta Education. (nd). Benchmarks, strategies and resources for teachers of English language learners. http://www.learnalberta.ca/content/eslapb/ **Suggested Readings that might help with Learning Tasks** 6. Harlen, W. (2015). Working with Big Ideas of Science Education. Hatfield, UK: Association for Science Education. Chapter 3-4 (pp 11-33) https://www.interacademies.org/publication/working-big-ideas-science-education 7. 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 8. *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.asp*

		x?direct=true&db=sch&AN=26377643&site=ehost-live
Week 5 - October 1 **Making Use Of Experts and Access To Resources** **Field Trip to the Calgary Zoo**	Field Activities in Teaching Science	**Required Reading** 1. Behrendt, M. & Franklin, T. (2014). A review of research on school field trips and their value in educatio*n*. *International Journal of Environmental and Science Education*, *9*(3), 235-245. https://eric.ed.gov/?id=EJ1031445 2. Calgary Board of Education. (2023). Off-site Activities Procedures Manual. [Provided on D2L]
Week 6 - October 8 **Science Activities and Experiments for Elementary Students**	Science Activity Planning and assessment Teaching Science using Experiments	**Required Reading** 1. Lachapelle, C.P., Sargianis, K., & Cunningham, C.M. (2013). Engineer it, learn it: science and engineering practices in action. Science and Children, 51(3), 70-76. http://ezproxy.lib.ucalgary.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=ehh&AN=91710125&site=ehost-live 2. Keeley, P. (2020). "Doing" science vs. "doing" engineering. Science and Children, 57(6), 16-18. https://ezproxy.lib.ucalgary.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=ehh&AN=141705443&site=ehost-live 3. Alonso Yanez, G., Thumlert, K., de Castell, S., & Jenson, J. (2019). Towards a production pedagogy model for critical science and technology interventions. *Critical, transdisciplinary and embodied approaches in STEM education*, 41-60. https://link-springer-com.ezproxy.lib.ucalgary.ca/chapter/10.1007/978-3-030-29489-2_3 **Suggested Readings that might help with Learning Tasks** 4. Abrahams, I., & Millar, R. (2008). Does practical work really work? A study of the effectiveness of practical work as a teaching and learning method in school science. International Journal of Science Education, 30(14), 1945-1969. https://www-tandfonline-

		com.ezproxy.lib.ucalgary.ca/doi/full/10.1080/09500690701749305 1. Galileo Educational Network. (nd). Guide to Assessing Critical Thinking. http://www.galileo.org/tips/rubrics/ct_rubric.pdf 2. Galileo Educational Network. (nd). Designing rubrics. Focus on Inquiry. https://inquiry.galileo.org/ch3/designing-rubrics/ 3. Trauth-Nare, A., & Buck, G. (2011). Assessment for learning. The Science Teacher, 78(1), 34-39. https://ezproxy.lib.ucalgary.ca/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=sch&AN=61794775&site=ehost-live
Week 7 - October 15 **Inclusion and Equity in the Science Classroom**	Inclusion and Equity in the Science Classroom	**Required Reading** 1. Brownell, C. J. (2017). Starting where you are, revisiting what you know: A letter to a first-year teacher addressing the hidden curriculum. *Journal of Curriculum and Pedagogy*, *14*(3), 205-217. https://www-tandfonline-com.ezproxy.lib.ucalgary.ca/doi/full/10.1080/15505170.2017.1398697 2. Supalo, C. A., Isaacson, M. D., & Lombardi, M. V. (2014). Making hands-on science learning accessible for students who are blind or have low vision. Journal of Chemical Education, 91(2), 195-199. https://pubs-acs-org.ezproxy.lib.ucalgary.ca/doi/full/10.1021/ed3000765 3. Dixon, S. (2005). Inclusion—Not segregation or integration is where a student with special needs belongs. The Journal of Educational Thought (JET)/Revue de La Pensée Éducative, 33-53. https://ezproxy.lib.ucalgary.ca/login?qurl=https%3A%2F%2Fwww.proquest.com%2Fscholarly-journals%2Finclusion-not-segregation-integration-is-where%2Fdocview%2F213807077%2Fse-2%3Faccountid%3D9838 4. Moore, S. (2017). *One without the other: Stories of unity through diversity and inclusion* (Vol. 1). Portage & Main Press.

