

THE CYPRUS INTERNATIONAL INSTITUTE OF MANAGEMENT

COURSE UNIT DESCRIPTION

Course Unit Title	Quantitative Methods and Statistical Analysis	
Course Unit Code	BI430	
Type of Unit	Core	
Level of Course Unit	First cycle	
Year of Study	First	
Number of ECTS Credits	6.0 ECTS	
Class Contact Hours	28	
Minimum Learning Effort (In Hours)	150	
Course Unit Objectives	The objective of this course is to introduce the fundamental concepts and tools of statistical theory, provide the appropriate theoretical and practical skills necessary for collecting, analyzing and interpreting data for addressing a business problem in the real world. Both emphasis on descriptive and inferential statistics will be given.	
Learning Outcomes	The students completing the course should be able to	
	CILO 1	Demonstrate understanding of the value of extracting information from data and use it in the decision making process
	CILO 2	Demonstrate understanding of the basic concepts used in quantitative and qualitative research
	CILO 3	Create effective data visualizations
	CILO 4	Use the appropriate techniques and tools to determine relationships among variables
	CILO 5	Employ the most appropriate statistical methods in collecting and analyzing data for a particular research purpose
	CILO 6	Demonstrate understanding of concepts like probabilities and distributions
	CILO 7	Apply appropriate statistical thinking by developing and testing a hypothesis or forecasting applications related to an identified business problem
	CILO 8	Demonstrate understanding of how to use statistical packages for statistical purposes
	CILO 9	Build sufficient skills to provide leadership in statistical methods in the areas of their responsibility and increase their capability as managers to think statistically using data.
Name of Lecturer(s)	Dr Stylianos Kampakis	
Mode of delivery	Face to Face	
Prerequisites or corequisites	None	
Course Content	1. Introduction to statistics, data types, data-driven decision making, data management, data lifecycle	CILO 1,2,9
	2. Introduction to Microsoft Excel for statistical analysis	CILO 3,4,5,8

	3. Descriptive Statistics: measures of location and dispersion	CILO 1,2,8
	4. Data Visualization Techniques: tabular and graphical methods (frequency tables, bar chart, pie chart, histogram)	CILO 1,3,4,8
	5. Probability theory	CILO 6
	6. Distributions: Discrete (Binomial, Poisson) and Continuous (Uniform, Normal, t-distribution, chi-square)	CILO 6
	7. Sampling, sampling distributions and the Central Limit Theorem (CLT))	CILO 6,7
	8. Inferential Statistics (Normal and t-distribution)	CILO 6,7
	9. Point (statistic) and Interval Estimation (population mean, confidence interval, margin of error)	CILO 6,7
	10. Hypothesis Testing (Single mean & proportion, two means - paired data - two proportions, types of error, standard deviation test)	CILO 7
	11. Simple and Multiple Linear regression and Correlation	CILO 4,7,8
	12. Autoregressive Integrated Moving Average (ARIMA) models	CILO 4,7,8
Recommended or required reading	<p>Required Textbook:</p> <p>Illowsky, B. & Dean, S. (2012). Collaborative Statistics. Houston, Texas: Connexions, Rice University. Available for download under Creative Commons license at: http://cnx.org/content/col10522/latest/</p> <p>Online Learning:</p> <p>Descriptive Statistics:</p> <ol style="list-style-type: none"> 1. https://www.khanacademy.org/math/probability/descriptive-statistics/central_tendency/v/statistics-intro-mean-median-and-mode 2. https://www.khanacademy.org/math/probability/descriptive-statistics/central_tendency/v/mean-median-and-mode <p>Visualization Techniques:</p> <ol style="list-style-type: none"> 1. https://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-data-statistics/histograms/v/histograms-intro 2. https://www.khanacademy.org/math/probability/descriptive-statistics/box-and-whisker-plots/v/reading-box-and-whisker-plots <p>Statistics with Excel, Calculating Mean, Median, Mode and Standard Deviation:</p> <ol style="list-style-type: none"> 1. https://www.youtube.com/watch?v=2rEhWFhSqnI <p>Frequency Function and Histograms:</p> <ol style="list-style-type: none"> 1. https://www.youtube.com/watch?v=asEuFvWGJDs <p>Z-scores in Normal Distribution:</p> <ol style="list-style-type: none"> 1. https://www.youtube.com/watch?v=nSZR8yRsrFo 	

