

Subject Description Form

Subject Code	AMA1102																															
Subject Title	Calculus IA																															
Credit Value	4																															
Level	1																															
Pre-requisite	Foundation Mathematics (AMA1100)																															
Co-requisite/ Exclusion	Nil																															
Objectives	This subject aims to introduce students to the theory and applications of differential and integral calculus. Emphasis will be on the understanding of fundamental concepts as well as applications of mathematical techniques in solving practical problems in science and engineering.																															
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> 1. apply mathematical reasoning to solve problems in science and engineering; 2. make use of the knowledge of mathematical techniques and adapt known solutions to various situations; 3. apply mathematical modeling in problem solving; 4. demonstrate abilities of logical and analytical thinking. 																															
Contribution of the Subject to the Attainment of the Programme Outcomes	<p>Programme Outcomes:</p> <p><u>Category A: Professional/academic knowledge and skills</u></p> <ul style="list-style-type: none"> • Programme Outcomes 4 and 5. <p><u>Category B: Attributes for all-roundedness</u></p> <ul style="list-style-type: none"> • Programme Outcomes 9 and 10. 																															
Subject Synopsis/ Indicative Syllabus	Review of limit and differentiation; indefinite and definite integrals; fundamental theorem of calculus; logarithmic, exponential, trigonometric and hyperbolic functions; techniques of integration; applications.																															
Teaching/Learning Methodology	Basic concepts and techniques of calculus will be taught in lectures. These will be further enhanced in tutorials through practical problem solving.																															
Assessment Methods in Alignment with Intended Learning Outcomes	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="width: 30%;">Specific assessment methods/tasks</th> <th rowspan="2" style="width: 15%;">% weighting</th> <th colspan="4" style="text-align: center;">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th style="width: 10%; text-align: center;">1</th> <th style="width: 10%; text-align: center;">2</th> <th style="width: 10%; text-align: center;">3</th> <th style="width: 10%; text-align: center;">4</th> </tr> </thead> <tbody> <tr> <td>1. Homework, quizzes and mid-term test</td> <td style="text-align: center;">40%</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> </tr> <tr> <td>2. Examination</td> <td style="text-align: center;">60%</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> </tr> <tr> <td>Total</td> <td style="text-align: center;">100%</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Continuous Assessment comprises of assignments, in-class quizzes, online quizzes and a mid-term test. An examination is held at the end of the semester.</p>				Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)				1	2	3	4	1. Homework, quizzes and mid-term test	40%	✓	✓	✓	✓	2. Examination	60%	✓	✓	✓	✓	Total	100%				
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	<p>Questions used in assignments, quizzes, tests and examinations are used to assess students' level of understanding of the basic concepts and their ability to use mathematical techniques in solving problems in science and engineering.</p> <p>To pass this subject, students are required to obtain grade D or above in both the continuous assessment and the examination components.</p> <p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p><i>The subject focuses on understanding of basic concepts and application of techniques in calculus. As such, an assessment method based mainly on examinations/tests/quizzes is considered appropriate. Furthermore, students are required to submit homework assignments regularly in order to allow subject lecturers to keep track of students' progress in the course.</i></p>	
Student Study Effort Expected	Class contact:	
	• Lecture	42 Hours
	• Tutorial	14 Hours
	Other student study effort:	
	• Homework and self-study	84 Hours
	Total student study effort:	140 Hours
Reading List and References	<ol style="list-style-type: none"> 1. K.F. Hung, Wilson C.K. Kwan and Glory T.Y. Pong, <i>Foundation Mathematics & Statistics</i>, McGraw-Hill, 2011. 2. G.B. Thomas and R.L. Finney etc., <i>Thomas' Calculus</i>, 12th ed., Addison-Wesley, 2009. 3. S. Lang, <i>Short Calculus</i>, Springer, 2002. 	
Last Updated	Aug 2012	
Prepared by	AMA Department	