Main Events
20 October 2020
13 February 2021
Register at
www.myucd.ie
This booklet (Version 18 2021) is intended to assist prospective UCD students and the information is given in good faith. It is not, however, an official publication of the university and does not bind the university in any way. The information provided in this booklet is correct at the time of going to press but degree programmes are subject to continuing development and the university reserves the right to make changes at any time, before or after a student’s admission.
WHY UCD SCIENCE?

Flexible Curriculum
UCD offers the broadest and most diverse Science programme in Ireland, with degree courses in biological, environmental, biomedical, chemical, geological, mathematical, physical and computer sciences, all delivered by lecturers at the forefront of teaching and research. The curriculum can be adapted to your personal preferences through the unique flexibility of UCD Horizons.

World-Class Facilities
The UCD O’Brien Centre for Science is the largest capital investment in Science in the history of the Irish State with state-of-the-art labs, active learning environments, lecture theatres and classrooms.

Internship Opportunities
Professional Science Placements are available as Summer Internships or longer placements in industry for specific disciplines. All internships are secured on a competitive basis.

Dynamic Campus
UCD has over 150 clubs and societies as well as a cinema, student residences, excellent sports facilities, a gym and 50-metre swimming pool.
The following are some terms that you will come across when researching courses in UCD.

Academic Terms

**BSc**
Bachelor of Science.

**BAFS**
Bachelor of Actuarial and Financial Studies.

**Degree Subject**
Examples of degree subject areas are Microbiology, Physics with Astronomy & Space Science or Chemistry. In DN200 Science, your degree will eventually be in one of 27 different subjects.

**Entry Requirements**
The minimum standard in order to be eligible for consideration for admission.

**Common Entry**
A common entry programme has a single entry point for multiple potential degree options.

**Stage**
A student progresses through an undergraduate programme in stages. For full-time undergraduate students, a 60-credit stage will normally be completed in one academic year.

**Major**
A main area of study. A major will show what subject area your degree is in, such as Zoology.

**Trimester**
The academic year in UCD is divided into Trimesters (Autumn, Spring, Summer). Undergraduate degree teaching takes place in the Autumn Trimester (September to December) and the Spring Trimester (January to May). This is normally 15 weeks of student activity: 12 weeks of teaching and learning, one week of revision and two weeks of revision and assessment.

**Grade Point Average (GPA)**
Each grade has a number associated with it, called a grade point. When you have completed all the modules of a Stage, all your grade points are averaged to get a Grade Point Average, or GPA, for that Stage.

**Stream**
DN200 Science in UCD has 4 streams. The streams available in DN200 Science are Biological, Biomedical & Biomolecular Sciences (BBB), Chemistry & Chemical Sciences (CCS), Mathematical, Physical & Geological Sciences (MPG) and No Preference (NPF). Streams are used to categorise the 27 different subjects available as degree options in the common entry programme. By meeting the requirements of a particular stream in First Year, the subjects within that stream remain available to choose in Second Year.
Module
A self-contained unit of teaching and learning, which is usually studied over one Trimester. Undergraduate modules are normally 5 credits. A standard 5-credit UCD module represents 100-125 hours of student effort including time spent in class, studying and assessment. Modules in UCD are divided into core, option and elective modules.

Core Module
A compulsory module that you must do as part of your programme. You will usually be pre-registered to these modules.

Option Module
A module that is part of your programme but is not compulsory. You will be given a list of option modules to choose from when you register online.

Elective Module
As well as Core and Option modules, you can study Elective modules that either deepen your knowledge in your chosen programme or allow you to explore subjects outside of your area of study. For example, a student in Computer Science could take a Business or Language module.

Timetable
Each student will have their own personalised timetable based on their individual module selection. The timetable will be filled with a variety of class types such as lectures, practicals, tutorials etc. An average First Year timetable will have 30 hours of class time per week including lectures, practicals and tutorials. Sample timetables for First Year are available on the UCD Science website at www.ucd.ie/science/.

Practicals
Practical (or laboratory) classes involve carrying out selected experiments, examining scientific material and getting hands-on experience of practical subjects. They generally take place in the afternoons and are of two-to-three hours duration.

Tutorials
Tutorials generally take place in a classroom with a smaller group size than lectures. They provide an opportunity to explore and apply the concepts, skills and competencies in a manner that is not usually possible in larger classroom environments.

Credit
This is a standard way of representing the amount of student effort, the achievement of learning outcomes and educational activity associated with a module. UCD utilises the European Credit Transfer System (ECTS). The ECTS was developed to facilitate educational mobility for students and inter-institutional cooperation amongst higher education institutions within the European Union.

Student Life

Orientation
To help you settle into life at UCD, orientation events are organised for new students prior to the start of term. This includes important academic advice as well as extra-curricular activities to help you settle into life at UCD.

Societies
Student societies are a great way to explore your interests or develop new ones. UCD currently has over 70 active societies so there really is something for everyone, from fun events to guest speakers, plays to debates and comedy nights. An example is the UCD Science Society (SciSoc). SciSoc is one of UCD’s biggest societies and it is responsible for a range of events such as the annual “Cycle to Galway”, Science Day festival, the Science Ball and many more.

Peer Mentor
Peer Mentors are students in Stage 2 or 3 who very generously give of their time to help welcome and support Stage 1 students. Students are introduced to their Peer Mentor during Orientation.

Clubs
UCD sports clubs are at the centre of student sport. Clubs provide a range of opportunities to train, play and compete in sport, no matter your passion, ability or level.
Internships and Professional Experience at a Glance

These are some of the main areas that students have gained experience in through internships or professional experience and reflect the sectors graduates go on to work in.

Pharmaceuticals, Biotechnology, Medical Devices, Clinical Trials, Chemical Industry & Hospitals

### Degrees
- BSc Biochemistry & Molecular Biology
- BSc Cell & Molecular Biology
- BSc Genetics
- BSc Microbiology
- BSc Neuroscience
- BSc Pharmacology
- BSc Physiology
- BSc Chemistry
- BSc Chemistry with Biophysical Chemistry
- BSc Chemistry with Environmental & Sustainable Chemistry
- BSc Medicinal Chemistry & Chemical Biology
- All BSc Physics Degrees

### Examples of Internships/Professional Experience

The internships/professional experience listed are examples of past placements and are a guide only. Not all degrees map to all companies. Placements are secured on a competitive basis.

#### Degree Subjects
- Biochemistry & Molecular Biology
- Cell & Molecular Biology
- Genetics
- Microbiology
- Neuroscience
- Pharmacology
- Physiology
- Chemistry
- Chemistry with Biophysical Chemistry
- Chemistry with Environmental & Sustainable Chemistry
- Medicinal Chemistry & Chemical Biology

#### Companies and Research Institutes
- Sanofi
- Takeda
- Merck
- Public Analyst Lab
- Teva Pharmaceuticals
- APC Ltd
- Pfizer
- Donders Institute
- LEO Pharma
- International: Max Planck Institute for Brain Research, Frankfurt
- NSTDA-BIOTEC, Thailand
- Institute for Brain Research, Netherlands
- Karolinska Institutet, Sweden

Energy, Natural Resources, Climate, Conservation & Environment

### Degrees
- BSc Environmental Biology
- BSc Geology
- BSc Plant Biology
- BSc Zoology
- BSc Chemistry with Biophysical Chemistry
- BSc Chemistry with Environmental & Sustainable Chemistry
- BSc Physics
- BSc Sustainability: Environmental Science & Engineering

### Examples of Internships/Professional Experience

The internships/professional experience listed are examples of past placements and are a guide only. Not all degrees map to all companies. Placements are secured on a competitive basis.

#### Degree Subjects
- Environmental Biology
- Plant Biology
- Zoology
- Geology

#### Companies/Professional Experience
- Dublin Zoo
- Acclimatize
- EPA
- UCD Research team
- Teagasc

Geology students complete residential field training at the end of the summer vacation prior to their final year, followed by an independent field mapping research project during September-October, providing them with key technical and transferable skills needed in numerous geoscientific careers.

The information given is a guide only and does not bind the university in any way.
Computing, Risk, Finance & Analytics

**Degrees**
- BSc Computer Science
- BSc Applied & Computational Mathematics
- BAFS Actuarial & Financial Studies
- BSc Financial Mathematics
- BSc Mathematics
- BSc Statistics
- BSc Physics
- BSc Theoretical Physics
- BSc Physics with Astronomy & Space Science
- BSc Chemistry
- BSc Theoretical Physics
- BSc Physics with Astronomy & Space Science

**Examples of Internships/Professional Experience**
The internships/professional experience listed are examples of past placements and are a guide only. Not all degrees map to all companies. Placements are secured on a competitive basis.

<table>
<thead>
<tr>
<th>Degree Subjects</th>
<th>Companies</th>
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<tbody>
<tr>
<td>Applied and Computational Mathematics</td>
<td>Credit Suisse</td>
</tr>
<tr>
<td></td>
<td>Central Bank of Ireland</td>
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<tr>
<td></td>
<td>Irish Life</td>
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<tr>
<td></td>
<td>Deloitte</td>
</tr>
<tr>
<td>Financial Mathematics</td>
<td>Deutsche Bank</td>
</tr>
<tr>
<td>Mathematics</td>
<td>EY</td>
</tr>
<tr>
<td>Statistics</td>
<td>Zurich</td>
</tr>
<tr>
<td>Physics</td>
<td>Prudential, USA</td>
</tr>
<tr>
<td>Physics with Astronomy &amp; Space Science</td>
<td></td>
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<tr>
<td>Theoretical Physics</td>
<td></td>
</tr>
<tr>
<td>Computer Science</td>
<td>Salesforce</td>
</tr>
<tr>
<td>Computer Science with Data Science</td>
<td>Intel</td>
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<td></td>
<td>Amazon</td>
</tr>
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<td></td>
<td>Kerrygroup</td>
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<tr>
<td>Actuarial &amp; Financial Studies</td>
<td>Allianz</td>
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<td></td>
<td>Irish Life</td>
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<td></td>
<td>Susquehanna</td>
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<td>Aon</td>
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<td>Mercer</td>
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<td>Deloitte</td>
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<td>Zurich</td>
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</tbody>
</table>

Semiconductor, Nanotechnology, Meteorology & Space Industry

**Degrees**
- BSc Physics
- BSc Theoretical Physics
- BSc Physics with Astronomy & Space Science
- BSc Chemistry

**Examples of Internships/Professional Experience**
The internships/professional experience listed are examples of past placements and are a guide only. Research Internships are secured on a competitive basis.

<table>
<thead>
<tr>
<th>Degree Subjects</th>
<th>Research Internships</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics</td>
<td>Students have opportunities to complete Research Internships either within the UCD School of Physics or in external research institutes on topics across numerous research areas. These projects ensure students have a wide range of future career options within and outside the discipline.</td>
</tr>
<tr>
<td>Theoretical Physics</td>
<td></td>
</tr>
<tr>
<td>Physics with Astronomy &amp; Space Science</td>
<td></td>
</tr>
</tbody>
</table>

Further Education & Research

**Degree Subjects**
- Biology, Mathematics & Education
- Chemistry, Mathematics & Education
- Physics, Mathematics & Education
- Applied Mathematics, Mathematics & Education
- Computer Science, Mathematics & Education
- Students studying one of the five Science, Mathematics & Education subjects complete year-long placements at two different post-primary schools. These pathways lead to an MSc Mathematics and Science Education.

**Graduate Courses**
- MSc/MA – Graduate Taught or Graduate Research
- PhD – Academia/Research
- Graduate Veterinary Medicine
- Graduate Medicine
- Graduate Entry Pharmacy

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Joseph Mulligan
Financial Mathematics

I completed an internship in the summer between Third and Fourth Year at the global investment bank Credit Suisse in their Dublin office. I was able to earn credits for this as part of the professional placement module. After I graduated, I returned to work at that same firm full time.

