Mathematics and Physics
BSc

College of Science, Engineering and Food Science

UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

CK407
CK408

DEGREE OUTLET
COURSE PAGE ONLINE
www.ucc.ie/en/ck407/maths-physics

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Introduction
Physics is concerned with the nature and properties of matter and energy, from the quantum world on scales smaller than an atom, to the largest distances probed with powerful telescopes. The closely-related discipline of mathematics provides the language of physics and the fundamental underpinnings of science and technology.

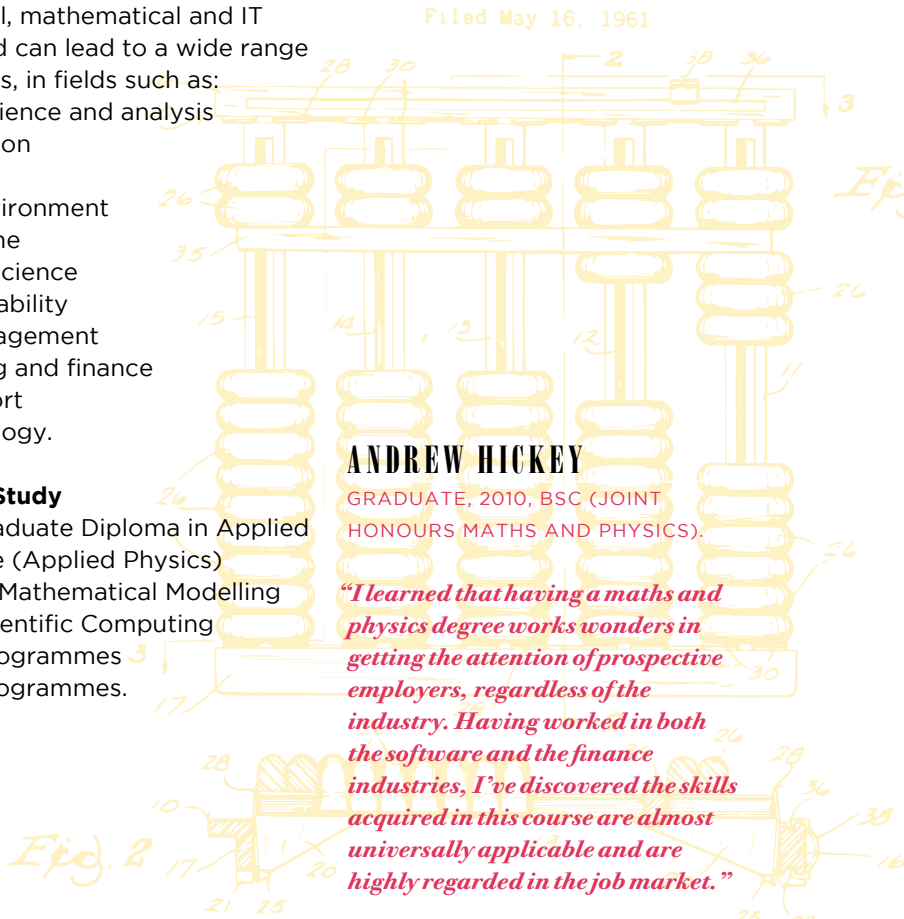
Why Study
This degree is a good option for those who are naturally curious and feel attracted by the rigour of pure mathematics. Physics encompasses the study of natural phenomena on all scales, while mathematics provides key analytical tools in science and engineering. These disciplines are closely related: the physics of general relativity and quantum mechanics would have been impossible without related advances in geometry and operator algebra. An education in mathematics and physics develops problem-solving skills and provides a firm knowledge of basic science, and the ability to apply and adapt that knowledge within a large variety of workplaces.

Work Placement
There is no work placement in the mathematics and physics degree programme, but there are opportunities for summer research in the physics department, the nearby Tyndall Institute, and other departments in the School of Science, Engineering and Food Science, following Year 2 and Year 3.

Study Abroad
There are opportunities for study abroad in Year 3 at a variety of universities in the US and Europe.

Careers
An education in mathematics and physics provides problem-solving, analytical, mathematical and IT skills, and can lead to a wide range of careers, in fields such as:
- data science and analysis
- education
- energy
- the environment
- medicine
- space science
- sustainability
- IT management
- banking and finance
- transport
- technology.

Further Study
- Postgraduate Diploma in Applied Science (Applied Physics)
- MSc in Mathematical Modelling and Scientific Computing
- MSc programmes
- PhD programmes.



ANDREW HICKEY
GRADUATE, 2010, BSC (JOINT HONOURS MATHS AND PHYSICS).

"I learned that having a maths and physics degree works wonders in getting the attention of prospective employers, regardless of the industry. Having worked in both the software and the finance industries, I've discovered the skills acquired in this course are almost universally applicable and are highly regarded in the job market."

#uccmakeyourmark

KEY FACTS

- **Physics and mathematics occupy central positions in science and technology**
- **Graduates enter the jobs market with a degree that combines a high level of training in both numerical and experimental work**
- **The emphasis on developing problem-solving skills across a range of disciplines, is highly regarded by employers. UCC students have an excellent track record in both career development and in postgraduate study**

Year 1 Modules

REFER TO CK407 AND CK408 ENTRIES ON PAGES 145 AND 146 IN THE FULL UCC 2017 ENTRY PROSPECTUS

Year 2 Modules

Astrophysics and Special Relativity; Classical Mechanics; Electrostatics and Magnetostatics; Experimental Physics; Fourier Methods; Linear Algebra; Mathematical Analysis; Mathematical Modelling; Dynamical Systems; Multivariable Calculus; Ordinary Differential Equations; Quantum Physics; Thermodynamics and Statistical Physics

Year 3 Modules

CORE: Complex Analysis; Differential Geometry; Electromagnetism; Experimental Physics; Mathematical Analysis; Metric Spaces and Topology; Modern Algebra; Optics; Quantum Mechanics; Statistical Thermodynamics; Ring and Field Theory

ELECTIVES: Observational Astrophysics; Nuclear and Particle Physics

Year 4 Modules

CORE: Functional Analysis, Measure Theory and Martingales, Research Projects in Mathematics and Physics; Topics in Mathematics

ELECTIVES: Topics in Differential Geometry, Topics in Modern Algebra, Stochastic Modelling; Introduction to Condensed Matter Physics; Nuclear and Particle Physics; Observational Astrophysics; Advanced Mechanics; Advanced Quantum Mechanics; Advanced Electromagnetism; Advanced Condensed Matter Physics; Atomic and Molecular Physics; Quantum Field Theory; Plasma Physics; Lasers and Photonics; Advanced Computational Physics; Stars and the Interstellar Medium; Galactic and Extragalactic Astrophysics; Gravitation and Cosmology; Experimental Physics; Quantum Optics; Physics of Semiconductor Devices