



B.E. International Program

Faculty of Economics, Thammasat University



Course Outline

ST216 Statistics for Social Science 1

Semester 1/2012 (August 14 – December 1, 2012)

Number of credits: 3 credits (3-0-6)

Lecture Time: (Section 046401) Wednesdays and Fridays, 8.00 – 9.30 hrs
(Section 046402) Wednesdays and Fridays, 11.00 – 12.30 hrs

Lecture Venue: (Section 046401) Room 304, Faculty of Economics
(Section 046402) Room 304, Faculty of Economics

Instructor: Associate Professor Chinnaphong Bumrunsup, Ph.D.
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Office or by appointment

General Information:

This course provides an introduction to the concept and applications of Statistics for Economics. As a practicing economist, you would have come across a tremendous amount of information that is contained in data. Statistics helps you extract and understand this information. It answers questions such as, How should we summarize this mountain of data? and, To what extent should you really believe these numbers and their implications? It thus helps complement your economics knowledge, experience and intuition with the knowledge that is contained in the numbers that you come across, which ultimately leads to better decision-making.

The course does not require advanced math knowledge, and your performance in this course will depend on conceptual skills that you develop through assignments, exercises, and class lectures. Some of you might have taken statistics from high school. These courses do not necessarily promise your success in this class because statistics courses vary in terms of content and approach.

Course Description:

Introduction to descriptive statistics; index numbers; unconditional and conditional probability; random variables and probability distribution; unconditional and conditional expectations; elementary sampling and sampling distribution; estimation and hypotheses testing for one population; statistical package results interpretation.

Prerequisites: -

Course Objectives:

This course covers the standard methods of descriptive statistics and some statistical inference needed for economics. The purpose of the course is to provide students in the economic sciences with enough understanding of statistical ideas and methodology to communicate knowledgeably and effectively with specialists in these technical areas. Upon successful completion of this course, students will be able to complete the following tasks:

1. Explain basic concepts of social statistics (e.g., population, sample, sampling distribution).
2. Summarize numeric data by computing descriptive statistics (e.g., mean, variance) and by creating tables and graphs. For each procedure, students will learn a hand calculation method (using calculators) and a computer method (using software called SPSS-computer outputs interpretation)
3. Compute various inferential statistics (e.g., z, t and chi-square statistics) using both hand calculation and computer method (computer outputs interpretation)
4. Parameter estimations and test hypotheses applying probability theory.
5. Explain the differences among various statistical techniques and identify an appropriate technique for a given set of variables and research questions.

The widespread availability of computer software packages is revolutionizing statistics education. Each year, more and more students enter statistics course with a good experience in computer technology and an expectation of using computer packages to solve problems in statistics. Because of this trend, this course will also focus on reading and interpreting the computer outputs. The computer software used in the course is SPSS for windows.

Main Text:

Anderson, David R., Sweeney, Dennis J., and Williams, Thomas A. ***Statistics for Business and Economics***. Eleventh Edition. International Student Edition South-Western, 2011.

Other Recommended Book:

1. Berenson, Mark L., Levine, David M., and Krehbielm Timothy C. ***Basic Recommended Business Statistics***. Eleventh Edition. Pearson/Prentice Hall, 2009.
2. Lind, Douglas A., Marchal, William G., and Wathen, Samuel A. ***Basic Statistics for Business and Economics***. Seventh Edition. McGraw-Hill Irwin, 2011.
3. McClave, James T., Benson, P. George, and Sincich, Terry. ***Statistics for Business and Economics***. Eleventh Edition. Student Edition. Prentice Hall, 2011.
4. Newbold, Paul, Carlson, William L., and Thorne, Betty. ***Statistics for Business and Economics***. Fifth Edition. Pearson Education, Inc., 2003.

Grading Policy:

The course grades will be based on two exams (individual performance) and homework assignments (individual performance). Grading scheme is as follows.

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| 1. Midterm Examination | 30% | (October 3rd, 2012, 08.00 - 09.30 hrs) |
| 2. Final Examination | 60% | (December 8th, 2012, 09.00-12.00 hrs) |
| 3. Homework Assignments | 10% | |

Remarks:

- ◆ First semester begins Aug. 14, 2012
- ◆ Period of withdrawal without “W” Aug. 14-28, 2012
- ◆ **Mid-Term Examination** Oct. 1 - 6, 2012
(Wednesday, October 3, 2012, 8.00 – 9.30 hrs)
- ◆ Course withdrawal with “W” Oct. 17 - 22, 2012
- ◆ Last day of class Dec. 1, 2012
- ◆ **Final Examination Period** Dec. 3 - 20, 2012
(Saturday, December 8, 2012, 9.00 – 12.00 hrs)

Teaching Plan:

