F71CM Credit Risk Modelling

### COURSE DETAILS
- **Course Code:** F71CM
- **Full Course Title:** Credit Risk Modelling
- **SCQF Level:** 11
- **SCAF Credits:** 15
- **Available as Elective:** No

### DELIVERY LEVEL
- **Undergraduate:** Yes
- **Postgraduate Taught:** Yes
- **Postgraduate Research:** No

### COURSE AIMS
The aims of this module are:

- to introduce students to quantitative models for measuring and managing credit risks
- to provide students with a critical understanding of the credit risk methodology used in the financial industry
- to give students an appreciation of the regulatory framework in which the models operate

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

- Demonstrate an understanding of the nature of credit risk
- Describe the theoretical underpinnings of models used in the financial industry
- Show a knowledge of the regulatory framework and, in particular, the Basel II regulatory capital formula
- Describe how dependence is modelled in credit portfolios
- Describe mixture models of default and derive their mathematical properties
- Describe and use methods for calculating the portfolio loss distribution
- Describe and apply statistical approaches to calibrating credit risk models
- Explain the features and uses of the most common single-name products and basket derivatives

### 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
- Demonstrate skills in the understanding and processing of numerical information and interpretation of statistics
- Show knowledge of appropriate software for implementing solutions
The module covers the following topics:

- Introduction to credit risk: credit-risky instruments, defaults, ratings
- Merton’s model of the default of a firm
- Common industry models (KMV, CreditMetrics, CreditRisk+)
- Modelling dependence between defaults with factor models
- Latent variable and mixture models of default
- The Basel II regulatory capital formula
- Calculating the portfolio credit loss distribution
- Large portfolio behaviour of the credit loss distribution
- Calibration and statistical inference for credit risk models
- Overview of the more common single-name and portfolio/basket credit derivatives

Re-assessment based on 100% exam, in the next academic year.