Subject Description Form

Subject Code	AMA3304
Subject Title	Theory of Interest and Portfolio Analysis
Credit Value	3
Level	3
Pre-requisite	Introduction to Statistics for Business (AMA1501) or Introduction to Statistics (AMA1502/AMA1602) or Probability and Engineering Statistics (AMA2104) or Probability and Distributions (AMA2691) or Mathematical Methods for Finance (AMA2703) **and** Linear Algebra (AMA1751) Intermediate Calculus and Linear Algebra (AMA2007/AMA2707) or Mathematics I (AMA2111) or Mathematics for Engineers (AMA2131/AMA2308) or Applied Mathematics II (AMA2512) or Mathematics for Scientists and Engineers (AMA2882) or Engineering Mathematics (AMA290) or Mathematical Methods for Data Science (AMA3001/AMA3701) or Further Mathematical Methods for Finance (AMA3723) or Further Mathematical Methods (AMA3724)
Exclusion	Financial Computations and Programming (AMA304) Mathematical Methods for Investment (AMA432)
Objectives	This subject is to introduce the concepts and techniques of financial mathematics and portfolio analysis. Special emphasis is on the application of mathematics and statistics to financial decision making and portfolio management using popular commercial/statistical software.
Intended Learning Outcomes	Upon satisfactory completion of the subject, students should be able to: a. outline the basic principles and assumptions for the theory of interest; b. apply portfolio theory to the management of portfolio; c. synthesize the knowledge and techniques required in solving real-life problems. d. present presumable analysis results; e. communicate effectively in a well-structured manner and build up an open-minded attitude towards enquiry.
Subject Synopsis/ Indicative Syllabus	*Interest Rates and Bonds (15 hours)* Simple interest, compound interest, flat rates, forward rates, internal rate of return and net present value; basic annuities, annuity functions, amortization and amortization schedules; Bond pricing, bond yield, par yield and duration.

	Portfolio Theory (24 hours) Measurement of risks. Portfolio risk and return. Market efficiency. Mean-variance portfolio analysis. The Markowitz model. Asset pricing models: capital asset pricing model; factor models. Utility theory: indifference curves; utility functions; risk aversion; the mean-variance criterion.
Teaching/Learning Methodology	The subject will be delivered mainly through lectures and tutorials. The lectures will be conducted to introduce the theory of interest and portfolio analysis concepts in the syllabus, which are then reinforced by learning activities involving demonstration, tutorial exercise and mini-project.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)				
		a	b	c	d	e
1. Assignments	15%	✓	✓	✓	✓	✓
2. Tests	25%	✓	✓	✓	✓	✓
3. Examination	60%	✓	✓	✓	✓	✓
Total	100%					

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The subject focuses on knowledge, skill and understanding of **Theory of Interest and Portfolio Analysis**, thus, **Exam-based assessment** is the most appropriate assessment method, including 25% test and 60% examination. Moreover, 15% worth of assignments are included as a component of continuous assessment so as to keep the students in progress.

Continuous Assessment comprises of assignments and tests. A written examination will be held at the end of the semester.

Student Study Effort Expected

Class contact:	
• Lecture	26 Hrs.
• Tutorial	13 Hrs.
Other student study effort:	
• Assignment	50 Hrs.
• Self-study	28 Hrs.
Total student study effort	117 Hrs.

Reading List and References

Textbook:

Luenberger D.G   Investment Science 2nd edition   Oxford University Press 2013

	Kellison, S.G.	The Theory of Interest 3rd edition	McGraw-Hill / Irwin 2008
	References:		
	Benninga, S.	Financial Modeling 4th edition	The MIT Press 2014
	Seydel, R.U.	Tools for Computational Finance 6th edition	Springer 2017
	Elton, E.J., Gruber, M.J., Brown, S.J. & Goetzmann, W.N.	Modern Portfolio Theory and Investment Analysis 8th edition	Wiley 2009
	Dunis, C.L., Laws, J. & Naïm, P.	Applied Quantitative Methods for Trading and Investment 1st edition	Wiley 2003