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## **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: PRINCIPLES OF STATISTICS**

Code: **TKKD1112**

Number of Credit: 03

#### **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:**

The principles of statistics course studies the statistical theory and methodology. It provides the basic concepts in statistics, survey methods, methods of data processing and presenting the statistical results. The course also covers analyzing and forecasting methods, including methods which describe and explore the characteristics of variables; the inferential statistical methods (such as estimating, analyzing the relationship, fluctuation analysis and forecasting) for decision making.

#### **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;

- Understand the general concepts of statistical surveys and technique in statistical surveys, sampling techniques and generalizing the results of sample surveys;
- Be proficient in data presentation skills: disaggregated statistical techniques under one or more criteria; methods of presenting data using statistical tables and graphs;
- Be proficient in descriptive statistics: calculation of common measures of central location and variability used in statistical analysis;
- Hone skills in statistical analysis (such as analysis of relationships, analysis of changes over time and the influencing factors ...) to serve different purposes in the management;
- 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	3	2	1	
2	Chapter 2	3	2	1	
3	Chapter 3	5	3	2	
4	Chapter 4	7	5	2	
5	Chapter 5	6	4	2	
6	Chapter 6	7	5	2	
7	Chapter 7	7	5	2	
8	Chapter 8	6	4	2	
9	Mid-course test	1		1	
	<b>Total</b>	<b>45</b>	<b>30</b>	<b>15</b>	

## CHAPTER 1 – INTRODUCTION TO STATISTICS

*Statistics is the science of learning from data. In economics, business, and management, the information will help managers get a deeper understanding of the economic environment, business and make better decisions. This chapter covers some common topics such as the introduction to statistics, the development and the roles of statistics, the basic concepts used in statistics and the scales.*

### **1.1. What is statistics?**

### **1.2. Basic concepts in statistics**

1.2.1. Population and population unit

1.2.2. Statistical criteria

1.2.3. Statistical indicators

### **1.3. Scale in Statistics**

1.3.1. Nominal scale

1.3.2. Ordinal scale

1.3.3. Interval scale

1.3.4. Ratio scale

### ***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 version) – 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**

*Objects of statistical research are often complicated phenomena. In order to find out the laws of development of the phenomena, statistical analysis must undergo a multi-stage process. It can be divided simply into three stages: Statistical Survey (data collection), data processing, analysis and forecast. This chapter presents the content of each mentioned stage.*

### **2.1. Surveys**

- 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. Methods of data processing

### **2.3. Analysis and forecast**

- 2.3.1. General concepts
- 2.3.2. Methods of forecast

#### ***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

*This chapter presents three methods to find out patterns of data sets. The first method is classification, which helps to summarize data set. This method divides the data set into classes by selected variables. The second and third methods are tabular and graphical methods, which are commonly used to summarize both qualitative and quantitative data. The chapter also mentions techniques to interpret summarized data.*

### 3.1. Classification

3.1.1. General concepts

3.1.2. The steps of classification

3.1.3. Sequence distribution

### 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. Concepts

##### 4.1.1.2. Types of absolute number

#### 4.1.2. Relative number in statistics

##### 4.1.2.1. Concepts

##### 4.1.2.2. Types 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 reliably about the population based on findings from the sample. This chapter will mention some general principles about sample survey.*

### **5.1. General issues of sample survey**

- 5.1.1. General concepts
- 5.1.2. Population and sample
- 5.1.3. Random and non-random sample

### **5.2. Basic issues of the random sample survey**

- 5.2.1. Repeated and unrepeatd selection
- 5.2.2. Errors
- 5.2.3. Estimates the survey result
- 5.2.4. Determining the required sample size

### **5.3. Sampling techniques**

#### ***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 version)* – Statistical Publishing House.

4. Nguyen Cao Van and Tran Thai Ninh (2008), *Probability and Mathematical Statistics Theory*, National Economics University 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.

## **CHAPTER 6: REGRESSION**

*Manager often make decisions by studying the relationship between variables, and progress improvement can often be made by understanding how changes in one or more variables affect the progress output. Regression analysis is used to predict the value of one variable on the basis of other variables. If we are interested only in determining whether a relationship exists, we employ correlation analysis. In this chapter, we focus on techniques that allow us to determine the relationship between only two variables which is called simple regression. Multiple regression will also be introduced in the end.*

### **6.1. General concepts**

- 6.1.1. Types of relationship
- 6.1.2. Roles of regression analysis

### **6.2. Simple regression**

- 6.2.1. Simple Linear regression
- 6.2.2. Simple Nonlinear regression

### **6.3. Multiple regression**

#### ***Texts and readings for the chapter:***

1. Tran Thi Kim Thu (2012), *Statistical Theory – Chapter 11, 12*, National Economics Publishing House.
2. Tran Ngoc Phac and Tran Thi Kim Thu (2006), *Statistical Theory – Chapter 7*, Statistical Publishing House.



3. Institute of Statistical Science (2010), *Statistics practice (translated version)* – Statistical Publishing House.
4. Nguyen Quang Dong (2006), *Econometrics (Advanced Program)*, Publishers of Hanoi scientific and technology.
5. Nguyen Khac Minh (2002), *The methods of analysis and forecasting in economics*, Publishers of Hanoi scientific and technology.
6. Nguyen Cao Van and Tran Thai Ninh (2008), *Probability and Mathematical Statistics Theory*, National Economics Publishing House.
7. Gujarati, Damodar N (2006), *Essentials of Econometrics*, McGraw-Hill. Inc
8. David R.Anderson, Dennis J.Sweeney (2011), Thomas A.Williams, *Statistics for business and economics*, 11th edition, South-Western, Cengage Learning.
9. Mark L. Berenson, David M. Levine, Timothy C. Krehbiel (2009), *Basic Business Statistics, Concepts and Applications*, Eleventh edition, Pearson International Edition.
10. Ken Black (2008), *Business Statistics for Contemporary Decision Making*, Fifth edition, Wiley.

