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

DELIVERY LEVEL
Undergraduate: Yes  Postgraduate Taught: Yes  Postgraduate Research: No

Additional Information:

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

COURSE RELATIONSHIPS

N/A

LOCATION AND ASSESSMENT METHODS

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<th>Edi</th>
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<td>Assessment</td>
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<td>Semester 1</td>
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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.