Class Schedule

Class	Date	Topics	Chapter	Section
1-2	Aug 15,17	1. Data and Statistics	1	
		1.1 What is Statistics?		1.4
		1.2 Types of Statistics		1.5
		1.2.1 Descriptive Statistics		
		1.2.2 Statistical Inference		
		1.3 Statistical Data		1.2
		1.3.1 Data, Element, Variable		
		1.3.2 Types of Data		
		1.4 Scales of Measurement		1.2
		1.4.1 Nominal Scale		
		1.4.2 Ordinal Scale		
		1.4.3 Interval Scale		
		1.4.4 Ratio Scale		
3-5	Aug 22, 24, 29	2. Describing Data: Frequency Tables, Frequency Distributions and Graphic Presentation		
		2.1 Summarizing Qualitative Data (Categorical Data)	2	2.1
		2.1.1 Frequency Distribution		
		2.1.2 Relative Frequency Distribution		
		2.1.3 Bar Charts and Pie Charts		
		2.2 Summarizing Quantitative Data (Numerical Data)		2.2
		2.2.1 Frequency Distribution		
		2.2.2 Relative Frequency Distribution		
		2.2.3 Histogram and Frequency Polygon		
		2.2.4 Cumulative Frequency Distributions		
		2.2.5 Stem-and-Leaf Displays		2.3

Class	Date	Topics	Chapter Section
6-7	Aug 31, Sep 5	3. Measures of Location	3
		3.1 Mean	3.1
		3.1.1 Sample Mean	
		3.1.2 Population Mean	
		3.2 Weighted Mean	
		3.3 Median	
		3.4 Mode	
		3.5 Percentiles, Deciles and Quartiles	
8-9	Sep 7, 12	4. 4.1 Measures of Dispersion (Measures of Variability)	3.2
		4.1.1 Range	
		4.1.2 Interquartile Range	
		4.1.3 Mean Deviation	
		4.1.4 Variance and Standard Deviation	
		4.1.5 Coefficient of Variation	
		4.2 Exploratory Data Analysis: Box- Plot	3.3
10-12	Sep 14, 19, 21	5. Introduction to Probability	4
		5.1 Random Experiment and Sample Space	4.1
		5.2 Approaches to Probability	4.1-4.4
		5.2.1 Classical Probability	
		5.2.2 Relative Frequency Probability	
		5.2.3 Subjective Probability	
		5.3 Properties of Probabilities	4.1-4.4
		5.4 Rules of Addition	4.1-4.4
		5.5 Conditional Probability	4.4
		5.6 Rules of Multiplication	4.1-4.4
		5.7 Tree Diagrams	4.4
		5.8 The Bayes' Theorem	4.5
		5.9 The Multiplication Formula	4.1
		5.10 The Permutation Formula	4.1
		5.11 The Combination Formula	4.1
13-15	Sep 26, 28, Oct 10	6. Discrete Probability Distributions	5
		6.1 Random Variables	5.1-5.2
		6.1.1 Discrete Random Variables	
		6.1.2 Continuous Random Variables	
		6.2 Expected Values and Variances of Random Variables	5.3
		6.3 The Binomial Probability Distribution	5.4
		6.4 The Poisson Probability Distribution	5.5
16-18	Oct 12, 17, 19	7. Continuous Probability Distributions	6
		7.1 General Probability Distributions for Continuous Random Variables	
		7.2 Normal Probability Distribution	6.2
		7.3 Areas under the Normal Curve	6.2
		7.4 Normal Approximation to the Binomial Probability Distribution	6.3

Class	Date	Topics	Chapter	Section
18-19	Oct 19, 24	8. 8.1 Bivariate Distributions	5	5.7 (Reference No. 4)
		8.2 Conditional Probability Function	5	5.7 (Reference No. 4)
		8.3 Conditional Expectation	5	5.7 (Reference No. 4)
20	Oct 26	9. Sampling and Sampling Distributions	7	
		9.1 Methods of Probability Sampling		7.2,7.8
		9.2 Sampling Distribution of the Mean		7.5
		9.3 Standard deviation of Sample Mean		7.5
		9.4 Central Limit Theorem		7.5
		9.5 Point Estimation		7.3,7.7
21-24	Oct 31, Nov 2, 7, 9	10. Interval Estimation	8	
		10.1 Interval Estimation of a Population Mean: Known Population Standard Deviation		8.1,8.2
		10.2 Interval Estimation of a Population Mean: Unknown Population Standard Deviation		8.1,8.2
		10.3 Interval Estimation of a Population Proportion		8.4
		10.4 Determining the Sample Size		8.3
25-30	Nov 14, 16, 21, 23, 28	11. Hypothesis Testing	9	
		11.1 Developing Null and Alternative Hypotheses		9.1
		11.2 Steps of Hypothesis Testing		9.1
		11.3 Type I and Type II Errors		9.2
		11.4 One-Tailed and Two-Tailed Tests of Significance		9.3
		11.5 Hypothesis Tests about a Population Mean		9.4,9.5
		11.5.1 Known Population Variance		
		11.5.2 Unknown Population Variance		
		11.6 Hypothesis Tests about a Population Proportion		9.6
		11.7 Hypothesis Tests about a Population Variance	11	11.1
31	Nov 30	12. Index Numbers	17	17.1-17.7
		12.1 The Meaning of Index Numbers		
		12.2 Types of Index Numbers		
		12.2.1 Price Indexes		
		12.2.2 Quantity Indexes		
		12.2.2 Quantity Indexes		

Course Evaluation

Type of evaluation	Evaluation Method	Evaluation date
Homework	Written assignment (essay questions)	Every Fridays
Midterm Examination	Written exam (essay questions)	October 3 rd , 2012, Time: 08.00-09.30 hrs.
Final Examination	Written exam (essay questions)	December 8 th , 2012, Time: 09.00-12.00 hrs.