George Harding
Actuarial & Financial Studies

I completed my 6-month work placement in a consultancy company in Dublin. Every day was quite varied, and I worked on projects in life and non-life insurance as well as in pensions. I spent a lot of time using Excel working on different actuarial models. It was great to see what life is like in an actuarial company.

Niamh McKeever
Chemistry

I completed an internship with APC Ltd, a consulting company that provides process development for pharmaceutical companies. My role involved assisting scientists and engineers by analysing samples from their processes and determining various properties of the materials such as purity, water content and thermal characteristics. My internship gave me an understanding of what the pharmaceutical industry and a lab-based job entails. After I graduated, I returned to work in APC Ltd and I am now a Process Development Scientist.

Maria Noone
Geology

Choosing the Field Geology module in First Year inspired me to pursue the subject of Geology by giving me the opportunity to apply real practical geological work outside of the UCD campus and giving me a feel for what it would be like to be a real life Geologist. I really enjoyed the field trips throughout the degree because there was a lot of engaging hands-on learning. My Field Mapping project in Fourth Year was on “The Solid Geology of the Ord Window, Isle of Skye”. I am currently working as an Engineering Geologist with Arup.

Clíodhna Connolly
Computer Science

I completed a Summer Internship with Deloitte Ireland in their Technology Consulting department. It highlighted how to apply the skills I had already learnt from my degree but also the skills I should focus more on during my final year. The problem-solving and software development skills I had learnt really stood by me well especially when I was adapting my existing knowledge to working with an entirely new language. After graduating I took up a position with Deloitte Ireland and since then I’ve worked on different delivery teams in a full stack development role.

Lána Salmon
Physics with Astronomy & Space Science

I completed the 8-week UCD Physics Summer Internship Programme. My project focused on Gamma-Ray Bursts – the most powerful electromagnetic explosions in the Universe that occur when a star collapses. Using data from the Swift and XMM Newton satellites, I used X-Ray data to try and understand these bursts. This experience allowed me to begin to think about my future career. I’m currently a PhD student in the UCD Space Science Group specialising in Gamma-Ray Bursts and Gravitational Waves. I am also part of the EIRSAT-1 team, which is currently designing, building, and preparing to launch Ireland’s first satellite.

Sadhbh McCarrick
Environmental Biology

As part of the Environmental Biology Degree, I had the opportunity to travel to the Costa Rican Rainforest for a two-week field trip with my classmates and lecturers. This field study served as a percentage of academic credit for a Fourth Year module. The trip to the rainforest truly allowed us to put the theory we had learned at UCD into practice. Not only did we have the chance to advance our skills in field sampling, monitoring and data handling, but we also got to live in one of the most biodiverse ecosystems in the world with pumas, monkeys, parrots, giant butterflies and snakes.

Jodie Bermingham
Neuroscience

I completed a 6-months internship at the Max Plank Institute for Brain Research (MPIBR) in Frankfurt whilst completing my Final Year Project. It was an incredible experience. My project was based on the characterisation and morphology of NDNF-interneurons in layer 1 of the neocortex, comparing them with somatostatin interneurons, and lastly, quantifying the NDNF-interneurons throughout the entire brain. This project entailed a mix of histology, immunology, microscopy, computation and data analysis. These are all skills that will be helpful in my future career. I am now working as a Process Technician at Pfizer.
The Business of Science and IT in Ireland

Ireland is home to many of the world’s top companies and businesses.

Over 1000 Overseas companies have chosen Ireland as their strategic location in Europe.

5 of the top 10
Companies on Forbes’ list of The World’s Most Innovative Companies have Irish operations according to IDA Ireland

More than 250
Global financial institutions have established operations in Ireland, located in Dublin’s International Financial Services Centre

Top Global financial institutions

Bank of America, HSBC, Citi, AIG, ZURICH, CITCO, Allianz

ALL 10 OF THE TOP 10 GLOBAL PHARMACEUTICAL COMPANIES ARE LOCATED IN IRELAND.

Ireland is home to operations by some of the world’s leading pharmaceutical, biotechnology and medical devices companies making some of the world’s blockbuster medicines.

5 OF THE TOP 10
Worldwide security software companies are located in Ireland

The Top Ten
“Born on the Internet” companies are based in Ireland
The DN230 Actuarial & Financial Studies course will prepare you for a professional career in the actuarial or financial professions.

Exams of the Institute and Faculty of Actuaries, UK

The Institute and Faculty of Actuaries, which accredits this course, has made changes to the syllabus. The Actuarial and Financial Studies degree at UCD covers the Core Principles subjects (CS1, CS2, CM1, CM2, CB1, CB2) and Core Practicals subject CP1 of the examinations of the Institute and Faculty of Actuaries, UK.

Professional work placement in Third Year

Students have completed their work placement in a variety of companies and locations. The companies include Allianz, Aon, Deloitte, Irish Life, Mercer, Susquehanna (SIG) and Zurich. The locations include Dublin, London, Boston and New York. There is a wide choice of placements that last for 6-8 months, and these are secured through a competitive process.

Frequently Asked Questions

Q: How long does it take to become a qualified actuary?

A: Students must successfully complete professional exams and complete a work-based skills framework with their employer which includes a Learning Log. The exams are held twice a year. It typically takes 3 to 6 years to complete the exams, depending on the extent to which you can claim exemptions on the basis of relevant third-level qualifications.

Q: How can I find out more information?

A: The Society of Actuaries in Ireland is the professional body representing the actuarial profession in Ireland. The Society is dedicated to serving the public by fostering the highest standards of professionalism and competence in actuarial practice.

Further information on becoming an actuary is available on the Society of Actuaries website at web.actuaries.ie
Sample pathway for a degree in Actuarial & Financial Studies *

**YEAR 1**

ENGAGE WITH THE PRINCIPLES

ACTUARIAL & FINANCIAL STUDIES

Modules include:

- Linear Algebra
- Advanced Calculus
- Statistical Modelling
- Numbers and Functions
- Introduction to Actuarial & Financial Studies
- Fundamentals of Actuarial Business Theory
- Introduction to Programming
- Financial Accounting
- Differential & Difference Equations
- Principles of Finance
- One Elective module

**YEAR 2**

BROADEN YOUR KNOWLEDGE

ACTUARIAL & FINANCIAL STUDIES

Modules include:

- Economic History
- Professional & Classical Ethics
- Probability Theory
- Inferential Statistics
- Advanced Corporate Finance
- Bayesian Analysis
- Predictive Analysis
- Fundamentals of Actuarial Mathematics
- Two Elective modules

**YEAR 3**

REFINE YOUR KNOWLEDGE

ACTUARIAL & FINANCIAL STUDIES – Modules include:

- Investing and Trading
- Stochastic & Survival Models
- Time Series Analysis
- Information Management for Actuaries
- Workplace Skills
- BAFS Professional Work Placement
  (at least 6 months)
- Two Elective modules

**YEAR 4**

REFINE YOUR KNOWLEDGE

ACTUARIAL & FINANCIAL STUDIES – Modules include:

- Actuarial Statistics
- Core Actuarial Principles
- Financial and Actuarial Mathematics
- Actuarial Mathematics
- One Optional Module

BAFS (Honours) Actuarial and Financial Studies

Industry

Actuarial Trainee in the following areas:
- Life Insurance
- Pensions
- Investment
- Health Insurance
- General Insurance
- Banking or Finance
- Trading

PhD

- Students can pursue a PhD
  in Ireland or abroad in areas as
diverse as: Mathematics,
Statistics and Actuarial Studies

Conversion Courses

- MSc Data &
  Computational Science
- MSc Mathematical Science
- MSc Mathematics
- MSc Statistics

*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. Modules are subject to change each year.

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Computer Science
DN201

Degree Options:
Computer Science
Computer Science with Data Science

DN201 Computer Science is designed for students who wish to specialise in computer science or data science, and want to pursue careers in software engineering, data analytics, the tech industry or research and development.

Frequently Asked Questions

Q: Do I need to have prior experience of programming?
A: No. DN201 Computer Science is suitable for students with or without previous programming experience. There is no assumption that students have prior programming experience and all students will take introductory programming modules in First Year.

Q: Where can I practice programming to see if I enjoy it?
A: There are many excellent resources available online to try out programming and Computer Science. Beginners can use resources such as MIT’s Scratch or Greenfoot. Students looking to advance their knowledge can also use resources such as Coursera and edX to sample free online courses in Computer Science.
Many graduates pursue MSc and PhD studies as well as postdoctoral research in Ireland and abroad in diverse areas such as:

- Artificial Intelligence
- Software and Systems Engineering
- Networks and Distributed Systems

Develop skills in object-oriented programming languages such as Java and Ruby, the latest Internet technologies, software engineering, mobile application development, database technology and operating systems

Opportunities for industry internships

I chose to study Computer Science at UCD because of my avid interest in technology and the great opportunities it afforded me going forward. I have always been really passionate about technology, and always intended on pursuing a career within the field. Upon graduating I intend on pursuing a career in the technology consultancy field, exercising technical expertise within the business sector.

Ryan Kane, Graduate
Computer Science with Data Science

CAO code: DN201

Learn key skills to demonstrate basic knowledge and understanding of the fundamentals of data science.

Develop the technical depth and the practical experience that you will need to stand out in an increasingly demanding marketplace.

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"I loved Mathematics in school and studying Computer Science has given me an outlet to apply these problem-solving skills. I had an opportunity to gain a better understanding of my strengths and interests which led me into opting for Computer Science with Data Science. A degree in data science provides endless career opportunities and studying in UCD makes it all the more enjoyable. Electives have given me the ability to extend my love for sport to an academic level, completing modules in exercise and performance. As a GAA scholar, UCD has given me the best opportunity to perform and succeed with access to world-class facilities and services.

Chloé Foxe, Student"

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Sample pathway for a degree in Computer Science with Data Science

**YEAR 1**

**COMPUTER SCIENCE**

Modules include:
- Algorithmic Problem-Solving
- Computer Programming
- Introduction to Computer Architecture

**MATHMATICS**

Modules include:
- Formal Foundations
- Computer Science in Practice
- Software Engineering Project I
- Introduction to Functional Programming

**YEAR 2**

**SOFTWARE ENGINEERING**

- Linear Algebra II
- Databases and Information Systems I
- Digital Systems
- Introduction to Operating Systems

**YEAR 3**

**COMPUTER SCIENCE WITH DATA SCIENCE**

- Data Science in Python
- Networks and Internet Systems
- Probability Theory

**YEAR 4**

**COMPUTER SCIENCE WITH DATA SCIENCE**

- Data Science Project
- Machine Learning
- Deep Learning
- Data Mining
- Cloud Computing
- Connectionist Computing

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BSc (Honours) Computer Science with Data Science

**MSc (Taught)**

- MSc Computer Science (Negotiated Learning)
- MSc Business Analytics
- MSc Cognitive Science

**Research**

- Many graduates pursue MSc and PhD studies as well as postdoctoral research in Ireland and abroad in diverse areas such as:
  - Artificial Intelligence
  - Software and Systems Engineering
  - Networks and Distributed Systems

**Industry**

- Banking and Financial Services
- Consultancy (e.g. Accenture, Deloitte)
- Internet companies such as Google, PayPal and Facebook
- Established ICT companies such as IBM, Microsoft and Intel
- ICT Startups

**Conversion Courses**

- UCD Michael Smurfit Graduate Business School postgraduate degrees, e.g., Master of Management

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Q: Will there be an opportunity to complete an internship or study abroad?

A: Students will have the opportunity to study abroad as part of international internships with relevant industries and employers. Placements are secured through a competitive process. There will also be opportunities to apply for the Erasmus Study Abroad Programmes and there will be opportunities for overseas field trips.

