COLLEGE OF THE ROCKIES

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

Access Education/Upgrading for Academic and Career Entry

Course Outline

COURSE IMPLEMENTATION DATE:	**Pre 1998**
OUTLINE EFFECTIVE DATE:	**September 2020**
COURSE OUTLINE REVIEW DATE:	**March 2025**

GENERAL COURSE 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: This course is delivered in a directed study format.

ABE Credits: 3

Hours for this course: 90 hours

Typical Structure of Instructional Hours:

Instructional Activity	Duration
Lecture Hours	
Seminars / Tutorials	
Laboratory / Studio Hours	
Practicum / Field Experience Hours	
Other Contact Hours	90
Total	90

Practicum Hours (if applicable):

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

Other Contact Hours:

- Directed Study

Course Outline Author or Contact:
Deb Heal, BEd

Signature

APPROVAL SIGNATURES:

Department Head
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Dean Signature

EDCO

Valid from: September 2020 - March 2025

Education Council Approval Date

COURSE PREREQUISITES AND TRANSFER CREDIT:

Prerequisites: Either MATH 070, MATH 072, Workplace Mathematics 10 or equivalent or permission of the instructor.

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:

Advanced Level Business/Technical Math Modules

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:

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)
   - $y = ax^2 + bx + c$ (quadratic)
   - $y = a/x$ (reciprocal)
   - $y = a(bx)$ ½ (square root)
   - $y = a(b^x)$ (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.

EVALUATION AND ASSESSMENT:

Assignments	% Of Total Grade
Unit Tests	100%
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)	≥ 95	94-90	89-85	84-80	79-75	74-70	69-65	64-60	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 will endeavour to provide notice of changes to students as soon as possible. The instructor reserves the right to add or delete material from courses.