MATH-081 – Math – Advanced Level (Business/Technical Mathematics)

College Preparation and Upgrading

Effective Term & Year: Fall 2022
Course Outline Review Date: 2025-03-01

Program Area: Upgrading for Academic and Career Entry

Description:

The goal of Advanced Business/Technical Mathematics is to provide the student with practical applications useful in future vocational training, careers, or personal life. This course is not designed as a prerequisite to further study in Math.

Program Information:

Math 081 fulfills the math requirement for the BC Adult Graduation Diploma. No sequential courses are available

Delivery Methods: Directed/Guided Studies

Credit Type: ABE Credits

Credits: 3

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:

- Complete 1 of the following
  - Completed at least 1 of the following:
    - MATH070 – Mathematics Intermediate Level (Algebraic)
    - MATH072 – Mathematics Intermediate Level (Developmental)
  - Or Workplace Mathematics 10 or equivalent or permission of the instructor.

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 Columba 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:

Advanced Level Business/Technical Math Modules

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.

Learning Outcomes:

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

1. Operations with Real Numbers

It is expected that learners will be able to:

a) add, subtract, multiply and divide rational numbers;

b) evaluate powers with rational bases and integer exponents;

c) demonstrate the order of operations with rational numbers;

d) evaluate radicals and distinguish between exact answers and approximate answers;

e) write numbers in scientific notation, convert from scientific notation to decimal notation, and multiply and divide numbers expressed in scientific notation; and

f) use a scientific calculator.

2. First Degree Equations and Inequalities

It is expected that learners will be able to:

a) solve first degree equations, in one variable, including those involving parentheses;

b) solve formulas for a given variable;

c) solve first degree inequalities in one variable; and

d) solve practical problems using a first degree equation.

3. Equations and their graphs

It is expected that learners will be able to:

a) plot points on a coordinate system;

b) use number pairs to name points on the coordinate system;

c) determine whether a given point is a solution to an equation in two variables;

d) (optional) create an appropriate table of values and recognize the graph of the following relations:

- y = ax +b (linear)

- y = ax2 + bx + c (quadratic)
- y = a/x (reciprocal)
- y = a(bx) ½ (square root)
- y = a(bx) (exponential) where a, b, and c are real numbers

e) (optional) given the graph of an equation, determine, where appropriate, the following:

- x- and y-intercepts
- vertex
- slope

Optional Learning Outcomes

Learners must complete a minimum of three of the following units:

A. Consumer Mathematics

It is expected that learners will be able to:

a) solve consumer problems involving unit prices, wages earned in various situations, taxation simple and compound problems, and exchange rates;

b) reconcile financial statements;

c) solve budget problems; and

d) solve investment and credit problems involving interest.

B. Finance

It is expected that learners will be able to:

a) solve problems involving compound interest;

b) find the effective interest rate;

c) solve annuity problems;

d) solve loan and mortgage problems; and

e) determine the finance charge on a loan.

C. Data Analysis

It is expected that learners will be able to:

a) determine the mean, median, mode and range from a set of data;

b) interpret and/or construct frequency tables, broken line graphs, bar graphs, and stem-plots from a set of data;

c) (optional) find quartiles and the percentile represented by a given data value;

d) (optional) calculate the standard deviation of a set of data using appropriate technology;

e) (optional) use z-scores to analyze normally distributed data; and

f) design a statistical experiment, collect the data, analyze and communicate the results.

D. Measurement

It is expected that learners will be able to:

a) solve problems involving composite shapes and solids, with reference to perimeter, area, volume and surface area;

b) calculate maximum and minimum values, using tolerances, for lengths, areas and volumes; and

c) enlarge or reduce a dimensional object according to a specified scale.

E. Geometry

It is expected that learners will be able to:

a) use any of the following angle properties to determine an angle in a drawing:

- vertically opposite angles
- corresponding angles, alternate interior angles, and angles on the same side of the transversal
- angles on a line
- angles on a point
- complementary and supplementary angles
- angle sum of a triangle

b) classify triangles and quadrilaterals according to their sides and angles;

c) draw triangles given:

- three sides
- two sides and an included angle
- two angles and a side

d) draw quadrilaterals given various combinations of sides, angles, and diagonals.

F. Trigonometry

It is expected that learners will be able to:

a) solve right triangles using one or more of

i. the sine ratio

ii. the cosine ratio

iii. the tangent ratio

iv. the Pythagorean theorem

v. the angle sum property of triangles

b) (optional) solve triangles using the Law of Sines and/or the Law of Cosines (excluding the ambiguous case)

G. Systems of Equations

It is expected that learners will be able to:

a) solve systems of linear equations in two variables graphically and/or algebraically;

b) graph linear inequalities in two variables;

c) solve graphically, systems of linear inequalities; and

d) solve practical problems.

H. Trades Option

It is expected that learners will be able to solve applied problems (as related to a specific trade) using:

a) algebra;

b) geometry;

c) right triangle trigonometry;

d) ratio and proportion; and

e) percentage

I. Health Option

It is expected that learners will be able to solve applied problems (as related to the health field) using:

a) ratio and proportion;

b) unit conversion; and

c) percentage

Material covered in this course is consistent with the articulated outcomes for ABE Advanced Level -Business/Technical Math as found in the 2018 – 2019 ABE Articulation Guide.

Course Topics:

Core

- Operations with Real Numbers
- First Degree Equations and Inequalities
- Equations and their Graphs

Optional Units (Student must complete 3 of the following)

- Consumer Mathematics
- Finance
- Data Analysis
- Measurement
- Geometry
- Trigonometry
- Systems of Equations
- Trades Option
- Health Option

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

The outcomes of this course meet and are consistent with the outcomes prescribed for Computer Studies: Fundamental Level in the Adult Basic Education in British Columbia Colleges – An Articulation Handbook – https://www.bctransferguide.ca/wp-content/uploads/2022/08/abeguide2223.pdf

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Evaluation and Assessments

Assessment Type: Directed/Guided Studies

Assessment Type	% of Total Grade
Unit Tests	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

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.