Faculty of Economics and Business
Universitas Gadjah Mada

ECON1102

Mathematics for Business Economics I

Course information
Course description

This course is designed to provide students in economics with basic mathematics that will be used in micro and macroeconomics. This course is designed for one semester that discuses sets, functions, sequences, series, and limits, matrices, derivative, and optimization of functions of one variable. Students will also learn how to use the mathematical concepts in the context of economics.

Learning outcomes

In the end of the semester, the students will have knowledge and ready to use the concepts in economic applications both in micro and macroeconomics.

Topics and readings

Hoy, M. et al. 2001. *Mathematics for Economics,* 2nd eds., The MIT Press, Massachusetts.

Chiang, A.C., *Fundamental Methods of Mathematical Economics*, 4th eds. McGraw-Hill, New York.

Week	Topics	Subtopics
1	Introduction to mathematics for economics	1. Introductions 2. Contracts 3. Sets 4. Subsets
2 & 3	Functions	1. Definition and concepts 2. Linear function 3. Quadratic functions 4. Exponential and logarithmic functions 5. Concavity and convexity
4 & 5	Sequences, series, and limits	1. Sequences and series 2. Interest rates 3. Present values 4. Compounding 5. Limits
6 & 7	Continuity of functions	1. One variable 2. Economic applications

Week	Topics	Subtopics
7 & 8	Derivative and differential for functions of one variable	1. Tangent line 2. Derivative and differential concepts 3. Derivative rules 4. Economic applications
9.	Higher-order derivation and Taylor series	1. Concavity 2. Convexity 3. Taylor series
10 & 11	Optimization of functions of one variable (unconstrained)	1. Necessary conditions 2. Sufficient conditions 3. Economic applications
12.	Matrices	1. Definitions and notations 2. Matrix operations 3. Matrix transposition 4. Special matrices
13.	Determinant and the inverse matrix	1. Definitions 2. Determinant 3. Inverse matrix 4. Matrix properties
14.	Matrix applications	1. Cramer's rule 2. Input-Output model

Exams and assignments

Your grade will be evaluated based on your total score on the following items:

> Homework 30%
> Mid exam 35%
> Final exam 35%

Faculty policies

Absenteeism

Students are expected to attend all scheduled class meetings. Absence from class meetings shall not exceed 20%. Students who exceed the 20% limit without a medical or emergency excuse acceptable to and approved by the Director of Undergraduate Program shall not be allowed to take the final exam and shall receive a grade of E from this course.

Plagiarism and ethical conduct

Academic integrity forms a fundamental bond of trust between colleagues, peers, lecturers, and students, and it underlies all genuine learning. There is no tolerance for plagiarism or academic dishonesty in any form_, including, but not limited to, viewing the exams of others, cheating or sharing answers with others, using books or notes while taking the exam, copying answers or papers, or passing off someone else's work as one's own. Plagiarism can result in punishment in accordance with the university regulation.

Policy on extension and late submissions

Students may work together to solve the assignments but must submit the final work individually. Each student must put **student number** (do **not** put your name) in the submitted work. Each late submission will get a penalty of 25% from the final assignment mark.