MODULE **DESCRIPTOR**

MODULE TITLE	INTRODUCTION TO REAL ANALYSIS		
MODULE CODE	MA1821 (L4)	**CREDIT VALUE**	20 CREDITS (10 ECTS)
CAMPUS	UCLAN CYPRUS		
SCHOOL	SCHOOL OF SCIENCE		

MODULE **AIMS**

This module aims to:

1) Equip students with the tools and background needed to be able to rigorously treat mathematical ideas relating to real numbers, functions, sequences and series.
2) Develop students understanding of and ability to develop mathematical proofs.

MODULE **CONTENT**

Proof: logic and truth tables, counter-examples and contradiction, induction, complete induction.

Real numbers: Rational and irrational numbers, density, decimal representations. Field, order and completeness axioms for R.

Inequalities: Properties of the modulus, quadratics, the Cauchy-Schwartz inequality.

Sequences: convergence and boundedness of sequences, monotonic sequences, Cauchy sequences.

Series: Convergence of series, the comparison and ratio tests, series of positive and negative terms, conditional and absolute convergence.

Functions and Continuity: Limits, continuity, the intermediate value theorem, the interval theorem, the boundedness theorem.

INTENDED **LEARNING OUTCOMES**

On successful completion of this module a student will be able to:	
1.	Develop their own proofs using common methods such as induction.
2.	State and use key theorems and results given in and related to the module.
3.	Prove key theorems and results given in and related to the module.

TEACHING **METHODS**

The module will be delivered on campus, with weekly lecture/tutorial sessions. The class contact will consist of lectures together with tutorials. Lectures will introduce the theory and provide examples of its application. Key elements of the learning strategy are regular worksheets in which students are encouraged to practise their mathematical techniques. These will be discussed in the tutorials.

To facilitate and monitor the formative learning process a portfolio of formative assessments will be set, with diagnosis of any deficiencies students may have in their learning and skills development being fed back during tutorials. Summative assessment is by closed-book examination.

ASSESSMENT **METHODS**

The module is assessed through a Portfolio of 10 assessed questions and an examination.