

Applied & Computational Mathematics

CAO code: DN200 Option: Mathematical, Physical & Geological Sciences (MPG)



Discover how Applied and Computational Mathematics is fundamental in providing uniquely powerful ways to describe, analyse and advance the physical and life sciences, engineering, technology, business and finance

Applied and Computational Mathematics gave the perfect balance between physical problems, maths problems and programming. You also learn how to apply these methods to real life physical systems. As well as being interesting, one of the great things about studying a subject that you like so much is that you get to meet a lot of other people who share your passion for the subject.



Shane Walsh, Student

Sample pathway for a degree in Applied & Computational Mathematics *

YEAR 1 ENGAGE WITH THE PRINCIPLES

APPLIED & COMPUTATIONAL MATHEMATICS

Topics include:

- ▶ Applied Mathematics: Mechanics and Methods
- ▶ Applications of Differential Equations

MATHEMATICS

Topics include:

- ▶ Calculus in the Mathematical and Physical Sciences
- ▶ Mathematical Analysis
- ▶ Linear Algebra in the Mathematical and Physical Sciences

- ▶ Introduction to Statistical Modelling
- ▶ One Elective module
- ▶ One Small-Group Project

YEAR 2 CHOOSE YOUR SUBJECTS

APPLIED & COMPUTATIONAL MATHEMATICS

Topics include:

- ▶ Computational Science
- ▶ Vector Integral and Differential Calculus
- ▶ Oscillations in Mechanical Systems
- ▶ Classical Mechanics and Special Relativity

MATHEMATICS

Topics include:

- ▶ Linear Algebra 2
- ▶ Groups, Rings & Fields
- ▶ Calculus of Several Variables
- ▶ One Elective module

STATISTICS

Topics include:

- ▶ Probability Theory
- ▶ Inferential Statistics

- ▶ Two Elective modules

YEAR 3 FOCUS ON YOUR CHOSEN SUBJECT

APPLIED & COMPUTATIONAL MATHEMATICS – Topics include:

- ▶ Analytic Mechanics
- ▶ Dynamical Systems
- ▶ Functions of One Complex Variable
- ▶ Partial Differential Equations

- ▶ Advanced Mathematical Methods
- ▶ Foundations of Fluid Mechanics
- ▶ Foundations of Quantum Mechanics

- ▶ Two Elective modules

YEAR 4 REFINE YOUR KNOWLEDGE

APPLIED & COMPUTATIONAL MATHEMATICS – Topics include:

- ▶ Applied & Computational Mathematics Research Project
- ▶ Differential Geometry
- ▶ General Relativity and Black Holes

- ▶ Numerical Algorithms
- ▶ Electrodynamics and Gauge Theory
- ▶ Environmental Fluid Mechanics

- ▶ Stochastic Methods
- ▶ Computational Finance
- ▶ Advanced Mathematical Methods

BSc (Honours) Applied & Computational Mathematics

MSc (Taught)	PhD	Industry	Conversion Courses
<ul style="list-style-type: none"> ▶ MSc Data & Computational Science ▶ MSc Mathematical Science ▶ MSc Climate Change & Impact ▶ MSc Applied Mathematics & Theoretical Physics ▶ MSc Computational Physics 	<p>Students can pursue a PhD in universities in Ireland or abroad in areas as diverse as:</p> <ul style="list-style-type: none"> ▶ Data and Computational Science ▶ Meteorology and Climate ▶ Mathematical Biology ▶ Fluid Mechanics ▶ Dynamical Systems ▶ General Relativity 	<p>A wide variety of career opportunities are open with new application areas discovered constantly. Technology areas include:</p> <ul style="list-style-type: none"> ▶ Data Analytics ▶ Computing ▶ Finance ▶ Energy ▶ Environment ▶ Communication 	<ul style="list-style-type: none"> ▶ Professional Master of Education (PME) ▶ Masters of Management ▶ Graduate Medicine ▶ MSc Quantitative Finance

*See pages 4 and 5 for information on the terminology used above. Potential combinations shown here are examples only and are not guaranteed by UCD. Topics are subject to change each year.



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