AB

EDUC 427.03: STEM Education – Secondary

Fall, 2020

Year Coordinator: Miwa Takeuchi				miwa.takeuchi@ucalgary.ca
Section	**Instructor**	**Zoom Dates**	**Zoom Time**	**Email**
S01	Paulino Preciado Babb	Sept. 10, 29 Oct. 29 Nov. 24	8:00-9:30	apprecia@ucalgary.ca
S02	Paulino Preciado Babb	Sept. 10, 29 Oct. 29 Nov. 24	2:00-3:30	apprecia@ucalgary.ca
S03	Olive Chapman	Sept. 11, 28 Oct. 30 Nov. 23	9:30-11:00	chapman@ucalgary.ca
S04	Marie-Claire Shanahan	Sept. 11, 28 Oct. 30 Nov. 23	2:00-3:30	mcshanah@ucalgary.ca
S05	Jeff Turner	Sept. 11, 28 Oct. 30 Nov. 23	3:30-5:00	turnej@ucalgary.ca

Class Dates: September 8 – December 9
Field Experience Dates: October 12-23
No class: Term Break, November 8 – 14

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: By appointment directly with your instructor

COURSE DESCRIPTION:

EDUC 427 (STEM Education): This course provides an introduction to key elements of Science, Technology, Engineering, and Mathematics (STEM) education, including curriculum, pedagogy, standards and assessment. This interdisciplinary course is for all first-year education students. The intent of the course is to foster an understanding of how STEM can inform and be used to shape teaching and learning across grade levels and subject areas. In so doing, participants will attend to STEM's role in culture and society.

LEARNER OUTCOMES:

In this course, students will:

1) Develop a foundational understanding of the nature of discourse in STEM disciplines as related to teaching and learning, including STEM literacy, STEM identity, and transferring understandings across disciplines;
2) Understand and appreciate how the engineering design process can contribute to teaching and learning mathematics and science;
3) Design learning environments in STEM;
4) Identify concepts and make explicit the connections across disciplines; and,
5) Apply introductory literature related to the teaching of STEM with an emphasis on the implementation of resources, the classroom environment, diverse and innovative methods of teaching within STEM, and an introduction to the Alberta Programs of Study.

COURSE DESIGN AND DELIVERY:

This online course is delivered through a design-based and inquiry-focused approach. Student participation is crucial to the knowledge building in this course. Students are expected to participate in synchronous meetings organized as whole-class ZOOM sessions and in asynchronous conversations via the discussion forums (blogs) in Desire2Learn (D2L). Assessment is both formative and summative based on rubrics for the four Learning Tasks. D2L will be used to post class information and for submitting assignments. You will need a device that supports online audio (and preferably video) communication.

You may be invited to participate in research involved in this course. However, a consent process will be put in place so that the instructors will not know whether you will be participating in the research until after the end of the course, when grades have been submitted.

REQUIRED READINGS:

Alberta Education (2014). *Program of Study: Mathematics Kindergarten to Grade 9*. Edmonton: Government of Alberta. https://education.alberta.ca/media/3115252/2016_k_to_9_math_pos.pdf

Alberta Education (2008). *Program of Study: Mathematics Grade 10 to Grade 12*. Edmonton: Government of Alberta. https://education.alberta.ca/media/564028/math10to12.pdf

Alberta Education (2003/2009/2014). *Program of Study: Sciences Grades 7-8-9*. Edmonton: Government of Alberta. https://education.alberta.ca/media/3069389/pos_science_7_9.pdf

Davis, B., Francis, K., & Friesen, S. (2019). *STEM Education by design: Opening horizons of possibility*. New York: Routledge. https://ebookcentral-proquest-com.ezproxy.lib.ucalgary.ca/lib/ucalgary-ebooks/detail.action?docID=5763030

Galileo Educational Network. (n.d.). *Designing learning*. Retrieved from https://galileo.org/designing-learning/

Piggott, J. (2014). *Rich tasks and contexts*. http://nrich.maths.org/5662

Truesdell, P. (2014). The engineering design process. In *Engineering essentials for STEM instruction: How do I infuse real-world problem solving into science, technology, and math?* (pp. 7-15) Alexandria, VA: ASCD. [library e-version available] http://ebookcentral.proquest.com.ezproxy.lib.ucalgary.ca/lib/ucalgary-ebooks/reader.action?ppg=12&docID=1709532&tm=1500497319721