Q: What could my career involve after graduating?

A: Graduates will enjoy careers as consultants, managers and advisers in large organisations and private businesses. An interdisciplinary education in sustainability theory, policy and practise will equip you to work in areas such as renewables, clean technology management and energy efficiency, or advise industries on social and environmental strategies. Many opportunities also exist in organisations such as the UN, the European Environment Agency and the European Commission, government departments and state agencies.
Sample pathway for a degree in Sustainability *

**ENGLISH**

**Year 1**

**Sustainability**
- Introduction to Sustainability
- Business in Society
- Sustainability Challenges

**Environmental Science & Engineering**
- Statistical Modelling
- Chemistry for Biology
- Land Use and the Environment
- Energy Climate Change and Policy
- Principles of Environmental Biology and Ecology

**Social Sciences**
- Sociology of Human Rights
- Mapping a Sustainable World
- Global Development
- Introduction to Economics

**Year 2**

**Choose Your Subjects**

**Environmental Science and Engineering Pathway**
- Statistical Modelling
- Chemistry for Biology
- Land Use and the Environment
- Energy Climate Change and Policy
- Principles of Environmental Biology and Ecology

**Social Sciences, Policy and Law**
- Achieving the Sustainable Development Goals
- Introduction to GIS for Sustainability

**Year 3**

**Refine Your Knowledge**

**Environmental Science and Engineering Pathway**
- Forest Climate and Carbon
- Geoscience for Sustainability
- Professional Work placement
- Field trip

**Social Sciences, Policy and Law**
- Environmental Law and Policy

**Year 4**

**Focus on Your Chosen Subject**

**Environmental Science and Engineering Pathway**
- Research Project
- Agri-Environmental Issues and Policy
- Transport Operations and Planning
- Environmental Impact Assessment

**Social Sciences, Policy and Law**
- The Urban Environment
- Climate Politics and Policy
- Behavioural Economics for Environmental Policy

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**BSc (Honours) Sustainability: Environmental Science and Engineering**

**MSc (Taught)**
- MSc Applied Environmental Science
- MSc World Heritage Management
- MSc Plant Biology
- MSc Climate Change: Science and Impacts
- MSc Environmental Sustainability
- MSc Environmental Technology
- MSc(Agr) Rural Environmental Conservation and Management
- MSc(Agr) Sustainable Agriculture and Rural Development
- MSc Sustainable Energy and Green Technology
- MSc Wildlife Conservation and Management
- MEngSc Water, Waste and Environmental Engineering

**PhD**
- Students can pursue a PhD in universities in Ireland or abroad in areas such as ecology, microbiology, fisheries, conservation biology, environmental management and global change

**Industry**
- Careers as consultants, managers and advisers in large organisations and private businesses
- International organisations such as the UN, the European Environment Agency and the European Commission, Government Departments, State agencies and Conservation Organisations.
- Diverse areas such as renewables, clean technology management and energy efficiency
- Advise industries on social and environmental strategies.

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**www.ucd.ie/myucd/sustainability**

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twitter.com/ucdscience

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# BSc Sustainability: Social Sciences, Policy and Law

**CAO Code:** DN240

## Sample pathway for a degree in Sustainability

### FIRST YEAR – COMMON TO BOTH PATHWAYS

<table>
<thead>
<tr>
<th>SUSTAINABILITY</th>
<th>Modules include:</th>
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<tbody>
<tr>
<td>Introduction to Sustainability</td>
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<tr>
<td>Business in Society</td>
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<tr>
<td>Sustainability Challenges</td>
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<th>ENVIRONMENTAL SCIENCE &amp; ENGINEERING</th>
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<tr>
<td>Scientific Enquiry</td>
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<td>Statistical Modelling</td>
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<td>Basis of Organic and Biological Chemistry</td>
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<td>Calculus</td>
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<th>Modules include:</th>
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<td>Sociology of Human Rights</td>
<td></td>
</tr>
<tr>
<td>Mapping a Sustainable World</td>
<td></td>
</tr>
<tr>
<td>Global Development</td>
<td></td>
</tr>
<tr>
<td>Introduction to Economics</td>
<td></td>
</tr>
</tbody>
</table>

### SOCIAL SCIENCES, POLICY AND LAW PATHWAY

#### YEAR 2

<table>
<thead>
<tr>
<th>Modules include:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achieving the Sustainable Development Goals</td>
</tr>
<tr>
<td>Introduction to GIS for Sustainability</td>
</tr>
<tr>
<td>Weather, Climate and Climate Change</td>
</tr>
<tr>
<td>Environmental Management</td>
</tr>
<tr>
<td>Peace, Conflict and Justice</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cities in a Global World</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sociology of Health and Inequality</td>
</tr>
<tr>
<td>Law and Policy</td>
</tr>
<tr>
<td>Research Tools for Sustainability</td>
</tr>
<tr>
<td>Innovation, Communication and Careers in Sustainability</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Modules include:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Use and the Environment</td>
</tr>
<tr>
<td>Earth, Environment and Society</td>
</tr>
</tbody>
</table>

### SOCIAL SCIENCES, POLICY AND LAW PATHWAY

#### YEAR 3

<table>
<thead>
<tr>
<th>Modules include:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment and Sustainability</td>
</tr>
<tr>
<td>World Heritage and Sustainable Development</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Modules include:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Democracy and Civil Society</td>
</tr>
<tr>
<td>Climate Politics and Policy</td>
</tr>
<tr>
<td>Environmental Assessment</td>
</tr>
<tr>
<td>Rivers, Estuaries and Coasts</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Modules include:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Inequalities</td>
</tr>
<tr>
<td>Professional Work Placement</td>
</tr>
<tr>
<td>Field Trip</td>
</tr>
</tbody>
</table>

### SOCIAL SCIENCES, POLICY AND LAW PATHWAY

#### YEAR 4

<table>
<thead>
<tr>
<th>Modules include:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Project</td>
</tr>
<tr>
<td>Urban Environments</td>
</tr>
<tr>
<td>Climate Politics and Policy</td>
</tr>
<tr>
<td>Planning Law</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Modules include:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development Geographies</td>
</tr>
<tr>
<td>Climate Model and Scenario Applications</td>
</tr>
<tr>
<td>Overseas Field Trip</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Modules include:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interdisciplinary Project on Sustainability</td>
</tr>
<tr>
<td>Environmental Economics</td>
</tr>
<tr>
<td>Social Policy, Social Justice and the Environment</td>
</tr>
</tbody>
</table>

### BSc (Honours) Sustainability: Social Sciences and Law

<table>
<thead>
<tr>
<th>MSc (Taught)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSc Applied Environmental Science</td>
</tr>
<tr>
<td>MSc World Heritage Management</td>
</tr>
<tr>
<td>MSc Plant Biology</td>
</tr>
<tr>
<td>MSc Environmental Policy</td>
</tr>
<tr>
<td>MSc Global Change: Ecosystem Science and Policy</td>
</tr>
<tr>
<td>MSc Planning, Development and Urban Design</td>
</tr>
<tr>
<td>MA Politics and International Relations</td>
</tr>
<tr>
<td>MSc Risk, Resilience &amp; Sustainability</td>
</tr>
<tr>
<td>MSc Critical Geographies: Power &amp; Inequalities</td>
</tr>
<tr>
<td>MSc Applied Geospatial Analysis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PhD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students can pursue a PhD in universities in Ireland or abroad in areas such as geography, social policy, international development, planning and environmental policy, environmental law</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Careers as consultants, managers and advisers in large organisations and private businesses.</td>
</tr>
<tr>
<td>International organisations such as the UN, the European Environment Agency and the European Commission, Government Departments, State agencies and Conservation Organisations.</td>
</tr>
<tr>
<td>Diverse areas such as renewables, clean technology management and energy efficiency</td>
</tr>
<tr>
<td>Advise industries on social and environmental strategies.</td>
</tr>
</tbody>
</table>

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*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. Modules are subject to change each year.*

---

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**www.ucd.ie/myucd/sustainability**  
V1 2021
Science

DN200

27 Degrees available from the following streams:
Biological, Biomedical & Biomolecular Sciences (BBB)
Chemistry & Chemical Sciences (CCS)
Mathematical, Physical & Geological Sciences (MPG)

The First Year of the DN200 Science programme is designed to enable you to sample a number of subjects in your chosen area(s). You can focus on your preferred stream immediately or explore a range of subjects. All DN200 Science students are guaranteed a degree from within a stream of their choice. All students may change their choice of stream during First Year.

COMMON ENTRY:
1 CAO Code, 27 different degrees

Did You Know?
Students have the option to become Science and Maths teachers at post-primary level through DN200 Science via one of our Teaching Council-approved pathways.

TIME

Time to change your mind in First Year

No Preference
Students who want to sample a number of degree options from different streams can choose DN200 No Preference.

4 Year Honours BSc course

Frequently Asked Questions

Q: Is DN200 Science a General Science degree?
A: No. The DN200 Science course is a Level 8 BSc Honours degree of four years. Students enter by a single route and graduate with a BSc Honours degree in one of 27 different subjects, for example, BSc Theoretical Physics, BSc Mathematics, BSc Chemistry.

Q: Does common entry mean all students take a common First Year?
A: Common entry does not mean that all students take a common First Year. The advantage of a common entry course is that you can choose to specialise from First Year or you can leave your options open. The number of compulsory modules in First Year for each stream has been kept low to allow you the option to try out other subjects that you may not be familiar with or to deepen your interest in the areas that you wish to pursue to degree level.
First Year (Stage 1)

- We recommend that all incoming First Year Science students read the Science Student Handbook and the First Year Guide, which are available on the Science website at www.ucd.ie/science/study/currentundergraduatesciencestudents. These documents include information on the module combinations available in First Year.

- Each stream has a set number of compulsory modules you must take in First Year in order to pursue a subject or group of subjects in Second Year and to degree level.

- The number of compulsory modules has been kept low to allow you to try out other subjects that you may not be familiar with or to deepen your interest in the areas that you wish to pursue to degree level.

- The flexible curriculum allows you to focus on an area from First Year or keep your options open, depending on your preference. There is plenty of advice available during the application process and when you arrive at UCD on the module combinations to study in First Year.

Second Year (Stage 2)

- Depending on the modules you studied in First Year, you choose a minimum of 2 subjects in Second Year. Students who choose modules for the Biological, Biomedical & Biomolecular stream in First Year could combine Zoology with Biochemistry & Molecular Biology or Chemistry and Genetics, for example.

- Each subject pathway on pages 20 to 46 in this brochure illustrates common subject combinations for Second Year in DN200 Science. These are illustrative of the choices a student could make but other combinations are possible.

Third and Fourth Year (Stages 3 and 4)

- In Third and Fourth Year, you study your degree subject in depth. Sample modules from both these years are listed on each degree subject pathway page. Many subjects will include a research project which you complete in your final year. Opportunities to apply for internships or professional placements are usually at the end of Third Year.
Biochemistry & Molecular Biology

CAO code: DN200 Option: Biological, Biomedical and Biomolecular Science (BBB)

Biochemistry is at the core of all the biological sciences and provides an excellent foundation for a career in the field of biomolecular and biomedical science. I delved into key components of biochemistry such as metabolism, molecular basis of diseases, proteins and enzymes whilst also being able to maintain my love of Spanish and music through electives. Since graduating I have obtained a role as a quality control analyst in a global pharmaceutical company where I have been able to apply the knowledge I acquired during my degree to conduct a variety of analyses and tests on the finished product produced at the site.

