UNIVERSITI TEKNOLOGI MARA

ASC303: FINANCIAL MATHEMATICS

Course Name (English)	FINANCIAL MATHEMATICS APPROVED
Course Code	ASC303

MQF Credit	4

Course Description	This course will explain, describe and discuss on the basic concepts, calculations and simple applications of the mathematical modelling used in the financial world. Its goal is to provide students with first-hand exposure in financial modelling and actuarial analysis as basic knowledge before proceeding further to the Advanced Financial Mathematics course in the later semesters of the Actuarial Science Program.

Transferable Skills	1. Demonstrate the ability to identify and articulate self-skills, knowledge and understanding in a variety of financial contexts. 2. Demonstrate the ability to apply creative, imaginative and innovative thinking and ideas to problem solving.

Teaching Methodologies	Lectures

CLO		
	CLO1	Describe the fundamental concepts, key terms and various investment instruments in Financial Mathematics.
	CLO2	Apply the key procedures of Financial Mathematics in valuing various stream cash flows and bonds.
	CLO3	Analyse the complexity of financial decisions by translating real-world problems into mathematical terms in business and personal arenas.

Pre-Requisite Courses	No course recommendations

Topics
1. Interest Rate Measurement 1.1) Interest Accumulation and Effective Rates of Interest. 1.2) Present Value and Equation of Value. 1.3) Nominal Rates of Interest. 1.4) Effective and Nominal Rates of Discount. 1.5) The Force of Interest 1.6) Inflation and the Real rate of Interest.
2. Valuation of Annuities 2.1) Annuity-immediate. 2.2) Annuity-due 2.3) Annuity values on any date. 2.4) Perpetuities. 2.5) Non-standard Terms and Interest Rates. 2.6) Solving for the Number of Payment in an Annuity 2.7) Solving for the Interest Rate in an Annuity. 2.8) Annuity with Non-constant Payments.
3. Loan Repayment 3.1) The Amortization Method of Loan Repayment. 3.2) Amortization of a Loan with Level Payments. 3.3) The Sinking-Fund Method of Loan Repayment. 3.4) Deferring Payment Periods and Interest Conversion Periods. 3.5) Varying Series of Payment. 3.6) Amortization with Continuous Payment.
4. Valuation of Bonds 4.1) Types of Securities. 4.2) Price of Bonds.

Assessment Breakdown	%
Continuous Assessment	40.00%
Final Assessment	60.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	Four case studies on Loan Repayment - CLO 3 - 10%	10%	CLO3
	Quiz	Quiz 1 - CLO 1 - 2%	2%	CLO1
	Quiz	Quiz 2 - CLO 2 - 3%	3%	CLO2
	Test	Test 1 - CLO 1 - 10%	10%	CLO1
	Test	Test 2 - CLO 2 - 15%	15%	CLO2

Reading List	Recommended Text	**Wai-Sum Chan,Yiu-Kuen Tse 2017, *Financial Mathematics for Actuaries*, 2 Ed., World Scientific Publishing Company [ISBN: 981322469X]**
	Reference Book Resources	**Raymond H. Chan,Yves ZY. Guo,Spike T. Lee,Xun Li 2019, *Financial Mathematics, Derivatives and Structured Products*, Springer [ISBN: 9811336962]**
		Yuliya Mishura 2016, *Financial Mathematics*, Elsevier [ISBN: 0081004885]
		Vigirdas Mackevicius 2016, *Stochastic Models of Financial Mathematics*, Elsevier [ISBN: 0081020864]
		Francesca Beccacece 2017, *Lecture Notes on Financial Mathematics*, EGEA [ISBN: 8864073396]
		Giuseppe Campolieti,Roman N. Makarov 2018, *Financial Mathematics*, CRC Press [ISBN: 1315360489]
Article/Paper List	This Course does not have any article/paper resources	
Other References	This Course does not have any other resources	