

Subject Description Form

Subject Code	AMA115
Subject Title	Engineering Mathematics I
Credit Value	3
Level	1
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	The subject aims to introduce students to some basic tools in mathematics. The emphasis will be on application of mathematical methods to solving problems in engineering.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: <ol style="list-style-type: none"> 1. apply mathematical reasoning to analyse essential features of diverse engineering problems; 2. extend their knowledge of mathematical techniques and adapt known solutions to different situations in engineering; 3. apply appropriate mathematical techniques to model and solve problems.
Subject Synopsis/ Indicative Syllabus	<p><i>Calculus:</i> Limits; Continuity; Derivatives; Techniques of differentiation; Maxima and minima; Definite and indefinite integrals; Techniques of integration; Geometric and physical applications in civil engineering such as determination of volume or pressure.</p> <p><i>Infinite Series:</i> Series representations of elementary functions; Taylor series and Maclaurin series.</p> <p><i>Functions of several variables:</i> Introduction to partial differentiation; The chain rule; Total differentials; Taylor series; Maxima and minima; Lagrange multipliers.</p>
Teaching/Learning Methodology	The subject will be delivered mainly through lectures and tutorials. The lectures aim to provide the students with an integrated knowledge required for the understanding and application of mathematical concepts and techniques. Tutorials will mainly be used to develop students' problem solving ability, logical thinking and effective communication.

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
	a. Continuous Assessment	40%	✓	✓	✓
	b. Examination	60%	✓	✓	✓
	Total	100 %			
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		28 Hrs.		
	▪ Tutorial		14 Hrs.		
	▪ Mid-term test and Examination		5 Hrs.		
	Other student study effort:				
	▪ Assignments and self-study		73 Hrs.		
	Total student study effort		120 Hrs.		
Reading List and References	<u>Textbook:</u>				
	K.F. Hung, Wilson C.K. Kwan and Glory T.Y. Pong	Foundation Mathematics & Statistics	McGraw Hill 2011		
	<u>References:</u>				
	Anton, H.	Elementary Linear Algebra 9 th edition	John Wiley & Sons 2004		
	Thomas, G.B., Weir, M.D. & Hass, J.R.	Thomas' Calculus 12 th edition	Addison Wesley 2009		
	Goldstein, L.J., Schneider, D.I., Lay, D.C. & Asmar, N.H.	Calculus and its Applications 12 th edition	Prentice Hall 2009		
	Kreyszig, E.	Advanced Engineering Mathematics 9 th edition	Wiley 2006		
Chan, C.K., Chan, C.W. & Hung, K.F.	Basic Engineering Mathematics Updated 3 rd edition	McGraw Hill 2011			