<p>Linear Regression:</p> <ol style="list-style-type: none">1. https://www.youtube.com/watch?v=Cltt47Ah3Q4 <p>Probability:</p> <ol style="list-style-type: none">1. https://www.khanacademy.org/math/precalculus/prob_com/b/basic_prob_precalc/v/basic-probability <p>Binomial Distribution:</p> <ol style="list-style-type: none">1. https://www.khanacademy.org/math/probability/random-variables-topic/binomial_distribution/v/binomial-distribution <p>Poisson Distribution:</p> <ol style="list-style-type: none">1. https://www.khanacademy.org/math/probability/random-variables-topic/poisson_process/v/poisson-process-1 <p>Normal Distribution:</p> <ol style="list-style-type: none">1. https://www.khanacademy.org/math/probability/statistics-inferential/normal_distribution/v/introduction-to-the-normal-distribution <p>Central Limit Theorem:</p> <ol style="list-style-type: none">1. https://www.khanacademy.org/math/probability/statistics-inferential/sampling_distribution/v/central-limit-theorem <p>Standard Error of the Mean:</p> <ol style="list-style-type: none">1. https://www.khanacademy.org/math/probability/statistics-inferential/sampling_distribution/v/standard-error-of-the-mean <p>Sampling Distribution of the Sample Mean:</p> <ol style="list-style-type: none">1. https://www.khanacademy.org/math/probability/statistics-inferential/sampling_distribution/v/sampling-distribution-of-the-sample-mean2. https://www.khanacademy.org/math/probability/statistics-inferential/sampling_distribution/v/sampling-distribution-of-the-sample-mean-2 <p>Hypothesis Testing:</p> <ol style="list-style-type: none">1. https://www.khanacademy.org/math/probability/statistics-inferential/hypothesis-testing/v/hypothesis-testing-and-p-values2. https://www.khanacademy.org/math/probability/statistics-inferential/hypothesis-testing/v/one-tailed-and-two-tailed-tests3. https://www.khanacademy.org/math/probability/statistics-inferential/hypothesis-testing/v/type-1-errors4. https://www.khanacademy.org/math/probability/statistics-inferential/hypothesis-testing/v/z-statistics-vs-t-statistics <p>Linear Regression and Correlation:</p> <ol style="list-style-type: none">1. https://www.khanacademy.org/math/probability/regression/regression-correlation/v/regression-line-example2. https://www.khanacademy.org/math/probability/regression/regression-correlation/v/correlation-and-causality	
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	<p><u>Recommended Reading:</u> Anderson, R.D., Sweeney, J.D. & Williams, A.T. (2012). Statistics for Business and Economics (11th ed.) Revised. South-Western: Cengage Learning.</p> <p>Anderson, R.D., Sweeney, J.D. & Williams, A.T., Camm, J.D., & Cochran, J. (2014). Essentials of Statistics for Business and Economics (7th ed.) Revised. South-Western: Cengage Learning.</p> <p>Keller, G. (2012). Statistics for Management and Economics. South-Western: Cengage Learning.</p> <p>Quirk, T.J. (2013). Excel 2013 for Business Statistics: A Guide to Solving Practical Problems. Springer</p>	
Planned learning activities and teaching methods	Lectures, in-class discussions and debates; in-class exercises and labs; team work; exercises which demonstrate the usage of statistical tools available in Microsoft Excel; in-class presentations; individual and group assignments/projects	
Assessment methods and criteria	Class participation: 10% Group assignment and presentation: 40% In-class examination: 50%	
Language of Instruction	English	
Work Placement(s)	Not applicable	