Alison Howett, Graduate

www.ucd.ie/myucd/bioandmolbio
Cell & Molecular Biology

CAO code: DN200 Option: Biological, Biomedical and Biomolecular Science (BBB)

Sample pathway for a degree in Cell & Molecular Biology

**YEAR 1**

**ENGAGE WITH THE PRINCIPLES**

**BIOLOGY**
Modules include:
- Biology in Action
- Life on Earth
- Cell Biology & Genetics
- Biomedical Sciences

**CHEMISTRY**
Modules include:
- The Basis of Organic and Biological Chemistry

**MATHEMATICS**
Modules include:
- Mathematics for the Biological & Chemical Sciences

**YEAR 2**

**CHOOSE YOUR SUBJECTS**

The subject combinations listed below are illustrative of what a student who graduates in Cell & Molecular Biology could choose in Year 2. Further subject combinations are possible depending on the choices in Year 1. Further information is available on page 19.

**CELL & MOLECULAR BIOLOGY**
Modules include:
- Scientific Communication
- Principles of Cell Biology
- Principles of Genetics
- Chemistry for Biologists
- Biomedical Sciences

**MICROBIOLOGY**
Modules include:
- Metabolic and Immune Systems
- Microbiology in Medicine, Biotechnology and the Environment

**GENETICS**
Modules include:
- Principles of Genetics
- Molecular Genetics

**YEAR 3**

**FOCUS ON YOUR CHOSEN SUBJECT**

**CELL & MOLECULAR BIOLOGY**
Modules include:
- Regulation of Gene Expression
- Developmental Biology
- Plant Cell Growth and Signalling
- Molecular Basis of Disease
- Working with Biological Data

**YEAR 4**

**REFINE YOUR KNOWLEDGE**

**CELL & MOLECULAR BIOLOGY**
Modules include:
- Advanced Cell Biology
- Hot Topics in Cell Biology
- Cell Biology Research Project
- Membrane Trafficking
- Cell Signalling
- The RNA World
- Human Genetics & Disease
- The Biological Imaging
- Plant Cell Growth and Signalling
- Molecular Basis of Disease
- Working with Biological Data
- Cell Biology of Cancer
- Cell Biology of Ageing
- Two Elective modules

**BSc (Honours) Cell & Molecular Biology**

**MSc (Taught)**
- MSc Biological & Biomolecular Science (NL)
- MSc Molecular Medicine
- MSc Biotechnology
- MSc Biotechnology & Business
- MSc Plant Biology & Biotechnology
- MSc Biotechnology
- MSc Biotechnology

**PhD**
- Students can pursue a PhD in universities in Ireland or abroad in areas as diverse as cell & molecular biology, biochemistry, genetics, systems biology and biomolecular science

**Industry**
- Pharmaceutical and Biotechnology companies
- Semi-State bodies such as BIM, Teagasc
- Hospital laboratories
- Genetic Counselling
- Forensic Science

**Conversion Courses**
- Professional Master of Education (PME)
- Graduate Veterinary Medicine
- Graduate Medicine
- Master of Management

*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. Modules are subject to change each year.

**Learn about the molecular basis of disease, the factors that influence normal cells becoming cancer cells, and the methods applied across the biomedical sciences**

**Develop practical skills in microscopy, cellular assays and diagnostic techniques used in industry, hospitals and research labs**

**Complete a research project in diverse areas such as cancer biology, drug delivery, genetic analysis and molecular imaging**

The capstone of the degree is a five-month research project where we gain hands-on experience of research. I developed a deep interest in the study of rare human diseases, and I am now a postdoctoral research scientist in the UCD Centre for Arthritis Research. My work focuses on identifying the genetic and biological cause of a rare paediatric auto-inflammatory condition that has been identified in a number of Irish families.

Dr Niamh Morgan, Graduate

www.ucd.ie/myucd/cellandmolecularbiology

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Environmental Biology
CAO code: DN200 Option: Biological, Biomedical and Biomolecular Science (BBB)

- Learn how environmental biology is central to our ability to understand and manage the world’s environmental problems.
- Develop practical skills in field-based sampling of plants and animals in their natural environments in Ireland, Spain and Costa Rica.

I had the opportunity to travel to the Costa Rican Rainforest for a two-week field trip with my classmates and lecturers. The trip to the rainforest allowed us to put the theory we had learned into practice. We had the chance to advance our skills in field sampling, monitoring and data handling and we also got to live in one of the most biodiverse ecosystems in the world with pumas, monkeys, parrots, giant butterflies and snakes.

Sadhbh McCarrick, Student

Sample pathway for a degree in Environmental Biology *

**YEAR 1**

**BIOLOGY**
Modules include:
- Biology in Action
- Life on Earth
- Cell Biology & Genetics
- Biomedical Sciences

**CHEMISTRY**
Modules include:
- The Basis of Organic and Biological Chemistry

**MATHEMATICS**
Modules include:
- Mathematics for the Biological & Chemical Sciences

**YEAR 2**

**ENVIRONMENTAL BIOLOGY**
Modules include:
- Principles of Environmental Biology and Ecology
- Scientific Communication
- Evolutionary Biology
- Microbial Interactions
- Global Environmental Change
- Forests, Climate and Carbon
- Applied Plant Biology

**ZOOLOGY**
Modules include:
- Principles of Zoology
- Animal Behaviour
- Molecular Genetics and Biotechnology

**PLANT BIOLOGY**
Modules include:
- Principles of Plant Biology and Biotechnology

**YEAR 3**

**FOCUS ON YOUR CHOSEN SUBJECT**

**ENVIRONMENTAL BIOLOGY** – Modules include:
- Systems Ecology
- Biogeography and Field Biology
- Diversity of Vertebrates
- Diversity of Plant Form & Function
- Ecology & Environmental Microbiology
- Wildlife and Fisheries Management

**YEAR 4**

**REFINE YOUR KNOWLEDGE**

**ENVIRONMENTAL BIOLOGY** – Modules include:
- Environmental Biology Research Project
- Marine Community Ecology
- Bioassessment of Freshwaters
- Biological Invasions
- Insect-Plant Interactions
- Ecological Modelling and QGIS
- Biodiversity
- Foodborne Pathogens
- Tropical Field Ecology
- Environmental Impact Assessment
- Peatlands and Environmental Change

**BSc (Honours) Environmental Biology**

**MSc (Taught)**
- MSc Applied Environmental Science
- MSc World Heritage Management
- MSc Plant Biology & Biotechnology

**PhD**
- Students can pursue a PhD in universities in Ireland or abroad in areas such as ecology, microbiology, fisheries, conservation biology, environmental management and global change

**Industry**
- National Parks and Wildlife Services
- Environmental Management with State agencies, companies or consultancies
- Semi-State bodies such as the EPA and BIM and NGOs such as An Taisce
- Conservation Organisations
- Agriculture and Aquaculture

**Conversion Courses**
- Professional Master of Education (PME)
- Graduate Veterinary Medicine
- Graduate Medicine
- Master of Management

*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. Modules are subject to change each year.

www.ucd.ie/myucd/environmentalbiology

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Image by Professor Tasman Crowe

Ireland, Spain and Costa Rica

Diversity of Vertebrates

Diversity of Plant Form & Function

Environmental Impact Assessment

Peatlands and Environmental Change

Biological Invasions

Ecosystems in the world with pumas, monkeys, parrots, giant butterflies and snakes.

Students can pursue a PhD in universities in Ireland or abroad in areas such as ecology, microbiology, fisheries, conservation biology, environmental management and global change.

www.ucd.ie/myucd/environmentalbiology

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Image by Professor Tasman Crowe

Ireland, Spain and Costa Rica
These are transgenic zebrafish larvae (5 days old, 3mm long) that express green fluorescent protein in all their blood vessels. The zebrafish is our animal model to study retinal development and disease.

Explore molecular genetics and molecular biology, which are core components of modern biology and medicine, and form the basis of biotechnology.

I chose Genetics as I find it incredible how our genes are influenced by the way we live and how this interaction can play such a key role in our overall health. Genetics in UCD is excellent at providing the most up-to-date information in the field, from recent discoveries to the latest cutting-edge technologies. One of my personal highlights was the final year research project which gave me a unique opportunity to gain invaluable lab experience. As Genetics is a cornerstone of all scientific disciplines, a major advantage of the degree is the flexibility it offers in terms of career prospects. I am currently undertaking a PhD at the University of Edinburgh and every day I find myself putting the knowledge and experience I gained at UCD to the best possible use.

Sarah Kent, Graduate
Microbiology

CAO code: DN200  Option: Biological, Biomedical and Biomolecular Science (BBB)

Learn about microbes that cause diseases, clean up environmental spills and produce antibiotics.

Understand how we engineer fungi and bacteria to produce a vast array of compounds, ranging from antibiotics and hormones to washing powder.

I found DN200 Science fantastic because I could try out all the subjects I liked before choosing my major. I found that I adored Microbiology. I am fascinated by how microorganisms can be manipulated to make such a wide assortment of valuable products – from antibiotics and crucial hormones like insulin to bioplastics and biofuels. I love seeing how what I’ve learned all these years is applied in real life in industry. I am now working as a Quality Control Microbiologist in Takeda Biologics Dunboyne. Without the leadership, teamwork and communication skills I learned while studying at UCD, I would not be here today.

Caoimhe Cullen, Graduate

Microbiology student in a practical in the UCD O’Brien Centre for Science.

Sample pathway for a degree in Microbiology *

YEAR 1

ENGAGE WITH THE PRINCIPLES

BIOLOGY – Modules include:
- Biology in Action
- Life on Earth
- Cell Biology & Genetics
- Biomedical Sciences

CHEMISTRY – Modules include:
- The Basis of Organic and Biological Chemistry

MATHEMATICS – Modules include:
- Mathematics for the Biological & Chemical Sciences

YEAR 2

CHOOSE YOUR SUBJECTS

The subject combinations listed below are illustrative of what a student who graduates in Microbiology could choose in Year 2. Further subject combinations are possible depending on the choices in Year 1. Further information is available on page 19.

MICROBIOLOGY – Modules include:
- Chemistry for Biologists
- Molecular Genetics and Biotechnology
- Biomolecular Laboratory Skills
- Metabolic and Immune Systems
- Microbiology in Medicine, Biotechnology and the Environment

CELL & MOLECULAR BIOLOGY – Modules include:
- Principles of Cell and Molecular Biology

GENETICS – Modules include:
- Principles of Genetics

YEAR 3

FOCUS ON YOUR CHOSEN SUBJECT

MICROBIOLOGY – Modules include:
- Regulation of Gene Expression
- Microbial Cell Factory
- Applied Microbiology
- Microbial Diversity & Growth

YEAR 4

REFINE YOUR KNOWLEDGE

MICROBIOLOGY – Modules include:
- Microbiology Research Project/Internship
- Ecological & Environmental Microbiology

MSc (Taught)

- MSc Biotechnology
- MSc Biotechnology & Business
- MSc Environmental Management
- MSc Regulatory Affairs & Toxicology
- MSc Plant Biology & Biotechnology
- MSc Biotherapeutics

PhD

- Students can pursue a PhD in universities in Ireland or abroad in areas as diverse as biotechnology, environmental biology, medical and veterinary sciences

Industry

- Pharmaceutical Companies
- Food and food-related companies
- (Veterinary) Hospitals and related laboratories
- Government agencies including the EPA and county councils

Conversion Courses

- Professional Master of Education (PME)
- Graduate Veterinary Medicine
- Graduate Medicine
- Medical Scientist

i

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www.ucd.ie/myucd/microbiology

*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. Modules are subject to change each year.

