

APPLIED ARTS DIVISION
School of Health, Education & Human Services
Winter 2020

University
of Regina



COURSE OUTLINE¹_{SEP}

EMTH 310

TEACHING MATHEMATICS IN ELEMENTARY SCHOOLS

39 HOURS
3 CREDIT COURSE

PREPARED BY: Carolyn Simmons

DATE: December 31, 2019

Acknowledging that we live and work in the traditional territory of the Kwanlin Dun First Nation and the Ta'an Kwäch'än Council.

TEACHING MATHEMATICS IN ELEMENTARY SCHOOLS (Pre-K to Grade 5)

INSTRUCTOR: Carolyn Simmons

OFFICE HOURS: by appointment

E-MAIL: csimmons@yukoncollege.yk.ca

CLASSROOM: A2712

TIME: Friday: 9 - 12:00 a.m.

TELEPHONE: 633-4772

DATES: January 10 - April 10

COURSE DESCRIPTION

The primary goal of this subject is to foster pre-service teacher development towards assuring the PSTs professional competence and disposition towards delivering comprehensive mathematics education. Being a math methods course, this focus means you will be developing and demonstrating your thorough understanding of the content and processes involved in the learning of mathematics in elementary school, and how to teach these effectively. Additionally, there will be opportunity to discuss and challenge mathematics in the context of prevailing beliefs and attitudes towards the subject.

In alignment with the YNTEP progression framework as a year three course, there are three areas of pedagogical focus. They include: pedagogical competence, deconstructing curricula, and attention to BC Mathematics Curriculum and Yukon First Nation principles and practices.

Upon completion of this subject, through the professional knowledge acquired and professional practice experiences provided, you will be able to approach the teaching of mathematics positively, and with an accurate and thorough understanding of what mathematics learning experiences entail for Yukon elementary students.

LEARNING OUTCOMES

By the completion of this course, pre-service teachers will be able to:

- demonstrate domain specific knowledge of selected mathematics curriculum areas which include Number/Fluency/Patterns, Attributes
- demonstrate Yukon First Nations content in methods and problem-solving

- demonstrate current approaches and methods in pedagogical methods and problem-solving, particularly a continuum perspective, anticipating the needs of higher secondary math contexts
- develop, implement, and evaluate lessons and lesson delivery that are responsive to the BC mathematics curriculum and the aspired experience of YFN students
- demonstrate informed understanding of pedagogical practices and methods and apply these to mathematics teaching practice - including teaching, assessment and behaviour management approaches
- use a range of mathematics curriculum specific assessment practices to support students in their learning and to inform mathematics teaching practice
- critically consider mathematics curriculum experiences provided for students and evaluate the appropriateness of these experiences based upon YNTEP's mandate and the current BC curriculum
- effectively engage with colleagues and community members in working constructively for positive mathematics education outcomes for all learners
- contribute to the professional learning of colleagues through course engagement and the provision of professional learning opportunities
- challenge prevailing beliefs and attitudes towards mathematics as a subject, to ensure that students have positive experiences with mathematics and are well prepared for secondary math experience

COURSE FORMAT ^[L]_[SEP]

This course will be a total of 39 class-contact hours. As a methods class, the emphasis is hands-on experience with teaching approaches and practices essential to the teaching of elementary school mathematics. Within this experience, Yukon First Nations contexts and content (how they can interact locally with the curriculum) will be interwoven.

ATTENDANCE AND PARTICIPATION

Students are expected to attend regularly, complete all assignments, come to class ready and prepared to learn, and participate actively in class activities.

Each YNTEP student is responsible for:

1. Contacting your instructor prior to a class to report your absence. In an urgent situation you can contact the YNTEP reception at 668.8781. ^[L]_[SEP]
2. Catching up on missed material and any incomplete assignments. ^[L]_[SEP]
3. Obtain proper documentation (ex. doctor's note) in the event that a serious ^[L]_[SEP] health concern affects attendance (3 or more classes). ^[L]_[SEP]
4. Familiarizing oneself with the YNTEP Handbook and the regulations

relating to attendance and punctuality. [SEP]

ASSIGNMENTS

1. Early Numeracy (30%)

The emphasis of this assignment is student teachers learning a variety of ways to model number ideas for numbers up and to 20, and up to 100. These are foundational ideas that can extend to larger numbers, operations, basic facts and computation. Student teachers will see later on as they experience number in higher grades, how important these early ideas are, and that they may re-visited in different contexts.

Early Numeracy Concept Notes will introduce each method: Notes taken from academic sources, analyzing specific numeracy concepts, key to the development of a child's numeracy foundation, will introduce each early numeracy concept.

Criteria for assessment: (1) Academic source/s (2) concept thoroughly explained and outlined (3) importance and relevancy discussed

Six Methods Descriptions: Student teachers will take notes as the early numeracy method/approach/activity/concept is delivered by the instructor, followed by the student teachers' practice of the method in small group. Student teachers will write the method, illustrate with visuals, and include any hands-on materials produced.

Criteria for assessment: (1) Written methods are succinct (2) method is illustrated with visuals (3) hands-on materials included (4) BC Curriculum 'Big Ideas', Curricular Competencies references (5) Relevancy to Yukon First Nation context

2. MULTIPLICATION: Methods Portfolio in Four Parts (30%)

An exploration of multiplication, focusing on generalizable strategies for multiplication that are useful in helping students understand the properties of arithmetic and provide a foundation for algebra. Pattern, strategies and mneumonics will be utilized for fact acquisition, as well as exploration of how to help students move into sense-making when they get stuck in an algorithm.

a) Times-table Exploration

Introductory Notes: Taken from Elementary and Middle School Mathematics; *Making Number Talks Matter* (hand-out)

Times-table patterns explored through entry into Hilroy bound book

Criteria for assessment: (1) patterns, strategies and mneumonics in the learning of times-tables are written and illustrated, using colour

Methods Description: Game as a method to practice individual times-tables. Student teachers will make a game board for one times-table, followed by written reflection on game usage.

