

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: Algebra

Code: TOCB 1101

Number of Credits: 03

2. DEPARTMENT IN CHARGE OF INSTRUCTION

Department of fundamental mathematics

Office: 4th 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. Prerequisite: 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 includes some minimum knowledge of algebra, required for students in bachelor's of economics, Business Administration, Finance and Banking, and especial for people who often work, research economic models such as the students of faculty of Mathematical Economics, students of economic Informatics, students of School of information technology. Through this module, students are equipped with the basic knowledge about the set, mapping, polynomial, vector space, quadratic form and effective computational tools for the system of linear equations, matrices, determinant, contributing practice scientific thinking and build a foundation of applied mathematics. The knowledge of the modules needed for students to learn the basics, and fields such as financial theory module, the statistical probability theory, optimization theory, Discrete Mathematics, Calculus 1, Calculus 2 and game theory, this course helps freshman apply Mathematics in economics, economic Informatics and economic information technology at the first semester.

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
- * To successfully use mathematics in information technology

6. COURSE OBJECTIVES

Course Content:

- Set theory
- Mapping
- Polynomials
- Binary relations
- 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
- Linear mapping
- Quadratic forms

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. Set, Mapping and polynomials	6	4	2
2	Chapter 2. Vector Spaces	9	6	3
3	Chapter 3. Matrix and Determinant	9	6	3
4	Chapter 4. Systems of linear equations	9	6	3
5	Chapter 5. Linear Mapping	6	3	3
6	Chapter 6. Quadratic forms	6	3	3
	Total	45	28	17

Weeks 1-2: CHAPTER 1. SET, MAPPING AND POLYNOMIAL

1.1 Some basic concepts about set

1.2 Binary relation

1.3 Complex numbers

1.4 Polynomials

Weeks 3 - 5: CHAPTER 2. VECTOR SPACES

2.1 System of linear equations - Gaussian and Gauss Jordan Elimination

2.2 Vectors and vector spaces

2.3 Linear dependence and linear independence

2.4 Bases and representations

2.5 Rank of a vectors set

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

Weeks 6 - 8: CHAPTER 3. MATRIX AND DETERMINANT

3.1 The concept of matrix and the matrix transformations

3.2 Algebra matrix

3.3 Determinant

3.4 Inverse matrix

3.5 Rank of matrix

Midterm Exam

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

Weeks 9 - 11: CHAPTER 4. SYSTEMS OF LINEAR EQUATIONS

4.1 Cramer systems

4.2 General systems of linear equations

4.3. Homogeneous linear equations

4.4 Some linear models in economics

Mid-term Test

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

Weeks 12 – 13: CHAPTER 5. LINEAR MAPPING

5.1 The concepts of linear mapping

5.2 Matrix of linear mapping

Weeks 14 – 15: CHAPTER 6. QUADRATIC FORMS

6.1 The Basic Concepts of the Quadratic Forms

6.2. Transforms a Quadratic Form to Fomal Quadratic Forms

6.3. Defined quadratic form

Revised

Final Examination

8. REQUIRED TEXTBOOK & COURSE MATERIALS

[1] Required: Addvanced Mathematics for Economist, LE DINH THUY, NGUYEN THI QUYNH LAN (2012), National Economics University Publisher

9. RECOMMENDED TEXTS & OTHER READINGS

[2] NGUYEN ĐINH TRI, TA VAN DINH, NGUYEN HO QUYNH (2008), Addvanced Mathematics, Vietnam Education Publisher, Volumn 1.

[3] CHIANG, A.C, (1985), Methods of mathematical Economics, Third edition, Mc. Graw-Hill, Inc.

[4] MICHAEL HOY, JOHN LIVERNOIS, CHRIS MCKENNA, RAY REES, THANASIS STENGOS (2001), Mathematics for Economics, Second edition, The MIT Press Cambrige, Massachusetts, London, England.

[5] CARLP. SIMON, LAWRENCE BLUME, (1994), Mathematics for Economists, Norton & Company, Inc.

[6] DOAN QUYNH (Editor) (1998), Linear Algebra and Analytic geometry, Hanoi National University publisher.

[7] HANS SCHNEIDER, GEORGE PHILLIP BARKER (1989), Matrices and linear algeblra, second edition, Dover publications, INC., New York,.

10. ASSESSMENT & GRADING POLICY

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

Item	Weight
Attendance	10%
Midterm	20%
Final Exam	70%
Total	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