

## MODULE DESCRIPTOR

<b>MODULE TITLE</b>	MULTIVARIATE ANALYSIS		
<b>MODULE CODE</b>	MA3874	<b>CREDIT VALUE</b>	20 CREDITS (10 ECTS)
<b>CAMPUS</b>	UCLAN CYPRUS		
<b>SCHOOL</b>	SCHOOL OF SCIENCE		

### MODULE AIMS

The aim of the module is to introduce students to the main ideas of multivariate statistical analysis, that is, the analysis of sets of data where we have several measurements on each of a number of individuals.

### MODULE CONTENT

Introduction: aims of multivariate analysis, descriptive statistics, graphical representation, basic concepts of vectors and matrices.

Multivariate Normal Distribution, estimation of the mean vector and the covariance matrix, maximum likelihood estimation.

Correlation coefficient, partial correlation coefficient and their distribution.

T2 statistic and its distribution, T2 one-sample tests, T2 two-sample tests, large sample inference.

Distribution of the sample covariance matrix, Wishart distribution, principal components, canonical correlations, cluster and discriminant analysis.

Introduction to multivariate analysis of variance: One-way and Two-way MANOVA, Wilks' Lambda and other criteria, Parameter estimation and tests.

Knowledge

### INTENDED LEARNING OUTCOMES

On successful completion of this module a student will be able to:	
1.	Apply models and methods for multivariate data
2.	Select and use the main techniques of multivariate analysis
3.	Select appropriate techniques to be applied to different sets of data
4.	Carry out and interpret the results from a principal component analysis, a discriminant analysis, and a cluster analysis

### TEACHING METHODS

The class contact will consist of teaching classes together with workshops. Teaching classes will introduce new material and provide examples. Tutorials have no new material introduced. Students will attempt problems during the tutorials. Key elements of the learning strategy are regular sessions during which problems are attempted. Throughout the week students will be given a list of problems to attempt.

The module will be assessed principally by examination. However, to facilitate and monitor the formative learning process selected set exercises will be submitted for assessment. These will present regular opportunities for feedback and feedforward. At the end of the module, students will be expected to include a reflective component in this portfolio of work. This will make up the coursework component of the module.

### **ASSESSMENT METHODS**

The module is assessed through a Portfolio of set exercises and a Written examination.