ORIGINAL COURSE IMPLEMENTATION DATE:	September 2009
REVISED COURSE IMPLEMENTATION DATE:	September 2018
COURSE TO BE REVIEWED: (six years after UEC approval)	September 2020

Course outline form version: 09/15/14

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 (if title exceeds 30 characters): Algebra & Functions for Business

Faculty: Faculty of Science

Department (or program if no department): Mathematics and Statistics

Calendar Description:

Develops mathematical skills and techniques necessary for the study of calculus with business applications. Students will solve small linear systems of equations, examine linear, quadratic, cubic, rational, exponential, logarithmic, and logistic models and their graphs, and study various measures of change. Practical applications in business, economics, and the social sciences are emphasized.

Note: Students with credit for MATH 110 cannot take this course for further credit.

Prerequisites (or NONE):	One of the following: (C+ or better in one of Foundations of Mathematics 11 or Pre-calculus 11) or (C or better in one of Principles of Mathematics 11 or MATH 085) or (one of Foundations of Mathematics 12, Pre-calculus 12, Principles of Mathematics 12, MATH 092, or MATH 096) or (a score of 17/25 or better on Part A of the MSAT). Note: As of January 2019, prerequisites will change to: One of the following: (C+ or better in Pre-calculus 11) or (C or better in one of Principles of Mathematics 11, or 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

Equivalent Courses (cannot be taken for additional credit)

Former course code/number:

Cross-listed with:

Equivalent course(s): **MATH 110**

Note: Equivalent course(s) should be included in the calendar description by way of a note that students with credit for the equivalent course(s) cannot take this course for further credit.

Transfer Credit

Transfer credit already exists: ☒ Yes ☐ No

Transfer credit requested (OReg to submit to BCCAT):

☐ Yes ☐ No (if yes, fill in transfer credit form)

Resubmit revised outline for articulation: ☒ Yes ☐ No

To find out how this course transfers, see **bctransferguide.ca**.

Total Hours: 50

Typical structure of instructional hours:

Lecture hours	50
Seminars/tutorials/workshops	
Laboratory hours	
Field experience hours	
Experiential (practicum, internship, etc.)	
Online learning activities	
Other contact hours:	
Total	**50**

Special Topics

Will the course be offered with different topics?

☐ Yes ☒ No

If yes, different lettered courses may be taken for credit:

☐ No ☐ Yes, repeat(s) ☐ Yes, no limit

Note: The specific topic will be recorded when offered.

Maximum enrolment (for information only): 36

Expected frequency of course offerings (every semester, annually, every other year, etc.): Every semester

Department / Program Head or Director: Ian Affleck	**Date approved:**	September 2017
Faculty Council approval	**Date approved:**	September 8, 2017
Campus-Wide Consultation (CWC)	**Date of posting:**	October 13, 2017
Dean/Associate VP: Lucy Lee	**Date approved:**	September 8, 2017
Undergraduate Education Committee (UEC) approval	**Date of meeting:**	October 27, 2017

Learning Outcomes

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

1. Perform arithmetic combinations of polynomial and rational expressions
2. Factor quadratic and some cubic expressions
3. Solve linear and quadratic equations, linear inequalities, and inequalities involving absolute values
4. Solve small systems of linear equations algebraically and graphically
5. Demonstrate appropriate use and interpretation of function notation
6. Sketch the graph of a given function and analyse a given graph of a function
7. Using graph, data, equation, or application, identify the following models: linear, quadratic, cubic, exponential, logarithmic, logistic
8. Use technology to construct regression equations for the above models from data, including piecewise-defined models
9. Compute and interpret inverses of linear, exponential, and logarithmic functions
10. Solve exponential and logarithmic equations
11. Translate between graph, point-slope form, and slope-intercept form of a line
12. Compute and interpret difference quotient and average rate of change of a function and secant slope on a graph
13. Interpret all results in the field of interest from which the model being analyzed arose

Prior Learning Assessment and Recognition (PLAR)

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

Course Challenge

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.

Grading system: Letter Grades: ☐ Credit/No Credit: ☐ Labs to be scheduled independent of lecture hours: Yes ☐ No ☐

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

Typical Text(s) and Resource Materials

	Author (surname, initials)	Title (article, book, journal, etc.)	Current ed.	Publisher	Year
1.	Bittinger et al	Precalculus: Graphs and Models, 4^{th} ed.	☐	Pearson	2009
2.			☐		
3.			☐		
4.			☐		
5.			☐		

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

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

Typical Evaluation Methods and Weighting

Final exam:	40%	Assignments:	10%	Midterm exam:	%	Practicum:	%
Quizzes/tests:	50%	Lab work:	%	Field experience:	%	Shop work:	%
Other:	%	Other:	%	Other:	%	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. Linear systems:

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

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

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

5. **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

6. **Introducation to calculus**
   (a) Difference quotients, secant slopes, average rate of change
   (b) Introduction to tangent lines and the instantaneous rate of change