MODULE SPECIFICATION

Part 1: Information			
Module Title	Financial Mathematics		
Module Code	UFMFUG-15-3	Level	Level 6
For implementation from	2019-20		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Environment & Technology	Field	Engineering, Design and Mathematics
Department	FET Dept of Engin Design & Mathematics		
Module type:	Standard		
Pre-requisites	Mathematical Methods 2019-20		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

Overview: In this module you will study the mathematical concepts that underpin financial trading with derivative contracts that are an important element of modern investment strategies. The topic of stochastic calculus has important applications in finance, but is also used to model problems that occur in biology and the physical world.

Educational Aims: In this module you will extend your knowledge of calculus to situations involving random variables.

Outline Syllabus: Financial concepts: Risk-free and risky assets, the stock market, interpreting financial information.

Derivative contracts: Forward and futures contracts, European and American style options, path dependent options, arbitrage, risk neutral valuation. Dividend payments, pay-off and profit diagrams. The Black Scholes model, Ito's lemma, put-call parity, hedging, Binomial tree model.

Dynamics of random walks: Random variables, lognormal distribution, volatility, discrete and continuous stochastic models, Wiener and Generalised Wiener process, Geometric Brownian motion, mean reverting processes, Ito process, stochastic differential equations.

Teaching and Learning Methods: Scheduled contact includes lectures and workshops. The latter serve partly to resolve issues brought up by the students on a week-by-week basis, and also to provide an arena for other learning activities appropriate to developing theory or to exploring applications.

Self-study includes: engaging with the resources provided; working on example sheets; locating and utilising other materials to support learning.

Contact: 36 hours
Assimilation and skill development: 54 hours
Coursework: 15 hours
Exam preparation: 45 hours
Total: 150 hours

Part 3: Assessment

Component A. An examination that assesses the student's understanding of concepts and techniques, and also their ability to apply these in relatively straightforward problems.

Component B. A piece of coursework that involves collection and analysis of real financial data within a trading strategy involving derivative contracts. The coursework plays an important role in consolidating the students understanding of financial concepts and terminology.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Report - Component B		25 %	Coursework
Examination - Component A	✓	75 %	Examination (2 hours)
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Report - Component B		25 %	Coursework
Examination - Component A	✓	75 %	Examination (2 hours)

Part 4: Teaching and Learning Methods

Learning Outcomes

On successful completion of this module students will achieve the following learning outcomes:

Module Learning Outcomes	Reference
To solve linear stochastic differential equations and obtain the probability distribution of the underlying variable	MO1
Select and apply appropriate techniques to price financial derivative contracts	MO2
Explain the underlying concepts and limitations of the Black-Scholes theory and be able to implement a dynamic hedging strategy to manage risk	MO3
Communicate mathematical concepts, analysis and results through a short written report	MO4

Contact Hours

Independent Study Hours:	
Independent study/self-guided study	114
Total Independent Study Hours:	114
Scheduled Learning and Teaching Hours:	
Face-to-face learning	36
Total Scheduled Learning and Teaching Hours:	36
Hours to be allocated	150
Allocated Hours	150

Reading List

The reading list for this module can be accessed via the following link:

https://uwe.rl.talis.com/modules/ufmfug-15-3.html

Part 5: Contributes Towards

This module contributes towards the following programmes of study: