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

LOCATION AND ASSESSMENT METHODS

Examination will be at least 60% and no more than 80%.
Coursework will be at least 20% and no more than 40%.
Re-assessment in the next academic year.

Examination 60 180 60 180 Examination Assessment Semester 1
Coursework 40 40 Assessment Assessment Semester 1
Examination 100 180 100 180 Reassessment Semster 1

COURSE RELATIONSHIPS

N/A

LOCATION AND ASSESSMENT METHODS

Edi | SBC | Ork | Dub | Malay | IDL | COLL | ALP | OTH | Method | Weight | Exam Mins | Type | Diet | Synoptic Course
---|---|---|---|---|---|---|---|---|---|---|---|---|---|---
Y | Examination 60 180 | Assessment | Semester 1
Y | Coursework 40 | Assessment | Semester 1
Y | Examination 100 180 | Reassessment | Semester 1

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Re-assessment in the next academic year.