

## Subject Description Form

<b>Subject Code</b>	AMA1702
<b>Subject Title</b>	Calculus
<b>Credit Value</b>	3
<b>Level</b>	1
<b>Co-requisite</b>	HKDSE extended module in Calculus and Statistics (M1) or HKDSE extended module in Calculus and Algebra (M2) with Level 2 or above, or Basic Mathematics - an introduction to Algebra and Differential Calculus (AMA1100)
<b>Exclusion</b>	Calculus and Linear Algebra (AMA1007) Calculus and Linear Algebra (AMA10071) Basic Mathematics I - Calculus and Probability & Statistics (AMA1110) Calculus for Engineers (AMA1130) Calculus (AMA1131) Foundation Mathematics for Accounting and Finance (AMA1500)
<b>Objectives</b>	This subject is to provide students with the basic concept and skills of Calculus and its applications.
<b>Intended Learning Outcomes</b>	Upon completion of the subject, students will be able to: a. apply mathematical reasoning to solve problems in their discipline b. make use of the knowledge of mathematical techniques and adapt known solutions to various situations c. apply mathematical modeling in problem solving in applied sciences d. develop and extrapolate mathematical concepts in solving new problems e. undertake continuous learning
<b>Subject Synopsis/ Indicative Syllabus</b>	<i>Differential Calculus</i> Functions; Limit and continuity; Derivatives; Mean Value Theorem; Logarithmic and exponential functions; Maxima and Minima; Taylor's Theorem; implicit differentiation; L'Hopital's rule.  <i>Integral Calculus</i>

	Definite and indefinite integrals; Techniques of integration; Fundamental Theorem of Calculus; Taylor's Theorem with remainder; Improper Integrals; Mean Value Theorem in integration; Applications.						
<b>Teaching/Learning Methodology</b>	The subject will be delivered mainly through lectures and tutorials. The lectures will be conducted to provide the students with an integrated knowledge required for the understanding of the basic mathematical concepts and techniques. To develop students' ability for logical thinking, effective communication and ability to apply the theory they learn in lectures, tutorial and presentation sessions will be held.						
<b>Assessment Methods in Alignment with Intended Learning Outcomes</b>	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)				
			a	b	c	d	e
	1. Tests/assignments	40%	✓	✓	✓	✓	✓
	2. Examination	60%	✓	✓	✓	✓	✓
	Total	100 %					
	<p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>By learning how to solve a collection of theoretical and practical mathematical problems designed and distributed in assignments, tests and examination, the students will master the basic techniques in calculus and linear algebra, and will be able to apply the techniques to model and solve simple practical problems in their discipline.</p>						
<b>Student Study Effort Expected</b>	Class contact:						
	▪ Lecture		26 Hrs.				
	▪ Tutorial		13 Hrs.				
	Other student study effort:						
	▪ Self-study		66 Hrs.				
	Total student study effort		105 Hrs.				

<b>Reading List and References</b>	James Stewart	Calculus. 8 <sup>th</sup> ed	Cengage Learning 2016
	Thomas, G.B., Weir, M.D. & Hass, J	Thomas' Calculus 14th edition	Pearson 2017
	K.C. Chung	A Short Course in Calculus and Matrices	McGraw Hill 2013
	K.F. Hung, Wilson	Foundation Mathematics	McGraw Hill 2013
	C.K. Kwan and Glory T.Y. Pong	& Statistics	