East West University
Department of Economics
Semester: Summer 2019

Course Outline

Course Code: MAT 110

Course Title: Mathematics for Business and Economics 1

Credit Hours: 3 ***Prerequisite: ECO 101, MAT100***

Class Time

Course	Sec	Time	Day	Room
MAT 110	8	11:50-01:20	TR	437

Instructor:Noara Razzak, Adjunct Faculty, Department of Economics, Room no. 345
Email: noara.razzak@gmail.com

Office Hours

Day	Sunday	Monday	Tuesday	Wednesday	Thursday
Time			10:00-11:50		10:00-11:50

Course Learning Outcomes

- CLO1:Review and learn number system, function and graph
- CLO2: Learn and understand the concept of Future value and Present value of an Annuity
- CLO3:Formulate a linear equations and system of equations using business and economic problems
- CLO4: Understand the static equilibrium analysis
- CLO5: Apply the comparative static and derivatives with applications
- CLO6: Use optimization problem (Unconstrained) for one or several variables with their applications
- CLO7: Use a mathematical software to solve business and economic applications.

Rationale of Course: Mathematics is an integral part of many disciplines such as Physics, Computer Science, Economics, Business Administration, Biology to name a few. Numerical and logical way of thinking play a significant role in each of these disciplines and these in turn equip students with analytical and problem solving skills. Moreover, a good understanding of maths is essential for developing problem solving skills required in the workplace.

Objectives of Course: The course is intended to provide a basic knowledge of mathematical tools required to understand and to apply concepts in business, economics and social sciences. Students of the course will primarily learn problem solving skills and develop an intuition of how and why mathematical tools are used to solve problems in fields such as business and economics. Lab class will be an essential part of the teaching method.

Course Schedule:

Part 1: Students will be able to understand functions and graphs, including elementary functions, quadratic functions. Students will be able to solve systems of linear equations, augmented matrices and inverse of matrices. Finally, they will develop an understanding of Leontief Input-Output Analysis. At the same time, future value and present value of annuity, amortization and sink fund, decision making using NPV and IRR will be covered.

Part 2: This module will introduce the concepts of limits, infinite limits, continuity. Students will receive a quick revision of the derivative, basic differentiation properties, derivatives of exponential and logarithmic functions and linear and non-linear growth rates. Finally, students will learn to apply and interpret marginal analysis in business and economics and to apply related prices and elasticity of demand

Part 3: The final module will cover, enable students form an intuition of first derivative and graphs, second derivative and graphs and learn to find and interpret absolute maxima and minima.. Students will learn to apply partial derivative and Young's Theorem. Finally, students will understand and apply unconstrained optimization and be able to perform equilibrium analysis using demand and supply functions taking substitute good, complementary goods, income and input into consideration.

Core Reading:

College Mathematics for Business, Economics, Life Sciences and Social Sciences (Global Edition) by R.A Barnett, M.R. Zeigler & K.E. Byleen

Part 1: Functions and Matrices

Topic 1	One to one functions, Linear and Nonlinear functions, Quadratic functions, Roots of Quadratic Functions (Supply, Demand, Cost, Revenue, Profit Functions), Number System
Topic 2	Future Value and Present Value of Annuity, Amortization and Sink Fund, Decision Making using NPV and IRR
Topic 3	Augmented matrices, Inverse of matrices, Leontief Input-Output Analysis, Equilibrium in Multiple Commodity Markets

Part 2: Limits and Derivatives

Topic 1	Concepts of limits, continuity, Exponential and Logarithmic functions, Compound Interest, Continuous Compound Interest
Topic 2	Derivative, Basic Differentiation Properties, Derivatives of exponential and logarithmic function, Linear and non-linear growth rates
Topic 3	Marginal analysis (Profit, Cost, Sales),

Part 3: Optimization

Topic 1	Related prices and elasticity of demand
Topic 2	First derivative and graphs, Second derivative and graphs, Maxima, Minima (Profit, Cost, Sales),
Topic 3	Equilibrium Analysis Using Non-Linear Demand and Supply Functions , Unconstrained Optimization

Note: The syllabus is at the instructor's discretion to be modified/ revised at any time to be notified to all students.

Assessment

Assignments	10%
Home works	5%
Lab	5%
Midterm 1	25%
Midterm 2	25%
Finals	30%
Total	100%

Grading Policy

% of Marks	***Grades***	***% of Marks***	***Grades***
97% - 100%	A+	73%-76%	C+
90% - 96%	A	70%-72%	C
87%-89%	A-	67%-69%	C-
83%-86%	B+	63%-66%	D+
80%-82%	B	60%-62%	D
77%-79%	B-	Below 60%	F

Special Instructions

There is zero tolerance for cheating at East West University. Students caught with cheat sheets in their possession, whether used or not used, and/or copying from cheat sheets, writing on the palm of hand, back of calculators, nearby walls, chairs etc. will be treated as cheating during an examination. The only penalty for cheating is expulsion from EWU.

- Class participation is highly desirable and in the past students who didn't attend classes regularly performed poorly, regardless of their prior capabilities.
- Lab attendance and assignments are mandatory; students will lose points if they are absent.

- No makeup exams are allowed except for compelling reasons by special arrangement ahead of time.
- No comprehensive exams. Each exam will consist of its own respective part.
- Students are advised to switch off phones during class time.
- Students are advised to go to teaching assistants to work regularly and work together in groups.