PH1501 - Gateway - Mathematics for Physicists 1A

Credits: 20.0  Semester: 1
Number of Lectures:  Number of Lectures:  Lecture: Dr Irina Leonhardt and MT1001 lecturer
Academic Year: 2018-19

Overview
This module is designed to give physics students a secure base in elementary calculus and other mathematical tools to enable them to access the mathematics modules needed for progression into physics and astronomy degrees. Participants will learn to use this mathematics effectively and efficiently in the context of work in physics. Some of the work is a revision and practice of material that will normally have been seen in the Scottish Higher and some A-Level maths syllabuses. The content is the same as MT1001 and will allow students to progress to MT1002 in semester 2.

Aims & Objectives

Learning Outcomes
Students who take PH1501 should develop a sound mathematics toolbox that will be used throughout a Physics degree.

Synopsis
Algebra: Recap of basic algebraic methods including solving equations and inequalities, manipulating algebraic and trigonometric expressions; proving trigonometric identities.

Functions: define a function and its inverse, define the exponential and logarithm functions; understand the idea of the limit of a function and apply it to the concept of continuity.

Sequences: manipulate arithmetic, geometric sequences; determine is a series converges or diverges.

Differentiation: differentiate polynomial, exponential, logarithmic, trigonometric and inverse trigonometric functions; use rules to differentiate products, quotients and functions of a function; calculate higher derivatives; use differentiation to assist in the sketching of curves and in the determination of maxima and minima.

Integration: calculate indefinite and definite integrals using standard integrals; integration by substitution, by parts and by partial fractions; evaluate areas under curves using trigonometry.

Pre-requisites
Entry to Physics and Astronomy (Gateway) or International Gateway Programmes

Anti-requisites
MT1001

Assessment
Coursework = 50% (Class Tests = 20%, Other Coursework = 30%), 2-hour Examination = 50%

Additional information on continuous assessment etc.

Recommended Books
Please view University online record:
http://resourcelists.st-andrews.ac.uk/modules/ph1501.html

General Information
Please also read the additional information in the School's handbook for first and second level modules.