B.E. International Program

Faculty of Economics, Thammasat University

Course Syllabus

ST216 Statistics for Social Science 1 (Section 046402)

Semester 2/2018 (January 14 – May 12, 2019)

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

Lecture Time: Section 046402: Tuesdays, 14.00 – 17.00 hours

Lecture Venue: Section 046402: Room 202, Faculty of Economics

Instructor: **Section 046402:** Dr. Chainarong Kesamoon

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Office hours: 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., Williams, Thomas A., Camm, Jeffrey D., and Cochran, James J. ***Statistics for Business and Economics.*** Thirteenth Edition. Cengage Learning, 2017.

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.

1. Midterm Examination 30% **(Tuesday, March 5, 2019, 09.00 - 11.00 hrs.)**
2. Final Examination 60% **(Monday, May 13, 2019, 09.00 – 12.00 hrs.)**
3. Homework Assignments 10%

Teaching Plans:

Week	Date	Topics
1-2	15, 22 Jan 19	1. Data and Statistics
		1.1 What is Statistics?
		1.2 Types of Statistics
		1.2.1 Descriptive Statistics
		1.2.2 Statistical Inference
		1.3 Statistical Data
		1.3.1 Data, Element, Variable
		1.3.2 Types of Data
		1.4 Scales of Measurement
		1.4.1 Nominal Scale
		1.4.2 Ordinal Scale
		1.4.3 Interval Scale
		1.4.4 Ratio Scale
3	29 Jan 19	2. Describing Data: Frequency Tables, Frequency Distributions and Graphic Presentation
		2.1 Summarizing Qualitative Data (Categorical Data)
		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)
		2.2.1 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
4	5 Feb 19	3. Measures of Location
		3.1 Mean
		3.1.1 Population Mean
		3.1.2 Sample Mean
		3.2 Weighted Mean
		3.3 Median
		3.4 Mode
		3.5 Percentiles, Deciles and Quartiles
5	12 Feb 19	4. 4.1 Measures of Dispersion (Measures of Variability)
		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

Week	Date	Topics
6	26 Feb 19	5. Introduction to Probability
		5.1 Random Experiment and Sample Space
		5.2 Approaches to Probability
		5.2.1 Classical Probability
		5.2.2 Relative Frequency Probability
		5.2.3 Subjective Probability
		5.3 Properties of Probabilities
		5.4 Rules of Addition
		5.5 Conditional Probability
		5.6 Rules of Multiplication
		5.7 The Bayes' Theorem
		5.8 The Multiplication Formula
		5.10 The Permutation Formula
		5.11 The Combination Formula
7		**Midterm Exam Date: Tuesday, March 5, 2019 Time: 09.00-11.00 Venue: Faculty of Economics**
8	12 Mar 19	6. Discrete Probability Distributions
		6.1 Random Variables
		6.1.1 Discrete Random Variables
		6.1.2 Continuous Random Variables
		6.2 Expected Values and Variances of Random Variables
		6.3 The Binomial Probability Distribution
		6.4 The Poisson Probability Distribution
9	19 Mar 19	7. Continuous Probability Distributions
		7.1 General Probability Distributions for Continuous Random Variables
		7.2 Normal Probability Distribution
		7.3 Areas under the Normal Curve
		7.4 Normal Approximation to the Binomial Probability Distribution
10	26 Mar 19	8. 8.1 Bivariate Distributions
		8.2 Conditional Probability Function
		8.3 Conditional Expectation
11	2 Apr 19	9. Sampling and Sampling Distributions
		9.1 Methods of Probability Sampling
		9.2 Sampling Distribution of the Mean, Proportion
		9.3 Standard deviation of Sample Mean
		9.4 Central Limit Theorem
		9.5 Point Estimation
12-13	9, 23 Apr 19	10. Interval Estimation
		10.1 Interval Estimation of a Population Mean:
		Known Population Standard Deviation
		10.2 Interval Estimation of a Population Mean:
		Unknown Population Standard Deviation

Week	Date	Topics
		10.3 Interval Estimation of a Population Proportion
		10.4 Determining the Sample Size
14	30 Apr 19	11. Hypothesis Testing
		11.1 Developing Null and Alternative Hypotheses
		11.2 Steps of Hypothesis Testing
		11.3 Type I and Type II Errors
		11.4 One-Tailed and Two-Tailed Tests of Significance
		11.5 Hypothesis Tests about a Population Mean
		11.5.1 Known Population Variance
		11.5.2 Unknown PopulationVariance
		11.6 Hypothesis Tests about a Population Proportion
		11.7 Hypothesis Tests about a Population Variance
15	7 May 19	12. Index Numbers
		12.1 The Meaning of Index Numbers
		12.2 Types of Index Numbers
		12.2.1 Price Indexes
		12.2.2 Quantity Indexes
		12.2.3 Value Indexes
16		**Final Exam Date: Monday, May 13, 2019 Time: 09.00-12.00** **Venue: Faculty of Economics**

Evaluation Methods

Type of evaluation	Evaluation Method	Evaluation date
Homework	Online assignment (Including Excel Practices)	Every Week
Midterm Examination	Written exam (Closed book, essay questions)	Tuesday, March 5, 2019 Time: 09.00-11.00 hrs.
Final Examination	Written exam (Closed book, essay questions)	Monday, May 13, 2019 Time: 09.00-12.00 hrs.

ACADEMIC CALENDAR SEMESTER 2/2018

Event	Semester 2 (January - June 2019)
Pre-Registration period (BE Portal)	October 29 - November 1, 2018
Course Registration (Reg TU)	November 20 - 23, 2018
Payment	November 20 - 26, 2018
Classes Begin	January 14, 2019
Adding and Dropping Courses W/O Record	January 14 - 28, 2019
Payment	January 14 - 29, 2019
*Makha Bucha Day**	*February 19, 2019*
Mid-term Examination Period	March 4 - 9, 2019
Course Withdrawal With "W"	March 20 - 25, 2019
*Chakri Memorial Day**	*April 6, 2019*
*Substitution for Chakri Memorial Day**	*April 8, 2019*
*Songkran Festival Day**	*April 12 - 18, 2019*
Last Day of Classes	May 12, 2019
Final Examination Period	May 13 - 17, 21 - 30, 2019

Remark:

* Holiday, No classes during this period