

# BSC (HONS) (RISK AND ACTUARIAL STUDIES)

## Overview

NFQ Level 8, Major Award

*(Dual Degree)*

This is a four year honours degree programme delivered in partnership with Beijing Technology and Business University (BTBU) whom University College Cork has signed a bilateral agreement under statute 263 of the National University of Ireland. This programme leads to a dual degree which is awarded independently from both institutions. The programme comprises 240 credits. Students will study for two years at a BTBU, taking modules to the equivalent of 120 credits (or ECTS equivalent) and for two years at University College Cork, taking modules to the value of 60 credits in each of Third and Fourth Year. When studying at UCC a student may not register for more than 60 credits in any one academic year.

## First Year - Risk and Actuarial Studies

This year is spent pursuing an approved course of study at a BTBU with whom UCC has a bilateral agreement. Students take the following core modules to the value of **60** credits (or ECTS equivalent).

## Second Year - Risk and Actuarial Studies

This year is spent pursuing an approved course of study at a BTBU with whom UCC has a bilateral agreement. Students take the following core modules to the value of **60** credits (or ECTS equivalent).

Students entering Year 3 of the programme at UCC will have taken and passed, inter alia, modules broadly equivalent to the relevant parts of the following UCC modules as part of their Year 1 & Year 2 studies at BTBU:

UCC Module Code (ECTS Credits)	UCC Module Name	BTBU Equivalent Module
AM1053 (5 credits)	Introduction to Mathematical Modelling	SCI1C4S002
MA1058 (5 credits)	Introduction to Linear Algebra	SCI1C4B004 & SCI1C4B005
MA1059 (5 credits)	Calculus	SCI1C4B001
MA1060 (5 credits)	Introduction to Analysis	SCI1C4B001
MA2051 (5 credits)	Mathematical Analysis 1	SCI1C4B002
MA2054 (5 credits)	Ordinary Differential Equations	SCI1C3B007
MA2055 (5 credits)	Linear Algebra	SCI1C4B004 & SCI1C4B005
MA2071 (5 credits)	Multivariable Calculus	SCI1C4B003
ST1051 (5 credits) & ST2051 (5 credits)	Introduction to Probability & Statistics	SCI1C4B006 & SCI1C3D001

## Third Year - Risk and Actuarial Studies

To be admitted to the Third University Examination in Risk and Actuarial Studies a student must have satisfactorily attended modules amounting to **60** credits comprising core modules to the value of **55** credits, and elective modules to the value of **5** credits.

## Fourth Year - Risk and Actuarial Studies

To be admitted to the Fourth University Examination in Risk and Actuarial Studies a student must have satisfactorily attended modules to the value of **60** credits comprising core modules to the value of **25** credits, and elective modules to the value of **35** credits.

**Note:**

1. Any elective module selected in Fourth Year must not have been taken in any previous year.
2. Students are also encouraged to consult the University's Book of Modules, 2023/2024, to be clear on the prerequisites required for each Fourth Year elective.

## Programme Requirements

For information about modules, module choice, options and credit weightings, please go to Programme Requirements (p. 1).

## Programme Requirements

Code	Title	Credits
<b>Year 1</b>		
Students take modules to the value of <b>60</b> credits (or ECTS equivalent) as follows:		
<i>Core Modules</i>		
FLG1C4G001	Comprehensive English Listening and Speaking 1	5
FLG1C6G002	Comprehensive English Reading and Writing 1	8
FLG1C4G003	Comprehensive English Listening and Speaking 2	5
FLG1C6G004	Comprehensive English Reading and Writing 2	8
PAE1B1Q001	Basic Physical Quality Training	2
PAE1B1G001	Physical Education 1	2
MAR1B3G001	Ethic & Law	4
STU1B1Q002	Military Training	2
SCI1C4B001	Mathematical Analysis 1	6
SCI1C4B002	Mathematical Analysis 2	6
SCI1C4B004	Advanced Algebra and Space Analytic Geometry 1	6
SCI1C4B005	Advanced Algebra and Space Analytic Geometry 2	6
<b>Year 2</b>		
Students take modules to the value of <b>60</b> credits (or ECTS equivalent) as follows:		
<i>Core Modules</i>		
FLG1C6G005	Comprehensive English 3	8
FLG1C6G006	Comprehensive English 4	8
CIE6C3S001	Algorithms and Data Structure	6
PAE1B1G002	Physical Education 2	2
PAE1B1G003	Physical Education 3	2
SCI1C4B003	Mathematical Analysis 3	8
SCI1C4B006	Probability	5
SCI1C3D001	Mathematical Statistics	3
SCI1C3S001	Discrete Mathematics	6
SCI1C3B007	Differential Equations	6
SCI1C4S002	Mathematical Modelling and Experiment Year 2	6
<b>Year 3</b>		
Students take <b>60</b> credits as follows – all listed core modules ( <b>55</b> credits) and <b>5</b> credits of elective modules:		
<i>Core Modules</i>		