## **CHAPTER 7: TIME SERIES ANALYSIS**

*A time series is a set of observations at successive points in time or over successive periods of time. A time series comprises of several components including trend, cyclical, seasonal and irregular components. This chapter introduces several procedures for analyzing a time series. One objective of such analyses is to provide forecasts or predictions of the future values of a time series. The forecast methods covered in this chapter can be used for both short and long-term forecasts.*

### **7.1. General concepts**

### **7.2. Describing a time series**

7.2.1. The average

7.2.2. Absolute increase/decrease

7.2.3. Percentage increase/decrease

7.2.4. The growth rate

7.2.5. Absolute value of 1% percent increase/decrease

### **7.3. Smoothing methods**

7.3.1. Moving average

7.3.2. Analysing series which contain a trend

## **7.4. Short-term forecast methods**

- 7.4.1. Forecast based on the increase (decrease) of average absolute
- 7.4.2. Forecast based on the average growth rate
- 7.4.3. Forecast based on the trend function

### ***Texts and readings for the chapter:***

1. Tran Thi Kim Thu (2012), *Statistical Theory – Chapter 13*, National Economics Publishing House.
2. Tran Ngoc Phac and Tran Thi Kim Thu (2006), *Statistical Theory – Chapter 8, 10*, Statistical Publishing House.
3. Institute of Statistical Science (2010), *Statistics practice (translated version)* – Statistical Publishing House.
4. Nguyen Quang Dong (2006), *Econometrics (Advanced Program)*, Publishers of Hanoi scientific and technology.
5. Nguyen Khac Minh (2002), *The methods of analysis and forecasting in economic*, Publishers of Hanoi scientific and technology.
6. Jonathan D.Cryer (1986), *Time series analysis*, PWS-KENT.
7. Walter Enders (2004), *Applied econometric time series*, Wiley.
8. Gujarati, Damodar N (2006), *Essentials of Econometrics*, McGraw-Hill. Inc.
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.

## **CHAPTER 8 – INDEX NUMBERS**

*Index is not only an important method but also an effective tool in statistics in socio-economic research. This is the method to analyze the fluctuation of the phenomena through the different conditions of time and spaces. We can also analyze the effects of the composition factors that cause the variation. In order to do so, this chapter presents the details of index theory, the concept, classification, characteristics, basic index construction method and index system analytical method.*

### **8.1. General concept**

### **8.2. Development index**

8.2.1. Individual index

8.2.2. Composite index

### **8.3. Spatial index**

8.3.1. Individual index

8.3.2. Composite index

### **8.4. Index system**

#### ***Texts and readings for the chapter:***

1. Tran Thi Kim Thu (2012), *Statistical Theory – Chapter 13*, National Economics Publishing House.
2. Tran Ngoc Phac and Tran Thi Kim Thu (2006), *Statistical Theory – Chapter 8, 10*, Statistical Publishing House.
3. Circular 07/2011-MPI on the application of "Industrial production index every month".
4. Nguyen Van Nam and Vuong Trong Nghia (2002), *Stock market*, Finance Publishing House.
5. Nguyen Huu Hoe (1984), *Statistical Theory*, Statistical Publishing House.
6. Institute of Statistical Science (2005), *Some methodological issues statistics*, Statistical Publishing House.

## **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. General Statistics Office's website <http://www.gso.gov.vn>
4. General Statistics Office, *Magazine of figures and events*, issued monthly.
5. Nguyen Cao Van and Tran Thai Ninh (2008), *Probability and Mathematical Statistics Theory*, National Economics Publishing House.

6. Nguyen Huu Hoe (1984), *Statistical Theory*, Statistics Publishing House.
7. Institute of Statistical Science (2005), *Some statistical methodological issues*, Statistical Publishing House.
8. Gujarati, Damodar N (2006), *Essentials of Econometrics*, McGraw-Hill, Inc.
9. Jonathan D.Cryer (1986), *Time series analysis*, PWS-KENT.
10. Walter Enders (2004), *Applied econometric time series*, Wiley.
11. David R.Anderson, Dennis J.Sweeney (2011), Thomas A.Williams, *Statistics for business and economics*, 11th edition, South-Western, Cengage Learning.
12. Mark L. Berenson, David M. Levine, Timothy C. Krehbiel (2009), *Basic Business Statistics, Concepts and Applications*, Eleventh edition, Pearson International Edition.
13. Ken Black (2008), *Business Statistics for Contemporary Decision Making*, Fifth edition, Wiley.
14. Mc Graw-Hill Irwin (2002), *Complete Business Statistics*, Fifth edition.

#### 9. ASSESSMENT & GRADING POLICY:

Comply with the current regulations of the National Economics University:

- Teachers' evaluation: 10%
- Mid-course test: 30%
- Final examination: 60%

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

*Hanoi, 2016*

**HEAD OF DEPARTMENT**

**PRESIDENT**

(signed)

(signed)

**MSc. Do Van Huan**

**Prof.Dr. Tran Tho Dat**

