

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: APPLIED INFOMATICS FOR STATISTICS

Code: **TKKD1103**

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: *Theory of Statistics*

4. COURSE DESCRIPTION:

Applied Informatics for Statistics is a subject that guides students to use applied softwares in the statistical synthesis, analysis and forecast. Nowadays, large-scale surveys, often with large databases and complex analytical methods cannot be handled and analyzed manually by the simple analyzing methods, so the application of informatics in data analysis and data processing is important and necessary. Some common softwares are SPSS, Stata, Minitab, SAS,... In case the database is not too large and does not require sophisticated analytical methods, Excel can be a good choice. Basically, all these softwares supply analytical methods of statistical theory, but each software has its own strengths related to each method, and the interfaces or implementing procedures are different in different methods. This subject guides SPSS, which is a widely-used software with friendly interface and easy to use and install. In addition, it does not require high computer configuration. Along with each method to analyse and process data with SPSS, this subject will provide a basic theoretical introduction the method. The course refers to applying SPSS in building a database, processing survey results, using statistical methods for analysis and forecasting. It includes creating statistical tables, graphs, calculating parameters, solving estimate and test problems, analysis of variance, analysis of regression - correlation, factor analysis, sequence analysis and statistical forecasting. This courses also guides how to use Stata and Excel basically.

5. COURSE OBJECTIVES:

This course provides students with knowledge and the method to apply statistical softwares in building databases, data synthesis, processing, analysis and prediction. Along with basic content in using statistical softwares, the course also provides theoretical basis and analysis methods which helps students understand and use statistical methods effectively in analyzing social - economic phenomena.

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	2	2	-	
2	Chapter 2	4	2	2	
3	Chapter 3	4	2	2	
4	Chapter 4	4	1	3	
5	Chapter 5	7	2	5	
6	Chapter 6	6	2	4	
7	Chapter 7	5	2	3	
8	Chapter 8	5	2	3	
9	Chapter 9	7	2	5	
10	Mid-course test	1	-	1	
	Total	45	17	28	

CHAPTER I– INTRODUCTION TO SPSS

This chapter gives an overview of SPSS, its function and windows, how to create new files, open existing data files and data files from other software (Excel, Stata, FoxPro, ...), how to copy the results to other Microsoft Office applications, how to print result files, ...

Contents:

1.1. Introduction to SPSS

1.1.1. Data view

1.1.2. Variables view

1.1.3. Output view

1.1.4. Syntax view

1.2. Main menu of SPSS

1.3. Some default options in SPSS

Texts and readings for the chapter:

1. Vo Van Huy - Vo Thi Lan - Hoang Trong. Applying SPSS to analyze data in Marketing, Management, Economics, Medicine, Psychology, Social study. Technical Sciences Publishing House.

2. Hoang Trong - Chu Ngoc Nguyen Mong, University of Economics, Ho Chi Minh City (2008), Analysis of research data with SPSS. Hong Duc Publishing House.

3. Nguyen Van Lieu - Nguyen Dinh Cu - Nguyen Quoc Anh, SPSS 8.0 - 9.0 data analysis applications in business administration and social - natural sciences, Transportation Publishing House.

4. George A. Morgan, Nancy L. Leech, Gene W. Gloeckner, Karen C. Barrett – IBM SPSS for Introductory statistics.

5. John T. Kulas - SPSS Essentials: Managing and Analyzing Social Sciences Data

CHAPTER II– DATABASE ESTABLISHMENT

This chapter introduces how to create a database to serve analyzing by SPSS, in specific, how to create, declare a variable, format the variable, encode variable, build a database, create files, copy the database file...

Contents:

2.1. Measurement scales

2.2. Coding

2.3. Database establishment

2.4. Data entry

2.5. Data Computing and transforming

Texts and readings for the chapter:

1. Vo Van Huy - Vo Thi Lan - Hoang Trong. Applying SPSS to analyze data in Marketing, Management, Economics, Medicine, Psychology, Social study. Technical Sciences Publishing House.

2. Hoang Trong - Chu Ngoc Nguyen Mong, University of Economics, Ho Chi Minh City (2008), Analysis of research data with SPSS. Hong Duc Publishing House.

3. Nguyen Van Lieu - Nguyen Dinh Cu - Nguyen Quoc Anh, SPSS 8.0 - 9.0 data analysis applications in business administration and social - natural sciences, Transportation Publishing House.

4. www.spss.com

CHAPTER III– APPLIED INFORMATICS FOR DATA PRESENTATION

This chapter introduces the methods of presenting statistical data by statistical tables and graphs, guiding how to build statistical tables and draw statistical graph, how to edit, copy and print them in the Microsoft Office Applications,...

Contents:

3.1. Purpose, content and methods of data presentation

3.2. Graphs

3.3. Tabulation

Texts and readings for the chapter:

1. Vo Van Huy - Vo Thi Lan - Hoang Trong. Applied SPSS to analyze data in Marketing, Management, Economics, Medicine, Psychology, Social study. Technical Sciences Publishing House.

