

# MSC (MATHEMATICAL MODELLING AND MACHINE LEARNING)

## Overview

NFQ Level 9, Major Award

The MSc in Mathematical Modelling and Machine Learning is a full-time, blended learning programme running for 12 months from the date of first registration for the programme.

## Postgraduate Diploma in Mathematical Modelling and Machine Learning

Regulations regarding progression from Part I to Part II can be found in Marks and Standards (<https://ucc-ie-public.courseleaf.com/general/marksandstandards/>). Students who pass Part I but do not meet these, or who choose not to progress to Part II and exit the programme will be conferred with the Postgraduate Diploma in Mathematical Modelling and Machine Learning (<https://ucc-ie-public.courseleaf.com/programmes/pdmmml/>).

## Programme Requirements

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

## Programme Requirements

Code	Title	Credits
Students take <b>90</b> credits as follows:		
<b>Part I</b> <sup>1</sup>		
Students take <b>60</b> credits as follows:		
<i>Core Modules</i>		
AM6004	Numerical Methods and Applications	5
AM6005	Nonlinear Dynamics	5
AM6007	Scientific Computing with Numerical Examples	10
AM6015	Computational Techniques with Networks	5
AM6016	Dynamic Machine Learning with Applications	5
AM6017	Complex and Neural Networks	5
AM6020	Open Source Infrastructure for Modelling and Big Data	5
CS6421	Deep Learning	5
EE6024	Engineering Machine Learning Solutions	5
ST4060	Statistical Methods for Machine Learning I	5
ST4061	Statistical Methods for Machine Learning II	5
<b>Part II</b>		
<i>Dissertation</i>		
Students take <b>30</b> credits as follows:		
<i>Core Modules</i>		
AM6021	Dissertation in Mathematical Modelling and Machine Learning	30
<b>Total Credits</b>		<b>90</b>

<sup>1</sup> Students who have taken any of these modules in a previous degree must select alternative modules (subject to availability and timetabling) in consultation with the Programme Coordinator.

## 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 MSc (Mathematical Modelling and Machine Learning) (NFQ Level 9, Major Award)**

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

- Apply the basic concepts, theories, principles and practical methods of mathematical modelling and machine learning to analyse and solve theoretical and practical problems;
- Give clear and organized written and verbal explanations of ideas in the areas of mathematical modelling and machine learning;
- Critically discuss and evaluate the concepts and examples in several areas of mathematical modelling and machine learning;
- Extend the given course material to solve original problems and develop associated computer codes;
- Contribute effectively as members of project teams dealing with mathematical models and their computer implementation, including the delivery of oral presentations and written reports.