COLLEGE OF THE ROCKIES

Mathematics for Teachers 2 – MATH 107
University Studies Program

Course Outline

COURSE IMPLEMENTATION DATE: **September 2019**
OUTLINE EFFECTIVE DATE: **September 2022**
COURSE OUTLINE REVIEW DATE: **April 2027**

GENERAL COURSE DESCRIPTION:

Mathematics for Teachers 2 continues the learning from MATH 105 – Mathematics for Teachers 1 - and emphasizes topics taught in the upper elementary grades, such as ratio, proportion, and percent; geometry; relations, functions, and their graphs; coordinate geometry; and probability and statistics. Mathematics for Teachers 2 covers the important concepts, mathematical methods, and ideas required to teach the elementary mathematics curriculum. It emphasizes the foundational concepts needed to support abstract calculation and it broadens students' understanding of mathematics. The course blends theory, teaching models, and the use of a variety of manipulatives which are appropriate for teaching mathematics in the elementary grades. Students are required to explain various models for a particular concept, the relationships between them, and when it is appropriate to use them. This course incorporates local Indigenous knowledge, content, ways of knowing, and perspectives into each unit of study.

Program Information: This course is intended for university studies students planning to enter a Bachelor of Education program. It is not an eligible math course for credit in the Associate of Arts degree or Associate of Science degree. This course is not accepted by some universities as transfer credit towards a BA or BSc degree; please check with the receiving institution.

Delivery: This course is delivered face-to-face.

COTR Credits: 3

Hours for this course: 45 hours

Typical Structure of Instructional Hours:

Instructional Activity	Duration
Lecture Hours	45
Seminars / Tutorials	
Laboratory / Studio Hours	
Practicum / Field Experience	
Other Contact Hours	
Total	45

Practicum Hours (if applicable):

Type of Practicum	Duration
On-the-Job Experience	N/A
Formal Work Experience	N/A
Other	N/A
Total	

Course Outline Author or Contact:
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Signature

APPROVAL SIGNATURES:

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EDCO

Valid from: September 2022 – April 2027

Education Council Approval Date

COURSE PREREQUISITES AND TRANSFER CREDIT:

Prerequisites: MATH 105 or equivalent.

Corequisites: None

Flexible Assessment (FA):

Credit can be awarded for this course through FA ☑ Yes ☐ No

Learners may request formal recognition for flexible assessment at the College of the Rockies through one or more of the following processes: External Evaluation, Worksite Assessment, Demonstration, Standardized Test, Self-assessment, Interview, Products/Portfolio, Challenge Exam. Contact an Education Advisor for more information.

Transfer Credit: For transfer information within British Columbia, Alberta and other institutions, please visit http://www.cotr.bc.ca/Transfer.

Student should also contact an academic advisor at the institution where they want transfer credit.

Prior Course Number: **N/A**

Textbooks and Required Resources:

Textbook selection varies by instructor and may change from year to year. At the Course Outline Effective Date the following textbooks were in use:

Musser, Burger, Peterson. *Mathematics for Elementary Teachers.* 10th Edition. New Jersey: Wiley, 2010.

Sowder, Sowder & Nickerson. Reconceptualizing Mathematics. W.H. Freeman & Company, 2008.

Wheeler, Ruric E. & Ed R. Wheeler. *Modern Mathematics for Elementary Educators.* 12th edition. Kendall/Hunt Publishing, 2009.

Bennett Jr., A. and L. Nelson. *Mathematics for Elementary Teachers: A Conceptual Approach*. 8th edition. McGraw Hill Higher Education, 2010.

Please see the instructor's syllabus or check COTR's online text calculator http://go.cotr.bc.ca/tuition/tCalc.asp for a complete list of the currently required textbooks.

LEARNING OUTCOMES:

The learning in this course can be broken into Mathematical Content and Mathematical Understanding.

Mathematical Content

Upon the successful completion of this course, students will be able to

- write word problems on rational and real numbers and their operations and solve those problems through manipulation of two- and three dimensional objects, graphical representations, and a variety of appropriate algorithms;
- identify, describe, and classify symmetries, rigid transformations, similarity, and congruency for two- and three-dimensional objects, with particular emphasis on triangles;
- identify properties such as commutativity, associativity, and distributivity and use them to compute with rational and real numbers;
- measure and calculate time, length, angles, perimeter, area, surface area, volume, weight, speed, and temperature in metric (SI) and nonstandard units using standard measurement formulas and convert from one unit to another;
- derive select standard measurement formulas by way of dissections; and
- apply the Pythagorean Theorem and work through at least one proof of the theorem.

Mathematical Understanding

Upon the successful completion of this course, students will be able to

- perform mental calculations for all the operations studied. Calculators will not be permitted;
- use pedagogical theory to develop computational strategies, explain concepts, and give feedback to students learning mathematics;
- create and solve a variety of word problems connected to place, stories, and cultural practices by using manipulatives, graphical representations, and symbolic calculations;

- explain how local Indigenous Peoples, past and present, envision, represent and use specific mathematical processes in their lifestyles and worldview, and incorporate those worldviews to make connections to mathematical concepts;
- develop an understanding of mathematics as a way of knowing the world that all humans are capable of achieving with respect to their personal experiences and needs; and
- address their fears and apprehensions towards mathematics and develop and understanding that mistakes and failure are an important part of the mathematical process.

COURSE TOPICS:

1. Ratio, Proportion, and Percent
2. Rational and Real Numbers
3. Geometric Shapes
4. Measurement
5. Geometry Using Triangle Congruence and Similarity
6. Relations, Functions, and their Graphs
7. Geometry Using Coordinates
8. Geometry Using Transformations
9. Probability
10. Statistics

See instructor's syllabus for the detailed outline of weekly readings, activities and assignments.

EVALUATION AND ASSESSMENT (Face-to-Face Delivery):

Assignments	% of Total Grade
Assignments	20%
Term Project and Presentation	20%
Midterms	25%
Final Exam	35%
Total:	100%

Please see the instructor's syllabus for specific classroom policies related to this course, such as details of evaluation, penalties for late assignments and use of electronic aids.

EXAM POLICY:

Students must attend all required scheduled exams that make up a final grade at the appointed time and place.

Individual instructors may accommodate for illness or personal crisis. Additional accommodation will not be made unless a written request is sent to and approved by the appropriate Department Head prior to the schedules exam.

Any student who misses a scheduled exam without approval will be given a grade of "0" for the exam.

COURSE GRADE:

Course grades are assigned as follows:

Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F
Mark (Percent)	≥ 90	89-85	84-80	79-76	75-72	71-68	67-64	63-60	59-55	54-50	< 50

A grade of "D" grants credit, but may not be sufficient as a prerequisite for sequential courses.

ACADEMIC POLICIES:

See www.cotr.bc.ca/policies for general college policies related to course activities, including grade appeals, cheating and plagiarism.

COURSE CHANGES:

Information contained in course outlines is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational, employment and marketing needs. The instructor endeavours to provide notice of changes to students as soon as possible. The instructor reserves the right to add or delete material from courses.