

Course Title	Statistical Applications in Business				
Course Code	MIS212				
Course Type	Compulsory				
Level	BSc/1st Cycle				
Year / Semester	2 ND /4 TH				
Teacher's Name	Christakis Charalambous				
ECTS	7.5	Lectures / week	3 hours	Laboratories / week	-
Course Purpose and Objectives	The main objectives of the course are to: • introduce students to the basic principles of statistical modelling and to familiarise them with its basic concepts • introduce students to a range of statistical methods • develop students' ability to build statistical models • develop students' analytical skills • develop students' ability to summarise and present data in a professional way • develop students' skills in practical decision making • develop students' ability to communicate effectively with non-technical managers • provide a conceptual understanding of the role of statistical modelling in decision making • help students appreciate the limitations of statistical methods in decision making.				
Learning Outcomes	After completion of the course students are expected to be able to: 1. recognise the importance of statistical modelling in problem solving and decision making 2. select appropriate statistical methods to address particular types of business and management problems 3. apply appropriate statistical methods to solve business and management problems 4. formulate statistical models to help propose policy alternatives 5. summarise and present data in a professional way 6. appreciate the limitations of statistical methods in decision making 7. communicate effectively with non-technical managers.				

Prerequisites		Required	-
Course Content	<u>DETAILED COURSE OUTLINE</u> MODULE 1: Introduction to Statistics: Types of statistics, types of variable, levels of measurements. MODULE 2: Describing Data (Frequency Tables, Frequency Distributions, and Graphic Presentation): Frequency table for qualitative data, frequency distributions for quantitative data, graphic representation of frequency distribution (histogram, frequency polygon, cumulative frequency distribution). MODULE 3: Describing Data (Numerical Measures): Mean, median and mode and their importance in characterizing a distribution. Different measures of dispersion (range, mean absolute deviation, standard deviation). Chebyshev's theorem and the empirical rule. MODULE 4: Describing Data (Displaying and Exploring Data): Dot plots, Stem-and-leaf, quartiles, deciles and percentiles, box plots, skewness. MODULE 5: Discrete Probability Distributions: Random variables, mean, variance and standard deviation of a discrete random variable, Binomial distribution. MODULE 6: Continuous Probability Distributions: Uniform distribution, the family of normal distributions, the standard normal distribution, the z value and its significance in finding areas under any normal curve. The normal approximation to the binomial. MODULE 7: Sampling Methods and the Central Limit Theorem: Different methods of sampling, sampling distribution of the sample mean, the central limit theorem. The mean and the standard deviation of the distribution of the sample mean. MODULE 8: Estimation of Confidence Intervals for Population Mean: Confidence intervals and confidence levels. The t-distribution. Confidence interval for population mean under different scenarios (population standard deviation known/unknown, sample size small/large). Confidence interval for proportion. Choosing the appropriate sample size. MODULE 9: One-Sample Tests of Hypothesis: The null-hypothesis and the alternate hypothesis, level of significance. The five step procedure for testing a hypothesis. One-tailed and two tailed tests of significance, p-value in hypothesis testing. Tests concerning proportions.		

	MODULE 10: Two-Sample Tests of Hypothesis: Independent samples and proportions. MODULE 11: Linear Regression and Correlation: Coefficient of correlation and its characteristics. Testing the significance of the correlation coefficient. The regression line, the standard error of estimate. Confidence and prediction intervals. Emphasis is given not only on the statistical methods and calculations but also on statistical thinking, and interpretation of the results.
Teaching Methodology	• Lectures, group work, case studies, computer workshops, solving problems in class and in the computer lab, guest speakers, homework and background reading.
Bibliography	Essential Reading: D.A. Lind, W.G. Marchal, S.W. Wathen, "Statistical Techniques in Business and Economics", McGraw-Hill, 17^h Edition, Due date, May 2021. The statistical software MINITAB will be used throughout the course.
Assessment	Tests, homework activities, student projects, mid-term examination, final examination.
Language	English