

**SUBJECT DESCRIPTION FORM**

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Subject Title: Mathematics II

Subject Code: AMA202

Credit Value: 3

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Pre-requisite: AMA201 Mathematics I

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Learning Activities:

Lecture	28 hours
Tutorial and Student Presentation	14 hours
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Total	42 hours

The lectures aim to provide the students with an integrated knowledge required for the understanding and application of mathematical concepts and techniques. To develop students' ability for logical thinking and effective communication, tutorial and presentation sessions will be held.

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Assessment:

Continuous Assessment	40%
Examination	60%
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Total	100%

To pass this subject, students are required to obtain Grade D or above in **both** the Continuous Assessment and the Examination components.

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Learning Outcomes:

The subject aims to introduce the students to some fundamental knowledge of engineering mathematics. The emphasis will be on the application of mathematical methods to solving practical engineering problems.

Upon satisfactory completion of the subject, students are expected to be able to:

- (i) apply mathematical reasoning to analyse essential features of different engineering problems;
- (ii) extend their knowledge of mathematical and numerical techniques and adapt known solutions to different situations;
- (iii) apply appropriate mathematical techniques to model and solve problems in engineering;
- (iv) develop and extrapolate mathematical concepts in synthesizing and solving new engineering problems;
- (v) search for useful information in solving problems;
- (vi) undertake continuous learning.

Syllabus:

*Calculus and functions of several variables:*

Infinite series; Power series; Taylor series; Fourier series; Partial differentiation; Maxima and minima; Lagrange multiplier.

*Partial differential equations:*

Formulation of partial differential equations; Method of separation of variables; Initial and boundary value problems.

*Vector Calculus:*

Vectors; Scalar and vector products; Gradient, divergence and curl operators; Multiple integrals; Line, surface and volume integrals; Green's theorem, divergence theorem and Stokes' theorem.

Textbooks and Reference books:

C.K. Chan, C.W. Chan & K.F. Hung	Basic Engineering Mathematics 2 <sup>nd</sup> edition	McGraw Hill 2008
G. James	Modern Engineering Mathematics 4 <sup>th</sup> edition	Pearson Education 2007
R. Haberman	Applied Partial Differential Equations 4 <sup>th</sup> edition	Prentice Hall 2003
H. Rogers R.L. Finney	Multivariable Calculus with Vectors	Prentice Hall 1998