V1 2021
# Neuroscience

CAO code: DN200  Option: Biological, Biomedical and Biomolecular Science (BBB)

## Sample pathway for a degree in Neuroscience *

<table>
<thead>
<tr>
<th>YEAR 1</th>
<th>ENgage with the principles</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Biology</strong></td>
<td>Modules include:</td>
</tr>
<tr>
<td>- Biology in Action</td>
<td></td>
</tr>
<tr>
<td>- Life on Earth</td>
<td></td>
</tr>
<tr>
<td>- Cell Biology &amp; Genetics</td>
<td></td>
</tr>
<tr>
<td>- Biomedical Sciences</td>
<td></td>
</tr>
<tr>
<td><strong>Chemistry</strong></td>
<td>Modules include:</td>
</tr>
<tr>
<td>- The Basis of Organic and Biological Chemistry</td>
<td></td>
</tr>
<tr>
<td><strong>Mathematics</strong></td>
<td>Modules include:</td>
</tr>
<tr>
<td>- Mathematics for the Biological &amp; Chemical Sciences</td>
<td></td>
</tr>
<tr>
<td>- One Elective Module</td>
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</tr>
<tr>
<td>- One Small-Group Project</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>YEAR 2</th>
<th>Choose your subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Neuroscience</strong></td>
<td>Modules include:</td>
</tr>
<tr>
<td>- Chemistry for Biologists</td>
<td></td>
</tr>
<tr>
<td>- Molecular Genetics and Biotechnology</td>
<td></td>
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<tr>
<td>- Biomolecular Laboratory Skills</td>
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<tr>
<td>- Metabolic and Immune Systems</td>
<td></td>
</tr>
<tr>
<td>- Principles of Neuroscience</td>
<td></td>
</tr>
<tr>
<td><strong>Biochemistry &amp; Molecular Biology</strong></td>
<td>Modules include:</td>
</tr>
<tr>
<td>- Principles of Biochemistry</td>
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<tr>
<td><strong>Pharmacology</strong></td>
<td>Modules include:</td>
</tr>
<tr>
<td>- Biomedical Science of Drugs</td>
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<tr>
<td><strong>Genetics</strong></td>
<td>Modules include:</td>
</tr>
<tr>
<td>- Principles of Genetics</td>
<td></td>
</tr>
<tr>
<td>- Two Elective modules</td>
<td></td>
</tr>
</tbody>
</table>

**YEAR 3**

| **FOCUS ON YOUR CHOSEN SUBJECT** | **NEuroscience**  | Modules include: |
|----------------------------------|-------------------|
| - Cell Signalling |
| - Drugs used in CNS diseases |
| - Nervous System Development |
| - Membrane Biology |
| - Biostatistics |
| - Sensory Neuroscience |
| - Genetic Basis of Disease |
| - Higher Cortical Function |
| - Two Elective modules |

**YEAR 4**

| **REfine your knowledge** | **Neuroscience**  | Modules include: |
|---------------------------|-------------------|
| - Neuroscience Research Project |
| - Synaptic Plasticity |
| - Advanced Topics in Neural Development |
| - Genetics of Disease & Behaviour |
| - Advanced Neuropharmacology |
| - Advanced Neurochemistry |
| - Molecular Neuroimmunology |
| - Emerging Therapies |

### BSc (Honours) Neuroscience

<table>
<thead>
<tr>
<th><strong>MSc (Taught)</strong></th>
<th><strong>PhD</strong></th>
<th><strong>Industry</strong></th>
<th><strong>Conversion Courses</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- MSc Biotechnology</td>
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<td></td>
</tr>
<tr>
<td>- MSc Biotechnology &amp; Business</td>
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<td></td>
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<tr>
<td>- MSc Biotherapeutics</td>
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<td></td>
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</tr>
<tr>
<td>- MSc Biotherapeutics &amp; Business</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Students can pursue a PhD in universities in Ireland or abroad in Neuroscience or in areas as diverse as biotechnology, cell biology, biomedical and health science.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Biotechnology companies</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>- Hospital laboratories</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>- Forensic Science laboratories</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Pharmaceutical companies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Professional Master of Education (PME)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Graduate Veterinary Medicine</td>
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<tr>
<td>- Graduate Medicine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Master of Management</td>
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</tbody>
</table>

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*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. Modules are subject to change each year.*

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Shauna Corry analysing the results of a knee-jerk reflex test in a Neuroscience laboratory.

---

I have always known that Science is my passion, but it wasn’t until I had the opportunity to explore the subject in a hands-on environment that I realised how much I love Neuroscience. I was intrigued straight away by the brain, and by how much is still to be discovered. I am a member of the UCD Lacrosse Club, I volunteered in Tanzania with UCD Volunteers Overseas and I work as a Residential Assistant on campus. The great thing about UCD is being able to study electives, so I was able to study French, Spanish, Astronomy and Psychology as well as all my Science modules. When I graduate, I hope to work in research, particularly on developing treatments for brain disorders.

Shauna Corry, Student
## Pharmacology

**CAO code: DN200  Option: Biological, Biomedical and Biomolecular Science (BBB)**

### Sample pathway for a degree in Pharmacology *

#### YEAR 1

**BIOLOGY**
- Modules include:
  - Biology in Action
  - Life on Earth
  - Cell Biology & Genetics
  - Biomedical Sciences

**CHEMISTRY**
- Modules include:
  - The Basis of Organic and Biological Chemistry

**MATHEMATICS**
- Modules include:
  - Mathematics for the Biological & Chemical Sciences

#### YEAR 2

**PHARMACOLOGY**
- Modules include:
  - Chemistry for Biologists
  - Molecular Genetics and Biotechnology
  - Metabolic and Immune Systems
  - Biomolecular Laboratory Skills
  - Pharmacology: Biomedical Science of Drugs

**PHYSIOLOGY**
- Modules include:
  - Introduction to Physiology
  - Organs and Systems Physiology

**MICROBIOLOGY**
- Modules include:
  - Microbiology in Medicine, Biotechnology and the Environment

#### YEAR 3

**FOCUS ON YOUR CHOSEN SUBJECT**

**PHARMACOLOGY** – Modules include:
- Drugs used in CNS diseases
- Advanced CNS Pharmacology
- Toxicology
- Molecular Pharmacology

**PHYSIOLOGY**
- Modules include:
  - Finding new Pharmaceuticals
  - Adv. Pharmacology of Cancer
  - Emerging Therapies
  - Advanced Renal Pharmacology

**BSc (Honours) Pharmacology**

**Concentration Modules**
- MSc Biotechnology
- MSc Biotechnology & Business
- MSc Biotherapeutics
- MSc Regulatory Affairs & Toxicology

- PhD Students can pursue a PhD in universities in Ireland or abroad in areas as diverse as drug development and biomedical science

**Industry**
- Pharmaceutical Companies
- Drug regulatory bodies such as the Irish Medicines Board
- Biotechnology sector
- Chemical safety and toxicology

**Conversion Courses**
- Professional Master of Education (PME)
- Graduate Veterinary Medicine
- Graduate Medicine
- Master of Management

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*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. Modules are subject to change each year.*

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The process of cell changes called EMT (epithelial mesenchymal transdifferentiation) that occur when kidney epithelial cells are treated with drugs. Image by Tara McMorrow and Eric Campbell © UCD

### CHOOSE YOUR SUBJECTS

- One Elective module
- One Small-Group Project

### ENGAGE WITH THE PRINCIPLES

- One Elective module
- One Small-Group Project

### FOCUS ON YOUR CHOSEN SUBJECT

- Two Elective modules

### REFINE YOUR KNOWLEDGE

- Two Elective modules

---

The degree programme offers a wide range of modules covering the scientific background of current therapies, to identifying novel targets in diseases, and the drug development process itself. I spent a semester abroad in the University of Queensland, Australia, which was an exciting opportunity to learn from other pharmacology experts from around the world. A degree in Pharmacology offers an ideal pathway into the pharmaceutical and healthcare industry where there are a huge variety of roles from research and development all the way through to the sales and marketing of medicines.

Áine Madden, Graduate

---

**Professor Orina Belton**
UCD School of Biomolecular and Biomedical Science

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www.ucd.ie/myucd/pharmacology

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*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. Modules are subject to change each year.*

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V1 2021
Physiology

CAO code: DN200 Option: Biological, Biomedical and Biomolecular Science (BBB)

### Sample pathway for a degree in Physiology *

#### YEAR 1

**BIOLOGY**
- Modules include:
  - Biology in Action
  - Diversity of Life
  - Cell Biology & Genetics
  - Biomedical Sciences

**CHEMISTRY**
- Modules include:
  - The Basis of Organic and Biological Chemistry

**MATHEMATICS**
- Modules include:
  - Mathematics for the Biological & Chemical Sciences

---

### YEAR 2

**PHYSIOLOGY**
- Modules include:
  - Chemistry for Biologists
  - Molecular Genetics and Biotechnology
  - Biomolecular Laboratory Skills
  - Introduction to Physiology
  - Organs and Systems Physiology
  - Metabolic and Immune systems

**NEUROSCIENCE**
- Modules include:
  - Principles of Neuroscience

**MICROBIOLOGY**
- Modules include:
  - Principles of Microbiology: Medicine, Environment and Biotechnology

---

### YEAR 3

**FOCUS ON YOUR CHOSEN SUBJECT**

**PHYSIOLOGY**
- Modules include:
  - Cardiovascular System
  - Biostatistics
  - Experimental Physiology
  - Endocrine/Reproductive Physiology
  - Digestion, Absorption and Excretion
  - Membrane Biology
  - Higher Cortical Function
  - Respiratory Physiology
  - Two Elective modules

---

### YEAR 4

**REFINE YOUR KNOWLEDGE**

**PHYSIOLOGY**
- Modules include:
  - Physiology Research Project
  - Lung Function Under Stress
  - Control of Vascular Resistance
  - Haemostasis and Thrombosis
  - Adaptation to Hypoxia
  - Physiological Genomics
  - The Physiology of Disease
  - Fundamentals of Physiological Research

---

**BSc (Honours) Physiology**

- Students can pursue a Taught Masters or Research Masters in universities in Ireland or abroad in any physiological discipline or a diverse range of medical or other biological areas
- Students can pursue a PhD in universities in Ireland or abroad in any physiological discipline or a diverse range of medical or other biological areas
- Students can pursue a PhD in universities in Ireland or abroad in any physiological discipline or a diverse range of medical or other biological areas
- Students can pursue a PhD in universities in Ireland or abroad in any physiological discipline or a diverse range of medical or other biological areas

---

**Conversion Courses**

- Professional Master of Education (PME)
- Graduate Entry Veterinary Medicine
- Graduate Entry Medicine
- Graduate Entry Physiotherapy

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*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. Modules are subject to change each year.

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Dr Katherine Howell  
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---

I completed a summer project, which involved learning essential lab skills and gaining experience in a laboratory setting by looking for a new experimental technique to identify changes to lung structure in an animal model of lung disease. The biggest benefit of completing the summer project was gaining essential lab experience, which has now developed my enthusiasm for research.

Stephen Murphy, Graduate

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www.ucd.ie/myucd/physiology
Plant Biology
CAO code: DN200  Option: Biological, Biomedical and Biomolecular Science (BBB)

Sample pathway for a degree in Plant Biology *

YEAR 1

ENGAGE WITH THE PRINCIPLES

- Biology Modules include:
  - Biology in Action
  - Life on Earth
  - Cell Biology & Genetics
  - Biomedical Sciences

- Chemistry Modules include:
  - The Basis of Organic and Biological Chemistry

- Mathematics Modules include:
  - Mathematics for the Biological & Chemical Sciences

YEAR 2

CHOOSE YOUR SUBJECTS

The subject combinations listed below are illustrative of what a student who graduates in Plant Biology could choose in Year 2. Further subject combinations are possible depending on the choices in Year 1. Further information is available on page 19.

