Subject Description Form

Subject Code	AMA539
Subject Title	Financial Modeling
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	**Pre-requisite:** AMA528 Probability and Stochastic Models
Objectives	To enable students to have a thorough understanding of financial modeling, their variations and their applications to financial policies. This module is designed to represent the performance of a financial asset or portfolio of a business, project, or any other investment. Students are expected to understand a comprehensive coverage of the basic concepts, theories, applications and decision-making rules for financial investments. Major topics cover the state-of-the-art knowledge and skills of computational methods for derivative pricing and hedging, financial model calibration and other aspects of investment and risk management with portfolio selections.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: (a) Apply the concepts and terminology of financial modeling and risk analysis. (b) Understand modern portfolio theory and its use in the investment management process. (c) Apply mathematical knowledge to value different financial securities including equity, bonds, and derivatives. (d) Understand the process of portfolio management and portfolio performance evaluation. (e) Apply stochastic processes to study continuous-time mean-variance and utility portfolio selections, optimal stopping in finance.
Subject Synopsis/ Indicative Syllabus	Measure of return and risk; risk return trade-off; diversification and portfolio risk; optimal risky portfolios; asset allocation; risk-free lending and borrowing. Typical investment instruments; investment process; risk free assets; market indexes and benchmarks; short sales; investment companies. Single-period mean-variance portfolio selection; Capital Asset Pricing Model (CAPM); Multi Factor Models; Arbitrage Pricing Theory (APT)**;** Valuation concepts and methods; valuation models such as dividend discount model; P/E based models. Elementary stochastic calculus, geometric Brownian motion, Ito's lemma. Continuous-time mean-variance and utility theory, optimal stopping in finance.
Teaching/Learning Methodology	The subject will be delivered mainly through lectures and tutorials. The teaching and learning approach is mainly problem-solving oriented. The approach aims at the development of mathematical techniques and how the techniques can be applied to solving real problems. Students are encouraged

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<tr><td></td><td>to adopt a deep study approach by employing high level portfolio strategies, such as mean-variance and utility models, integrating and applying theories to practice.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="5">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td></tr>
<tr><td>1. Assignments</td><td>10%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>2. Tests</td><td>30%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>3. Examination</td><td>60%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Total</td><td>100 %</td><td colspan="5"></td></tr>
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Continuous Assessment comprises of assignments and tests. A written examination is held at the end of the semester.
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<tr><td>Student Study Effort Required</td><td>
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<tr><td>Class contact:</td><td></td></tr>
<tr><td>▪ Lecture</td><td>26 Hrs.</td></tr>
<tr><td>▪ Tutorial</td><td>13 Hrs.</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>▪ Assignment/Mini-project</td><td>38 Hrs.</td></tr>
<tr><td>▪ Self-study</td><td>60 Hrs.</td></tr>
<tr><td>Total student study effort</td><td>137 Hrs.</td></tr>
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<tr><td>Reading List and References</td><td>
<table>
<tr><td>Zvi, B., Kane, A., and Marcus, A.J.</td><td>Essentials of Investments, 7th Edition</td><td>McGraw-Hill, 2007</td></tr>
<tr><td>Reilly, Frank K., and Edgar A.</td><td>Investments, 7th Edition</td><td>Thomson South-Western, 2006</td></tr>
<tr><td>Ho, S., Scott, R.H., and Wong, K.A.</td><td>The Hong Kong Financial System</td><td>Oxford University Press, 2004</td></tr>
<tr><td>Elton, E.J., Gruber, M.J., Brown, S.J., and Goetzmann, W.</td><td>Modern Portfolio Theory and Investment Analysis, 6th edition</td><td>Wiley, 2003</td></tr>
<tr><td>Luenberger, D.G.</td><td>Investment Science</td><td>Oxford University Press, 1998</td></tr>
<tr><td>Karatzas, I. and Shreve S.E.</td><td>Methods of Mathematical Finance</td><td>Springer 1999</td></tr>
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