ORIGINAL COURSE IMPLEMENTATION DATE: September 2009
REVISED COURSE IMPLEMENTATION DATE: September 2022
COURSE TO BE REVIEWED (six years after UEC approval)**:** February 2028
Course outline form version: 05/18/2018

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

Course Code and Number: MATH 140	**Number of Credits:** 3 Course credit policy (105)

Course Full Title: Algebra and Functions for Business
Course Short Title: Algebra & Functions for Bus.

(Transcripts only display 30 characters. Departments may recommend a short title if one is needed. If left blank, one will be assigned.)

Faculty: Faculty of Science	**Department (or program if no department):** Mathematics & Statistics

Calendar Description:

Develops mathematical skills and techniques necessary for the study of calculus with business applications. Topics include small linear systems of equations, linear, polynomial, rational, exponential, and logarithmic functions and their properties. Applications in business, economics, and the social sciences are emphasized.

Prerequisites (or NONE):	One of the following: (C+ or better in one of Pre-calculus 11 or Calculus 12) or (C or better in one of Principles of Mathematics 11, Pre-calculus 12, or MATH 085) or (one of Principles of Mathematics 12, MATH 092, or MATH 096) or (a score of 17/25 or better on Part A of the MSAT).
Corequisites (if applicable, or NONE):	NONE
Pre/corequisites (if applicable, or NONE):	NONE

Antirequisite Courses *(Cannot be taken for additional credit.)*

Former course code/number:

Cross-listed with:

Dual-listed with:

Equivalent course(s):

(If offered in the previous five years, antirequisite course(s) will be included in the calendar description as a note that students with credit for the antirequisite course(s) cannot take this course for further credit.)

Special Topics *(Double-click on boxes to select.)*

This course is offered with different topics:

☒ No ☐ Yes *(If yes, topic will be recorded when offered.)*

Independent Study

If offered as an Independent Study course, this course may be repeated for further credit: *(If yes, topic will be recorded.)*

☒ No ☐ Yes, _____ repeat(s) ☐ Yes, no limit

Transfer Credit

Transfer credit already exists: *(See **bctransferguide.ca**.)*

☐ No ☒ Yes

Submit outline for (re)articulation:

☒ No ☐ Yes *(If yes, fill in transfer credit form.)*

Typical Structure of Instructional Hours

Lecture/seminar hours	50
Tutorials/workshops	
Supervised laboratory hours	
Experiential (field experience, practicum, internship, etc.)	
Supervised online activities	
Other contact hours:	
Total hours	**50**

Labs to be scheduled independent of lecture hours: ☐ No ☐ Yes

Grading System
☒ Letter Grades ☐ Credit/No Credit

Maximum enrolment (for information only): 36

Expected Frequency of Course Offerings:

Every semester *(Every semester, Fall only, annually, etc.)*

Department / Program Head or Director	**Date approved:**	August 2021
Faculty Council approval	**Date approved:**	September 10, 2021
Undergraduate Education Committee (UEC) approval	**Date of meeting:**	February 25, 2022

Learning Outcomes:

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

1. Demonstrate proficiency in basic algebra skills required in calculus (eg, rules of exponents, factoring, combining and simplifying polynomials and rational expressions, difference quotients).
2. Solve linear and quadratic equations, and linear inequalities.
3. Solve small systems of linear equations algebraically and graphically.
4. Translate between graph, general form, point-slope form, and slope-intercept form of a line.
5. Demonstrate appropriate use and interpretation of function notation, and operations on functions, including piecewise functions.
6. Compute and interpret difference quotient and average rate of change of a function and secant slope on a graph.
7. Define, construct, and analyze graphs of equations, functions and their transformations.
8. Compute and interpret inverses of functions.
9. Solve exponential and logarithmic equations.
10. Identify linear, quadratic, cubic, exponential, and logarithmic functions and use them to model real world applications (primarily to business and social sciences).
11. Use technology to construct regression equations for the above models from data, including piecewise-defined models.

Prior Learning Assessment and Recognition (PLAR)

☒ Yes   ☐ No, PLAR cannot be awarded for this course because

Typical Instructional Methods *(Guest lecturers, presentations, online instruction, field trips, etc.; may vary at department's discretion.)*

Students will learn to use graphing calculators as a tool for plotting and analyzing functions.

NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

Typical Text(s) and Resource Materials *(If more space is required, download Supplemental Texts and Resource Materials form.)*

	Author (surname, initials)	Title (article, book, journal, etc.)	Current ed.	Publisher	Year
1.	Bittinger et al	Precalculus: Graphs and Models, 6th ed.	☒	Pearson	2018
2.			☐		
3.			☐		
4.			☐		
5.			☐		

Required Additional Supplies and Materials *(Software, hardware, tools, specialized clothing, etc.)*

A graphing calculator (such as TI-83, TI-83Plus, TI-84, TI-85, or TI-86) is required

Typical Evaluation Methods and Weighting

Final exam:	40%	Assignments:	10%	Field experience:	%	Portfolio:	%
Midterm exam:	%	Project:	%	Practicum:	%	Other:	%
Quizzes/tests:	50%	Lab work:	%	Shop work:	%	Total:	100%

Details (if necessary): * Students must obtain at least 40% on the final exam to pass the course, regardless of term grades.

Typical Course Content and Topics

1. **Algebra:**
   (a) Real numbers and their properties, intervals, absolute value
   (b) Integer exponents, order of operations
   (c) Polynomial arithmetic and basic factoring
   (d) Rational expressions: domain, arithmetic, simplification
   (e) Radical notation and rational exponents
   (f) Solving linear and quadratic equations, linear inequalities

2. Graphing:
   (a) Points in the plane, distances and midpoints
   (b) Graph of an equation in two variables
   (c) Graphs of linear, quadratic, polynomial, exponential, and logarithmic functions
   (d) Characteristics of graphs: zeros, intercepts, increasing, decreasing, maxima, minima

3. Linear systems:
   (a) Solving 2-variable linear systems algebraically and graphically
   (b) Solving 3-variable linear systems algebraically and with the use of technology

4. **Functions:**
   (a) Linear, quadratic, polynomial, rational, exponential, and logarithmic functions
   (b) Function notation
   (c) Graph of a function
   (d) Using functions to relate mathematical equations to real situations
   (e) Piecewise-defined functions
   (f) Algebraic combinations, compositions, and transformations of functions
   (g) Inverse functions: finding them graphically and algebraically, understanding their uses

5. **Modeling and regression:**
   (a) How to choose and build linear, exponential, logarithmic, logistic, polynomial models using technology
   (b) Constructing piecewise-continuous models using technology

6. **Applications in business and the social sciences**
   (a) Population growth, compound interest, depreciation, doubling time, and halving time
   (b) Supply and demand equilibrium, break-even point
   (c) Cost, revenue, profit as functions of production level

7. **Introduction to calculus**
   (a) Difference quotients, secant slopes, average rate of change
   (b) Introduction to tangent lines and the instantaneous rate of change, as time permits