

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: THEORY OF STATISTICS 1

Code: TKKD1101

Number of Credit: 3

**2. DEPARTMENT IN CHARGE OF INSTRUCTION: Business Statistics
Department**

Office: Room No.401 – Block 7 – National Economics University

Office Hours: 8:00 – 17:00, from Monday to Friday

Office Telephone: 04.38693275

3. PRE-REQUISITE:

- Mathematics for Economics 1, Mathematics for Economics 2
- Probability and Mathematical Statistics

4. COURSE DESCRIPTION:

‘Theory of statistics’ course provides learners the statistical theory and methods. It provides the basic concepts in statistics, survey methods, methods of data processing and presenting the statistical results. Course content consists of 11 chapters, divided into two modules. Part I learned from chapter 1 to chapter 6, section II of chapter 7 to chapter 11. Methods presenting in this module include the methods of describing and analyzing the characteristics of the phenomenon, the statistical inference and hypothesis testing.

5. COURSE OBJECTIVES:

After completing the course, students will:

- Be able to understand the general knowledge and introduction to statistical basic concepts and research process.
- Be able to understand the general concepts of statistical surveys and technique in statistical surveys, sampling techniques and generalizing the results of sample survey.

- be proficient in data presentation skills: disaggregated statistical techniques follow one or more criteria; methods of presenting data using statistical tables and graphs.

- be proficient in descriptive statistics: calculation of commonly used indicators in statistical analysis such as means, the population indicator of variability follow a criteria....

- Improve your skills in statistical analysis of situations with different purposes in the management by methods of statistical analysis (analysis of relationships, analyze changes over time and the factors influence...) with the specific conditions of use.

- Understand a statistical prediction methods commonly used in business administration and socio-economic management.

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 | 5 | 3 | 2 | |
| 2 | Chapter 2 | 5 | 3 | 2 | |
| 3 | Chapter 3 | 8 | 5 | 3 | |
| 4 | Chapter 4 | 10 | 7 | 3 | |
| 5 | Chapter 5 | 8 | 6 | 2 | |
| 6 | Chapter 6 | 8 | 6 | 2 | |
| | Midterm test | 1 | | 1 | |
| | Total | 45 | 30 | 15 | |

CHAPTER 1 – INTRODUCTION TO STATISTICS

Statistics is the science of collecting, analyzing, presenting and interpreting data. In economics and business administration, the information will help managers get a deeper understanding of the economic environment and business and make better decisions. This chapter covers some common issues such as the introduction of statistics, in particular: development and the role of statistics; content and the basic concepts used in the statistics; the scales and the statistical method.

1.1. The role of statistics

1.2. The concepts and the object of statistics

1.3. The concepts commonly used in statistics

1.3.1. Population and population unit

1.3.2. Statistical criteria

1.3.3. Statistical indicator

1.3.4. The system of statistical indicators

1.4. Scale in Statistics

1.4.1. Nominal scale

1.4.2. Ordinal scale

1.4.3. Interval scale

1.4.4. Ratio scale

1.5. Statistical data

1.5.1. The concept

1.5.2. Types of statistical data

1.5.3. Statistical data resources

1.6. Statistics methods

1.6.1. Descriptive Statistics

1.6.2. Statistical inference

Texts and readings for the chapter:

1. Tran Thi Kim Thu (2012), *Statistical Theory – Chapter 1*, National Economics Publishing House
2. Tran Ngoc Phac and Tran Thi Kim Thu (2006), *Statistical Theory – Chapter 1*, Statistical Publishing House
3. *Statistics law and the guiding documents* (2004), Statistical Publishing House
4. Institute of Statistical Science (2010), *Statistics practice (translated book) – Chapter 1*, Statistical Publishing House
5. David R.Anderson, Dennis J.Sweeney (2011), Thomas A.Williams, *Statistics for business and economics*, 11th edition, South-Western, Cengage Learning.

