Subject Description Form

Subject Code	AMA455
Subject Title	Financial Modelling
Credit Value	3
Level	4
Pre-requisite/ Co-requisite/ Exclusion	Pre-requisites: Further Calculus (AMA251) or Introduction to Calculus and Linear Algebra (AMA211) with basic knowledge in Lagrangian and Finance
Objectives	This subject aims to introduce the basic concepts and techniques of financial modelling. Special emphasis is on the applications of mathematics and statistics to financial decision making.
Intended Learning Outcomes	Upon satisfactory completion of the subject, students should be able to: 1. apply mathematics and statistical knowledge to financial modelling; 2. perform basic operations and implement strategies in the financial markets from a mathematical modelling point of view; 3. develop the mathematical models for financial tools as well as portfolio for investment; 4. apply probabilities, statistics and stochastic techniques for risk and management; 5. apply and evaluate the mathematical tools to analyze practical examples in finance and decision in investment; 6. work independently as well as in a team for a project in finance.
Subject Synopsis/ Indicative Syllabus	*Financial Mathematics* Compound interest, nominal and effective interest rates, present value and discounted cash flows, annuities, forward rates, methods of investment appraisal : NPV and IRR, utility theory, indifference curve, measurement of risks. *Portfolio Analysis* Indifference curve for risk and return, portfolio risk and return, market efficiency, mean-variance portfolio analysis, capital asset pricing model (CAPM), arbitrage pricing. *Options* Options market, properties of stock option prices, pricing an option, binomial trees, model of the behaviour of stock prices, Black-Scholes analysis, hedging. *Typical Mini-Project* Cases in investment appraisals and pricing an option
Teaching/Learning Methodology	A 2-hour lecture will be conducted every week to motivate students with daily life financial examples to understand and learn the financial model. Also, an one hour tutorial designed to consolidate and develop students knowledge through practical examples and discussion.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		1	2	3	4	5	6
a. Assignments	20%	✓	✓	✓	✓	✓	✓
b. Tests	20%	✓	✓	✓	✓	✓	✓
c. Examination	60%	✓	✓	✓	✓	✓	✓
Total	100 %						

The learning outcomes will be assessed by a combination of in-class exercises, assignments, mid-term tests and final examination.

To pass this subject, students are required to obtain Grade D or above in **both** the Continuous Assessment and the Examination components.

Student Study Effort Required

Class contact:	
▪ Lecture	28 Hrs.
▪ Tutorial	14 Hrs.
Other student study effort:	
▪ Assignment	42 Hrs.
▪ Self-study	36 Hrs.
Total student study effort	120 Hrs.

Reading List and References

Textbook:

Hull, J.C.	Options, Futures, and other Derivatives, 6th Edition	Prentice Hall, 2006

References:

Copeland & Weston	Financial Theory & Corporate Policy, 3rd Edition	Addison-Wesley, 1992
Elton, E.J. *et al.*	Modern Portfolio Theory and Investment Analysis	John Wiley & Sons, 2006
Luenberger, D.G.	Investment Science	Oxford University Press, 1997