Defining STEM Education (One or both of the following readings will be assigned by your instructor)

Shanahan, M. C., Burke, L. E. C. A., & Francis, K. (2016). Using a boundary object perspective to reconsider the meaning of STEM in a Canadian context. *Canadian Journal of Science, Mathematics and Technology Education*, *16*(2), 129-139. https://doi-org.ezproxy.lib.ucalgary.ca/10.1080/14926156.2016.1166296

Alonso Yanez, G., Thumlert, K., de Castell, S., & Jenson, J. (2019). Toward a production pedagogy model for critical sciences and technology interventions. In P. Sengupta., M.-C. Shanahan., & B. Kim (Eds.). *Critical, transdisciplinary and embodied approaches in STEM education* (pp. 41–60). New York, NY: Springer. https://ebookcentral-proquest-com.ezproxy.lib.ucalgary.ca/lib/ucalgary-ebooks/reader.action?docID=6000776&ppg=57

Note: Other required readings will be assigned by your instructor from the following Reading List. Please check your class D2L shell. Additional readings may be assigned by your instructor according to the emergent needs and particular course design for each section.

Resources for Rich Mathematics Problems

Banks, R. B. (2012). *Slicing pizzas, racing turtles, and further adventures in applied mathematics* (Reissue edition.). Princeton, NJ: Princeton University Press. [e-book in library] https://ucalgary-primo.hosted.exlibrisgroup.com/permalink/f/1jj5gu9/01UCALG_ALMA51642646240004336

Banks, R. B. (2013). *Towing icebergs, Falling dominoes, and other adventures in applied mathematics* (Reissue edition.). Princeton, NJ: Princeton University Press.[e-book in library] http://ebookcentral.proquest.com.ezproxy.lib.ucalgary.ca/lib/ucalgary-ebooks/detail.action?docID=1084830

Galileo Educational Network (2019) *Math*. Available: http://galileo.org/classroom-examples/math/math-fair-problems/

Hamilton, G. (2017) *Math pickle*. Available: http://mathpickle.com

Moskowitz. (2003). *Adventures in mathematics* (1 edition.). River Edge, N.J: World Scientific Publishing. [e-book in library] http://ebookcentral.proquest.com.ezproxy.lib.ucalgary.ca/lib/ucalgary-ebooks/detail.action?docID=1681495

ViMAP

Sengupta, P., Brown, B., Rushton, K., & Shanahan, M-C. (2018). Reframing coding as "mathematization" in the K-12 classroom: Views from teacher professional learning. *Alberta Science Education Journal*, 45 (2), 28-36. Available from https://prism.ucalgary.ca/handle/1880/107764

Scratch

Resnik, M. et al. (2009). Scratch: Programming for all. *Communications of the ACM, 52* (11), 60-67. http://ezproxy.lib.ucalgary.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=45021156&site=ehost-live

Minecraft

Kim, B., Rasporich, S., & Gupta, D. (2019). Imagining the sustainable future through the construction of fantasy worlds. In P. Sengupta., M.-C. Shanahan., & B. Kim (Eds.). *Critical, transdisciplinary and embodied approaches in STEM education* (pp. 61–82). New York, NY: Springer. https://ebookcentral-proquest-com.ezproxy.lib.ucalgary.ca/lib/ucalgary-ebooks/reader.action?docID=6000776&ppg=77

Gee, J.P. (2012, March 19). *James Paul Gee on learning with video games*: Edutopia. https://www.edutopia.org/video/james-paul-gee-learning-video-games

Resources for LT3:

Your instructor will give an instruction of the specific resource to be used in your class (*Note:* you will not use all the listed resources for your LT3).

- *ViMAP* Open Software: http://www.vimapk12.net/
- *Scratch* Open Software: https://scratch.mit.edu/
- *Minecraft* Open Software**:** https://education.minecraft.net/hour-of-code
  Note*: LT3** is a problem-based learning experience. This learning task requires you to have only an overview of the components of Minecraft. The accompanying document ***Getting Started with Minecraft provides resources to support you in the completion of LT3. A template from the World Library, https://education.minecraft.net/class-resources/worlds/
- *CS Unplugged* https://csunplugged.org/en/
- *Makerspaces* https://library.ucalgary.ca/education-makerspaces

LEARNING TASKS OVERVIEW

Completion of all assigned tasks is required for a passing grade in the course. All tasks should follow the American Psychology Association (APA) style 7th Edition for citations and references.