6. Mark L. Berenson, David M. Levine, Timothy C. Krehbiel (2009), *Basic Business Statistics, Concepts and Applications*, Eleventh edition, Pearson International Edition.
7. McGraw-Hill Irwin (2002), *Complete Business Statistic*, Fifth edition.
8. Ken Black (2008), *Business Statistics for Contemporary Decision Making*, Fifth edition, Wiley.

CHAPTER 2 – STATISTICAL RESEARCH PROGRESS

Object of statistical research is often complicated phenomena. In order to find out the laws of development of the phenomenon, statistical analysis must undergo a multi-stage process. It can be divided simply into three stages: Statistical Survey (data collection), aggregate statistics (data processing), analysis and forecast. This chapter will present the basics of each stage.

2.1. Survey

- 2.1.1. The general concept
- 2.1.2. Types of survey
- 2.1.3. Methods of collecting information
- 2.1.4. Statistical survey design
- 2.1.5. Errors

2.2. Data processing

- 2.2.1. General concepts
- 2.2.2. Cleaning data
- 2.2.3. Methods of data processing

2.3. Analysis and forecast

- 2.3.1. General concepts
- 2.3.2. Methods of forecasting

Texts and readings for the chapter:

1. Tran Thi Kim Thu (2012), *Statistical Theory – Chapter 2*, National Economics Publishing House
2. Tran Ngoc Phac and Tran Thi Kim Thu (2006), *Statistical Theory – Chapter 1, 2, 3*, Statistical Publishing House
3. *Statistics law and the guiding documents* (2004), Statistical Publishing House
4. *The guidance documents of Census of population and housing in 1999 and 2009*.

5. General Statistics Office (2010), *Census of population and housing in Vietnam in 2009, the full results*, Statistical Publishing House.
6. General Statistics Office, the annual survey plan is published on the website <http://www.gso.gov.vn>)

CHAPTER 3 – DATA PRESENTATION

After conducting a statistical survey, we will obtain the documents that reflect the individual characteristics of each population unit, so it cannot be used to analyze to specify the essence and the law of development of the whole phenomenon. The conducted data that need to be codified to make separate materials for each unit becomes the general characteristics of the object. Setting up the data for analysis is a pre-task and essential for successful data analysis. This chapter refers to the methods of presenting data.

3.1. Classification

- 3.1.1. The general concept
- 3.1.2. The steps of classification
- 3.1.3. Sequence distribution
- 3.1.4. Multidimensional classification

3.2. Tables and graphs

- 3.2.1. Tables
- 3.2.2. Graphs

Texts and readings for the chapter:

1. Tran Thi Kim Thu (2012), *Statistical Theory – Chapter 3*, National Economics Publishing House
2. Tran Ngoc Phac and Tran Thi Kim Thu (2006), *Statistical Theory – Chapter 3*, Statistical Publishing House
3. Institute of Statistical Science (2010), *Statistics practice (translated book)* – Chapter 1, Statistical Publishing House
4. David R.Anderson, Dennis J.Sweeney (2011), Thomas A.Williams, *Statistics for business and economics*, 11th edition, South-Western, Cengage Learning.
5. Mark L. Berenson, David M. Levine, Timothy C. Krehbiel (2009), *Basic Business Statistics, Concepts and Applications*, Eleventh edition, Pearson International Edition.

6. Ken Black (2008), *Business Statistics for Contemporary Decision Making*, Fifth edition, Wiley.

CHAPTER 4: NUMERICAL DESCRIPTIVE TECHNIQUES

In this chapter, we learn about descriptive statistics, which is the science of describing the important characteristics of a population or sample. Generally, we look at several important aspects of a set of measurements. One such aspect is the central tendency, or middle, of the data set. Another important aspect of data set is the variability, or spread, of the data.

