



East West University  
Department of Economics  
Semester: Summer 2026

### Course Information

**MAT 110: Mathematics for Business and Economics I**

Credit: 3

**Pre-requisite:** ECO101

### Instructor Information

Gazi Quamrul Hasan

**Room:** 356

**Contact:** [quamrulgazi@ewubd.edu](mailto:quamrulgazi@ewubd.edu)

**Contact No:** +8801716136440 (*You are encouraged to text if you can't find me during office hour*)

### Teaching Assistant

To be announced in the Class

### Class Routine & Office Hours

|           | 08:30-10:00                                               | 10:10-11:40           | 11:50-01:20          | 01:30-03:00           | 03:10-04:40 |
|-----------|-----------------------------------------------------------|-----------------------|----------------------|-----------------------|-------------|
| Sunday    | <i>Office Hour</i><br>(Thesis and Internship supervision) |                       |                      |                       |             |
| Monday    | <i>Office Hour</i>                                        | ECO7315(2)<br>AB3-602 | MAT100(2)<br>AB3-601 | <i>Office Hour</i>    |             |
| Tuesday   | MAT7110(1)<br>AB3-901                                     | <i>Office Hour</i>    | <i>Office Hour</i>   | ECO7310(2)<br>FUB-404 |             |
| Wednesday | <i>Office Hour</i>                                        | ECO7315(2)<br>AB3-602 | MAT100(2)<br>AB3-601 | <i>Office Hour</i>    |             |
| Thursday  | MAT7110(1)<br>AB1-201                                     | <i>Office Hour</i>    | <i>Office Hour</i>   | ECO7310(2)<br>433     |             |

### Course Learning Objectives (CLOs)

This course requires prior knowledge on the topics of differentiation and matrix algebra covered in MAT100 or in higher secondary level. This course aims to introduce the concepts of Business, Microeconomics and Macroeconomics using advanced mathematical tools. At the end of the course, students will be able to

CLO1: Review of the number system, functions, and graphs

CLO2: Understand the concept of Future value and Present value of an Annuity

CLO3: formulate a system of equations using business and economic problems

CLO4: Understand the static equilibrium analysis

CLO5: Apply comparative statistics and derivatives

CLO6: Use Optimization problem (Unconstrained) for one or several variables with their applications

### Course Description

This course focuses on the topics related to number system, function and graphs, linear function and straight line, quadratic function and parabolas, exponential and logarithmic functions and their applications in simple and compound interest rates, effective rate, concepts of future value and present value of an annuity, solving a system of linear equations, matrices and their applications, static equilibrium analysis- linear model. Concepts of comparative static and derivatives, partial and total differentiation with application, optimization problem (unconstrained) with one or more than one choice variables and their applications in economics and business models.

## Textbooks

1. **Mathematics for Economics and Business**, Ian Jacques, 5th edition
2. Raymond A. Barnett, Michael R. Zeigler, Karl E. Byleen, **Applied Mathematics for Business, Economics, Life Sciences and Social Sciences**.
3. Edward T. Dowling. Mathematical Economics, third edition (collect from the google classroom)

## Dropbox Link

[https://www.dropbox.com/sh/d9r5y2i4zkkrs6j/AAClhoJ7a37DI\\_lbWI5-elmYa?dl=0](https://www.dropbox.com/sh/d9r5y2i4zkkrs6j/AAClhoJ7a37DI_lbWI5-elmYa?dl=0)

## Course Contents & Tentative Teaching Schedule

| Serial No | Topics                                                                            | Teaching materials     |
|-----------|-----------------------------------------------------------------------------------|------------------------|
| 1         | Number Line, xy-Coordinate system, Number System                                  | Lectures and Textbooks |
| 2         | Relation, Function, One-one Function                                              | As Above               |
| 3         | Constant Function, Linear Function, Non-Linear Function                           | As Above               |
| 4         | Optimization with one choice variable (Quadratic and Cubic Functions)             | As Above               |
| 5         | Application of optimization problem in Business and Economics                     | As Above               |
| 6         | Partial and total differentiation with application                                | As Above               |
| 7         | Partial Equilibrium analysis and Comparative Static Analysis (Market equilibrium) | As Above               |
|           |                                                                                   |                        |
| 8         | Matrix Algebra                                                                    | As Above               |
| 9         | Solving a system of Linear equations (2 and 3 variables)                          | As Above               |
| 10        | Input Output Analysis                                                             | As Above               |
| 11        | Equilibrium in a multi-commodity market                                           | As Above               |
| 12        | Exponential and Logarithmic Functions                                             | As Above               |
| 13        | Formulation and Applications in Simple and Compound Interest rates                | As Above               |
| 14        | Net Present Value (NPV) and Internal Rate of Return (IRR) with applications       | As Above               |
|           |                                                                                   |                        |
| 15        | Optimization problem (unconstrained) with two choice variables                    | As Above               |
| 16        | Optimization problem (unconstrained) with more than two choice variables          | As Above               |
| 17        | Hessian Approach and Applications in Economics                                    | As Above               |
| 18        | Effective rates and Future value                                                  | As Above               |
| 19        | Application of Fischer's Formula in Economics and Finance                         | As Above               |
| 20        | Annuity, Perpetuity, Sunk Fund and Amortization                                   | As Above               |
| 21        | Equilibrium Analysis (Perfect Competition, Monopoly and Price Discrimination)     | As Above               |

## Class Policy and Grading

According to the university policy, students are required to attend at least 90% percent of the lectures and other academic activities. Class attendance is also very important to succeed in this course. If you must miss a class, please get notes and other course materials from a classmate.

In this course, students are expected to average a minimum of 6 hours of independent learning per week in addition to 3 hours per week of direct instructions.

Your course grade will be based on assignments, quizzes, class submissions and midterm exams.

1. The **assignments account for 5%** of the course grade.
2. The **quizzes account for 10% of the course grade**. You will have a quiz after a few classes and will be tested on materials covered in that class or in the last two classes.
3. **Term exams (Two) each account for 20% of the course grade**. These tests will be longer and will cover multiple chapters involving more complex problems covered in this course.
4. **Final Examination accounts for 40% of the course grade**. These tests will be longer and will cover multiple chapters involving more complex problems covered in this course
5. **Class Submission for 5% of the course grade** Class submissions and homework after each class will constitute 5% of the total grade.

#### **Special Instructions**

- No makeup exams and make up class quizzes except for serious compelling reasons.
- No comprehensive exams. Each exam will consist of its own respective part.
- No cellular phone during class hour.

***Good Luck***

