

Subject Description Form

Subject Code	AMA1110
Subject Title	Basic Mathematics I – Calculus and Probability & Statistics
Credit Value	3
Level	1
Pre-requisite	Nil
Exclusion	Calculus and Linear Algebra (AMA1007) Calculus for Engineers (AMA1130) Calculus (AMA1131) Foundation Mathematics for Accounting and Finance (AMA1500) Calculus (AMA1702)
Objectives	This subject aims to introduce students to the basic concepts and applications of elementary calculus and statistics. Emphasis will be on the understanding of fundamental concepts and the use of mathematical techniques in handling practical problems in science and engineering.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: (a) apply analytical reasoning to solve problems in science and engineering; (b) make use of the knowledge of mathematical/statistical techniques and adapt known solutions to various situations; (c) apply mathematical modeling in problem solving; (d) demonstrate abilities of logical and analytical thinking.
Subject Synopsis/ Indicative Syllabus	<p><u>Elementary calculus</u>: Limit and continuity, derivatives and their geometric meaning, rules of differentiation including chain rule, Leibniz’s rule and L’Hopital’s rule, exponential and logarithmic functions, trigonometric functions and their inverses, hyperbolic and inverse hyperbolic functions, applications of differential calculus.</p> <p><u>Elementary Probability and Statistics</u>: Descriptive statistics, random variables, probability and probability distributions, binomial, Poisson and normal distributions, applications.</p> <p>Population and random samples. Sampling distributions related to sample mean, sample proportions, and sample variances. Concepts of a point estimator and a confidence interval. Point and interval estimates of a mean and the difference between two means.</p>

Teaching/Learning Methodology	Basic concepts and elementary techniques of differential and integral calculus and elementary statistics 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" data-bbox="486 369 1428 795"> <thead> <tr> <th data-bbox="486 369 790 571" rowspan="2">Specific assessment methods/tasks</th> <th data-bbox="790 369 949 571" rowspan="2">% weighting</th> <th colspan="4" data-bbox="949 369 1428 504">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th data-bbox="949 504 1061 571">a</th> <th data-bbox="1061 504 1189 571">b</th> <th data-bbox="1189 504 1300 571">c</th> <th data-bbox="1300 504 1428 571">d</th> </tr> </thead> <tbody> <tr> <td data-bbox="486 571 790 672">1. Assignments and mid-term tests</td> <td data-bbox="790 571 949 672">40%</td> <td data-bbox="949 571 1061 672">✓</td> <td data-bbox="1061 571 1189 672">✓</td> <td data-bbox="1189 571 1300 672">✓</td> <td data-bbox="1300 571 1428 672">✓</td> </tr> <tr> <td data-bbox="486 672 790 728">2. Examination</td> <td data-bbox="790 672 949 728">60%</td> <td data-bbox="949 672 1061 728">✓</td> <td data-bbox="1061 672 1189 728">✓</td> <td data-bbox="1189 672 1300 728">✓</td> <td data-bbox="1300 672 1428 728">✓</td> </tr> <tr> <td data-bbox="486 728 790 795">Total</td> <td data-bbox="790 728 949 795">100 %</td> <td colspan="4" data-bbox="949 728 1428 795"></td> </tr> </tbody> </table> <p data-bbox="486 795 1444 884">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> <p data-bbox="486 884 1444 1019">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 data-bbox="486 1019 1444 1108">Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p data-bbox="486 1108 1444 1377"><i>The subject focuses on understanding of basic concepts and application of techniques in differential/integral calculus, elementary statistics. 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>					Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)				a	b	c	d	1. Assignments and mid-term tests	40%	✓	✓	✓	✓	2. Examination	60%	✓	✓	✓	✓	Total	100 %				
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Student Study Effort Expected	Class contact:																																
	▪ Lecture		26 Hrs.																														
	▪ Tutorial		13 Hrs.																														
	Other student study effort:																																
	▪ Homework and self-study		81 Hrs.																														
	Total student study effort		120 Hrs.																														
Reading List and References	Chung, K.C. <i>A Short Course in Calculus and Matrices</i> , McGraw Hill 2013																																

	Hung, K.F., Kwan, Wilson, Pong, T.Y. <i>Foundation Mathematics & Statistics</i> , McGraw Hill 2013
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	Larson, R., Edwards, B. <i>Single Variable Calculus</i> , Brooks/Cole 2012
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	Walpole, R.E., Myers, R.H., Myers, S.L. Ye, K. <i>Probability and Statistics for Engineers and Scientists</i> , Prentice Hall, 2012
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