2. Hoang Trong - Chu Ngoc Nguyen Mong, University of Economics, Ho Chi Minh City (2008), Analysis of research data with SPSS. Hong Duc Publishing House.

3. Nguyen Van Lieu - Nguyen Dinh Cu - Nguyen Quoc Anh, SPSS 8.0 - 9.0 data analysis applications in business administration and social - natural sciences, Transportation Publishing House.

4. www.spss.com

CHAPTER IV– APPLIED INFORMATICS IN STATISTICAL PARAMETERS CALCULATION

This chapter introduces the formula, the meaning and characteristics of the central tendency parameters, the dispersion parameters and the parameters measuring the shape of the distribution, guides how to calculate the parameters by SPSS and how to read the results in the output tables, how to copy and edit table results in SPSS and copy into Word.

Contents:

4.1. General issues of statistical parameters

4.2. Measures of Central location

4.3. Measures of Variability

4.4. Distribution

Texts and readings for the chapter:

1. Vo Van Huy - Vo Thi Lan - Hoang Trong. Applied SPSS to analyze data in Marketing, Management, Economics, Medicine, Psychology, Social study. Technical Sciences Publishing House.
2. Hoang Trong - Chu Ngoc Nguyen Mong, University of Economics, Ho Chi Minh City (2008), Analysis of research data with SPSS. Hong Duc Publishing House.
3. Nguyen Van Lieu - Nguyen Dinh Cu - Nguyen Quoc Anh, SPSS 8.0 - 9.0 data analysis applications in business administration and social - natural sciences, Transportation Publishing House.
4. George A. Morgan, Nancy L. Leech, Gene W. Gloeckner, Karen C. Barrett – IBM SPSS for Introductory statistics.
5. John T. Kulas - SPSS Essentials: Managing and Analyzing Social Sciences Data

CHAPTER V– APPLIED INFORMATICS IN STATISTICAL HYPOTHESIS TESTING

This chapter presents an overview of the process to implement a math test, the types and the statistical hypothesis tests, the cases and the way to carry out a statistical hypothesis test. It also gives a guidance how to implement a statistical test by SPSS and read results in the output table, how to copy and edit table results.

Contents:

- 5.1. General issues of hypothesis testing
- 5.2. Testing the mean
 - 5.2.1. One – sample test
 - 5.2.2. Two – sample test
 - 5.2.2.1. Comparing the means of two independent populations
 - 5.2.2.2. Comparing the means of two relative populations
 - 5.2.3. Analysis of Variance (ANOVA)
 - 5.3.1. One-way ANOVA
 - 5.3.2. Two-way ANOVA
- 5.3. Chi-square tests for independence
- 5.4. Chi-square tests in one sample

5.5. Nonparametric test

Texts and readings for the chapter:

1. Vo Van Huy - Vo Thi Lan - Hoang Trong. Applied SPSS to analyze data in Marketing, Management, Economics, Medicine, Psychology, Social study. Technical Sciences Publishing House.
2. Hoang Trong - Chu Ngoc Nguyen Mong, University of Economics, Ho Chi Minh City (2008), Analysis of research data with SPSS. Hong Duc Publishing House.
3. Nguyen Van Lieu - Nguyen Dinh Cu - Nguyen Quoc Anh, SPSS 8.0 - 9.0 data analysis applications in business administration and social - natural sciences, Transportation Publishing House.
4. George A. Morgan, Nancy L. Leech, Gene W. Gloeckner, Karen C. Barrett – IBM SPSS for Introductory statistics.
5. John T. Kulas - SPSS Essentials: Managing and Analyzing Social Sciences Data

CHAPTER VI– APPLIED INFORMATICS IN CORRELATION AND REGRESSION

This chapter provides an overview of the regression – correlation analysis methods, the steps to perform a regression analysis problem, the assumptions, the defects of the model: how to detect and solve them, the problem of simple regression and multiple regression. It also gives a guidance to implement regression - correlation analysis by SPSS, and read the results in the output table.

Contents:

- 6.1. Types of regression models
- 6.2. Simple regression model
 - 6.2.1. Simple Linear regression equation
 - 6.2.1. Regression equation of nonlinear estimation
- 6.3. Multiple regression models
- 6.4. Test for fit of model
- 6.5. Estimate and test coefficients
- 6.6. Collinearity diagnostics and autocorrelation
- 6.7. Dummy variable
- 6.8. Logistic Regression

Texts and readings for the chapter:

1. Vo Van Huy - Vo Thi Lan - Hoang Trong. Applied SPSS to analyze data in Marketing, Management, Economics, Medicine, Psychology, Social study. Technical Sciences Publishing House.
2. Hoang Trong - Chu Ngoc Nguyen Mong, University of Economics, Ho Chi Minh City (2008), Analysis of research data with SPSS. Hong Duc Publishing House.
3. Nguyen Van Lieu - Nguyen Dinh Cu - Nguyen Quoc Anh, SPSS 8.0 - 9.0 data analysis applications in business administration and social - natural sciences, Transportation Publishing House.
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5. John T. Kulas - SPSS Essentials: Managing and Analyzing Social Sciences Data

CHAPTER VII– APPLIED INFORMATICS IN PRINCIPAL COMPONENT ANALYSIS

This chapter introduces the basic content of the main component analysis (PCA). In case the variables are correlated with each other in the data, if those variables are put in the regression equation, it will lead to multicollinearity phenomenon. PCA aims to transfer data of correlated variables into main components, it reduces the number of variables and ensure them having no correlation with each other. This chapter presents the steps to implement PCA by SPSS, and how to read the results in the output table.

