BACHELOR OF ECONOMICS
THAMMASAT UNIVERSITY

Course Outline

ST216 Statistics for Social Science 1 (Section 046401-046402)

Semester 1/2021 (August 9 – November 27, 2021)

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

Lecture Time: Section 046401: Tuesday and Thursday, 08.00 – 09.30 hours
Section 046402: Tuesday and Thursday, 09.30 – 11.00hours

Lecture Venue: **Online Teaching: Zoom Meeting**

Section 046401
Meeting ID: 948 3409 0387
Passcode: 426686

Section 046402
Meeting ID: 975 1452 8643
Passcode: 052934

Online Quizzes: Microsoft Teams

Instructor: Asst. Prof. Dr. Supranee Lisawadi

Email: supranee@mathstat.sci.tu.ac.th

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 or quizzes (individual performance). Grading scheme is as follows.

1. Midterm Examination 40% **(Thursday, September 30, 2021, 09.00 - 11.00 AM)**
2. Final Examination 50% **(Tuesday, December 7 2021, 01.30 – 04.00 PM)**
3. Homework or Quizzes 10%

Teaching Plans:

Week	Topics
1-2	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
2-3	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	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
5-6	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

Week	Topics
	4.1.5 Coefficient of Variation
	4.2 Exploratory Data Analysis: Box-Plot
6-7	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
8	**Midterm Exam Date: Tuesday, September 30, 2021, 09.00- 11.00AM**
9	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
10	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
11	8. 8.1 Bivariate Distributions
	8.2 Conditional Probability Function
	8.3 Conditional Expectation
11-12	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

Week	Topics
	9.5 Point Estimation
12-13	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
	10.3 Interval Estimation of a Population Proportion
	10.4 Determining the Sample Size
14-15	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
16	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
17	**Final Exam Date: Tuesday, December 7, 2021, 01.30 – 04.00PM**

Evaluation Methods

Type of evaluation	Evaluation Method	Evaluation date
Homework or Quizzes	Written assignment or quiz (Essay questions)	During Week 1 – Week 15
Midterm Examination	Written exam (Closed book, essay questions)	Thursday, September 30, 2021 Time: 09.00-11.00 AM
Final Examination	Written exam (Closed book, essay questions)	Tuesday, December 7, 2021 Time: 01.30-04.00 PM

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ACADEMIC CALENDAR & HOLIDAY

Semester 1/2021 (August 9 - November 27, 2021)	
Classes Begin	August 9, 2021
Add-drop period	August 6 - 15, 2021
Tuition Fee Installment Plan For ID.61-63 only *(9 AM - 10.30 PM)*	#Round 1 (July 16 – 18, 2021) #Round 2 (August 30 – September 3, 2021) #Round 3 (September 20 – 22, 2021)
*H.M. Queen Sirikit The Queen Mother's Birthday**	*August 12, 2021*
*Prince Mahidol Day**	*September 24, 2021*
Mid-term Examination Period	September 27 - October 3, 2021
Withdrawal period with "W" on record	October 11 - November 15, 2021
*H.M. King Bhumibol Adulyadej The Great Memorial Day**	*October 13, 2021*
*Substitution for King Chulalongkorn's Day**	*October 22, 2021*
*King Chulalongkorn's Day**	*October 23, 2021*
Last day of class for Semester 1/2021	November 27, 2021
Final exam period	November 29-30, December 1-3, 7-9, 11-17, 2021
*H.M. King Bhumibol Adulyadej The Great's Birthday**	*December 5, 2021*
*Substitution for H.M. King Bhumibol Adulyadej The Great's Birthday**	*December 6, 2021*
*Constitution Day**	*December 10, 2021*

Remark * Holiday, No classes during this period