LEARNING TASK	DESCRIPTION OF LEARNING TASK	GROUP/ INDIVIDUAL	WEIGHT	DUE DATE
LT1	Inquiry into Teaching Through STEM Integration: Community Knowledge Building	Individual	30%	Wed & Fri (in Blog weeks: see the schedule)
LT2	Designing for Teaching Rich Mathematical Tasks	Group or Individual	30%	Oct 26

LT3	Pt. A: Designing a STEM Challenge	Group or Individual	30%	Dec 7
	Pt. B: Reflection on the Design of a STEM Challenge	Individual	10%	Dec 7

WEEKLY COURSE SCHEDULE:

Note: Please refer to instruction from your course instructor on specific weekly course schedule and readings for your section.

Date	Topic	Readings and Tasks
Week 1 Sep 8-11	Conceptualizing STEM education	Davis et al (2019). Chapter 1: STEM – disciplinarity vs transdisciplinating • Zoom session 1
Week 2 Sep 14-18	Conceptualizing STEM education	Shanahan et al (2016) and/or Alonso Yanez et al (2019) • Blog entry 1
Week 3 Sep 21-25	Mathematics in STEM education	Davis et al (2019). Chapter 3: Mathematics – calculation vs modeling
Week 4 Sep 28-Oct 2	Rich Mathematical Tasks in STEM education	Alberta Education Program of Study • Piggott, J. (2014) • Blog entry 2 • Zoom session 2
Week 5 Oct 5-9	Design in Learning	Galileo Educational Network. (n.d.). *Designing learning*. Retrieved from https://galileo.org/designing-learning/
Week 6 Oct 26-30	Technology in STEM education	**Submit LT2 by Oct 26** Davis et al (2019). Chapter 4: Technology – usage vs designing • Zoom Session 3

Date	Topic	Readings and Tasks
Week 7 Nov 2-6	Computational Thinking in STEM education	Reading of your instructor's choice Explore the resource of your instructor's choice • Blog entry 3
Week 8 Nov 16-20	Engineering Design Process	Davis et al (2019). Chapter 5: Engineering - Application vs Innovating Truesdell, P. (2014). • Blog entry 4
Week 9 Nov 23-27	STEM Challenge Design	Reading of your instructor's choice Explore the resource of your instructor's choice • Zoom Session 4
Week 10 Nov 30-Dec 4	STEM Challenge Design	TBA
Week 11 Dec 7-9	STEM Challenge Design	TBA

Changes to Schedule: Please note that changes to the schedule may occur to meet the emerging needs and dynamics of the participants in the course.

LEARNING TASKS AND ASSESSMENT

LT 1: INQUIRY INTO TEACHING THROUGH STEM INTEGRATION: COMMUNITY KNOWLEDGE BUILDING (INDIVIDUAL, 30%)

Due Date

Blog weeks (Week 2, 4, 7, 8 – as specified in the above weekly schedule)

- Blogs: Wednesdays (midnight)
- Responses: Fridays (midnight)

Format: Blog Format, APA 7 formatting

The purpose of the learning task is to provide a response to the following question: *How has your conceptualization of teaching STEM through a design-base and inquiry-focused approach changed, been modified, or reinforced?* Your response will be in the form of a blog; that is, you will write from a personal perspective that allows you to connect directly with your readers and support knowledge building.

i For each of the specified blog weeks (Weeks 2, 4, 7, 8), you will post an approximately 500-word blog in D2L Discussions by Wednesday midnight.
ii You will then respond to two other peers by Friday midnight. Approximately 200 words each.