- Plant Biology Modules include:
  - Chemistry for Biologists
  - Scientific Communication
  - Principles of Plant Biology
  - Biomolecular Lab Skills
  - Principles of Cell and Molecular Biology

- Environmental Biology Modules include:
  - Principles of Environmental Biology and Ecology

- Zoology Modules include:
  - Principles of Zoology
  - Animal Behaviour
  - Molecular Genetics and Biotechnology

YEAR 3

FOCUS ON YOUR CHOSEN SUBJECT

- Plant Biology – Modules include:
  - Plant Diseases
  - Plant Form & Function
  - Plant Biotechnology
  - Experimental Plant Physiology
  - Plant Cell Biology
  - Working with Biological Data
  - Genetics
  - Systems Ecology
  - Two Elective modules

YEAR 4

REFINE YOUR KNOWLEDGE

- Plant Biology Research Project
- Biology and Ecology of Coastal Wetlands
- Environmental Impact
- Plant Phenotyping
- Programmed Cell Death
- Plant Biotechnology and Entrepreneurship
- Two Elective modules

BSc (Honours) Plant Biology

- MSc (Taught)
  - MSc Applied Environmental Science
  - MSc World Heritage Management
  - MSc Plant Biology & Biotechnology

- PhD
  - Students can pursue a PhD in universities in Ireland or abroad in areas as diverse as climate change, marine biology or cell and molecular biology

- Industry
  - National Parks and Wildlife Services
  - State and Semi-State bodies
  - Conservation Bodies
  - Agriculture and Aquaculture
  - Environmental Management

- Conversion Courses
  - Professional Master of Education (PME)
  - Graduate Medicine
  - Master of Management
  - Graduate Veterinary Medicine

*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. Modules are subject to change each year.

V1 2021

www.ucd.ie/myucd/plantbiology

I chose Plant Biology as Plant Biotechnology and Plant Pathology particularly interested me. Our classes were specific to Plant Biology, were smaller and we had lots of contact with lecturers and tutors. The opportunity to carry out a research internship in South America with the Plant Palaeoecology and Palaeobiology research group in my third year was one of the highlights of my time in UCD. After graduating, I completed a research Master’s in Plant Pathology and I am currently completing a PhD in molecular plant genetics, focused on the regulation of gene expression in stomatal guard cells.

Emma Doyle, Graduate
Zoology

CAO code: DN200 Option: Biological, Biomedical and Biomolecular Science (BBB)

Sample pathway for a degree in Zoology *

**YEAR 1**

**ENGAGE WITH THE PRINCIPLES**

<table>
<thead>
<tr>
<th>BIOLOGY</th>
<th>CHEMISTRY</th>
<th>MATHEMATICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modules include:</td>
<td>Modules include:</td>
<td>Modules include:</td>
</tr>
<tr>
<td>Biology in Action</td>
<td>The Basis of Organic and Biological Chemistry</td>
<td>Mathematics for the Biological &amp; Chemical Sciences</td>
</tr>
<tr>
<td>Life on Earth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cell Biology &amp; Genetics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biomedical Sciences</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**YEAR 2**

**CHOOSE YOUR SUBJECTS**

The subject combinations listed below are illustrative of what a student who graduates in Zoology could choose in Year 2. Further subject combinations are possible depending on the choices in Year 1. Further information is available on page 19.

<table>
<thead>
<tr>
<th>ZOOLOGY</th>
<th>ENVIRONMENTAL BIOLOGY</th>
<th>GENETICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modules include:</td>
<td>Modules include:</td>
<td>Modules include:</td>
</tr>
<tr>
<td>Principles of Zoology</td>
<td>Principles of Environmental Biology and Ecology</td>
<td>Two Elective modules</td>
</tr>
<tr>
<td>Scientific Communication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animal Behaviour</td>
<td>Principles of Genetics</td>
<td></td>
</tr>
<tr>
<td>Molecular Genetics and Biotechnology</td>
<td>Metabolic and Immune Systems</td>
<td></td>
</tr>
<tr>
<td>Chemistry for Biologists</td>
<td>Biomolecular Laboratory Skills</td>
<td></td>
</tr>
</tbody>
</table>

**YEAR 3**

**FOCUS ON YOUR CHOSEN SUBJECT**

**ZOOLOGY** – Modules include:
- Systems Ecology
- Working with Biological Data
- Diversity of Vertebrates
- Evolutionary Biology
- Functional Morphology
- Arthropoda
- Diversity of Invertebrates
- Field courses in Ireland and Spain
- Two Elective modules

**YEAR 4**

**REFINE YOUR KNOWLEDGE**

**ZOOLOGY** – Modules include:
- Zoology Research Project
- Biological Invasions
- Marine Community Ecology
- Bioassessment of Freshwaters
- Biodiversity
- Molecular Phylogenetics and Evolution
- Physiology of Epithelial Transport
- Two Elective modules

**BSc (Honours) Zoology**

<table>
<thead>
<tr>
<th>MSc (Taught)</th>
<th>PhD</th>
<th>Industry</th>
<th>Conversion Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSc Applied Environmental Science</td>
<td>Students can pursue a PhD in universities in Ireland or abroad in areas as diverse as evolution and population biology and cell and molecular biology</td>
<td>National Parks and Wildlife Services</td>
<td>Professional Master of Education (PME)</td>
</tr>
<tr>
<td>MSc World Heritage Management</td>
<td></td>
<td>Semi-State bodies such as the ESB, BIM and Salmon Research Trust</td>
<td>Graduate Veterinary Medicine</td>
</tr>
<tr>
<td>MSc Biological &amp; Biomolecular Science (Negotiated Learning)</td>
<td></td>
<td>Conservation Bodies</td>
<td>Graduate Medicine</td>
</tr>
</tbody>
</table>

*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. Modules are subject to change each year.

Adam Smith, Student

“Learn about animals from the level of individual molecules to how animals interact with one another and their environment.

Develop key practical skills in field work, behavioural observation, species identification, genetic analysis, physiology and anatomy.

The Costa Rican rainforest was a sensual overload, a true wildlife paradise and a dream come true for any zoologist. Staff and students alike were constantly uncovering the countless creatures of the forest and putting our knowledge to work to quantify and sample in such a different world, a truly unforgettable experience.

Adam Smith, Student

www.ucd.ie/myucd/zoology
I knew that I wanted to explore Science and Mathematics at a deeper level but did not want to choose between them. The level of variety offered by the DN200 Science course stood out to me. I was able to sample Biology, Chemistry and Physics before deciding what I wanted to do next. I chose Biology, Mathematics and Education because I wanted to capitalise on my passion for these subjects while simultaneously satisfying my desire to teach the next generation of students. What makes this course unique is the sense of community that exists among people who share the same ambition as you. It is a hands-on, placement-focused experience that supports you to become the best teacher and person you can be.

Michael Allen, Student

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Chemistry

CAO code: DN200 Option: Chemistry & Chemical Sciences (CCS)

Sample pathway for a degree in Chemistry *

YEAR 1

**ENGAGE WITH THE PRINCIPLES**

**CHEMISTRY**
- Modules include:
  - The Basis of Organic and Biological Chemistry
  - The Basis of Physical Chemistry
  - The Molecular World

**MATHEMATICS**
- Modules include:
  - Mathematics for the Biological & Chemical Sciences

**One Small-Group Project**

**One Elective Module**

YEAR 2

**CHOOSE YOUR SUBJECTS**

The subject combinations listed below are illustrative of what a student who graduates in Chemistry could choose in Year 2. Further subject combinations are possible depending on the choices in Year 1. Further information is available on page 19.

**CHEMISTRY**
- Modules include:
  - The Basis of Inorganic Chemistry
  - Organic Chemistry
  - Physical Chemistry
  - Inorganic Chemistry

**MEDICINAL CHEMISTRY & CHEMICAL BIOLOGY**
- Modules include:
  - Molecular Genetics and Biotechnology
  - Principles of Biochemistry
  - Medicinal Chemistry & Chemical Biology
  - Pharmacology: Biomedical Science of Drugs
  - Biomolecular Laboratory Skills

**Two Elective Modules**

YEAR 3

**FOCUS ON YOUR CHOSEN SUBJECT**

**CHEMISTRY** – Modules include:
- Quantum Mechanics
- Carbonyl Chemistry & Synthesis
- Chemical Kinetics
- Mechanism & Stereochemistry

**MEDICINAL CHEMISTRY & CHEMICAL BIOLOGY**
- Modules include:
  - Instrumental Analysis
  - Main Group Chemistry & Bonding
  - Symmetry & Computational Chemistry

**Two Elective Modules**

YEAR 4

**REFINE YOUR KNOWLEDGE**

**CHEMISTRY** – Modules include:
- Chemistry Research Project
- Methods in Organic Synthesis
- Chemical Thermodynamics
- Electrochemistry
- Reactivity & Change
- Nanochemistry

**MEDICINAL CHEMISTRY & CHEMICAL BIOLOGY**
- Modules include:
  - Advanced Inorganic Chemistry
  - Methods in Organic Synthesis 2
  - Modern Methods and Catalysis

BSc (Honours) Chemistry

PhD
Chemistry graduates also pursue PhDs in Ireland or abroad in areas as diverse as:
- Total synthesis of natural products
- Biological aspects of nanoscience
- Novel material synthesis
- Energy generation
- Synthetic organic chemistry methodology development
- Polymer chemistry

Industry
Most graduates work in the pharmaceutical or chemical industries. Positions include the following:
- Manufacturing
- Process Chemists
- Quality Control, Analysis or Assurance
- Research and Development
- Raw Materials/Product Analysis

*Liam Jowett, Student*

Understand the important role chemistry plays in controlling the conversion of matter into useful substances such as new materials, sensors and medicines.

Develop skills in modern synthesis and analysis techniques used in the pharmaceutical and chemical industries.

I am fascinated by the world around me, from the fundamental laws of our universe to the mechanisms of life itself. I have found Chemistry in UCD to be a place where my own curiosities and my passion to make a difference have been nurtured and developed. The lecturers are all kind, helpful and supportive, and their passion for their work is something I continue to be inspired by. Through UCD I was lucky enough to be awarded a scholarship to study for a semester in the US, where I made many friends and grew as a chemist, and as a person.

Liam Jowett, Student
Chemistry with Biophysical Chemistry

CAO code: DN200 Option: Chemistry & Chemical Sciences (CCS)

Sample pathway for a degree in Chemistry with Biophysical Chemistry *

YEAR 1

CHEMISTRY
Modules include:
- The Basis of Organic and Biological Chemistry
- The Basis of Physical Chemistry
- The Molecular World

ENGAGE WITH THE PRINCIPLES

MATHEMATICS
Modules include:
- Mathematics for the Biological & Chemical Sciences

BIOLOGY
Modules include:
- Cell Biology & Genetics

YEAR 2

CHOOSE YOUR SUBJECTS

The subject combinations listed below are illustrative of what a student who graduates in Chemistry with Biophysical Chemistry could choose in Year 1. Further combinations are possible depending on the choices in Year 1. Further information is available on page 19.

CHEMISTRY WITH BIOPHYSICAL CHEMISTRY
Modules include:
- Biophysical Chemistry
- Physical Chemistry
- Inorganic Chemistry
- Organic Chemistry

FOCUS ON YOUR CHOSEN SUBJECT

YEAR 3

CHEMISTRY
Modules include:
- Students who choose Chemistry with Biophysical Chemistry as their main subject for Second Year also cover the requirements for Chemistry.

