

Applied Mathematics and Physics BSc

College of Science,
Engineering and Food
Science



University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

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 the most powerful telescopes. Applied mathematics can provide additional tools for understanding physical phenomena. Both subjects underpin much of modern technology.

Why Study

Physics encompasses the study of the entire universe, from the largest galaxies to the nature of matter itself, while applied mathematics and mathematical modelling are key tools in science and engineering. Mathematical models are used to describe physical phenomena, and even many processes in society. Applied mathematics and physics together, can be used to study a wide range of topics, spanning economics to ecology and medicine to meteorology. An education in physics and applied mathematics develops problem-solving skills and provides a firm knowledge of basic science and the ability to apply and adapt that knowledge within a variety of workplaces.

Work Placement

There is no formal work placement in the applied 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 applied mathematics and physics provides problem-solving, analytical, computational, mathematical and IT skills, and can lead to a wide range of careers, in fields such as:

- computer science
- data science and analysis
- education
- energy
- the environment
- medicine
- space science
- sustainability
- IT management
- meteorology
- 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.

CK407 CK408

DEGREE OUTLET

COURSE PAGE ONLINE

www.ucc.ie/en/ck407/appliedmaths-physics

CONTACT INFORMATION

School of Mathematical Sciences

T: +353 (021) 420 5818 or

+353 (021) 490 2468

E: sms@ucc.ie or

physics@ucc.ie

www.ucc.ie/en/matsci or

www.physics.ucc.ie



COLM COUGHLAN

GRADUATE 2010

BSC (JOINT HONS), APPLIED MATHS
& PHYSICS.

“I found the degree excellent. The applied maths and physics modules gave me the mathematical and computational skills that I now need to conduct cutting-edge research. Those skills are highly sought after in industries such as computing, finance and engineering.”

#uccmakeyourmark



KEY FACTS

- **Successful mathematical modelling of the natural world requires mastering many skills, such as understanding physical phenomena, the ability to construct and solve model equations, and the capacity for model evaluation. In this regard, applied mathematics and physics are genuinely complementary disciplines**
- **An education in physics and applied mathematics provides problem-solving, analytical, computational, mathematical and IT training**

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; C/C++ Programming with Applications; Classical Mechanics; Computer Modelling and Numerical Techniques; Electrostatics and Magnetostatics; Experimental Physics; Fourier Methods; Mathematical Experimentation and Chaos; Mathematical Modelling; Multivariable Calculus; Quantum Physics; Thermodynamics and Statistical Physics

Year 3 Modules

CORE: Computational Techniques; Electromagnetism; Experimental Physics; Fluid Mechanics; Nonlinear Dynamics and Control; Optimisation and the Calculus of Variations; Optics; Partial Differential Equations with Applications; Quantum Mechanics; Statistical Thermodynamics; Vector and Tensor Methods

ELECTIVES: Nuclear and Particle Physics; Observational Astrophysics

Year 4 Modules

CORE: Applied Stochastic Differential Equations; Fluid Mechanics; Partial Differential Equations with Applications; Perturbation and Asymptotic Methods; Projects in Applied Mathematics and Physics

ELECTIVES: Condensed Matter Physics; Nuclear and Particle Physics; Observational Astrophysics; Advanced Mechanics; Advanced Quantum Mechanics; Advanced Electromagnetism; Atomic and Molecular Physics; Quantum Field Theory; Introduction to Plasma Physics; Lasers and Photonics; Computational Physics; Stars and the Interstellar Medium; Galactic and Extragalactic Astrophysics; Experimental Physics; Quantum Optics; Physics of Semiconductor Devices

