



## Mathematics for Teachers 1 – MATH 105

### University Studies Program

### Course Outline

COURSE IMPLEMENTATION DATE: Pre 1998  
OUTLINE EFFECTIVE DATE: September 2022  
COURSE OUTLINE REVIEW DATE: April 2027

---

#### GENERAL COURSE DESCRIPTION:

Mathematics for Elementary Teachers 1 is a math course that 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. This course emphasizes the foundational topics taught in the early elementary grades including problem solving strategies; whole number operations such as addition, subtraction, multiplication, and division; fractions and decimals; and 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 Hours	
Other Contact Hours	
<b>Total</b>	45

#### Practicum Hours (if applicable):

Type of Practicum	Duration
On-the-job Experience	N/A
Formal Work Experience	N/A
Other	N/A
<b>Total</b>	

**Course Outline Author or Contact:**

Andrea Hyde, BSc Hons, MSc

---

Signature

---

**APPROVAL SIGNATURES:**

Department Head  
Erin Aasland Hall  
E-mail: [aaslandhall@cotr.bc.ca](mailto:aaslandhall@cotr.bc.ca)

Dean of Business and University Studies  
Darrell Bethune  
E-mail: [bethune@cotr.bc.ca](mailto:bethune@cotr.bc.ca)

---

Department Head Signature

---

Dean Signature

EDCO

Valid from: September 2022 – April 2027

---

Education Council Approval Date

---

**COURSE PREREQUISITES AND TRANSFER CREDIT:**

**Prerequisites:** Minimum 60% in either MATH 080, MATH 100, MATH 101, Pre-Calculus 11, Principles of Math 11, Foundations of Math 11, Applications of Math 11, Pre-Calculus 12, Calculus 12, or equivalent; or 70% or better in either Geometry 12, Statistics 12, or equivalent; or any grade in Foundations of Math 11 and 70% or higher in Foundations of Math 12.

**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>.

Students 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*. 10<sup>th</sup> 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*. 12<sup>th</sup> edition. Kendall/Hunt Publishing, 2009.

Bennett Jr., A. and L. Nelson. *Mathematics for Elementary Teachers: A Conceptual Approach*. 8<sup>th</sup> 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

- develop and implement a plan for solving a problem;
- describe and perform fundamental relations (greater than, less than, equal to) and operations (addition, subtraction, multiplication, division) on whole numbers, integers, fractions, and decimals;
- apply the techniques of elementary formal logic to solve problems and interpret mathematical proofs;
- perform and explain a variety of symbolic calculations at a level which is appropriate for the elementary grades;
- create word problems on whole numbers, integers, fractions, and decimals and their operations, and solve those problems through manipulation of two- and three dimensional objects, graphical representations, and a variety of appropriate algorithms;
- identify properties such as commutativity, associativity, and distributivity and use them to compute with whole numbers, integers, fractions, and decimals;
- describe the structure of base counting systems (base 10 and other bases), and represent numbers, count, and perform operations within these systems; and
- justify and apply basic divisibility tests with an understanding of the role of prime numbers, composite numbers, greatest common divisors, and least common multiples.

## 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 an understanding that mistakes and failure are an important part of the mathematical process.

---

### COURSE TOPICS:

1. Introduction to Problem Solving
2. Sets, Whole Numbers, and Numeration
3. Elementary Logic
4. Whole Numbers: Operations and Properties
5. Whole Number Computation – Mental and Written
6. Number Theory
7. Integers
8. Fractions
9. Decimals

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

---

### EVALUATION AND ASSESSMENT:

Assignments	% Of Total Grade
Assignments	20%
Term Project and Presentation	20%
Midterms	25%
Final Exam	<u>35%</u>
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 scheduled 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](http://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.