OFFICIAL UNDERGRADUATE COURSE OUTLINE (page 1)

UNIVERSITY OF THE FRASER VALLEY

COURSE IMPLEMENTATION DATE:	September 2009
COURSE REVISED IMPLEMENTATION DATE:	September 2014
COURSE TO BE REVIEWED:	September 2020
(six years after UEC approval)	*(month, year)*

OFFICIAL UNDERGRADUATE COURSE OUTLINE INFORMATION

Students are advised to keep course outlines in personal files for future use.

Shaded headings are subject to change at the discretion of the department – see course syllabus available from instructor

MATH 140	Science/Mathematics & Statistics	3
COURSE NAME/NUMBER	FACULTY/DEPARTMENT	UFV CREDITS

Algebra and Functions for Business
COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:

This course is intended to give students an opportunity to develop the mathematical skills and techniques necessary for the study of differential and integral calculus with business applications. Students will strengthen their basic algebraic skills, solve small linear systems of equations by various methods, examine linear, quadratic, cubic, rational, exponential, logarithmic, and logistic models and their graphs, and study various measures of change of functions. Practical applications in business, economics, and the social sciences are emphasized. Many applications involve modeling data with piecewise continuous models.

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

PREREQUISITES: 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 Math 11 or MATH 085; or one of Foundations of Mathematics 12, Pre-calculus 12, or Principles of Math 12; or a score of 17/25 or better on Part A of the MSAT.

COREQUISITES:

PRE or COREQUISITES:

SYNONYMOUS COURSE(S):

(a) Replaces:

(b) Cross-listed with:

(c) Cannot take: MATH 110 for further credit.

SERVICE COURSE TO: *(department/program)*

TOTAL HOURS PER TERM: 45

STRUCTURE OF HOURS:

Lectures:	45	Hrs
Seminar:		Hrs
Laboratory:		Hrs
Field experience:		Hrs
Student directed learning:		Hrs
Other (specify):		Hrs

TRAINING DAY-BASED INSTRUCTION:

Length of course: N/A

Hours per day: N/A

OTHER:

Maximum enrolment: 36

Expected frequency of course offerings: Every semester

(every semester, annually, every other year, etc.)

WILL TRANSFER CREDIT BE REQUESTED? (lower-level courses only)	☒ Yes	☐ No
WILL TRANSFER CREDIT BE REQUESTED? (upper-level requested by department)	☐ Yes	☐ No
TRANSFER CREDIT EXISTS IN BCCAT TRANSFER GUIDE:	☐ Yes	☒ No

Course designer(s):	**Ian Affleck**		
Department Head:	**Cindy Loten**	Date approved:	**April 29, 2013**
Campus-Wide Consultation (CWC)		Date of meeting:	**May 31, 2013**
Curriculum Committee chair:	**David Fenske**	Date approved:	**September 20, 2013**
Dean/Associate VP:	**Lucy Lee**	Date approved:	**September 20, 2013**
Undergraduate Education Committee (UEC) approval		Date of meeting:	**October 25, 2013**

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

METHODS: *(Guest lecturers, presentations, online instruction, field trips, etc.)*

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

METHODS OF OBTAINING PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):

☐ Examination(s) ☐ Portfolio assessment ☐ Interview(s)

☒ Other (specify): Course Challenge

☐ PLAR cannot be awarded for this course for the following reason(s):

TEXTBOOKS, REFERENCES, MATERIALS:

[Textbook selection varies by instructor. An example of texts for this course might be:]

Sullivan, Precalculus, 8th edition, Pearson, 2008 (Chapters 1-5 and 14)
Lial, Hungerford and Holcomb, Finite Mathematics with Applications in the Management, Natural, and Social Sciences, 9th edition, Pearson, 2006 (Chapters 1-5)
Beecher, Penna, and Bittinger, Precalculus, 3rd edition, Pearson, 2008 (Chapters R, 1-4)
Swokowski and Cole, Precalculus: Functions and Graphs, 11th edition, Thomson, 2008 (Chapters 1-4)
Haussler, Paul, and Wood, Introductory Mathematical Analysis for Business, Economics, and the Life and Social Sciences, 12th edition, Pearson, 2008 (Chapters 0-4)

SUPPLIES / MATERIALS:

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

STUDENT EVALUATION:

[An example of student evaluation for this course might be:]

Progress will be evaluated with regular short tests and/or assignments, one or more midterms and a three hour comprehensive final exam.

Quizzes, assignments, and projects:	30%
Term tests:	30%
Final exam:	40%*

* Students must obtain at least 40% on the final exam to pass the course, regardless of term grades.

COURSE CONTENT:

[Course content varies by instructor. An example of course content might be:]

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