This connection allows you to interact and share ideas with your colleagues. Thoughtfully plan how you will engage the members of your class on your insights and learning. Your blogs and responses must be persuasive, that is, you should take a personal stance on the question and explain your response, using relevant and varied evidence. Your blog must include significant insights from:

- Professional discussions
- Course readings and resources
- Current research
- Classroom observations/experiences

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

CRITERIA FOR ASSESSMENT OF LEARNING TASK 1

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 STEM concepts	Blog and responses are introduced, clearly communicated, and the focus is strongly maintained for the purpose of knowledge building.	Blog and responses are clear, and the focus is maintained for the purpose of knowledge building.	Blog and responses are generally clear, but the focus may be insufficiently sustained for the purpose of knowledge building.	Blog and responses are unclear and not clearly developed for the purpose of knowledge building.
Relevant evidence from the readings and other sources to support responses	Build upon content from the readings, conversations, and 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 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 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 credible and/or relevant sources to support ideas that are appropriate for the discipline. Does not cite sources.
Democratizing knowledge	Recognize all participants as legitimate contributors to the shared goals of the knowledge building community through dialogic interactions	Recognize and praise everyone's work and help others find needed information.	You add your contribution with little recognition of others contribution.	You add little independent contribution with little dialogic interaction with others in the group.

LT2: DESIGNING FOR TEACHING RICH MATHEMATICAL TASKS (INDIVIDUAL OR GROUP, 30%)

Due Date: October 26, 2020

LT2 introduces you to how a rich and authentic problem-solving approach to mathematics teaching and learning helps to build students' conceptual understanding of mathematics.

By the end of this learning task you will be able to:

- Identify and create mathematical concepts within rich, inquiry focused and authentic problems.
- Connects these concepts explicitly to STEM components and to the Alberta Education's *Programs of Study* strands and general outcomes
- Make connections within and across mathematical concepts.
- Use technology for conveying mathematical concepts.

With instructor guidance, individually or in teams (max. of 4 members), you will research, develop and present a rich, real-to-the-world-of-the-child problem that authentically incorporates two mathematical concepts.

What you will design:

Create a narrated and animated power-point (ppt) professional development opportunity for teachers on how to create a rich and authentic problem-solving approach that builds students' conceptual understanding of mathematics.

This ppt of 8-10 slides which includes the name[s] of the presenter[s]:

- Presents a rich mathematical task that reflects your understanding of STEM education.
- Explains the rationale for why the mathematical task is rich and how that relates to your understanding of STEM education.
- Identifies two mathematical concepts contained in the task, with explicit connections to the Alberta Education's *Programs of Study* (PoS) strands and general outcomes.
- Provides three examples of how students might solve the task.

More detailed guidelines and examples available on D2L and during Zoom meetings.

Please refer to terminologies that appear in the following criteria for assessment:

Galileo Educational Network. (n.d.). *Designing learning*. Retrieved from https://galileo.org/designing-learning/

CRITERIA FOR ASSESSMENT OF LEARNING TASK 2

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
Presentation of the Mathematical Problem	Presents the mathematical problem through an Essential Question referenced to Design Thinking	Presents the mathematical problem through an Essential Question	Presents the mathematical problem	No presentation of the mathematical problem
Rationale	Clearly explains the intent of the task and why the problem is rich, inquiry focused and authentic to the world of the student.	Explains the intent of the task and why the problem is rich, inquiry focused and authentic to the world of the student.	Rationale is ambiguous and the problem is procedural and rote in nature.	No rationale provided. Problem is procedural and rote.
Relevant Evidence to Support Rationale	Demonstrates skillful use of high quality, credible, relevant sources to develop the rationale. Cites all content obtained from other sources. APA 7 citation style is accurate.	Demonstrates consistent use of credible sources to develop the rationale. Cites most content obtained from other sources. APA 7 citation style is accurate.	Demonstrates an attempt to use credible and/or relevant sources to support ideas that develop the rationale. Cites some content obtained from other sources. Citation style is either inconsistent or incorrect.	Does not use credible and/or relevant sources to support the rationale. Does not cite sources.
Concept Identification: *Two mathematical concepts*	Identifies concepts contained in the problem with explicit connections to STEM components and the Mathematics PoS strands and general outcomes.	Identifies concepts contained in the problem with minimal connections to STEM components and/or the Mathematics PoS strands and general outcomes.	Concepts insufficiently identified, missing, or underdeveloped in the problem with missing connections to STEM components and/or the Mathematics PoS strands and general outcomes.	No concepts identify within the problem and no connections to STEM components and/or the Mathematics PoS strands and general outcomes.
Addressing the Essential Question (EQ) *Provides three examples of how students might solve the problem*	Examples are insightful and accurately depict different approaches to how students might solve the problem and answer the EQ.	Examples depict different approaches to how students might solve the problem and answer the EQ. More detail is needed.	Examples are missing, ambiguous, and/or similar as how students might solve the problem and answer the EQ.	Provides no example of how students might solve the problem and answer the EQ.

