

Subject Description Form

Subject Code	AMA1502
Subject Title	Introduction to Statistics
Credit Value	3
Level	1
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	<p>This subject aims to:</p> <ul style="list-style-type: none"> (i) provide students with a variety of basic techniques in understanding and interpreting data; (ii) allow students to develop skills in analyzing scenarios and problems in engineering, industry and science by applying statistical methods. The emphasis will be on applications of elementary statistical methods to engineering, industry and science.
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <ul style="list-style-type: none"> a. use a variety of basic techniques in understanding and interpreting data; b. apply elementary statistical methods in analyzing scientific and industrial problems; c. think critically and creatively about the uses and limitations of statistical methods; d. use statistical package and interpret the output, appreciate the applications of information technology for statistical analysis in engineering, industry and science.
Subject Synopsis/ Indicative Syllabus	<p>Descriptive Statistics Presentation of data in tabular, diagrammatic and graphic forms; misleading presentations. Summary measures of location and spread.</p> <p>Probability Concepts of probability. Probability rules. Bayes' Theorem. Random variables and expected values; uses and limitations in decision making. Common probability distributions: Binomial, Poisson and Normal.</p> <p>Estimation Simple random samples. Sampling distributions: mean, proportion and differences. Confidence intervals: mean, proportion and differences.</p> <p>Hypothesis Testing Hypothesis testing: mean, proportion and differences.</p> <p>Chi-square Test Test of goodness of fit. Test of independence.</p> <p>Relationships between Variables Exploratory data analysis. Linear relationships: ordinary least squares.</p>

	Correlation coefficients. Multiple Regression Multiple regression equation. Inferences about parameters. Modelling techniques						
Teaching/Learning Methodology	The lectures aim to provide the students with an integrated knowledge required for the understanding and application of statistical concepts and techniques. To develop students' ability for logical thinking and effective communication, tutorial and presentation sessions will be held.						
Assessment Methods in Alignment with Intended Learning Outcomes	Specific assessment methods/tasks		% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)			
				a	b	c	d
	1. Assignment and Presentation		20%	✓	✓	✓	✓
	2. Mid-term Test		30%	✓	✓	✓	
	3. Examination		50%	✓	✓	✓	✓
	Total		100 %				
<p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>The subject focuses on knowledge, skill and understanding of Statistics, thus, Exam-based assessment is the most appropriate assessment method, including 30% test and 50% examination. Moreover, 20% worth of assignments and presentations are included as a component of continuous assessment so as to keep the students in progress.</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>							
Student Study Effort Expected	Class contact:						
	▪ Lecture			26 Hrs.			
	▪ Tutorial and Student Presentation			13 Hrs.			
	Other student study effort:						
	▪ Assignments			20 Hrs.			
	▪ Self-study			58 Hrs.			
	Total student study effort			117 Hrs.			

Reading List and References	<p><u>Study Guide:</u></p> <p>Introduction to Statistics, Department of Applied Mathematics, The Hong Kong Polytechnic University</p> <p><u>Reference Books:</u></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> <p>Levin, Richard I. and Rubin, David S., <i>Statistics for Management</i>, 7th ed., Prentice-Hall, 1998.</p> <p>Moore, David S. and McCabe, G., <i>Introduction to the practice of Statistics</i>, 7th ed., W H Freeman, 2012.</p>
------------------------------------	---