CHEMISTRY WITH BIOPHYSICAL CHEMISTRY – Modules include:
- Instrumental Analysis
- Carbonyl Chemistry & Synthesis
- Quantum Mechanics
- Mechanism & Stereochemistry
- Nano-Assemblies and Interfaces
- Organometallic & Solid State Chemistry
- Main Group Chemistry & Bonding
- Symmetry & Computational Chemistry
- Optional modules in Biomolecular, Organic and Inorganic Chemistry

YEAR 4

REFINE YOUR KNOWLEDGE

CHEMISTRY WITH BIOPHYSICAL CHEMISTRY – Modules include:
- Biophysical Chemistry Research Project
- Metals in Biology
- Electrochemistry
- Biophysical Chemistry
- Advanced Kinetics and Thermodynamics
- Nanochemistry
- Pharmaceutical, Biomedical, Medical Device Industry
- Biotechnology, Food Technology, Agrochemistry
- Fine Chemical, Chemical Development
- Personal Care, Cosmetics, Environmental Protection, Paints and Coatings/Petrochemistry
- Novel materials and materials analysis
- Polymer chemistry

BSc (Honours) Chemistry with Biophysical Chemistry

PhD

Students can pursue a PhD in Ireland or abroad in areas as diverse as:
- Pharmaceutical and biomedical biomolecular formulations design
- Bio-processing and bio-engineering
- Bio-nanotechnology
- Forensic science
- Food and agro technologies
- Energy generation
- Novel materials and materials analysis
- Polymer chemistry

Industry

- Pharmaceutical, Biomedical, Medical Device Industry
- Biotechnology, Food Technology, Agrochemistry
- Fine Chemical, Chemical Development
- Personal Care, Cosmetics, Environmental Protection, Paints and Coatings/Petrochemistry
- Patenting
- Science-based Sales, Marketing, Finance

Conversion Courses

- Professional Master of Education (PME)
- Graduate Veterinary Medicine
- Graduate Medicine
- Master of Management

In the summer after third year, I did a summer internship in Associate Professor Vitaly Buckin’s lab in UCD which I found really interesting as well as very helpful in preparing me for the final year research project. This, as well as my thesis research in my final year, led me to realise that I’d like to pursue further research in a PhD which is what I hope to continue into in the coming year.

Rian Lynch, Student

Associate Professor Vitaly Buckin
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*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. Modules are subject to change each year.

www.ucd.ie/myucd/biophysicalchemistry

V1 2021
Chemistry with Environmental & Sustainable Chemistry

CAO code: DN200 Option: Chemistry & Chemical Sciences (CCS)

Sample pathway for a degree in Chemistry with Environmental & Sustainable Chemistry

**YEAR 1**

**CHEMISTRY**

Modules include:
- The Basis of Organic and Biological Chemistry
- The Basis of Physical Chemistry
- The Molecular World

**MATHEMATICS**

Modules include:
- Mathematics for the Biological & Chemical Sciences
- One Small-Group Project
- One Elective module

**YEAR 2**

**CHOOSE YOUR SUBJECTS**

The subject combinations listed below are illustrative of what a student who graduates in Chemistry with Environmental & Sustainable Chemistry could choose in Year 2. Further subject combinations are possible depending on the choices in Year 1. Further information is available on page 19.

**CHEMISTRY WITH ENVIRONMENTAL & SUSTAINABLE CHEMISTRY**

Modules include:
- Environmental and Sustainable Chemistry
- Inorganic Chemistry
- Physical Chemistry
- Environmental Geology

**CHEMISTRY**

Modules include:
- The Basis of Inorganic Chemistry
- Organic Chemistry
- Chemical Biology
- Biophysical Chemistry

**YEAR 3**

**FOCUS ON YOUR CHOSEN SUBJECT**

**CHEMISTRY WITH ENVIRONMENTAL & SUSTAINABLE CHEMISTRY** – Modules include:
- Quantum Mechanics
- Carboxyl Chemistry & Synthesis
- Self-Assembly of Biomolecules
- Mechanism & Stereochemistry
- Instrumental Analysis
- Organometallic & Solid State Chemistry
- Main Group Chemistry & Bonding
- Symmetry & Computational Chemistry
- Two Elective modules

**YEAR 4**

**REFINE YOUR KNOWLEDGE**

**CHEMISTRY WITH ENVIRONMENTAL & SUSTAINABLE CHEMISTRY** – Modules include:
- Environmental & Sustainable Chemistry Research Project
- Green and Sustainable Chemistry
- Methods in Organic Synthesis
- Chemical Thermodynamics
- Nanochemistry
- Electrochemistry
- Reactivity & Change
- Modern Methods and Catalysis
- Advanced Inorganic Chemistry
- Methods in Organic Synthesis 2
- Industrial Internship
- Two Elective modules

**BSc (Honours) Chemistry with Environmental & Sustainable Chemistry**

Apart from the positions that a chemistry degree would qualify a student for (see below), graduates in this degree would be uniquely qualified to work in fields related to Environmental Protection (e.g., the Environmental Protection Agency), Green Chemistry and Sustainable Energy generation.

**PhD**

Students can pursue a PhD in Ireland or abroad in areas as diverse as:
- Pharmaceutical design
- Atmospheric kinematics
- Biological aspects of nanoscience
- Energy generation
- Pollution control
- Novel material synthesis
- Polymer chemistry
- Materials analysis bio-inorganic chemistry
- Computational studies

**Industry**

Most graduates work in the pharmaceutical or chemical industries. Positions range from manufacturing chemists to quality control/analysis/assurance, research and development and raw materials/product analysis in manufacturing.
- 2nd level or 3rd level Teaching
- State Labs such as the Forensic laboratory
- ESB and Bord Gáis
- Medical device industry
- Patent law
- Healthcare industry
- 2nd level or 3rd level Teaching
- State Labs such as the Forensic laboratory
- ESB and Bord Gáis
- Medical device industry
- Patent law
- Healthcare industry

*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. Modules are subject to change each year.

Eimear Madden, Graduate

DN200 allowed me to sample subjects from across Biology, Chemistry, Physics and Geology and I decided Chemistry was the subject for me. I believe a knowledge in Chemistry with Environmental & Sustainable Chemistry is very applicable in industry as legislation is being introduced which holds industries accountable for the waste they produce. This degree investigates how Chemistry can be used to tackle issues such as global warming, acid rain, water pollution and ozone layer depletion. After graduating, I moved to London to complete a Research Masters in Green Chemistry and Sustainability at Imperial College London. In the future, I would like to work within an industrial laboratory setting to encourage and implement the principles of green chemistry on a larger scale.

Eimear Madden, Graduate
Learn how to apply the tools of Chemistry to study biological systems
Develop experience in techniques and instrumentation used in the pharmaceutical industry, e.g., the synthesis, identification and analysis of chemicals

DN200 allowed me to study Biomolecular & Biomedical Science subjects, but it also enabled me to pick up Chemistry, without having studied it for the Leaving Certificate. Due to the flexibility within DN200, I was able to pursue my interests and I am now currently studying Medicinal Chemistry & Chemical Biology. The facilities in UCD are state of the art and I find it exciting being able to spend so much time in the labs, practically applying the skills I am learning every day. When I graduate, I hope to enter the pharmaceutical industry and work in drug research and development.

Amber Barry, Student

www.ucd.ie/myucd/medicinalchemistryandychemicalbiology

Medicinal Chemistry & Chemical Biology
CAO code: DN200  Option: Chemistry & Chemical Sciences (CCS)

Sample pathway for a degree in Medicinal Chemistry & Chemical Biology *

YEAR 1

CHEMISTRY
Modules include:
- The Basis of Organic and Biological Chemistry
- The Basis of Physical Chemistry
- The Basis of Inorganic Chemistry
- The Molecular World

ENGAGE WITH THE PRINCIPLES

MATHEMATICS
Modules include:
- Mathematics for the Biological & Chemical Sciences

BIOLOGY
Modules include:
- Cell Biology & Genetics

YEAR 2

CHOOSE YOUR SUBJECTS

The subject combinations listed below are illustrative of what a student who graduates in Medicinal Chemistry & Chemical Biology could choose in Year 2. Further subject combinations are possible depending on the choices in Year 1. Further information is available on page 19.

YEAR 3

FOCUS ON YOUR CHOSEN SUBJECT

YEAR 4

REFINE YOUR KNOWLEDGE

BSc (Honours) Medicinal Chemistry & Chemical Biology

PhD
- Students can pursue a PhD in universities in Ireland or abroad in areas as diverse as chemistry, chemical biology, medicinal chemistry, and biochemistry

Industry
- Pharmaceuticals and Biopharmaceuticals
- Cosmetics
- Food Technology
- Fine Chemicals
- Chemical Development
- Patenting
- Science-based Sales, Marketing, Finance

Conversion Courses
- Professional Master of Education (PME)
- Graduate Veterinary Medicine
- Graduate Medicine
- Master of Management

*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. Modules are subject to change each year.

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V1 2021
Chemistry, Mathematics & Education

CAO code: DN200 Option: Chemistry & Chemical Sciences (CCS)

Sample pathway to become a Chemistry and Mathematics teacher *

YEAR 1

ENGAGE WITH THE PRINCIPLES

EDUCATION
Modules include:

- Mathematics & Science
  Education & Communication

CHEMISTRY
Modules include:

- Introductory Chemistry
- Organic Chemistry and
  Chemical Biology

MATHEMATICS
Modules include:

- Linear Algebra
- Calculus
- Statistical Modelling

SCIENCE
Modules include:

- Biology
- Physics

The subject combinations listed below are illustrative of what a student who graduates in Chemistry, Mathematics & Education could choose in Year 2. Further subject combinations are possible depending on the choices in Year 1. Further information is available on page 19.

YEAR 2

CHOOSE YOUR SUBJECTS

EDUCATION
Modules include:

- Education for Democracy
- Science and Mathematics
  Pedagogy

CHEMISTRY
Modules include:

- Physical Chemistry
- Organic Chemistry
- Inorganic Chemistry

MATHEMATICS
Modules include:

- Calculus of Several Variables
- Differential & Difference
  Equations
- Analysis

- Two Elective Modules

REFINE YOUR KNOWLEDGE

EDUCATION
Modules include:

- Teaching Second-
  Level Science
- Schools and Society

SCHOOL PLACEMENT

- Post-Primary Placement
- Peer-Assisted Tutoring

CHEMISTRY
Modules include:

- Instrumental Analysis
- Mechanism and
  Stereochemistry
- Main Group Chemistry
  and Bonding
- Chemical Thermodynamics
- Carbonyl Chemistry and
  Synthesis
- Organometallic and Solid
  State Chemistry

MATHEMATICS
Modules include:

- Algebraic Structures
- Probability Theory
- Geometry

YEAR 3

PREPARE FOR PROFESSIONAL PRACTICE

EDUCATION
Modules include:

- Pedagogical Approaches to
  Mathematics and Science
- Psychology for Teaching and
  Learning

SCHOOL PLACEMENT

- Year-Long Placement in Post-
  Primary School
- Classroom Teaching
- Broad Experience of Wider
  School Context

BSc Chemistry, Mathematics & Education

YEAR 4

PREPARE FOR PROFESSIONAL PRACTICE

EDUCATION
Modules include:

- Research Methods
- Professional Dissertation

SCHOOL PLACEMENT

- Year-Long Placement in Post-Primary School
- Continuous Professional Development Activities
- Further Development of Professional Practice Portfolio

MSc Mathematics and Science Education

POST-PRIMARY SCHOOL TEACHER

QUALIFIED TO TEACH

Chemistry
Leaving Certificate

Mathematics
Leaving Certificate

Science
Junior Certificate

*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. Modules are subject to change each year.

Conor Eivers, Student

Science and Mathematics were always my favourite subjects in school and I knew I would study something Science related at third level. Having always wanted to be a teacher, I realised that the Science, Maths and Education pathway was for me as I get to study my two favourite subjects, Chemistry and Mathematics, in depth. I am currently undertaking a placement in Third Year. It is an eight-week observation/teaching placement that runs alongside my lectures and labs. It is extremely beneficial as I can see the theories and educational practices I have been learning over the last two years put into practice and it is an opportunity to prepare myself for the year-long placement in my final year.

Conor Eivers, Student
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.

