

**COURSE SYLLABUS**  
**FOR FULL-TIME UNDERGRADUATE PROGRAMS**  
*(Issued under Decision No.1380/QĐ-ĐHKTQĐ on 15/8/2016 by the University President)*

**1. COURSE NAME: Mathematics for Economics 1**

Code: TOCB 1105

Number of Credits: 02

**2. DEPARTMENT IN CHARGE OF INSTRUCTION**

**Department of fundamental mathematics**

**Office:** 4<sup>th</sup> floor, Building 7, National Economics University, 207 Giai Phong road, Hanoi, Vietnam

**Office Hours:** 8am-5pm, from Monday to Friday

**Office Telephone:** 084 4 36283007, ext: 5944 or 5798

**3. PRE-REQUISITE:** High school algebra.

**4. COURSE DESCRIPTION**

This course is intended for freshman who wish to obtain knowledge of mathematical techniques suitable for economic analysis. It assumes very little prerequisite knowledge.

The module is located in the general knowledge of curriculum BA in economics and business administration. The module provides the basic content of Linear Algebra in economic applications. The module aims to train thinking ability, improve math skills and application of knowledge in math analysis, object research and economics. This unit is also equipped with the basic knowledge to students learning modules Microeconomics, Macroeconomics, Mathematical models in economics, .... The course will introduce mathematical concepts and their applications on economics and business. We emphasize on Linear algebra, which are widely used in almost all branches of sciences, including business and economics. The approach is informal and aims to show students how to do and apply the mathematics they require for a successful study of economics. Economic applications are considered although this course aims to teach the mathematics not the economics. Topics covered include vector spaces, matrix algebra, determinat, system of linear equations, linear models, and its applications in economics.

## 5. LEARNING OUTCOMES

On successful completion of this course students will be able to:

- \* To gain confidence with mathematics
- \* To develop analytical skills
- \* To develop organizational skills
- \* To develop both independent learning and group work skills
- \* To develop verbal and non-verbal communication skills
- \* To successfully use mathematics in economics and business applications

## 6. COURSE OBJECTIVES

Course Content:

- Vectors and vector spaces
- Economic applications
- Matrix algebra
- Special kinds of matrices
- Inverse matrix
- Rank of matrix and application to portfolio theory
- Systems of linear equations
- Cramer System
- Linear models – applications in economics and business

## 7. COURSE CONTENT AND LECTURE PLAN

### TENTATIVE SCHEDULE

<i>No</i>	<i>Contents</i>	<i>Total hours</i>	<i>In details</i>	
			<i>Theory</i>	<i>Practice, Discussion, Exams</i>
1	Chapter 1. Vector Spaces	8	6	2
2	Chapter 2. Matrix and Determinant	10	6	4
3	Chapter 3. Systems of linear equations	12	8	4
	<b>Total</b>	<b>30</b>	<b>20</b>	<b>10</b>

**Weeks 1 - 4: CHAPTER 1: VECTOR SPACES**

- 1.1 System of linear equations - Gaussian and Gauss Jordan Elimination
- 1.2 Vectors and vector spaces
- 1.3 Linear dependence and linear independence
- 1.4 Bases and representations
- 1.5 Rank of a vectors set

**Reading and Homework: Chapter 2 [1], Chapters 2 [3], Chapter 10 [4]**

**Weeks 5 - 9: CHAPTER 2: MATRIX AND DETERMINANT**

- 2.1 The concept of matrix and the matrix transformations
- 2.2 Algebra matrix
- 2.3 Determinant
- 2.4 Inverse matrix
- 2.5 Rank of matrix

**Midterm Examination**

**Reading and Homework: Chapter 3[1], Chapters 8, 9 [4], Chapter 8, 9 [5]**

**Weeks 10 - 15: CHAPTER 3: SYSTEMS OF LINEAR EQUATIONS**

- 3.1 Cramer systems
- 3.2 General systems of linear equations
- 3.3. Homogeneous linear equations
- 3.4 Some linear models in economics

**Reading and Homework: Chapter 4 [1], Chapters 2[3], Chapter 7[4]**

**CHAPTER 4: QUADRATIC FORMS**

(Chapter reference)

- 4.1 The Basic Concepts of the Quadratic Forms
- 4.2. Transforms a Quadratic Form to Fomal Quadratic Forms
- 4.3. Defined quadratic form

Revised

**Final Examination**

**8. REQUIRED TEXTBOOK & COURSE MATERIALS**

[1] Required: Addvanced Mathematics for Economist, Le Đình Thuy, Nguyen Thi Quynh Lan, (2012)

## 9. RECOMMENDED TEXTS & OTHER READINGS

[2] Additional: College Algebra trigonometry, McGraw - Hill, Ninth Edition, A. BARNETT, R. ZIEGLER, E. BYLEEN, DAVE SOBECKI, (2011)

[3] Additional: Methods of mathematical Economics, CHIANG, A.C, (1985).

[4] Additional: Mathematics for economics, Second edition, MICHAEL HOY, JOHN LIVERNOIS, CHRIS MCKENNA, RAY REES, THANASIS STENGOS, (2001).

[5] Additional: Mathematics for Economists, CARLP. SIMON, LAWRENCE BLUME, (1994).

## 10. ASSESSMENT & GRADING POLICY

Your course score will be determined as the following weighted average:

Item	Weight
Attendance	10%
Midterm	20%
Final Exam	70%
<b>Total</b>	100%

Grading Criteria: %		Letter Grade
96%-100%	A+	4,0
91%-95%	A	4,0
85%-90%	A-	3,7
81% - 84%	B+	3,3
76%-80%	B	3,0
71%-75%	B-	2,7
66%-70%	C+	2,3
61%-65%	C	2,0
55%-60%	C-	1,7
51%-54%	D+	1,3
46%-50%	D	1,0
40%-45%	D-	0,7
<39%	F/WU/IC	0,0

- **Attendance policy:**

Attendance is required. You are responsible for everything that happens in the class. If you miss a class, ask your friends about materials covered in the class. The parts of the course are very well related to each other. It is a requirement that a student need to attend at least 80% time of course to have the right to take the final exam.

*Hanoi, 2016*

**HEAD OF DEPARTMENT**

**PRESIDENT**

(signed)

(signed)

**PhD. Tong Thanh Trung**

**Prof.Dr. Tran Tho Dat**