MF2052	Introduction to Financial Mathematics	10
PA3002	Principles and Applications of Market Analysis	10
ST1050	Statistical Programming in R	5
ST3054	Survival Analysis	5
ST3055	Generalised Linear Models	5
ST3068	Probability and Statistics for Risk Applications	5
ST3074	Statistical Methods for Non-Life Insurance	5
ST3092	Statistics Readings and Literature Review Workshop	5
ST4400	Data Analysis II	5

**Elective Modules**

Students take modules to the value of **5** credits from the following: 5

AM2060	Object Oriented Programming with Applications (5)	
MF2050	Discrete Time Financial Models (5)	
ST3061	Statistical Theory of Estimation (5)	

**Year 4**

Students take **60** credits as follows – all listed core modules (**25** credits) and **35** credits of elective modules:

**Core Modules**

ST3053	Stochastic Modelling I	5
ST4060	Statistical Methods for Machine Learning I	5
ST4061	Statistical Methods for Machine Learning II	5
ST4064	Time Series	5
ST4090	Current Topics in Statistics I	5

**Elective Modules**

Students take modules to the value of **35** credits from the following: 35

AM2060	Object Oriented Programming with Applications (5)	
AM2061	Computer Modelling and Numerical Techniques (5)	
MF2050	Discrete Time Financial Models (5)	
MF2053	Financial Modelling for Actuarial Science 1 (5)	
MF3052	Derivatives, Securities and Option Pricing (5)	
MF3053	Financial Modelling for Actuarial Science 2 (5)	
ST3061	Statistical Theory of Estimation (5)	
ST3075	Methods of Reporting in Actuarial Science (5)	
ST4068	Contingencies (10)	
ST4401	Introduction to Operations Research (5)	
ST4402	Modelling and Systems for Decision Making (5)	

**Total Credits** **240**

**Examinations**

Full details and regulations governing Examinations for each programme will be contained in the *Marks and Standards Book* and for each module in the *Book of Modules*.

**Programme Learning Outcomes****Programme Learning Outcomes for BSc (Hons) (Risk and Actuarial Studies) (NFQ Level 8, Major Award)**

On successful completion of this programme, students should be able to:

- Effectively utilise probability, mathematical and applied statistical theories, concepts, models, and frameworks as apparatus of thought for risk assessment, risk characterization and risk modelling;

- Identify the major risks faced by an insurance or financial firm and show how these risks can be managed by actuaries and quantitative analysts;
- Apply the actuarial control cycle mechanism in the management of insurance risks;
- Describe the fundamental theories, models and principles of Actuarial Science and carry out a wide range of calculations involved in financial decision making, valuation and risk modelling;
- Use computational methods as fundamental tools in the modelling and management of risk;
- Conduct undergraduate research and be able to present your results in technical and non-technical modes;
- Work in numerate and professional roles in insurance firms, financial institutions, banks, investment management and financial consultancy firms;
- Enter postgraduate research fields in the areas of Mathematical and Actuarial Science;
- Demonstrate the high professional standards required of an actuary or financial risk analyst in terms of behaviour, interpersonal and communication skills as well as a commitment to life-long learning.