LT3: DESIGNING AND REFLECTING ON A STEM CHALLENGE (PART A – GROUP 30%)

Due Date: December 7, 2020

Working as an individual or as a small group (max. of 4 members), you will design a rich, authentic, and inquiry-based STEM challenge, using the resource specified by the instructor. The learning task will pose a challenge to students and invite them to design a solution that addresses the theme: *Build a Better*

World. You will create a digital presentation showcasing the STEM challenge and associated lesson plans which can be shared with other teachers.

By the end of Learning Task 3, pt. A & B, you will be able to:

- Present a rich, authentic, and inquiry-based STEM challenge;
- Make explicit the engineering design process within the STEM challenge;
- Make explicit the conceptual understandings of STEM components and their alignment with Alberta Education's Programs of Study for a specific grade;
- Build on your understanding of the mathematics and science concepts contained within your STEM challenge;
- Begin to articulate classroom teaching strategies: e.g. group/individual work, collaboration and communication of assignments, and developing habits of mind;
- Appreciate how integrating design processes are important beyond the STEM disciplines;
- Learn how to work as a team to develop inquiry teaching approaches;
- Present your unit of study in a digital presentation.

During the final week of class, you will present the following two components in a virtual showcase.

1. Your designed STEM challenge
2. Digital Presentation

The purpose of the digital presentation is to describe and illustrate the design of the LT3 teaching and learning experience. This digital presentation will illustrate how you would teach this project. Consider the audience for the presentation to be teachers and administrators.

The presentation:

- States the challenge in which your students will engage;
- Describes and illustrates the engineering design process specific to the challenge;
- Identifies, shows, and develops the STEM concepts intrinsic to the challenge;
- Identifies and models TWO mathematics concepts and ONE science concept that are addressed in your challenge;
- Attends to how your students will be assessed.

Please refer to terminologies that appear in the following criteria for assessment:

Chapter 5 in Davis, B., Francis, K., & Friesen, S. (2019). *STEM Education by design: Opening horizons of possibility*. New York: Routledge. https://ebookcentral-proquest-com.ezproxy.lib.ucalgary.ca/lib/ucalgary-ebooks/detail.action?docID=5763030

Truesdell, P. (2014). The engineering design process. In *Engineering essentials for STEM instruction: How do I infuse real-world problem solving into science, technology, and math?* (pp. 7-15) Alexandria, VA: ASCD. [library e-version available] https://ebookcentral-proquest-com.ezproxy.lib.ucalgary.ca/lib/ucalgary-ebooks/reader.action?docID=1709532&ppg=12

CRITERIA FOR ASSESSMENT OF LEARNING TASK 3, PT. A

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
STEM Challenge				
Challenge	Created a rich, authentic, and inquiry-based STEM challenge, that centralizes the theme of *Build a Better World*.	Created a STEM challenge that is rich and authentic, that touches upon the theme of *Build a Better World*.	Created a STEM challenge but does not accurately reflect the expectation for this challenge. May not have all needed information.	Did not create STEM challenge.
Digital Presentation				
Engineer Design Process				
STEM Design Process	Clearly articulates and illustrates how learners will recognize and apply the components of the engineering design process as found in the challenge.	Articulates how learners will recognize and apply the components of the engineering design process as found in the challenge.	Articulates an engineering design process that is generic and/or superficial to the challenge.	Does not articulate an engineering design process.
Mathematics (x2) and Science (x1) Concepts				
Concept Identification	All concepts are clearly, accurately, and sufficiently identified and developed within the challenge. Direct connections are made to the Programs of Study's general outcomes.	Most concepts are accurately identified and developed within the challenge. Connections are made to the Programs of Study. More detail is required, or a concept is missing.	Concepts are insufficiently identified, underdeveloped, and/or missing.	Concepts are not stated and/or inaccurate.
Concept Explanation	The ways that the concepts connect to the challenge are clearly, sufficiently, and accurately explained.	The ways that the concepts are addressed by the challenge is explained. More detail is needed.	The ways that the concepts are addressed by the challenge are ambiguous and/or generic.	The ways that the concepts are addressed by the challenge are not stated or are in accurate.

