MATH-083 – Mathematics – Advanced Level – Foundations

College Preparation and Upgrading

Effective Term & Year: Winter 2027
Course Outline Review Date: 2032-09-01

Program Area: Upgrading for Academic and Career Entry

Description:

Equivalent to high school Foundations of Math 11 and a prerequisite for many Career/Technical and University programs. Topics include rates, systems of linear inequalities, quadratic functions, geometry, statistics, trigonometry, measurement, and logical reasoning.

Program Information:

This course fulfills the math requirement for the BC Adult Graduation Diploma. It also serves as a versatile academic prerequisite, meeting the entry requirements for a wide range of post-secondary credentials, including many business diplomas and health science programs.

Delivery Methods: Directed/Guided Studies, On-campus (Face-to-Face)

Credit Type: ABE Credits

Credits: 0

Instructional Activity and Hours:

Activity	Hours
Classroom, Directed Studies or Online Instruction	90
Seminar/Tutorials	
Laboratory/Studio	
Practicum/Field Experience	
Co-op/Work Experience	

Other	
Total	90

Course Requisites:

- Completed at least 1 of the following:
  - FMP 10 – Foundations of Mathematics and Pre-Calculus 10
  - MATH070 – Mathematics Intermediate Level (Algebraic)
  - MATH082 – Mathematics, Advanced Level (Developmental Mathematics) (0)

Prior Learning and Recognition: Yes

Prior Learning Assessment and Recognition:

Students are able to request formal recognition of their prior learning or experience outside the classroom. Challenge examination, portfolio-assisted assessment, work-based assessment or a combination of assessments that is appropriate to identify, assess, and recognize prior skills, competencies, and knowledge to achieve course credit. Tuition fees apply, refer to Policy 2.5.5 Prior Learning Assessment and Recognition (PLAR) or contact an education advisor for more information.

Course Transfer Credit:

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 Enrollment Service 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:

Nelson. (2012). *Foundations of mathematics 11* (Workbook). Nelson Education.

Scientific Calculator

Learning Outcomes:

The outcomes of this course meet and are consistent with the outcomes prescribed for Mathematics: Advanced Level – Foundations, in the Adult Basic Education in British Columbia Colleges – An Articulation Handbook ABE Articulation Handbook: 2026 – 2027

Learners are expected to use a scientific calculator to evaluate complex expressions, with an emphasis on using specialized functions and keys effectively.

General Problem-Solving Strategies:
Guess and check, pattern recognition, systematic lists, modeling/drawing, eliminating options, simplifying, working backward, and alternative approaches.
Core Learning Outcomes

1. **Skills Review**
    - **Basic Algebra:** Number classification, order of operations, first-degree equations/inequalities, word problems, and formula rearrangement.
    - **Linear Relations:** Slope-intercept form, graphing (tables, intercepts, slope), rate interpretation, domain, range, and function notation.
    - **Systems of Linear Equations:** Solving 2-variable systems (graphing, substitution, elimination) and practical applications.
    - **Right Triangle Trigonometry:** Sine, cosine, tangent ratios, angle sum property, and the Pythagorean theorem.
2. **Rates**
    - Interpret and solve contextual rate problems using proportions, unit rates, and dimensional analysis.
3. **Systems of Linear Inequalities**
    - Graph linear inequalities and the solution regions for systems of inequalities in two variables, and use the graphs to solve optimization problems.
4. **Quadratic Functions**
    - Factor expressions (GCF, difference of squares, $x^2 + bx + c$) and solve quadratic equations (factoring, quadratic formula).
    - Identify graph characteristics (vertex, vertex formula, max/min, intercepts, domain, range, axis of symmetry), graph quadratic functions, and solve problems using quadratic functions.
5. **Geometry**
    - Classify angles and triangles; work with similar and congruent shapes, measure angles with a protractor.
    - Use inductive and deductive reasoning to analyze angle relationships (parallel lines, transversals, angle sums) and derive proofs involving the properties of angles and triangles.
6. **Statistics**
    - Calculate and interpret central tendency, range, and standard deviation.
    - Analyze graphical data, identify bias, and work with normal curves and z-scores.

- Interpret statistical data using confidence intervals, confidence levels, and margin of error.

7. **Trigonometry**
   - Solve triangles and contextual problems using the Law of Sines and Law of Cosines (excluding the ambiguous case).
8. **Measurement**
   - Create and interpret scale diagrams of 2-D shapes and 3-D objects.
   - Use proportions for scale factors/dimensions and determine the effect of scale changes on area and volume.
9. **Logical Reasoning**
   - Formulate and test conjectures using patterns, inductive reasoning, and deductive reasoning.
   - Find counterexamples, evaluate argument validity, and use deductive proofs.
   - Use problem-solving strategies to solve problems or play games

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Course Topics:

- Review
- Rates
- Systems of Linear Inequalities
- Quadratic Functions
- Geometry
- Statistics
- Trigonometry
- Measurement
- Logical Reasoning

Evaluation and Assessments

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

Assessment Type	% of Total Grade
Unit Tests	40%
Assignments-must be completed in order to write tests	10%
Projects – must be presented	10%
Final Exam	40%
Total	100%

Assessment Type: Directed/Guided Studies

Assessment Type	% of Total Grade
Unit Tests	40%
Assignments-must be completed in order to write tests	10%

Projects – must be presented	10%
Final Exam	40%
Total	100%

Grade Scheme

A+	A	A-	B+	B	B-	C+	C	C-	D	F
>=95	94-90	89-85	84-80	79-75	74-70	69-65	64-60	59-55	54-50	<50

Evaluation Notes: A grade of D (50%) grants credit but may not be sufficient as a prerequisite for sequential courses and/or for transfer to other institutions.

Exam Attendance:

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:

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 2.1.4 Course Audit
- Policy 2.4.1 Credential Framework
- Policy 2.4.3 Students with Documented Disabilities
- Policy 2.4.4 Student Rights, Responsibilities and Conduct
- Policy 2.4.8 Academic Performance
- Policy 2.4.9 Student Feedback and Concerns
- Policy 2.4.11 Storage of Academic Works
- Policy 2.5.3 Student Appeal
- Policy 2.5.5 Prior Learning Assessment and Recognition (PLAR)

Course Changes:

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.