

Subject Description Form

Subject Code	AMA1104
Subject Title	Introductory Probability
Credit Value	2
Level	1
Pre-requisite/ Co-requisite/ Exclusion	Pre-requisite: NSS Mathematics Exclusion: NSS Mathematics Module I
Objectives	This subject aims to introduce students to some basic principles and knowledge of probability. 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	Upon completion of the subject, students will be able to: (a) apply probabilistic and statistical reasoning to describe and analyze essential features of data sets; (b) make use of the knowledge and techniques in probability and adapt known results to various situations; (c) develop and extrapolate concepts of probability and statistics in data analysis and problem solving; (d) demonstrate abilities of logical and analytical thinking.
Subject Synopsis/ Indicative Syllabus	<i>Introduction to Probability</i> Experiment, events and probability. Probability rules. Bayes' Theorem. <i>Discrete Random Variables</i> Introduction to discrete random variables such as uniform, binomial, Poisson, etc. and their probability distributions. Mathematical expectation. <i>Continuous random variables</i> Concept of continuous random variables such as uniform, exponential, normal, etc. and their probability density functions. Mathematical expectation. Normal approximation to the binomial distribution.

	<p><i>Sampling Distributions</i> Population and random samples. Sampling distributions related to sample mean, sample proportions, and sample variances.</p> <p><i>Estimation of Parameters</i> Concepts of a point estimator and a confidence interval. Point and interval estimates of a mean and the difference between two means.</p>																												
<p>Teaching/Learning Methodology</p>	<p>Basic concepts and techniques of probability and statistics will be taught in lectures. These will be further enhanced in tutorials through practical problem solving and case study.</p>																												
<p>Assessment Methods in Alignment with Intended Learning Outcomes</p>	<table border="1"> <thead> <tr> <th rowspan="2">Specific assessment methods/tasks</th> <th rowspan="2">% weighting</th> <th colspan="4">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th>a</th> <th>b</th> <th>c</th> <th>d</th> </tr> </thead> <tbody> <tr> <td>1.Homework, quizzes and mid-term test</td> <td>40%</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>2. Examination</td> <td>60%</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>Total</td> <td>100 %</td> <td colspan="4"></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> <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>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 probability distributions, random variables and sampling distribution. 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.Homework, quizzes and mid-term test	40%	✓	✓	✓	✓	2. Examination	60%	✓	✓	✓	✓	Total	100 %				
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Student Study Effort Expected	Class contact:	
	▪ Lecture	19 Hrs.
	▪ Tutorial	7 Hrs.
	Other student study effort:	
	▪ Homework and self-study	42 Hrs.
	Total student study effort	68 Hrs.
References	<p>Hung, K.F., Kwan W.C.K. & Pong, G.T.Y. Foundation Mathematics & Statistics, McGraw Hill 2013.</p> <p>Walpole, RE, Myers, RH, Myers, SL and Ye, K.Y. Probability and Statistics for Engineers and Scientist. 9th ed. Prentice Hall 2012</p>	