Digital Presentation				
Visual Presentation	Design and layout of presentation is creative, visually appealing, and effectively supports readable; using word count, font style, color, headlines, bullets, and numbers. Graphics (e.g., diagrams, picture, tables, figures, etc.) effectively enhance the text. Content is clearly arranged so that the viewer can easily understands the purpose of the challenge without narration. Cites all content obtained from other sources. APA 7 citation style is accurate.	Overall design and layout of presentation is visually appealing that supports readability. Adequate use of word count, font style, color, headlines, bullets, and numbers. Graphics enhance the text. Content is arranged so that the viewer can understand the purpose of the challenge without narration. Cites most content obtained from other sources. APA 7 citation style is accurate.	Design and layout of presentation is adequate but somewhat cluttered. Choice of word count, font style, color, headlines, bullets, and numbers detract from the readability. Graphics are limited in enhancing the text. Content arrangement is somewhat confusing and does not adequately assist the viewer in understanding order without narration. Cites some content obtained from other sources. Citation style is either inconsistent or incorrect.	Design and layout of presentation not very visually appealing; cluttered; choice of word count, font style, color, headlines, bullets, and numbers hinder readability. Graphics do not enhance the text. Organization, presentation, and readability is inconsistent and or distracting and does not adequately assist the viewer in understanding order without narration. Does not cite sources.

LT3, PT. B: BUILDING UNDERSTANDING OF TEACHING STEM COMPONENTS THROUGH A DESIGN-BASE AND INQUIRY-FOCUSED APPROACH (INDIVIDUAL 10%)

Due Date: December 7, 2020

Based on your conceptualization of STEM education, write a narrative (500 - 750 words) that reflects your own "*process of learning*" during this learning task and how these reflections will inform your own teaching. In particular, what would you need to consider in the design process in developing an inquiry-focused STEM challenge that reflects the theme of *Build a Better World*? The medium format for this narrative is open.

CRITERIA FOR ASSESSMENT OF LEARNING TASK 3, PT. B

	Expert: A to A+ Meets all and exceeds some requirements	Practitioner: B+ to A- Meets all requirements	Apprentice: B- to B Meets most requirements	Unsatisfactory
Depth of Reflection	Demonstrates an in-depth reflection of own learning with insightful connections to the learning task. Interpretations are insightful and well supported with clear and detailed examples.	Demonstrates a general reflection of own learning with connections to the learning task. Interpretations are supported with examples.	A minimal reflection on own learning with minimal connections to the learning task. Interpretations are unsupported or supported with irrelevant examples.	Reflection demonstrates a lack of connection of own learning to the learning task. Interpretations are missing, inappropriate, and/or unsupported.
Evidence of Informed Teaching Practice	Reflection shows strong evidence of synthesis of ideas presented and insights gained throughout the learning task. The implications of these insights for teaching practice are thoroughly detailed. Clear links to the design process are provided.	Reflection shows evidence of synthesis of ideas presented and insights gained throughout the learning task. The implications of these insights for teaching practice are presented. Links to the design process are made.	Reflection shows little evidence of synthesis of ideas presented and insights gained throughout the learning task. Few implications of these insights for teaching practice are presented. Links to the design process are minimal.	Reflection shows no evidence of synthesis of ideas presented and insights gained throughout the learning task. No implications for teaching practice are presented. Links to the design process are minimal or not provided.
Composition of the Narrative	Writing is clear, concise, and well organized with excellent sentence and paragraph construction. Thoughts are expressed in a coherent and logical manner. There are minimal spelling, grammar, or syntax errors.	Writing is mostly clear, concise, and organized with good sentence and paragraph construction. Thoughts are expressed in a coherent and logical manner. There are a few spelling, grammar, or syntax errors.	Writing is unclear and or disorganized. Thoughts are not expressed in a logical manner. There a number of spelling, grammar, or syntax errors.	Writing is unclear and disorganized. Thoughts ramble and make little sense. There are numerous spelling, grammar, or syntax errors.

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
Students seeking an accommodation based on disability or medical concerns should contact Student Accessibility Services; SAS will process the request and issue letters of accommodation to instructors. For additional information on support services and accommodations for students with disabilities, visit www.ucalgary.ca/access/. Students who require an accommodation in relation to their coursework based on a protected ground other than disability should communicate this need in writing to their Instructor. The full policy on Student Accommodations is available at http://www.ucalgary.ca/policies/files/policies/student-accommodation-policy.pdf.

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

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