THE UNIVERSITY OF THE WEST INDIES – MONA CAMPUS
DEPARTMENT OF ECONOMICS

ECON1003: Mathematics for Social Sciences I

Academic Year:	Semester II - 2020/2021
Pre-requisite:	CSEC/CXC Math or GCE Math or ECON0001 or GOVT0100
Anti-requisite:	MATH0100, MATH0110 & MATH1141
Lecturer:	Romae Muschette
Lecture:	Wednesdays 6:00pm - 8:00pm & Fridays 2:00pm – 4:00pm
Email:	romae.finegan@uwimona.edu.jm
Office Hours:	Tuesdays 2:00pm – 4:00pm (via Blackboard Collaborate)

Course Description

This course is designed to build on students' understanding of elementary mathematics and to expose them to some of the mathematical concepts that will be useful in the study of mathematical models in economics and the management sciences. Emphasis will be placed on the understanding and application of mathematical concepts, rather than just computational skills and the use of algorithms and formulas.

This course is aimed at:
- Developing the mathematical skills needed to successfully navigate the seas of quantitative courses in economics and management studies.
- Developing an appreciation for the beauty and power of mathematics.

Learning Outcome

At the end of the course students will be able to use mathematical concepts and skills to solve problems in economics and management sciences.

Modes of Delivery

Two lecture hours and one tutorial hour per week via Blackboard Collaborate

Syllabus

This course is divided into eight (8) units as follows:

SECTION A: PRE-CALCULUS

Unit 1: Functions
1.1 Definition of a function
1.2 Evaluating functions
1.3 Domain, range, and graphs of functions
1.4 One to one and onto functions
1.5 Composition of functions
1.6 Inverse functions and their graphs
1.7 Special functions and their graphs (polynomial, rational, absolute value, square root)
1.8 Transforming graphs (horizontal and vertical shifts, reflection)

Unit 2: Inequalities
2.1 Linear inequalities including absolute value and double inequalities
2.2 Solving quadratic inequalities graphically
2.3 Graphs of systems of linear inequalities
2.4 Applications of inequalities (profit, sales allocation, investment)

Unit 3: Equations
3.1 Brief review of linear and quadratic equations
3.2 Cubic equations – Remainder and Factor Theorems
3.3 Nonlinear equations to include radicals and absolute value
3.4 Manipulation of formulas

Unit 4: Exponential & Logarithmic Functions
4.1 Graphs of exponential and logarithmic function
4.2 The natural exponential and natural logarithmic function
4.3 Basic properties of logarithmic
4.4 Solving exponential equations
4.5 Applications

Unit 5: Matrix Algebra
5.1 Matrix addition, multiplication and transposition
5.2 Determinants of (2x2) and (3x3) matrices
5.3 Cramer's Rule

Unit 6: Sequences
6.1 Definition of a sequence (general terms and recursive definition)
6.2 Sigma notation, including double sums

SECTION B: CALCULUS
Unit 7: Limits & Continuity
7.1 Concept of a Limit
7.2 Limits of Polynomial and Rational Functions including limits to infinity
7.3 One-Sided Limits
7.4 Distinguish between Continuous and Discontinuous Functions
7.5 Finding points of discontinuity of Rational Functions

Unit 8: Differentiation of Single Variable Functions
8.1 The concept of the derivative
8.2 Rules of differentiation (power, chain, product, quotient rules)
8.3 Higher order derivatives
8.4 Differentiation of Exponential and Logarithmic Functions
8.5 Marginal functions
8.6 Relative extrema (maxima/minima) using the first and second derivative tests

Assessment

Mode of Assessment	Format	Weight
Two Mid-Semester exams (25% each)	Multiple Choice Questions (via OurVLE)	50%
Final Exam	Multiple Choice Questions (via OurVLE)	50%
Total		**100%**

Resources
Recommended Textbooks:
- Introductory Mathematical Analysis for Business, Economics, and the Life and Social Sciences by Haeussler, Paul and Wood.

- Essential Mathematics for Economic Analysis by Sydaester and Hammond.

Other Materials:
- Scientific Calculator

Other Details
Tutorials
STUDENTS ARE REQUIRED TO ATTEMPT ALL TUTORIAL QUESTIONS PRIOR TO THE TUTORIAL. Failure to do so will result in the tutorial ending prematurely and the tutor assuming that students are comfortable with the information contained therein.

The role of the tutor is not to do the tutorial questions but to assist students through the tutorial questions. Therefore, an attempt must be made by students prior to the tutorial session.

Communication
If you need to contact me, please do so through the OurVLE platform.