4.1. Absolute and relative numbers in statistics

4.1.1. Absolute number in statistics

4.1.1.1. Concept

4.1.1.2. Type of absolute number

4.1.2. Relative number in statistics

4.1.2.1. Concept

4.1.2.2. Type of relative number

4.1.3. Apply conditions of absolute and relative numbers in statistics.

4.2. Measures of central location

4.2.1. The mean

4.2.2. The mode

4.2.3. The median

4.3. Measures of variability

4.3.1. The range

4.3.2. The means absolute deviation

4.3.3. The variance

4.3.4. The standard deviation

4.3.5. The coefficient of variation

Texts and readings for the chapter:

1. Tran Thi Kim Thu (2012), *Statistical Theory – Chapter 4*, National Economics Publishing House
2. Tran Ngoc Phac and Tran Thi Kim Thu (2006), *Statistical Theory – Chapter 4*, Statistical Publishing House

3. Institute of Statistical Science (2010), *Statistics practice (translated book)* – Chapter 2, Statistical Publishing House
4. David R.Anderson, Dennis J.Sweeney (2011), Thomas A.Williams, *Statistics for business and economics*, 11th edition, South-Western, Cengage Learning.
5. Mark L. Berenson, David M. Levine, Timothy C. Krehbiel (2009), *Basic Business Statistics, Concepts and Applications*, Eleventh edition, Pearson International Edition.
6. Ken Black (2008), *Business Statistics for Contemporary Decision Making*, Fifth edition, Wiley.

CHAPTER 5: SAMPLE SURVEY

Based on objectives of the research, researchers can define the target population. The population is usually too large for the researcher to attempt to survey all of its members. A small, but careful chosen sample can be used to represent the population. If the sample is representative for the population and the sample size is large enough, researchers can say something reliable about the population based on findings from the sample. This chapter presents some general principles about sample survey.

5.1. Sampling distribution

5.2. General Concept

5.2.1. Population and sample

5.2.2. Errors

5.2.3. Determining the required sample size

5.3. Sampling techniques

5.3.1. Random sample

5.3.2. Non-random sample

5.4. Procedures of sample survey

5.5. Estimation of the population mean and proportion

5.5.1. Simple random sampling

5.5.2. System sampling

5.5.3. Classification sampling

5.5.4. Cluster sampling

5.5.5. Stratified sampling

Texts and readings for the chapter:

1. Tran Thi Kim Thu (2012), *Statistical Theory – Chapter 5, 6*, National Economics Publishing House
2. Tran Ngoc Phac and Tran Thi Kim Thu (2006), *Statistical Theory – Chapter 5*, Statistical Publishing House
3. Institute of Statistical Science (2010), *Statistics practice (translated book)* – Statistical Publishing House
4. Nguyen Cao Van and Tran Thai Ninh (2008), *Probability and Mathematical Statistics Theory*, National Economics Publishing House
5. Tang Van Khien (1995), *The basic issues of sample survey*, Statistical Publishing House
6. David R.Anderson, Dennis J.Sweeney (2011), Thomas A.Williams, *Statistics for business and economics*, 11th edition, South-Western, Cengage Learning.
7. Mark L. Berenson, David M. Levine, Timothy C. Krehbiel (2009), *Basic Business Statistics, Concepts and Applications*, Eleventh edition, Pearson International Edition.
8. Ken Black (2008), *Business Statistics for Contemporary Decision Making*, Fifth edition, Wiley.
9. McGraw-Hill Irwin, 2002, *Complete Business Statistics*, Fifth edition.
10. Paul Newbold (1995), *Statistics for Business and Economics*, Prentice Hall International Editions.

CHAPTER 6: TESTING HYPOTHESIS

CONCERNING THE MEAN AND PROPORTION

Hypothesis testing is a statistical procedure used to provide evidence in favor of some statement. The purpose of this type of inference is to determine whether enough statistical evidence exists to enable us to conclude that a belief or hypothesis about a parameter is supported by the data. For instance, hypothesis testing might be used to assess whether a population parameter such as a population mean, differ from a specified standard or previous value. In this chapter, we discuss testing hypotheses about population means, proportions and variances.

