



## MATH-107 – Mathematics for Teachers 2

University Arts and Science

**Effective Term & Year:** Fall 2022

**Course Outline Review Date:** 2027-04-01

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**Program Area:** Math and Sciences

### **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.

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### **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 Methods:** On-campus (Face-to-Face)

**Credit Type:** College of the Rockies Credits

**Credits:** 3

**Course type/s:** Sciences

**Instructional Activity and Hours:**

Activity	Hours
Classroom, Directed Studies or Online Instruction	45
Seminar/Tutorials	
Laboratory/Studio	
Practicum/Field Experience	
Co-op/Work Experience	
Other	
<b>Total</b>	<b>45</b>

**Course Requisites:**

- Completed the following:
  - [MATH105](#) – Mathematics for Teachers I (3)

**Flexible Assessment:** Yes

In some cases students may be able to apply for recognition of prior learning outside the classroom. This flexible assessment process provides equivalent course credit. It is a rigorous process that may include external evaluation, worksite assessment, demonstration, standardized test, self-assessment, interview, products/portfolio, and challenge exam, or other measures as appropriate. Tuition fees apply. Contact an education advisor for more information.

**Course Transfer Credit:**

For information about receiving transfer credit for courses taken at either British Columbia or Alberta institutions, please see <https://www.bctransferguide.ca/> or <https://transferalberta.alberta.ca> . For more transfer credit information, please visit <https://www.cotr.bc.ca/Transfer>

All requests for course transfer credit from institutions in British Columbia or elsewhere should go to the College of the Rockies Enrolment Services office.

**Textbook 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 <https://textbook.cotr.bc.ca/> for a complete list of the currently required textbooks.*

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## **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;
- apply the Pythagorean Theorem and work through at least one proof of the theorem.

### **Mathematical Understanding**

- 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.
- address their fears and apprehensions towards mathematics and develop and understanding that mistakes and failure are an important part of the mathematical process.

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### 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.*

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## Evaluation and Assessments

### Assessment Type: On-Campus (face-to-face)

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

### Grade Scheme

A+	A	A-	B+	B	B-	C+	C	C-	D	F
>=90	89-85	84-80	79-76	75-72	71-68	67-64	63-60	59-55	54-50	<50

**Pass requirements:** None

**Evaluation Notes:** A grade of “D” grants credit, but may not be sufficient as a prerequisite for sequential courses.

**Exam Attendance:**

Students must attend all scheduled exams at the appointed time and place. Instructors may approve an alternate exam to accommodate an illness or personal crisis. Department heads will consider other written requests. Any student who misses a scheduled exam without prior approval will receive a “0” on the exam.

**Academic Policies:**

College of the Rockies policies related to courses can be found at <https://cotr.bc.ca/about-us/college-policies/> and include the following:

- Policy 2.4.3 Students with Documented Disabilities
- Policy 2.4.4 Student Conduct (plagiarism, other cheating, behavioral misconduct)
- Policy 2.5.8 Academic Performance
- Policy 2.5.3 Grade Appeal
- Policy 2.4.9 Student Concerns Re Faculty

**Course Changes:**

The College of the Rockies updates course outlines regularly to meet changing educational, employment and marketing needs. The instructor will notify students in writing of any updates to this outline during the semester. The instructor reserves the right to revise, add or delete material while meeting the learning outcomes of this course outline.