Contents:

- 7.1. Techniques of principal component analysis
- 7.2. Test for principal component analysis
- 7.3. Process of principal component analysis
- 7.4. Explain output

Texts and readings for the chapter:

1. Vo Van Huy - Vo Thi Lan - Hoang Trong. Applied SPSS to analyze data in Marketing, Management, Economics, Medicine, Psychology, Social study. Technical Sciences Publishing House.
2. Hoang Trong - Chu Ngoc Nguyen Mong, University of Economics, Ho Chi Minh City (2008), Analysis of research data with SPSS. Hong Duc Publishing House.

3. Nguyen Van Lieu - Nguyen Dinh Cu - Nguyen Quoc Anh, SPSS 8.0 - 9.0 data analysis applications in business administration and social - natural sciences, Transportation Publishing House.

4. George A. Morgan, Nancy L. Leech, Gene W. Gloeckner, Karen C. Barrett – IBM SPSS for Introductory statistics.

5. John T. Kulas - SPSS Essentials: Managing and Analyzing Social Sciences Data

CHAPTER VIII– APPLIED INFORMATICS IN TIME SERIES AND FORECAST

This chapter introduces the basic content of the analysis method of time series, the component of time series, method of expression trends in time series by trend functions, exponential smoothing; and calculates seasonal index in the model that combined addition and multiplication; uses SPSS to perform the analysis of the time series. It also provides the prediction methods and criteria to choose the best prediction method, how to forecast based on the time series by SPSS, how to read the results in the output table.

Contents:

8.1. What is forecast?

8.2. Choosing an appropriate forecasting model

8.3. The trend model

8.4. The Exponential smoothing model

8.5. The exponential trend model

8.6. The exponential trend and seasonal model

8.7. Box – Jenkin model

Texts and readings for the chapter:

1. Vo Van Huy - Vo Thi Lan - Hoang Trong. Applied SPSS to analyze data in Marketing, Management, Economics, Medicine, Psychology, Social study. Technical Sciences Publishing House.

2. Hoang Trong - Chu Ngoc Nguyen Mong, University of Economics, Ho Chi Minh City (2008), Analysis of research data with SPSS. Hong Duc Publishing House.

3. Nguyen Van Lieu - Nguyen Dinh Cu - Nguyen Quoc Anh, SPSS 8.0 - 9.0 data analysis applications in business administration and social - natural sciences, Transportation Publishing House.

4. George A. Morgan, Nancy L. Leech, Gene W. Gloeckner, Karen C. Barrett – IBM SPSS for Introductory statistics.
5. John T. Kulas - SPSS Essentials: Managing and Analyzing Social Sciences Data.

CHAPTER IX– INTRODUCTION TO STATA

Currently, besides SPSS, there are many other softwares used in data analysis.. In Vietnam STATA is one popular software due to its convenience and professionalism, This chapter focuses on introducing an overview of STATA.

Contents:

- 9.1. General introduction to STATA
- 9.2. Data management in STATA
- 9.3. Structure Command
- 9.4. Applied Stata in statistical analysis

Texts and readings for the chapter:

1. Ho Chi Minh City University of Economics (2006), Econometric exercises with the help from Eviews and Stata. Ho Chi Minh City Publishing House.
2. Tran Thi Tuan Anh (2014), A guide to practice Stata 12, Ho Chi Minh City University of Economics
3. www.spss.com
4. www.stata.com

7. REQUIRED TEXTBOOK & COURSE MATERIALS

Tran Thi Kim Thu, Do Van Huan (2015), Lectures of Informatics for Statistics

8. RECOMMENDED TEXTS & OTHER READINGS

1. Vo Van Huy - Vo Thi Lan - Hoang Trong. Applied SPSS to analyze data in Marketing, Management, Economics, Medicine, Psychology, Social study. Technical Sciences Publishing House.
2. Hoang Trong - Chu Ngoc Nguyen Mong, University of Economics, Ho Chi Minh City (2008), Analysis of research data with SPSS. Hong Duc Publishing House.
3. Nguyen Van Lieu - Nguyen Dinh Cu - Nguyen Quoc Anh, SPSS 8.0 - 9.0 data analysis applications in business administration and social - natural sciences, Transportation Publishing House.

4. George A. Morgan, Nancy L. Leech, Gene W. Gloeckner, Karen C. Barrett – IBM SPSS for Introductory statistics.

5. John T. Kulas - SPSS Essentials: Managing and Analyzing Social Sciences Data

6. www.spss.com

7. www.stata.com

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. Do Van Huan

Hanoi, 2016

PRESIDENT

(signed)

Prof.Dr. Tran Tho Dat