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**EDUC 562 S01: Mathematics Instruction in the Elementary Classroom  
Winter, 2024**

Class Dates: 10<sup>th</sup> January, 2024 - 7<sup>th</sup> February, 2024

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

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

Office Hours: By appointment only

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

**COURSE DESCRIPTION:**

The intent of this seminar is to introduce students to concepts, theory, and planning related to teaching mathematics in the elementary grades. Topics will include learning to think mathematically, inquiry-oriented approaches to teaching mathematics, planning that addresses the needs of diverse learners, and authentic assessment practices.

**LEARNER OUTCOMES:**

Over the course of the semester, students will:

- 1) Develop a foundational understanding of the nature of discourse in the discipline, as related to teaching and learning, including specialized language, concepts, and terminology;
- 2) Become familiar with the resources available for designing learning and assessment in mathematics.
- 3) Explore and apply introductory theory related to the teaching of the discipline with an emphasis on learning to design discipline-based tasks and assessment processes and creating an adaptive classroom learning environment to better meet the needs of today's diverse learners.

**COURSE DESIGN AND DELIVERY:**

This course will be delivered online via Zoom with supplementary engagement in a D2L environment.

**REQUIRED RESOURCES:**

Required readings will be made available through D2L.

**ADDITIONAL RESOURCES:**

Alberta Assessment Consortium (Username: [teachers](#) Password: [master](#))

Alberta Education. (2011). *English as a Second Language Proficiency Benchmarks*. Retrieved from:  
<http://www.learnalberta.ca/content/eslapb/>

Alberta Education. (2019). *Numeracy*. Retrieved from: <https://education.alberta.ca/literacy-andnumeracy/numeracy>

Alberta Learning. (2010). *Making a difference: Meeting diverse learning needs with differentiated instruction*. Retrieved from: [https://education.alberta.ca/media/384968/makingadifference\\_2010.pdf](https://education.alberta.ca/media/384968/makingadifference_2010.pdf)

Alberta Education. (2022). *Program of Study for Mathematics, K-6*. Available online at:  
<https://curriculum.learnalberta.ca/curriculum/en>

Doucette Library – Library guide for lesson planning: [https://libguides.ucalgary.ca/guides/lesson\\_planning\\_resources](https://libguides.ucalgary.ca/guides/lesson_planning_resources)

Small, M. (2015). *Making math meaningful to Canadian students, K-8* (3<sup>rd</sup> Ed.). Nelson. Print copy available:  
 Doucette Library Main collection 510.71 SMM 2016

Van de Walle, J.A., Karp, K.S., Bay-Williams, J.M., & McGarvey, L.M. (2017). *Elementary and middle school mathematics: Teaching developmentally*, 5<sup>th</sup> Canadian Ed. Pearson. Print copy available: Doucette Library Main collection 510.7 VaE 2018

### WEEKLY COURSE SCHEDULE:

Date	Topic	Readings and Tasks	Due Dates
Week of Jan. 8-12, 2024	What is mathematics?	Alberta Education. (2022). <i>Program of Study for Mathematics, K-6</i> (see link under Additional Resources)	
Week of Jan 15-19, 2024	Teaching for mathematical understanding	TBA	
Week of Jan. 22-26, 2024	Planning for teaching mathematics	TBA	Learning Task 1 Due Wednesday 24 <sup>th</sup> January, 2024
Week of Jan. 29-Feb 2, 2024	Mathematics and Social Justice/ Culturally-relevant pedagogy/ Teaching diverse learners	TBA	
Week of Feb 5-9, 2024	Assessment	TBA	Learning Task 2 Due Wednesday 7 <sup>th</sup> February, 2024

**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:**
**LEARNING TASKS OVERVIEW**

LEARNING TASK	DESCRIPTION OF LEARNING TASK	GROUP / INDIVIDUAL	WEIGHT	DUE DATE
1	Expanding Mathematical Knowledge	Individual	50%	Wednesday 24 <sup>th</sup> January, 2024
2	Teaching Resources Dossier	Individual	50%	Wednesday 7 <sup>th</sup> February, 2024

There are two required Learning Tasks for this course.

**LEARNING TASK 1: *Expanding Mathematical Knowledge*—DUE: *Wednesday 24<sup>th</sup> January, 2024***

As a teacher of mathematics (even at the elementary school level) it is important to continually update and enhance one's mathematical knowledge. An interesting way to keep abreast of developments in the field of mathematics, to better understand how mathematics is used in the world, and/or to situate one's technical knowledge of mathematical topics in a historical/social context is to engage with contemporary mathematics media. In this task, you will choose one or more mathematics-based podcasts, listen to a series of episodes, and then reflect on your learning. Your reflection can take the form of a set of journal entries following each podcast episode, an academic essay, an audio report, or many other alternative forms of expression. If you have an idea for an alternative way of demonstrating your learning, please talk to me about it. Your reflection should include:

- a description of the overall focus of the podcast,
- a discussion of why you chose that particular podcast,
- a brief description of any episodes that you choose to discuss (so that I have a sense of the content to which you are referring),
- a description *and* analysis of what you learned, including what surprised or intrigued you, what you want to follow up on, what you didn't understand/went over your head, what it all means to you, etc., and
- a description of how your learning might apply to your teaching of elementary/middle school mathematics topics.

