



## **Module Specification**

### **Financial Mathematics**

Version: 2024-25, v4.0, 20 May 2024

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## Part 1: Information

**Module title:** Financial Mathematics

**Module code:** UFMFUG-15-3

**Level:** Level 6

**For implementation from:** 2024-25

**UWE credit rating:** 15

**ECTS credit rating:** 7.5

**College:** College of Arts, Technology and Environment

**School:** CATE School of Computing and Creative Technologies

**Partner institutions:** None

**Field:** Computer Science and Creative Technologies

**Module type:** Module

**Pre-requisites:** Mathematical Methods 2024-25

**Excluded combinations:** None

**Co-requisites:** None

**Continuing professional development:** No

**Professional, statutory or regulatory body requirements:** None

## Part 2: Description

**Overview:** In this module, you will study on the fundamental mathematical framework for Mathematical Finance, focusing on key topics essential to quantitative finance theory and practice. Probability theory and stochastic processes and techniques will be the foundational tools for expressing and solving financial problems.

**Features:** Not applicable

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

**Outline syllabus:** Introduction to basic concepts of finance: probability theory, conditional expectation.

Advanced topics: martingale theory and the study of essential stochastic processes in finance: random walks, Brownian motion, and the Poisson process. Stochastic calculus and applications in finance. The materials will contain examples and computer-based demonstrations to enhance understanding. By the conclusion of this module, students will attain proficiency in key mathematical methods and techniques essential for the Financial Market.

Main Topics may include:

Interest Accumulation and Time Value of Money and Annuities:

Spot Rates, Forward Rates, the Term Structure and Rates of Return:

Loans and Costs of Borrowings

Bond, Interest Rates and Financial Securities

Stochastic Interest Rates

Pricing

Derivative contracts

Dynamics of random walks

### **Part 3: Teaching and learning methods**

**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

**Module Learning outcomes:** On successful completion of this module students will achieve the following learning outcomes.

**MO1** Explain the underlying concepts and limitations of the financial market.

**MO2** Select and apply appropriate techniques used in the financial market.

**MO3** Communicate mathematical concepts, analysis and results through a written report

**Hours to be allocated:** 150

**Contact hours:**

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

Total = 0

**Reading list:** The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://uwe.rl.talis.com/modules/ufmfug-15-3.html) via the following link <https://uwe.rl.talis.com/modules/ufmfug-15-3.html>

## **Part 4: Assessment**

**Assessment strategy:** The module will be assessed through an assignment that requires the application of mathematical concepts and approaches to the pricing of financial derivative contracts and the analysis of advanced trading strategies. The assignment will require the comparison of different trading and risk management

strategies involving forward and option style contracts. Students will use individual data obtained from the financial markets to describe the underlying financial asset.

The output will be a 10 to 12 page report.

The resit assessment will take the same format as the first sit assessment but will be based on a different trading scenario.

### **Assessment tasks:**

#### **Report (First Sit)**

Description: Assignment. Report will be typically 10 to 12 pages in length.

Weighting: 100 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO3

#### **Report (Resit)**

Description: Assignment. Report will be typically 10 to 12 pages in length.

Weighting: 100 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO3

### **Part 5: Contributes towards**

This module contributes towards the following programmes of study:

Mathematics [Frenchay] BSc (Hons) 2022-23

Mathematics [Sep][SW][Frenchay][5yrs] - Not Running MMath 2021-22

Mathematics [Sep][SW][Frenchay][4yrs] BSc (Hons) 2021-22

Mathematics {Foundation}[Sep][FT][Frenchay][4yrs] BSc (Hons) 2021-22

Mathematics and Statistics {Foundation} [Sep][SW][Frenchay][5yrs] - Not Running  
BSc (Hons) 2020-21

Mathematics {Foundation}[Sep][SW][Frenchay][5yrs] BSc (Hons) 2020-21

Mathematics {Foundation} [Sep][SW][Frenchay][5yrs] BSc (Hons) 2020-21