



**THE CYPRUS INTERNATIONAL INSTITUTE OF MANAGEMENT**  
**COURSE UNIT DESCRIPTION**

Course Unit Title	<b>QUANTITATIVE AND QUALITATIVE METHODS</b>	
Course Unit Code	MB730	
Type of Unit	Core	
Level of Course Unit	First cycle	
Year of Study	First/second year	
Semester	On demand	
Number of ECTS Credits	6 ECTS	
Course Unit Objectives	The objective of this course is to introduce the fundamental concepts and tools of statistics/data-analytics, provide the appropriate theoretical and practical skills necessary for collecting, analyzing and interpreting data for addressing a business problem in the real world.	
Learning Outcomes	On completion of the course the students are expected to 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 related to an identified business problem
	CILO 8	Demonstrate understanding of how to use statistical packages (Microsoft Excel) for data analytics purposes
	CILO 9	Demonstrate understanding of the state-of-art of the world of data analytics, Business Intelligence and the challenges in our Big Data era
Name of Lecturer(s)	Dr Theodosios Mourouzis	
Mode of delivery	Face to Face	
Prerequisites or corequisites	Some very basic algebra and excel knowledge. Students can view before each lecture the suggested videos offered by different education platforms (cf. Recommended or Required Reading section)	
Course Content	1. Introduction to statistics/data-analytics, data types and data-driven decision making	CILO 1,2
	2. (Introduction) Business Intelligence, Data Management and challenges of Big Data	CILO 9
	3. Introduction to Microsoft Excel for statistical analysis	CILO 3,4,5,8
	4. Descriptive Statistics: measures of location and dispersion	CILO 1,2,8
	5. Data Visualization Techniques: tabular and graphical methods (frequency tables, bar chart, pie chart, histogram)	CILO 1,3,4,8
	6. Probability theory	CILO 6
	7. Distributions: Discrete (Binomial, Poisson) and Continuous (Uniform, Normal, t-distribution, chi-square)	CILO 6
	8. Sampling, sampling distributions and the Central Limit Theorem (CLT)	CILO 6,7
	9. Inferential Statistics (Normal and t-distribution)	CILO 6,7
	10. Point (statistic) and Interval Estimation (population mean, confidence interval, margin of error)	CILO 6,7

	11. Hypothesis Testing (Single mean & proportion, two means - paired data - two proportions, types of error, standard deviation test)	CILO 7
	12. Linear regression and Correlation	CILO 4,7,8
Recommended or required reading	<p><b>Required Textbook:</b></p> <p>Illowsky, B. &amp; Dean, S. (2012). Collaborative Statistics. Houston, Texas: Connexions, Rice University. Available for download under Creative Commons license at: <a href="http://cnx.org/content/col10522/latest/">http://cnx.org/content/col10522/latest/</a></p> <p><b>Required Online Learning:</b></p> <p>Descriptive Statistics:</p> <ol style="list-style-type: none"> <li>1. <a href="https://www.khanacademy.org/math/probability/descriptive-statistics/central_tendency/v/statistics-intro-mean-median-and-mode">https://www.khanacademy.org/math/probability/descriptive-statistics/central_tendency/v/statistics-intro-mean-median-and-mode</a></li> <li>2. <a href="https://www.khanacademy.org/math/probability/descriptive-statistics/central_tendency/v/mean-median-and-mode">https://www.khanacademy.org/math/probability/descriptive-statistics/central_tendency/v/mean-median-and-mode</a></li> </ol> <p>Visualization Techniques:</p> <ol style="list-style-type: none"> <li>1. <a href="https://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-data-statistics/histograms/v/histograms-intro">https://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-data-statistics/histograms/v/histograms-intro</a></li> <li>2. <a href="https://www.khanacademy.org/math/probability/descriptive-statistics/box-and-whisker-plots/v/reading-box-and-whisker-plots">https://www.khanacademy.org/math/probability/descriptive-statistics/box-and-whisker-plots/v/reading-box-and-whisker-plots</a></li> </ol> <p>Statistics with Excel, Calculating Mean, Median, Mode and Standard Deviation:</p> <ol style="list-style-type: none"> <li>1. <a href="https://www.youtube.com/watch?v=2rEhWFhSqnI">https://www.youtube.com/watch?v=2rEhWFhSqnI</a></li> </ol> <p>Frequency Function and Histograms:</p> <ol style="list-style-type: none"> <li>1. <a href="https://www.youtube.com/watch?v=asEuFvWGJDs">https://www.youtube.com/watch?v=asEuFvWGJDs</a></li> </ol> <p>Z-scores in Normal Distribution:</p> <ol style="list-style-type: none"> <li>1. <a href="https://www.youtube.com/watch?v=nSZR8yRsrFo">https://www.youtube.com/watch?v=nSZR8yRsrFo</a></li> </ol> <p>Linear Regression:</p> <ol style="list-style-type: none"> <li>1. <a href="https://www.youtube.com/watch?v=Cltt47Ah3Q4">https://www.youtube.com/watch?v=Cltt47Ah3Q4</a></li> </ol> <p>Probability:</p> <ol style="list-style-type: none"> <li>1. <a href="https://www.khanacademy.org/math/precalculus/prob_comb/basic_prob_precalc/v/basic-probability">https://www.khanacademy.org/math/precalculus/prob_comb/basic_prob_precalc/v/basic-probability</a></li> </ol> <p>Binomial Distribution:</p> <ol style="list-style-type: none"> <li>1. <a href="https://www.khanacademy.org/math/probability/random-variables-topic/binomial_distribution/v/binomial-distribution">https://www.khanacademy.org/math/probability/random-variables-topic/binomial_distribution/v/binomial-distribution</a></li> </ol> <p>Poisson Distribution:</p> <ol style="list-style-type: none"> <li>1. <a href="https://www.khanacademy.org/math/probability/random-variables-topic/poisson_process/v/poisson-process-1">https://www.khanacademy.org/math/probability/random-variables-topic/poisson_process/v/poisson-process-1</a></li> </ol> <p>Normal Distribution:</p> <ol style="list-style-type: none"> <li>1. <a href="https://www.khanacademy.org/math/probability/statistics-inferential/normal_distribution/v/introduction-to-the-normal-distribution">https://www.khanacademy.org/math/probability/statistics-inferential/normal_distribution/v/introduction-to-the-normal-distribution</a></li> </ol> <p>Central Limit Theorem:</p> <ol style="list-style-type: none"> <li>1. <a href="https://www.khanacademy.org/math/probability/statistics-inferential/sampling_distribution/v/central-limit-theorem">https://www.khanacademy.org/math/probability/statistics-inferential/sampling_distribution/v/central-limit-theorem</a></li> </ol>	

	<p>Standard Error of the Mean:</p> <ol style="list-style-type: none"> <li>1. <a href="https://www.khanacademy.org/math/probability/statistics-inferential/sampling_distribution/v/standard-error-of-the-mean">https://www.khanacademy.org/math/probability/statistics-inferential/sampling_distribution/v/standard-error-of-the-mean</a></li> </ol> <p>Sampling Distribution of the Sample Mean:</p> <ol style="list-style-type: none"> <li>1. <a href="https://www.khanacademy.org/math/probability/statistics-inferential/sampling_distribution/v/sampling-distribution-of-the-sample-mean">https://www.khanacademy.org/math/probability/statistics-inferential/sampling_distribution/v/sampling-distribution-of-the-sample-mean</a></li> <li>2. <a href="https://www.khanacademy.org/math/probability/statistics-inferential/sampling_distribution/v/sampling-distribution-of-the-sample-mean-2">https://www.khanacademy.org/math/probability/statistics-inferential/sampling_distribution/v/sampling-distribution-of-the-sample-mean-2</a></li> </ol> <p>Hypothesis Testing:</p> <ol style="list-style-type: none"> <li>1. <a href="https://www.khanacademy.org/math/probability/statistics-inferential/hypothesis-testing/v/hypothesis-testing-and-p-values">https://www.khanacademy.org/math/probability/statistics-inferential/hypothesis-testing/v/hypothesis-testing-and-p-values</a></li> <li>2. <a href="https://www.khanacademy.org/math/probability/statistics-inferential/hypothesis-testing/v/one-tailed-and-two-tailed-tests">https://www.khanacademy.org/math/probability/statistics-inferential/hypothesis-testing/v/one-tailed-and-two-tailed-tests</a></li> <li>3. <a href="https://www.khanacademy.org/math/probability/statistics-inferential/hypothesis-testing/v/type-1-errors">https://www.khanacademy.org/math/probability/statistics-inferential/hypothesis-testing/v/type-1-errors</a></li> <li>4. <a href="https://www.khanacademy.org/math/probability/statistics-inferential/hypothesis-testing/v/z-statistics-vs-t-statistics">https://www.khanacademy.org/math/probability/statistics-inferential/hypothesis-testing/v/z-statistics-vs-t-statistics</a></li> </ol> <p>Linear Regression and Correlation:</p> <ol style="list-style-type: none"> <li>1. <a href="https://www.khanacademy.org/math/probability/regression/regression-correlation/v/regression-line-example">https://www.khanacademy.org/math/probability/regression/regression-correlation/v/regression-line-example</a></li> <li>2. <a href="https://www.khanacademy.org/math/probability/regression/regression-correlation/v/correlation-and-causality">https://www.khanacademy.org/math/probability/regression/regression-correlation/v/correlation-and-causality</a></li> </ol> <p><u>Further Reading:</u></p> <p>Anderson, R.D., Sweeney, J.D. &amp; Williams, A.T. (2012). Statistics for Business and Economics (11th ed.) Revised. South-Western: Cengage Learning.</p> <p>Anderson, R.D., Sweeney, J.D. &amp; Williams, A.T., Camm, J.D., &amp; 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	<p><b>10%</b> Individual Class Participation  <b>20%</b> First Group Assignment and Presentation  <b>70%</b> Final Group Assignment</p> <p>Note: Your individual assessment will contribute 50% towards your final score. 10% will be according to your Individual Class Participation while the rest 40% will be computed via the Intra-Team evaluation score method* based on the final group assignment.</p> <p>*For each group assignment, individual score will be given to each team member based on performance and contribution</p>
Language of Instruction	English
Work Placement(s)	Not applicable