Criteria for assessment: (1) game board is created and visualized (2) Written reflection of game use (3) BC Curriculum 'Big Ideas', Curricular Competencies references (4) Relevancy to Yukon First Nation context

b) Effectiveness and Use of Multiplication Games

Student teachers will play a number of games, and reflect on what they specifically practice; when, where and how to use them.

Criteria for Assessment: (1) Copy of Game and written critical analysis at the end of that game play (2) Written analysis of all games played - what do they specifically practice? When, where and how could they be used in a classroom setting?

c) Factors and Multiples

Modelled and explored on Hundred Charts, followed by a written visual description of their qualities.

Criteria for Assessment: (1) Hundreds Chart illustration (2) Paragraph describing the qualities of multiples and factors, and how they differ (3) BC Curriculum Big Ideas and Curricular Competencies (4) Relevancy to Yukon First Nation context

d) Project-based Learning: Illustrating Multiplication Grades 4-5-6

Development of number sense and number flexibility in seeing the relationships of multiplication. In this visual activity, student teachers will learn how they can present visual representations of multiplication problems as area model, to students, who then make their own visual proofs of mathematical expressions. Project culminates with a multiplication game.

Criteria for Assessment: (1) Written methods are succinct (2) method is illustrated with visuals (3) hands-on materials included (4) BC Curriculum 'Big Ideas', Curricular Competencies references (5) Relevancy to Yukon First Nation context

3. UNIT PLAN: Project-Based Learning/FRACTIONS/Grades 5 (40%)

Using a number of hands-on explorations of fractions, student teachers will experience, record, make and reflect on the visual learning of fractions in a Grade 5 classroom. The plan has two modules: one is Estimating with Fractions, and the other Using Fraction Equivalence.

The UNIT Planning takes place during three EMTH 310 sessions, therefore allowing for working together, learning and sharing - all First Nation values of doing, knowing and being.

Each module is to begin with notes, commenting on the mathematical research underlining each particular module, taken from Mathematical Mindsets Grade 5.

Criteria for assessment: (1) Academic source/s (2) concept thoroughly explained and outlined (3) importance and relevancy discussed

After experiencing the visual hands-on approaches to Grade 5 Fractions, student teachers, using the 7E model, the YNTEP lesson plan and backward design templates, along with project assessments, will build their UNIT PLAN. The plan will also include producibles created, and photographs of the sharing of them, as would happen in a classroom.

Students will present their work to colleagues and instructor for feed-back, before final hand-in.

Criteria for assessment: (1) Written methods are succinct (2) method is illustrated with visuals (3) hands-on materials included (4) YNTEP General Lesson Plan Template (5) Backwards Unit Design Template (5) BC Curriculum 'Big Ideas', Curricular Competencies references (6) Relevancy to Yukon First Nation context

EVALUATION:

Assignment	
Early Numeracy	30%
Multiplication: Methods Portfolio in Four Parts	30%
UNIT PLAN: Project-Based Learning/ FRACTIONS, GRADES 4-5-6	40%
	100%

TEXTBOOK AND MATERIALS

Required Texts:

Van de Walle, J.A., Karp, K.S., Bay-Williams, J.M., McGarvey, L.M., Folk, S. (2015). Elementary and Middle School Mathematics. (Fifth Canadian Edition). Pearson Canada Inc: Toronto, Ontario.

Boaler, Jo. (2015). Mathematical Mindsets: Unleashing Students' Potential through Creative Math, Inspiring Messages and Innovative Teaching. Josey-Bass (A Wiley Brand).

ACADEMIC AND STUDENT CONDUCT

Information on academic standing and student rights and responsibilities can be found in the Academic Regulations:

http://www.yukoncollege.yk.ca//downloads/Yukon_College_Academic_Regulations_and_Procedures_-_August_2013_final_v1.pdf

PLAGIARISM

Plagiarism is a serious academic offence. Plagiarism occurs when students present the words of someone else as their own. Plagiarism can be the deliberate use of a whole piece of another person's writing, but more frequently it occurs when students fail to acknowledge and document sources from which they have taken material. Whenever the words, research or ideas of others are directly quoted or paraphrased, they must be documented according to an accepted

manuscript style (e.g., APA, CSE, MLA, etc.) Resubmitting a paper which has previously received credit is also considered plagiarism. Students who plagiarize material for assignments will receive a mark of zero (F) on the assignment and may fail the course. Plagiarism may also result in dismissal from a program of study or the College.

YUKON FIRST NATIONS CORE COMPETENCY

Yukon College recognizes that a greater understanding and awareness of Yukon First Nations history, culture and journey towards self-determination will help to build positive relationships among all Yukon citizens. As a result, to graduate from ANY Yukon College program, you will be required to achieve core competency in knowledge of Yukon. The YNTEP meets the requirements of YFN Core Competency.

ACADEMIC ACCOMMODATION

Reasonable accommodations are available for students with a documented disability or chronic condition. It is the student's responsibility to seek these accommodations. If a student has a disability or chronic condition and may need accommodation to fully participate in this class, he/she should contact the Learning Assistance Centre (LAC) at (867) 668-8785 or lassist@yukoncollege.yk.ca. The LAC staff assists the student in communicating accommodations that are needed to support student success.

