



UNIVERSITI TEKNOLOGI MARA

ASC637: FINANCIAL RISK MANAGEMENT

Course Name (English)	FINANCIAL RISK MANAGEMENT APPROVED
Course Code	ASC637
MQF Credit	4
Course Description	The course provides students with the grounding on the fundamental of financial risk management via financial products i.e. insurance, derivatives product and risk theory. Part of this course follows the syllabus of CM2 from IFoA.
Transferable Skills	Demonstrate ability to apply creative, imaginative and innovative thinking and ideas to Risk Management problem solving. Demonstrate ability to provide effective risk management solutions.
Teaching Methodologies	Lectures, Tutorial
CLO	<p>CLO1 Show capabilities to generate solution to solve problems related to the models underlying option pricing and financial risk management.</p> <p>CLO2 Construct and use problem-solving techniques in relation to the models underlying option pricing and financial risk management.</p> <p>CLO3 Discuss lifelong learning skills in assignments related to the models underlying option pricing and financial risk management.</p>
Pre-Requisite Courses	No course recommendations
Topics	
<p>1. Derivatives Markets</p> <p>1.1) Introduction to Derivatives</p> <p>1.2) Forwards, Options and Option Basic Strategies</p> <p>1.3) Financial Forwards, Futures and Swap</p>	
<p>2. Parity and other Option Relationship</p> <p>2.1) Put-Call Parity</p> <p>2.2) Generalized Parity and Exchange Options</p> <p>2.3) Comparing Option with Respect to Style, Maturity and Strike</p>	
<p>3. Binomial Option Pricing Models</p> <p>3.1) Type of Binomial Option Pricing Model & Arbitrage</p> <p>3.2) Type of Options, Early Exercise and Risk Neutral Pricing</p> <p>3.3) The Binomial Tree and Lognormality</p> <p>3.4) Estimating Volatility</p>	
<p>4. The Black-Scholes Formula & Equation</p> <p>4.1) Introduction and Application of Black Scholes Formula</p> <p>4.2) Option Greeks, Profit Diagram and Implied Volatility</p> <p>4.3) Differential Equations and Valuation under Certainty</p> <p>4.4) The Black-Scholes Equation</p> <p>4.5) Risk-Neutral Pricing and Changing the Numeraire</p> <p>4.6) Option Pricing When the Stock Price Can Jump</p>	
<p>5. Interest Rate Models</p> <p>5.1) Market Making and Bond pricing</p> <p>5.2) Equilibrium Short Rate Bond Price</p> <p>5.3) Bond Options, Caps and the Black Model</p> <p>5.4) A Binomial Interest Rate Model</p> <p>5.5) The Black-Derman-Toy Model</p>	

6. Stochastics interest rate models

- 6.1) Independent rate of interest
- 6.2) The lognormal model
- 6.3) Times series model & Binomial lattice
- 6.4) Continuous stochastics model

7. Value at risk

- 7.1) The VaR Measure/Tail VaR
- 7.2) Historical Simulation
- 7.3) Model Building Approach
- 7.4) Linear and Quadratic Model
- 7.5) Monte Carlo Simulation
- 7.6) Comparison of approaches
- 7.7) Stress Testing and Back Testing
- 7.8) Issues with VaR

8. Credit Risk

- 8.1) Credit Ratings
- 8.2) Historical Default probabilities & Recovery Rates
- 8.3) Estimating default probabilities from bond prices
- 8.4) Comparison of default probability estimates
- 8.5) Credit Risk Mitigation and Default Correlation
- 8.6) Credit VaR
- 8.7) Default Concepts and Terminology
- 8.8) The Merton Default Model
- 8.9) Bond Ratings and Default Experience
- 8.10) Credit Instruments

Assessment Breakdown	%
Continuous Assessment	30.00%
Final Assessment	70.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	This is an individual assignment CLO1 - 5%	5%	CLO1
	Group Project	This is a group project CLO3 - 5%	5%	CLO3
	Test	Test 1 - Covers first half of the syllabus contents CLO1 - 10%	10%	CLO1
	Test	Test 2 - Covers the second half of the syllabus contents CLO2 - 10%	10%	CLO2

Reading List	Recommended Text	McDonald, R.L. 2016, <i>Derivatives Markets</i> , 2 Ed., Boston: Pearson Education Inc
	Reference Book Resources	<ul style="list-style-type: none"> • Institute and Faculty of Actuaries 2019, <i>CM2 Loss Reserving and Financial Engineering</i>, IFoA • Weishaus, A. 2018, <i>Study Manual for Exam IFM. Exam IFM: Investment and Financial Market</i>, First Ed., Actuarial Study Manual (ASM) New York • Hull, J. C. 2017, <i>Option, futures and other derivatives</i>, New Jersey: Pearson Prentice Hall • Jarrow, R., Chatterjea, A. 2019, <i>An Introduction to Derivative Securities, Financial Markets, and Risk Management</i>, 2nd Ed., World Scientific Publishing Company

Article/Paper List	This Course does not have any article/paper resources
---------------------------	---

Other References	This Course does not have any other resources
-------------------------	---