

Course unit title:	Statistics II		
Course unit code:	AMAT210		
Type of course unit:	Required		
Level of course unit:	Bachelor (1st Cycle)		
Year of study:	3		
Semester when the unit is delivered:	6 (Fall)		
Number of ECTS credits allocated :	6		
Name of lecturer(s):	Dr Petroula Mavrikiou, Dr. Elena Tsolaki		
Learning outcomes of the course unit:	<ol style="list-style-type: none"> 1) Understand and implement the sampling distribution of the mean. Use the t-distribution and read the table of t-distribution. 2) Understand, calculate and interpret interval estimation of the population mean for either small or large sample with σ known or unknown 3) Determine interval estimation of the population proportion and determining the sample size 4) Understand the concept of hypothesis testing and be in a position to state the null and alternative hypothesis. Also understand the meaning of the significant level and recognise the two types or errors (type I and II). 5) Apply hypothesis testing for the mean (small and large sample size) in business problems. 6) Apply hypothesis testing for the proportion (large sample size) in business problems. 7) Distinguish the difference between independent and dependent variable and construct the scatter diagram. Calculate and interpret the Pearson's coefficient, and, estimate and interpret the coefficients (b_0 and b_1) of the simple linear regression model. Apply regression, using data from the business environment and do forecasting. 8) Recognize the chi-square distribution and make use of its table. 9) Implement the two chi square tests, goodness of fit test and test of independence, with real data and interpret the results. Explain the meaning of the "statistical significance". 		
Mode of delivery:	Face-to-face		
Prerequisites:	AMAT112	Co-requisites:	None
Recommended optional program components:	None		
Course contents:	<ul style="list-style-type: none"> • Sampling and sampling distributions The various kinds of sampling techniques (simple, stratified, clustering). Sampling from finite and infinite population. Sampling distribution of the mean. • Interval estimation Recall of the normal distribution. Point estimation of the population mean. Interval estimation of the population mean for large sample with σ known and σ unknown. The t-distribution and the table of t-distribution. Interval estimations of the population mean for small sample with σ known or σ unknown. Interval estimation of the population proportion. Determining the sample size for estimating mean or proportion. • Hypothesis testing Hypothesis testing. Null and alternative hypothesis. Significant level. Types or errors (type I and II). • Hypothesis testing for the mean (Z and t-test) Hypothesis testing for the population mean using large and small sample size. Z and t test-statistics. • Hypothesis testing for the proportion Hypothesis testing for the proportion using large sample size. Z test-statistics. 		

	<ul style="list-style-type: none"> • Tests of goodness of fit and independence Chi-square distribution and its table. Chi square goodness of fit test. Contingency tables and the chi square test of association. "Statistical significance". • Correlation Independent and dependent variables. Pearson's coefficient and the values of it • Simple linear regression Independent and dependent variable. Scatter diagram. Coefficients (b_0 and b_1) of the simple linear regression model. Regression, using data from the business environment. Forecasting.
Recommended and/or required reading:	Mavrikiou P., Understanding Essential Probability and Statistics: Some theory and applications (Instructor's notes)
Textbooks:	Anderson D.R., Sweeny D.J., Williams T.A., (2011) Statistics for Business and Economics , South Western
References:	Black K., (2012) Applied Business Statistics Making Better Business Decisions
Planned learning activities and teaching methods:	The taught part of course is delivered to the students by means of lectures, and tutorials. Lecture notes are available through the e-learning platform of the University, and the instructor's webpage. Students are encouraged for class work, problem solving and discussion. Students are also introduced in data analysis using IBM SPSS but under a different course (ARRW101).
Assessment methods and criteria:	<ul style="list-style-type: none"> • Test 1 20% • Test 2 20% • Final Exam 60%
Language of instruction:	English
Work placement(s):	No