

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	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> 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	<p><i>Linear Algebra:</i> Matrices and determinants; Vectors; Systems of linear equations; General properties of solutions; Elimination methods; Ill-conditioned systems; Eigenvalues and eigenvectors; Applications.</p> <p><i>Functions of several variables:</i> Partial derivatives; Maxima, minima and saddle points; Lagrange multiplier; Application to error estimates.</p> <p><i>Linear Programming:</i> Formulation; Graphical solution; Simplex method; Parametric modelling.</p>
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

	<p>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.</p>																																																						
<p>Assessment Methods in Alignment with Intended Learning Outcomes</p>	<table border="1" data-bbox="472 448 1433 999"> <thead> <tr> <th data-bbox="472 448 842 707" rowspan="2">Specific assessment methods/tasks</th> <th data-bbox="842 448 989 707" rowspan="2">% weighting</th> <th colspan="4" data-bbox="989 448 1433 622">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th data-bbox="989 622 1098 707">1</th> <th data-bbox="1098 622 1206 707">2</th> <th data-bbox="1206 622 1315 707">3</th> <th data-bbox="1315 622 1433 707">4</th> </tr> </thead> <tbody> <tr> <td data-bbox="472 707 842 837">a. Assignment and a Mid-term Test</td> <td data-bbox="842 707 989 837">40%</td> <td data-bbox="989 707 1098 837">✓</td> <td data-bbox="1098 707 1206 837">✓</td> <td data-bbox="1206 707 1315 837">✓</td> <td data-bbox="1315 707 1433 837">✓</td> </tr> <tr> <td data-bbox="472 837 842 918">b. Examination</td> <td data-bbox="842 837 989 918">60%</td> <td data-bbox="989 837 1098 918">✓</td> <td data-bbox="1098 837 1206 918">✓</td> <td data-bbox="1206 837 1315 918">✓</td> <td data-bbox="1315 837 1433 918">✓</td> </tr> <tr> <td data-bbox="472 918 842 999">Total</td> <td data-bbox="842 918 989 999">100 %</td> <td colspan="4" data-bbox="989 918 1433 999"></td> </tr> </tbody> </table> <p data-bbox="469 1088 1445 1169">Continuous Assessment comprises of assignments and a Mid-term Test. A written examination is held at the end of the semester.</p> <p data-bbox="469 1191 1445 1272">Questions used in assignments, tests and examinations are set to test students' ability with regard to any one of the intended learning outcomes.</p> <p data-bbox="469 1294 1445 1375">To pass this subject, students are required to obtain Grade D or above in both the Continuous Assessment and the Examination components.</p>						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 %																									
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**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 Prentice Hall
9th edition 2011