
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: MATHEMATICAL ECONOMIC MODELS

Code: TOKT1107

Number of Credit: 2

2. DEPARTMENT IN CHARGE OF INSTRUCTION:

Office: *Location

Office Hours: *Times & Days

Office Telephone: *Phone Number

3. PRE-REQUISITE:

Advanced Mathematics 2; Microeconomics 1, Macroeconomics 1, Probability and Mathematical Statistics 1.

4. COURSE DESCRIPTION:

This course applies several mathematical methods to modeling and quantitative analysis in making decisions in economic management and business executive. It contains 4 chapters with the quantitative analysis model as the optimal one for the production and consumption, a linear programming problem, reserve management model inputs in production, and the model input / Output. Through analyzing the mathematical model in economic activity, students can apply to similar situations in practice and make specific decisions in economics and business. The math problems can be supported by the calculation software as Excel, software TKT.

5. COURSE OBJECTIVES:

Students can format some econometric models and methods of analysis in economic management and business administration.

Quantify the optimal problem for the different economic subjects and find solutions to this problem in the conditions of foreign influence on making decisions in economics and business.

Apply mathematical economic softwares to solve linear programming problems and reserve management problems.

6. COURSE CONTENT:

TENTATIVE SCHEDULE

| <i>No</i> | <i>Contents</i> | <i>Total hours</i> | <i>In details</i> | | <i>Notes</i> |
|-----------|-----------------|--------------------|-------------------|------------------------------------|--------------|
| | | | <i>Theory</i> | <i>Practice, Discussion, Exams</i> | |
| 1 | Chapter 1 | 8 | 6 | 2 | |
| 2 | Chapter 2 | 6 | 4 | 2 | |
| 3 | Chapter 3 | 10 | 8 | 2 | |
| 4 | Chapter 4 | 6 | 4 | 2 | |
| | Total | 30 | 20 | 10 | |

CHAPTER 1 - INTRODUCTION TO MATHEMATICAL ECONOMIC MODEL

This chapter introduces methods of comparative static analysis for econometric model, such as measuring the absolute change and relative of the endogenous variables under exogenous, growth factors, replacement coefficient of microeconomic and macroeconomic variables and. Since, students learn to use the tools mentioned above in the analysis of specific economic issues as described behavior and optimal model of producers, consumers, market equilibrium models of goods and general equilibrium model of the economy.

1.1. The meaning and concept of econometric models in the economic analysis

1.2. Structure, classification and content of modeling methods

1.3. Analysis method - comparative static analysis

1.4. Applying for some common economic models

Text books:

1. Nguyen Quang Dong, Ngo Van Thu, and Hoang Dinh Tuan (2006), *The mathematical economic model*, Statistical publisher, Chapter 1.

2. Alpha.C.Chiang (2006), Fundamental methods of mathematical economics, 4th edition, McGraw-hill, Part 1.

CHAPTER 2 - INPUT/OUTPUT TABLE

This chapter provides students with an understanding of the process of formation, structure and concepts related to model I / O. This is a system for analyzing statistics of economic relations between the manufacturing sector in terms of distribution and production, the balance of relations artifacts and value, and analysis of the ripple effect in the economy.

2.1. A brief history of the development

2.2. The methodology of input/output table

2.3. I/O table – the artifacts format

2.4. on the table - the value format

2.5. Application I/O table in the analysis and forecasting in economy

Textbooks:

1. Nguyen Quang Dong, Ngo Van Thu, and Hoang Dinh Tuan (2006), *The mathematical economic model*, Statistical publisher, Chapter 2.

2. Le Dinh Thuy (2004), *Advanced Mathematics for economists*, Statistical publisher, Chapter 2

CHAPTER 3 - OPTIMAL LINEAR MODEL

In fact, production and sales are diverse, especially in conditions of competition. Managers, therefore, must have the optimal choice according to predetermined objectives. If all the elements are linear relationships, we can use the linear programming model to describe, analyze and find solutions. This is the content of chapter 3, introducing models and methods to find the answers to linear optimization problems.

3.1. Some economic situations and linear programming models

3.2. The model of linear programming problem

3.3. The general nature

3.4. Simplex method

3.5. Dual problem and analyze the relationship in pairs dual problem

Textbooks:

1. Nguyen Quang Dong, Ngo Van Thu, and Hoang Dinh Tuan (2006), *The mathematical economic model*, Statistical publisher, Chapter 3.
2. Tran Tuc (2000), *Exercise of linear programming*, Science and Technology Publisher.

CHAPTER 4 - RESERVE MANAGEMENT MODEL

In most economic and social activities, we must solve the problem of reserves with the least cost. In this chapter, we consider a class of specific problems solving economic relationships in the reserve. That problems are shown as models allows extending the applicability in similar situations.

4.1. Reserve problems and concepts

4.2. Some reserve deterministic models

4.2.1. Reserve models with both consumption and supplement instantaneous

4.2.2. Reserve models with both consumption and supplemented gradually

4.2.3. Reserve models with multiple prices

4.3. The random storage models

Textbooks:

Nguyen Quang Dong, Ngo Van Thu, and Hoang Dinh Tuan (2006), *The mathematical economic model*, Statistical publisher, Chapter 5.

7. REQUIRED TEXTBOOKS & COURSE MATERIALS

Nguyen Quang Dong, Ngo Van Thu, and Hoang Dinh Tuan (2006), *The mathematical economic model*, Statistical publisher.

8. RECOMMENDED TEXTS & OTHER READINGS

1. Tran Tuc (2000), *Exercise of linear programming*, Science and Technology Publisher.
2. Le Dinh Thuy (2004), *Advanced Mathematics for economists*, Statistical publisher, Chapter 2
3. Alpha.C.Chiang (2006), *Fundamental methods of mathematical economics*, 4th edition, Mcgraw-hill, Part 1.
4. Fredic.S.Mishkin (1992), *The economics of Money, Banking and Financial Markets*, Harper Collins.

9. ASSESSMENT & GRADING POLICY:

- Band score: 10 and 4
- In details:
 - + Attendance: 10%
 - + Midterm test: 30%
 - + Final test: 60%

HEAD OF DEPARTMENT

(signed)

PhD. Nguyen Manh The

Hanoi, 2016

PRESIDENT

(signed)

Prof.Dr. Tran Tho Dat