		Suggested Readings that might help with Learning Tasks
Week 8 - October 23 **Course Debrief and LT3 Showcase**	Course Debrief Field Experience Prep Conversation Conceptualization of Science Teaching Work Period	**Learning Task 2 Due Friday, October 24th - 40%** **Learning Task 3 Due Wednesday October 24th, -30%** **Required Reading** 1. 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

Learning Tasks

The course is structured around the completion of three Learning Tasks. The Learning Task descriptions and assessment details will be discussed in class. The instructor will facilitate the ongoing work and will support students as they engage in the Learning Tasks by providing ongoing, timely and constructive feedback to further learning.

I. Learning Task 1: Inquiry into Metaphor/Myth/Misconception of Science Project, 30%, Due: Friday, September 26th

For this Learning Task, students will explore a Science Metaphor/Myth encountered at the secondary level in the student's teachable area as well as the conceptions/misconceptions that may arise from its usage in teaching. The Metaphors/Myths chosen for this Learning Task should emerge from class activities, engagement with peers & class readings, and should, ideally, be connected to the development of the longer-term unit plans. Students will investigate the topic through research into resources within the discipline and through peer discussion of personal experiences and observations. The choice of metaphors/myths for this Learning Task are up to each individual student based on their own interests, although https://science-education-research.com/teaching-science/constructivist-pedagogy/making-the-unfamiliar-familiar/science-metaphors/ is a good starting place for ideating if they get stuck.

Artifacts of Learning Task 1 will be shared electronically via D2L Discussion Board on the date due. This post can include text, visuals, media, links, or any other medium allowed by D2L. Students should be creative in the development of this post. Submission components for the **Inquiry into Metaphor/Myth of Science Project** will include:

1. A starting explanation of your chosen Metaphor/Myth including a clear statement of the curricular concepts connected to it, an explanation of what makes it a Metaphor/Myth, and some conceptions/misconceptions that arise from using it in teaching.
2. A brief summary of your thoughts as a developing teacher on your chosen Metaphor/Myth as well as new or further questions raised as a result of your learning. Include a digital collection illustrating your developing thoughts through the process of exploring your Metaphor/Myth. You can create these and/or share existing links or examples (where copyright permits). The connection to your Metaphor/Myth should be made clear.
3. A list of resources used in the project completion (APA 7th edition).
4. Two responses to posts by classmates on D2L of your own thoughts on their Metaphor/Myth as a developing teacher.

Grading Criteria for Learning Task 1

For Learning Task 1, you will be assessed based on the following criteria (which will be expanded on in a rubric posted to D2L)

1. Quality and meaningfulness of Metaphor/Myth and resources used in investigation
   - Metaphor/Myth is articulated clearly, insightfully, and completely.
   - Metaphor/Myth is clearly connected to the Alberta Science Curriculum.
   - Metaphor/Myth is meaningful to teaching high school science.
   - Argument demonstrates an emerging understanding of concepts and theories related to the teaching of the discipline.
   - Submission includes at least 3 peer reviewed references.

2. Overall Presentation of Metaphor/Myth
   - Metaphor/Myth is presented in an organized, clear, and succinct way.
   - Thoughts as a developing teacher are presented with "I statements" and demonstrate a growing understanding of science teaching.
   - Resources are cited correctly and embedded when relevant.

3. Quality of responses to classmates
   - Responses to peers are thoughtful and representative of a growing teacher identity.

II. Learning Task 2: Design of a Unit and Assessment Plan, 40%, Due: Friday, October 24th

For this Learning Task, students will work individually or in small groups to design a set of unit learning plans that are illustrative of key aspects of curriculum and educational research introduced in the course. Students will then present on their Unit Plan designs as a group showcase in order to build the collective teacher toolbox of the class. Ideally, students will select the unit they will explore based on their work on their Metaphors/Myths submitted for Learning Task 1 and design a larger unit plan around that topic, although this is not a requirement. These unit plans may take any form chosen by the groups/individuals (such as around a specific project, a unit as distinguished in the Alberta Programs of Study, or other design choice). Additionally, all unit plans must contain one planned field trip relevant to the chosen topic. This field trip will be outlined and documented through a template that will be provided on D2L based on CBE requirements.

