Subject Description Form

Subject Code	AMA290
Subject Title	Engineering Mathematics
Credit Value	3
Level	2
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	The subject aims to introduce students with some fundamental mathematical concepts. The emphasis will be on application of mathematical methods to solving practical problems in the construction industry.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: 1. apply knowledge of Vector Calculus to solve problems in Engineering Mathematics; 2. apply knowledge of Linear Algebra to solve problems in Engineering Mathematics; 3. apply algorithms to solve for simple Linear Programming problems; 4. apply the idea of partial derivatives and Lagrange Multiplier to solve for constrained optimization problems.
Subject Synopsis/ Indicative Syllabus	*Linear Algebra:* Matrices and determinants; Vectors; Systems of linear equations; General properties of solutions; Elimination methods; Ill-conditioned systems; Eigenvalues and eigenvectors; Applications. *Functions of several variables:* Partial derivatives; Maxima, minima and saddle points; Lagrange multiplier; Application to error estimates. *Linear Programming:* Formulation; Graphical solution; Simplex method; Parametric modelling.
Teaching/Learning Methodology	The subject will be delivered mainly through lectures, tutorials and presentation. 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.

Assessment Methods in Alignment with Intended Learning Outcomes	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)			
			1	2	3	4
	a. Assignment and a Mid-term Test	40%	✓	✓	✓	✓
	b. Examination	60%	✓	✓	✓	✓
	Total	100 %				

Continuous Assessment comprises of assignments and a Mid-term Test. A written examination is held at the end of the semester.

Questions used in assignments, tests and examinations are set to test students' ability with regard to any one of the intended learning outcomes.

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

Student Study Effort Required	Class contact:	
	▪ Lecture	26 Hrs.
	▪ Tutorial and Student Presentation	13 Hrs.
	Other student study effort:	
	▪ Assignment	20 Hrs.
	▪ Self-study	58 Hrs.
	Total student study effort	117 Hrs.

Reading List and References	Textbook:		
	Chan, C.K., Chan, C.W. & Hung, K.F.	Basic Engineering Mathematics	McGraw Hill 2013
	References:		
	Taha, H.A.	Operations Research - An Introduction 9th edition	Prentice Hall 2011