When choosing the podcast, please ensure that the content/focus of the podcast is the discipline of *mathematics*—not topics in how to teach mathematics (though there are many good mathematics education podcasts out there), nor science-focused podcasts that contain reference to mathematics. A list of possible podcasts will be provided but you are not restricted to choosing from that list.

**CRITERIA FOR ASSESSMENT OF LEARNING TASK 1**

Learning Task 1 will be assessed on:

- the clarity of the description of the focus and aims of the podcast and why you chose it,
- the thoroughness of the description of relevant episodes, demonstrating that you engaged extensively with multiple episodes of the podcast,
- the depth of your description (the ‘what’) and analysis (the ‘so what?’/why does this matter?) of what you learned, and
- the thoughtfulness and creativity of your ideas for connection to your future teaching of mathematics.

### **LEARNING TASK 2: *Teaching Resources Dossier—DUE: Wednesday 7<sup>th</sup> February, 2024***

For this assignment, you will source, and post onto D2L for sharing with the class, **a minimum of two** teaching ideas that demonstrate that you understand what it means to choose rich, flexible tasks that will engage diverse learners in inquiry while addressing topics relevant to the Alberta Program of Study for Mathematics, K-6. These are not full-blown lesson plans; rather, they are brief but complete ideas for teaching that contain all the information necessary to be developed into lesson plans for a specific group of learners *in the future*. The teaching ideas should be developed so that someone other than you should be able to pick up the idea, see its worth, and be able to use it, based on your description, to develop a lesson for their own grade level/group of students. Any website links should be present solely as acknowledgements of the source(s) of the idea or for helpful extraneous information, not as a source of information necessary to understand or enact the task (e.g., any required worksheets, etc., should be appended to the dossier rather than referred to in a link. Please respect copyright rules in your choices of tasks and their appendices.).

Each dossier idea should be no more than two pages, plus any necessary appendices. These are not lengthy descriptions and do not need to appear (in fact, should **not** appear) on a lesson plan template because they are not lesson plans (which can really only be effectively created when you know who you will be teaching).

Each dossier idea should contain:

- (a) a title for the task/activity,
- (b) a statement of why you consider the task to be worthwhile,
- (c) a statement of the broad topic area(s) (as per the Alberta Program of Studies for Mathematics, K-6) into which the activity falls (e.g., Number, Geometry, Measurement, etc.),
- (d) a statement of the target grade level(s) for the task,
- (e) a list of the specific Learning Outcomes and Knowledge, Understandings, and Skills and Procedures in the Alberta Program of Study for Mathematics, K-6, that the task might address at the target grade level,
- (f) a list of the materials or resources necessary,
- (g) an indication of the amount of time that the task might take,
- (h) a description of the task/activity,
- (i) a brief description of how the task could be extended or made simpler for diverse learners,
- (j) a brief but *specific* description of how you could assess student learning (N.B., for this item, indicating that you would assess by walking round the room to monitor what students are doing is not sufficient. Be specific—e.g., what questions would you ask to determine if students are learning the concept(s)?), and
- (k) an acknowledgment of the source of your task/activity.

The teaching resources dossier will be assessed based on the following criteria:

1. Quality, meaningfulness, and mathematical integrity of the teaching ideas.
2. Breadth (demonstrated by covering a number of topic (or even subject) areas within one idea, or by showing how your idea could be used with several grade or ability levels.)
3. Usefulness (there should be enough detail to be useful, but your descriptions should be brief enough for browsing.)
4. Clarity (the ideas should enable the reader to imagine how the idea could be used in the classroom, what core mathematical concept(s) it addresses, what materials are needed, how much time should be allotted, how to launch the task, how to extend it or make it simpler for diverse learners, etc.)
5. Inquiry-oriented (the ideas should demonstrate that you understand what it means to choose rich, flexible tasks that will engage diverse learners in inquiry while addressing topics relevant to the Alberta Program of Study for Mathematics.)

### **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 collaborating as a group, please inform the instructor.

### **EXPECTATIONS FOR WRITING**

All written assignments 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 must be properly documented. All assignments are expected to be the original work of the student. 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/e2.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. 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-AccommodationPolicy.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 is Claire Gillis, [esa@ucalgary.ca](mailto:esa@ucalgary.ca).

**Werklund SU Representative** is Elsa Stokes, [educrep@su.ucalgary.ca](mailto:educrep@su.ucalgary.ca).