**COURSE DETAILS**

**Course Code:** F71QR  
**Full Course Title:** Quantitative Risk Analysis  
**SCQF Level:** 11  
**SCAF Credits:** 15  
**Available as Elective:** No

**DELIVERY LEVEL**

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<th>Undergraduate:</th>
<th>No</th>
<th>Postgraduate Taught:</th>
<th>Yes</th>
<th>Postgraduate Research:</th>
<th>No</th>
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**COURSE AIMS**

The aims of this course are:

- To provide a thorough grounding in the wide range of risks that a financial institution or other enterprise might be exposed to
- To provide an introduction to the statistical methods underpinning financial risk management
- To teach students the different methods of assessing financial risk
- To equip students with a variety of tools to tackle problems involving financial data

**LEARNING OUTCOMES – SUBJECT MASTERY**

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

- Demonstrate an understanding of the different reasons for measuring financial risk.
- Describe and apply the different measures of financial risk
- Define what is meant by a coherent measure of risk;
- Use appropriate statistical and computational methods to determine the fatness of the tails of returns data
- Describe and apply the main univariate and multivariate distributions to financial data
- Describe and apply the fundamental concepts and theorems in Extreme Value Theory (EVT)
- Describe how analysis of financial data using EVT differs from traditional statistical methods
- Describe and apply the main statistical methods in EVT to financial data
- Demonstrate how multivariate returns can be described using marginal distributions and copulas
- Describe and apply the main copulas
- Explain how the use of different copulas can affect the returns distribution on a portfolio containing two assets
- Demonstrate a good understanding of the different sources of credit risk and credit spreads
- Understand how ratings agencies assess risk
- Explain the risk management control cycle
- Describe the feedback loop in risk management
- Define what is meant by securitization and alternative risk transfer
- Describe different forms of risk transfer and their advantages
- Use appropriate statistical software to analyse problems involving financial risk
- Show an awareness of the different approaches to modelling and managing credit risk
F71QR Quantitative Risk Analysis

- Use an appropriate computer package to analyse financial data and solve complex problems

LEARNING OUTCOMES – PERSONAL ABILITIES

- Show an appreciation of the interface between academic theory and industrial practice
- Show an appreciation of the societal role of risk management in protecting the consumer and other stakeholders
- Demonstrate the ability to learn independently and as part of a group
- Manage time, work to deadlines and prioritise workloads
- Use an appropriate computer package to analyse financial data and solve complex problems
- Present results in a way that demonstrates that they have understood the technical and broader issues of financial risk management

SYLLABUS

Introduction
- The concept of Enterprise Risk Management, the drivers behind it and the resulting value to organisations
- Risk and uncertainty, different definitions
- Direct and indirect stakeholders in an enterprise: Relevance of risk measurement and management to all stakeholders
- Risk taxonomy and overlaps

Quantitative Analysis of Financial Data
- Quantifiable and non-quantifiable risks
- Common univariate distributions, model fitting and diagnostic tests
- Extreme value theory
- Common multivariate distributions
- Modelling multivariate risks using copulas
- Different measures of correlation including tail correlation
- Risk measures; coherent risk measures
- Model and parameter risk
- Backtesting

Contagion and Credit Risk
- Sources of credit risk; contagion
- Theoretical and commercial approaches to modelling credit risk

Risk Management
- Securitisation and alternative risk transfer
- The risk management control cycle
### COURSE RELATIONSHIPS

| N/A |

### LOCATION AND ASSESSMENT METHODS

<table>
<thead>
<tr>
<th>Edi</th>
<th>SBC</th>
<th>Ork</th>
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<tbody>
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<td>120</td>
<td>Assessment</td>
<td>Semester 1</td>
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Assessment is at least 70% by examination and up to 30% by coursework.

| Y   | Y   |     |     |       |     |      |     |     | Coursework    | 30     |           | Assessment | Semester 1 |      |                |

Assessment is at least 70% by examination and up to 30% by coursework.

| Y   | Y   |     |     |       |     |      |     |     | Examination    | 100    | 120       | Reassessment | Semester 1 |      |                |

Re-assessment is in the next academic year.