### COURSE DETAILS

**Course Code:** F71AB  
**Full Course Title:** Financial Mathematics  
**SCQF Level:** 11  
**SCAF Credits:** 15  
**Available as Elective:** No

### DELIVERY LEVEL

<table>
<thead>
<tr>
<th>Undergraduate:</th>
<th>Postgraduate Taught:</th>
<th>Postgraduate Research:</th>
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<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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### COURSE AIMS

This module aims to provide postgraduate students with a broad knowledge of basic concepts in financial mathematics including interest rates, arbitrage, stochastic interest rates, inflation and continuous cash flows.

### LEARNING OUTCOMES – SUBJECT MASTERY

On completion of this module the student should be able to:

- Know how to discount and accumulate cash flows and calculate internal rates of return.
- Know the derivation of formulae for standard cash flows.
- Derive and solve equations of value.
- Understand the principle of equivalence.
- Understand the theory and practice of loan repayments.
- Understand measures of investment performance.
- Value fixed interest securities subject to tax and determine their yield.
- Understand the concept of arbitrage and the no-arbitrage assumption.
- Calculate the forward price and the value of forward contracts using arbitrage free pricing.
- Develop a replicating portfolio for forward contracts.
- Understand forward interest rates and the term structure of interest rates.
- Calculate the duration and convexity of a set of cash flows.
- Understand Redington's theory of immunization and apply it in simple situations.
- Understand simple stochastic interest rate models.
- Calculate the accumulated profit of projects using deterministic interest rates.
- Understand the concept of inflation and calculate inflation adjusted payoffs.
- Find the real yield and the monetary yield of inflation linked gilts.
- Calculate the break-even rate of inflation.

### LEARNING OUTCOMES – PERSONAL ABILITIES

On completion of this module the student should be able to:

- Demonstrate knowledge and critical understanding of the basic concepts and models in financial mathematics.
- Demonstrate the ability to learn independently.
• manage time, work to deadlines and prioritize workloads
• present results in a way that demonstrates that they have understood the technical and broader issues in financial mathematics

SYLLABUS

• Rates of interests
• Present values, equations of value and yields
• Principle of equivalence
• Annuities
• Loan schedules and mortgages
• Project appraisal and discounted cash flows
• Measures of fund performance
• Fixed interest securities
• Inflation and index-linked securities
• Continuous Compounding, force of interest and continuous cash flows
• Immunisation, duration and convexity
• Arbitrage and forward contracts
• The term structure of interest rates and forward rates
• Stochastic interest rate models

LOCATION AND ASSESSMENT METHODS

Exam Mins Type Diet Synoptic Course

Y Examination 60 180 Assessment Semester 1

Examination will be at least 60% and no more than 80%.

Y Coursework 40 Assessment Semester 1

Coursework will be at least 20% and no more than 40%.

Y Examination 100 180 Reassessment Semester 1

Re-assessment in the next academic year.