Artifacts of Learning Task 2 will be submitted individually, shared electronically via a digital folder to be uploaded on D2L on the date due. This post can include text, visuals, media, links, or any other medium allowed by D2L. Submission components for the **Design of a Unit and Assessment Plan** will include:

1. You will individually design a Unit Plan for learning and assessment to foster deep understanding of science at the secondary level. Submission of this plan will be in the form of a .doc AND a .pdf file submission based on a provided (or approved) template. Components of this submission will include a rationale for the learning plan, as supported by theory and discipline discussed in and beyond the course, discussion of practicalities of enacting this Unit Plan (i.e. how it fits it into a larger context/concept), and consideration for integration of effective formative assessment strategies for scaffolding/learning progression and adapting to the needs of diverse learners.
2. You will individually research, plan, and document a field trip activity that builds into your unit plan submission using a provided template based on CBE requirements. Submission of this plan will be in the form of a .doc AND a .pdf file submission. Components of this submission will include a rationale for the field trip plan, as supported by theory and discipline discussed in and beyond the course, discussion of practicalities of running this field trip (i.e. safety considerations), and consideration for adapting to the needs of diverse learners.

Grading Criteria for Learning Task 2

For Learning Task 2, you will be assessed based on the following criteria (which will be expanded on in a rubric posted to D2L)

1. Quality of unit structure
- Unit plans cover the entirety of a single unit of elementary or middle school instruction (7-10 weeks of 45-minute daily classes) with direct connections to the Alberta Science Curricula.
- Considerations are embedded of required prior content knowledge, skills, or other considerations for each lesson, activity, and the unit itself.
- Assessment opportunities (formative and summative) are embedded throughout the unit design with clear expectations for students

2. Recognition of diversity
- Unit plan includes considerations of accessibility and understanding inclusion within school systems.
- Unit plan includes opportunities for discussion of multiple ways of knowing.

3. Overall Presentation of Unit Plan
- Unit Plan is presented in an organized, clear, and succinct way.
- Resources are cited correctly and embedded when relevant.

4. Showcase presentation of Unit Plan
- Presentation is organized, clear, and succinct.
- Unit plans are presented in ways that other classmates might be able to adapt them into their own teaching.
- Resources are cited correctly and embedded when relevant.

III. Learning Task 3: Evolving Conceptual Understanding of Science, 30%, Due Friday, October 24th

Part A) As a developing teacher, you are expected to engage in and contribute to learning opportunities as a professional. In this course, this looks like: completing course readings and engaging in reading discussions, completing D2L discussion board posts as they arise, and attending opportunities for learning as a part of the course. In particular, this will include planning and bringing a station activity for class on Week 6 (October 8th) and attending the field trips on September 17th and September 24th. Grading for Part A of LT3 will be by completion only.

Part B) For this Learning Task, students will respond to the prompt of "**Your changing conceptualization of science**" as a way of reflecting thoughtfully on the pedagogical content knowledge in their subject area. Responses may take a number of forms, such as: an academic essay, an imagined Socratic dialogue between a teacher and student, an illustrated story, an animation, a short video or podcast, or other approved model. However, all responses must be persuasive – that is, students must fashion a personal stance on the prompt and then set out to persuade the reader of their interpretation using *relevant and varied evidence.* At a minimum, all responses must refer to the Alberta Education Programs of Study and at least 3 articles or chapters read during the course. In addition to these sources, you may also want to draw upon discussions in your class inquiry groups, additional readings from this and other courses, and observations made during your field experiences.

Artifacts of Learning Task 3 will be submitted individually, shared electronically via a digital folder to be uploaded on D2L on the date due. This post can include text, visuals, media, links, or any other medium allowed by D2L. Submission components for the **Evolving Conceptual Understanding of Science Task** will include:

1. You will submit a single file, link to a webpage, or folder submission of whatever you chose to create as your response to the prompt.

Grading Criteria for Learning Task 3
For Learning Task 3, you will be assessed based on the following criteria (which will be expanded on in a rubric posted to D2L)
1. Quality of Argument
- Argument is articulated clearly, insightfully, and persuasively.
- Argument demonstrates an emerging understanding of concepts and theories related to the teaching of the discipline.
- Submission includes at least 3 peer reviewed references.
2. Overall Presentation of Submission
- Submission is presented in an organized, clear, and succinct way.
- Submission uses an appropriate mode of expression for the argument being made.
- Resources are cited correctly and embedded when relevant.

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.

- *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

Missing or Late Submissions

All late submissions of assignments must be discussed with the instructor prior to the due date. A deferral of up to 30 days may be granted at the discretion of the Associate Dean of Undergraduate Programs prior to the end of the course with accompanying written evidence. https://calendar.ucalgary.ca/pages/jyekfh6xwhoHwxcetCi1

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 https://calendar.ucalgary.ca/pages/fc4adb8643f84441ab32300237b80df1

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

Academic Misconduct

Academic Misconduct refers to student behavior which compromises proper assessment of a student's academic activities and includes cheating; fabrication; falsification; plagiarism; unauthorized assistance; failure to comply with an instructor's expectations regarding conduct required of students completing academic assessments in their courses; and failure to comply with exam regulations applied by the Registrar.

For information on the Student Academic Misconduct Policy and Procedure please visit:

https://www.ucalgary.ca/legal-services/university-policies-procedures/student-academic-misconduct-policy

https://www.ucalgary.ca/legal-services/university-policies-procedures/student-non-academic-misconduct-policy

Additional information is available on the Academic Integrity Website at: https://ucalgary.ca/student-services/student-success/learning/academic-integrity

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://ucalgary.ca/student-services/access/prospective-students/academic-accommodations.

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: https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Accommodation-for-Students-with-Disabilities-Procedure.pdf

Research Ethics

Students are advised that any research with human participants – _including any interviewing (even with friends and family), opinion polling, or unobtrusive observation – _must have the approval of the Conjoint Faculties Research Ethics Board (https://research.ucalgary.ca/conduct-research/ethics-compliance/human-research-ethics/conjoint-faculties-research-ethics-board-cfreb) or the Conjoint Health Research Ethics Board https://research.ucalgary.ca/conduct-research/ethics-compliance/human-research-ethics/conjoint-health-research-ethics-board-chreb)

In completing course requirements, students must not undertake any human subjects research without discussing their plans with the instructor, to determine if ethics approval is required. Some courses will include assignments that involve conducting research with

human participants; in these cases, the instructor will have applied for and received ethics approval for the course assignment. The instructor will discuss the ethical requirements for the assignment with the students.

For further information see E.5 Ethics of Human Studies
https://calendar.ucalgary.ca/pages/627ed88eb4b041b7a2e8155effac350

Instructor Intellectual Property
Course materials created by instructors (including presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the instructor. These materials may NOT be reproduced, redistributed or copied without the explicit consent of the instructor. The posting of course materials to third party websites such as note-sharing sites without permission is prohibited. Sharing of extracts of these course materials with other students enrolled in the course at the same time may be allowed under fair dealing.

Freedom of Information and Protection of Privacy
Student information will be collected in accordance with typical (or usual) classroom practice. Students' assignments will be accessible only by the authorized course faculty. Private information related to the individual student is treated with the utmost regard by the faculty at the University of Calgary. For more information, please see:
https://www.ucalgary.ca/hr/work-compensation/working-ucalgary/freedom-information-and-privacy-act

Copyright Legislation
All students are required to read the University of Calgary policy on Acceptable Use of Material Protected by Copyright (https://www.ucalgary.ca/legal-services/university-policies-procedures/acceptable-use-material-protected-copyright-policy) and requirements of the copyright act (https://laws-lois.justice.gc.ca/eng/acts/C-42/index.html) to ensure they are aware of the consequences of unauthorised sharing of course materials (including instructor notes, electronic versions of textbooks etc.). Students who use material protected by copyright in violation of this policy may be disciplined under the Non-Academic Misconduct Policy https://www.ucalgary.ca/legal-services/university-policies-procedures/student-non-academic-misconduct-policy.

Sexual and Gender-Based Violence Policy
The University recognizes that all members of the University Community should be able to learn, work, teach and live in an environment where they are free from harassment, discrimination, and violence. The University of Calgary's sexual violence policy guides us in how we respond to incidents of sexual violence, including supports available to those who have experienced or witnessed sexual violence, or those who are alleged to have committed sexual violence. It provides clear response procedures and timelines, defines complex concepts, and addresses incidents that occur off-campus in certain circumstances. Please see

the policy available at https://www.ucalgary.ca/legal-services/university-policies-procedures/sexual-and-gender-based-violence-policy

Other Important Information
Please visit the Registrar's website at: https://www.ucalgary.ca/registrar/registration/course-outlines for additional important information on the following:
• Wellness and Mental Health Resources
• Student Success
• Student Ombuds Office
• Student Union (SU) Information
• Graduate Students' Association (GSA) Information
• Emergency Evacuation/Assembly Points
• Safewalk

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 Tracy Dinh, esa@ucalgary.ca.

Werklund SU Representative is Siena Yee, educrep@su.ucalgary.ca.