6.1. General concepts

6.1.1. Hypothesis

6.1.2. Type I and type II errors in hypothesis testing

6.1.3. Level of Significance

6.1.4. Test statistics

6.1.5. Steps of hypothesis testing

6.2. Test of hypothesis for a population

6.2.1. Test of hypothesis for the mean

6.2.2. Test of hypothesis for a single proportion

6.3. Test of hypothesis for two populations

6.3.1. Comparing two means

6.3.2. Comparing two proportions

6.4. Test of hypothesis for more than two populations

6.4.1. One way ANOVA

6.4.2. Chi-square tests

6.5. Nonparametric test

Texts and readings for the chapter:

1. Tran Thi Kim Thu (2012), *Statistical Theory – Chapter 7, 8, 9 and 10* National Publishing House
2. Tran Ngoc Phac and Tran Thi Kim Thu (2006), *Statistical Theory – Chapter 6*, Statistical Publishing House
3. Institute of Statistical Science (2010), *Statistics practice (translated book)* – Statistical Publishing House
4. Nguyen Cao Van and Tran Thai Ninh (2008), *Probability and Mathematical Statistics Theory*, National Economics Publishing House
5. Tang Van Khien (1995), *The basic issues of sample survey*, Statistical Publishing House
6. David R.Anderson, Dennis J.Sweeney (2011), Thomas A.Williams, *Statistics for business and economics*, 11th edition, South-Western, Cengage Learning.
7. Mark L. Berenson, David M. Levine, Timothy C. Krehbiel (2009), *Basic Business Statistics, Concepts and Applications*, Eleventh edition, Pearson International Edition.
8. Ken Black (2008), *Business Statistics for Contemporary Decision Making*, Fifth edition, Wiley.

7. REQUIRED TEXTBOOK & COURSE MATERIALS

Tran Thi Kim Thu (2012), *Statistical Theory*, National Economics Publishing House

8. RECOMMENDED TEXTS & OTHER READINGS

1. Tran Ngoc Phac and Tran Thi Kim Thu (2006), *Statistical Theory* Statistical Publishing House
2. Institute of Statistical Science (2010), *Statistics practice (translated book)* – Statistical Publishing House
3. *Statistics law and the guiding documents* (2004), Statistical Publishing House
4. General Statistics Office (2010), *Census of population and housing in Vietnam in 2009, the full results*, Statistical Publishing House.
5. General Statistics Office, the annual survey plan is published on the website <http://www.gso.gov.vn>)
6. *The guidance documents of Census of population and housing in 1999 and 2009.*
7. Tang Van Khien (1995), *The basic issues of sample survey*, Statistical Publishing House
8. Nguyen Cao Van and Tran Thai Ninh (2008), *Probability and Mathematical Statistics Theory*, National Economics Publishing House
9. David R.Anderson, Dennis J.Sweeney (2011), Thomas A.Williams, *Statistics for business and economics*, 11th edition, South-Western, Cengage Learning.
10. Mark L. Berenson, David M. Levine, Timothy C. Krehbiel (2009), *Basic Business Statistics, Concepts and Applications*, Eleventh edition, Pearson International Edition.
11. Ken Black (2008), *Business Statistics for Contemporary Decision Making*, Fifth edition, Wiley.
12. McGraw-Hill Irwin, 2002, *Complete Business Statistics*, Fifth edition.
13. Paul Newbold (1995), *Statistics for Business and Economics*, Prentice Hall International Editions

9. ASSESSMENT & GRADING POLICY:

Comply with the current regulations of National Economics University.

- The evaluation of teachers: 10%
- Mid-course test: 30%
- Final test: 60%

(Students are eligible to take the final test if: the evaluation of teachers is at least 5, the minimum of mid-course test score is 3)

HEAD OF DEPARTMENT

(signed)

MSc. Nguyen Thi Xuan Mai

Hanoi, 2016

PRESIDENT

(signed)

Prof.Dr. Tran Tho Dat