COURSE DETAILS
Course Code: F78AB
Full Course Title: Actuarial and Financial Mathematics B
SCQF Level: 8
SCAF Credits: 7.5
Available as Elective: No

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

Additional Information:

COURSE AIMS
To introduce the student to more advanced mathematical models of cashflows accumulated or discounted at interest, and to develop skill in applying these models to real financial contracts and transactions.

LEARNING OUTCOMES – SUBJECT MASTERY
On completion of this course the student should be able to:

• Describe and calculate nominal rates of interest.
• Know how to value and accumulate continuously-payable cash flows and how to calculate internal rates of return for transactions with such cash flows.
• Define the duration and convexity of a cash flow sequence and illustrate how these may be used to estimate the sensitivity of the value of the cash flow sequence to changes in the rate of interest.
• Know how duration and convexity are used in the immunisation of a portfolio of liabilities.
• Show an understanding of the term structure of interest rates and of the main factors influencing this structure.
• Calculate the delivery price and the value of a forward contract, using arbitrage-free pricing methods and to explain what is meant by hedging in the case of a forward contract.
• Know how to calculate the value of various types of forward contracts at any time during their duration.
• Use an appropriate computer package to apply the methods introduced in this course.

LEARNING OUTCOMES – PERSONAL ABILITIES

• Interpreting problems from commercial practice in terms of relevant mathematical models
• Independently recognizing and applying appropriate mathematical techniques to solve problems
• Interpreting solutions expressed mathematically in terms of the original problem
• Communicating the solutions to complex problems in the financial services sector

SYLLABUS

• Nominal rates of interest
• Force of interest and continuous cash flows
• Duration and Redington's theory of immunization
• The term structure of interest rates
Forward contracts

COURSE RELATIONSHIPS

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Level</th>
<th>Title</th>
<th>School</th>
<th>Type</th>
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<td>8</td>
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LOCATION AND ASSESSMENT METHODS

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<td>120</td>
<td>Assessment</td>
<td>Semester 2</td>
<td>F78AA</td>
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The assessments will be as follows:
F78AA (Semester 1): 25% Continuous assessments. No final exam at the end of the semester.
F78AB (Semester 2): 5% Continuous assessments. Final exam for F78AA and F78AB syllabus amounting to 70% of the total grade at the end of semester 2.

| Y   | Y   | Y   |     |       |     |      |     |     | Coursework | 5      | Assessment | Semester 2 | F78AA |

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| Y   | Y   | Y   |     |       |     |      |     |     | Examination | 100    | 120       | Reassessment | Semester 3 | F78AA |