

6501 (Mathematics for Engineers 1)

<i>Year:</i>	2016–2017
<i>Code:</i>	MATH6501
<i>Level:</i>	First
<i>Value:</i>	Half unit (= 7.5 ECTS credits)
<i>Term:</i>	1
<i>Structure:</i>	4 hours per week. Weekly assessed coursework.
<i>Assessment:</i>	90% examination, 10% coursework
<i>Normal Pre-requisites:</i>	A-level type mathematics, especially calculus.
<i>Lecturer:</i>	Miss B Seymenoglu

Course Description and Objectives

The course is designed to introduce to students with diverse mathematical backgrounds the basic mathematical methods which occur most frequently in engineering. Topics covered include differentiation and integration with applications, some differential equations, basic vectors, numerical methods and some statistics and probability. Each topic is illustrated by a wide variety of examples.

Recommended Texts

Relevant books are: (i) Stroud, *Engineering Mathematics* (Palgrave); (ii) Croft and Davison, *Mathematics for Engineers* (Prentice Hall); (iii) Kreyszig, *Advanced Engineering Mathematics* (Wiley).

Detailed Syllabus

Differentiation and Integration: Revision of basic rules and methods for differentiating and integrating a function of one variable, maxima, minima and points of inflection.

Partial Differentiation: up to chain rule.

Differential Equations: First order equations with separable variables, first order linear equations.

Vectors: Addition of vectors, scalar and vector products, applications to three-dimensional geometry.

Statistics and Probability: Mean and standard deviation, regression and correlation.

Numerical Methods: Numerical integration, eg trapezium and Simpson's rules, Newton's method for solving algebraic equations.