"I assumed I would end up pursuing Physics when I first started university; however, after my first Applied & Computational Mathematics class I knew it was the right choice for me. The chance to study further into the mechanics and structure of Mathematics, and learn how to apply it to not just Physics and Computer Science but to a wide range of other fields is thrilling. That along with my time spent as the class representative with the Students Union has been so rewarding, getting to organise events, trips and hoodies for my class. As well as this, DN200 gave me the opportunity to spend a trimester studying abroad in California, broadening my perspective and giving me a more varied education."

Pj Nee, Student

---

### Sample pathway for a degree in Applied & Computational Mathematics *

**YEAR 1**

**APPLIED & COMPUTATIONAL MATHEMATICS**

**Modules include:**
- Applied Mathematics: Mechanics and Methods
- Applications of Differential Equations

**MATHMATICS**

**Modules include:**
- Calculus in the Mathematical and Physical Sciences
- Mathematical Analysis
- Linear Algebra in the Mathematical and Physical Sciences

**STATISTICS**

**Modules include:**
- Introduction to Statistical Modelling
- One Elective module
- One Small-Group Project

**YEAR 2**

**APPLIED & COMPUTATIONAL MATHEMATICS**

**Modules include:**
- Computational Science
- Vector Integral and Differential Calculus
- Oscillations in Mechanical Systems
- Classical Mechanics and Special Relativity

**MATHMATICS**

**Modules include:**
- Linear Algebra 2
- Groups, Rings & Fields
- Calculus of Several Variables
- One Elective module

**YEAR 3**

**FOCUS ON YOUR CHOSEN SUBJECT**

**APPLIED & COMPUTATIONAL MATHEMATICS** – **Modules include:**
- Analytic Mechanics
- Dynamical Systems
- Functions of One Complex Variable
- Partial Differential Equations

**YEAR 4**

**REFINE YOUR KNOWLEDGE**

**APPLIED & COMPUTATIONAL MATHEMATICS** – **Modules include:**
- Applied & Computational Mathematics Research Project
- General Relativity and Black Holes

**STATISTICS**

**Modules include:**
- Probability Theory
- Inferential Statistics
- Two Elective modules

---

**BSc (Honours) Applied & Computational Mathematics**

**MSc (Taught) Data & Computational Science**

- Students can pursue a PhD in universities in Ireland or abroad in areas as diverse as:
  - Data and Computational Science
  - Meteorology and Climate
  - Mathematical Biology
  - Fluid Mechanics
  - Dynamical Systems
  - General Relativity

**PhD**

- A wide variety of career opportunities are open with new application areas discovered constantly. Technology areas include:
  - Data Analytics
  - Computing
  - Finance
  - Energy
  - Environment
  - Communication

---

*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. Modules are subject to change each year.*

---

**www.ucd.ie/myucd/appliedandcomputationalmathematics**

Assistant Professor Conor Sweeney
UCD School of Mathematics and Statistics

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V1 2021
When I learned about Financial Mathematics, it sounded like the perfect way to continue to study mathematics while also combining it with my interest in financial markets. I was lucky enough to get to go abroad for my third year to UC Berkeley in California which was an amazing experience. I completed an internship in the summer between third and fourth year at Credit Suisse and was able to earn credits as part of the professional placement module. After I graduated, I went back to work at that same firm full time.

Joseph Mulligan, Graduate

Develop strong mathematical, problem-solving and analytical skills used in banking and finance

Learn the mathematical theories that underpin financial models, as well as computational expertise in the algorithms used to price financial products

---

**Sample pathway for a degree in Financial Mathematics**

<table>
<thead>
<tr>
<th>YEAR</th>
<th>ENGAGE WITH THE PRINCIPLES</th>
</tr>
</thead>
</table>
| YEAR 1 | **STATISTICS** Modules include:  
- Statistical Modelling  
**APPLIED & COMPUTATIONAL MATHEMATICS** Modules include:  
- Applications of Differential Equations  
- One Elective module  
- One Small-Group Project |
| **MATHMATICS** Modules include:  
- Calculus in the Mathematical and Physical Sciences  
- Linear Algebra in the Mathematical and Physical Sciences  
- Numbers and Functions  
- Mathematical Analysis |
| **FINANCIAL MATHEMATICS** Modules include:  
- Calculus of Several Variables  
- Linear Algebra 2  
- Theory of Games  
- Business Economics  
- Foundations in Finance |

<table>
<thead>
<tr>
<th>YEAR 2</th>
<th>CHOOSE YOUR SUBJECTS</th>
</tr>
</thead>
</table>
| **FINANCIAL MATHEMATICS** Modules include:  
- Fundamentals of Actuarial and Financial Mathematics  
- Optimization in Finance  
- Corporate Finance  
**STATISTICS** Modules include:  
- Inferential Statistics  
- Probability Theory  
- Predictive Analytics  
**APPLIED AND COMPUTATIONAL MATHEMATICS** Modules include:  
- Computational Science  
- Vector Calculus  
- Two Elective modules |
| The subject combinations listed below are illustrative of what a student who graduates in Financial Mathematics could choose in Year 2. Further subject combinations are possible depending on the choices in Year 1. Further information is available on page 19. |

<table>
<thead>
<tr>
<th>YEAR 3</th>
<th>FOCUS ON YOUR CHOSEN SUBJECT</th>
</tr>
</thead>
</table>
| **FINANCIAL MATHEMATICS** – Modules include:  
- Statistical Machine Learning  
- Computational Finance  
- Stochastic Models  
**STATISTICS** Modules include:  
- Inferential Statistics  
- Probability Theory  
- Predictive Analytics  
**APPLIED AND COMPUTATIONAL MATHEMATICS** Modules include:  
- Computational Science  
- Vector Calculus  
- Two Elective modules |
| **FINANCIAL MATHEMATICS** – Modules include:  
- Financial and Actuarial Mathematics  
- Investment and Trading  
- Advanced Risk Management  
**APPLIED & COMPUTATIONAL MATHEMATICS** Modules include:  
- Applications of Differential Equations  
- One Elective module  
- One Small-Group Project  
- Two Elective modules |
| **MATHMATICS** Modules include:  
- Calculus in the Mathematical and Physical Sciences  
- Linear Algebra in the Mathematical and Physical Sciences  
- Numbers and Functions  
- Mathematical Analysis |

<table>
<thead>
<tr>
<th>YEAR 4</th>
<th>REFINISH YOUR KNOWLEDGE</th>
</tr>
</thead>
</table>
| **FINANCIAL MATHEMATICS** – Modules include:  
- Financial and Actuarial Mathematics  
- Investment and Trading  
- Advanced Risk Management  
**STATISTICS** Modules include:  
- Inferential Statistics  
- Probability Theory  
- Predictive Analytics  
**APPLIED AND COMPUTATIONAL MATHEMATICS** Modules include:  
- Applications of Differential Equations  
- One Elective module  
- One Small-Group Project  
- Two Elective modules |
| **MATHMATICS** Modules include:  
- Calculus in the Mathematical and Physical Sciences  
- Linear Algebra in the Mathematical and Physical Sciences  
- Numbers and Functions  
- Mathematical Analysis |

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**BSc (Honours) Financial Mathematics**

<table>
<thead>
<tr>
<th>MSc (Taught)</th>
<th>PhD</th>
<th>Industry</th>
<th>Conversion Courses</th>
</tr>
</thead>
</table>
| MSc Financial Mathematics  
MSc Mathematical Science  
MSc Statistics  
MSc Actuarial Science  
MSc Business Analytics  
MSc Data Analytics | Graduates can pursue a PhD in algorithmic trading, or stochastic differential equations, for example.  
Quantitative positions in the financial sector  
Risk modelling in banking and insurance  
Computing in business, technology, research and academia  
Trainee Actuary | Professional Master in Education (PME)  
MSc Computer Science (conversion) |  

---

*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. Modules are subject to change each year.*
Mathematics
CAO code: DN200  Option: Mathematical, Physical & Geological Sciences (MPG)

Discover the power and beauty of the universal language of Mathematics
Explore its applications and its deep influence on the physical and social sciences, technology, data analysis, philosophy and more

Sample pathway for a degree in Mathematics *

Mathematics
- Calculus in the Mathematical and Physical Sciences
- Numbers & Functions
- Linear Algebra in the Mathematical and Physical Sciences
- Mathematical Analysis
- Applications of Differential Equations
- Statistical Modelling

One Elective module
One Small-Group Project

Choose Your Subjects

Linear Algebra 2
Calculus of Several Variables
Groups, Rings & Fields

COMPUTATIONAL MATHEMATICS (OPTIONAL)
- Computational Science
- Vector Calculus
- Oscillations in Mechanical Systems
- Classical Mechanics and Special Relativity

Probability Theory
Stochastic Models
Inferential Statistics

Two Elective modules

Focus on Your Chosen Subject

Advanced Linear Algebra
Metric Spaces
Fourier Analysis
Measure Theory & Integration

Functions of One Complex Variable
Topology
Number Theory
Coding Theory

Two Elective modules

Refine Your Knowledge

Mathematics Research Project
Differential Geometry
Set Theory
Combinatorics

Functional Analysis
Cryptography
Ring Theory
Stochastic Analysis

Numerical Algorithms
History of Mathematics
Predictive Analytics
Advanced Mathematical Methods

BSc (Honours) Mathematics

MSc (Taught)
- MSc Financial Mathematics
- MSc Mathematical Science
- MSc Statistics
- MSc Actuarial Science
- MSc Business Analytics
- MSc Data Analytics

Students can pursue a PhD in universities in Ireland or abroad

PhD
- Banking & Finance
- Mathematical Modelling
- Information and Communications Technology
- Actuarial Science

Industry
Conversion Courses
- Professional Master of Education (PME)
- MSc Computer Science (Conversion)
- 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. Modules are subject to change each year.

www.ucd.ie/myucd/mathematics

Dr Michael Mackey
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twitter.com/ucdscience

Caitriona Byrne, Graduate

Mathematics requires a lot of critical thinking and rigorous understanding, and the lecturers in UCD certainly encourage this. Lecturers here are very good at transmitting their enthusiasm for their subject to the students. What’s really great about UCD is that the maths lecturers are approachable, and are both willing and keen to answer any questions you may have.

V1 2021
# Statistics

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

## Sample pathway for a degree in Statistics *

**YEAR 1**

**ENGAGE WITH THE PRINCIPLES**

<table>
<thead>
<tr>
<th>STATISTICS</th>
<th>MATHEMATICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modules include:</td>
<td>Modules include:</td>
</tr>
<tr>
<td>Applications of Differential Equations</td>
<td>Calculus in the Mathematical and Physical Sciences</td>
</tr>
<tr>
<td>Statistical Modelling</td>
<td>Linear Algebra in the Mathematical and Physical Sciences</td>
</tr>
<tr>
<td>Research Methods for Science</td>
<td>Mathematical Analysis</td>
</tr>
</tbody>
</table>

**YEAR 2**

**CHOOSE YOUR SUBJECTS**

The subject combinations listed below are illustrative of what a student who graduates in Mathematics could choose in Year 2. Further subject combinations are possible depending on the choices in Year 1. Further information is available on page 19.

<table>
<thead>
<tr>
<th>STATISTICS</th>
<th>MATHEMATICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modules include:</td>
<td>Modules include:</td>
</tr>
<tr>
<td>Probability Theory</td>
<td>Calculus of Several Variables</td>
</tr>
<tr>
<td>Inferential Statistics</td>
<td>Computational Science</td>
</tr>
<tr>
<td>Bayesian Statistics</td>
<td></td>
</tr>
</tbody>
</table>

**YEAR 3**

**FOCUS ON YOUR CHOSEN SUBJECT**

<table>
<thead>
<tr>
<th>STATISTICS – Modules include:</th>
<th>MATHEMATICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statistical Data Mining</td>
<td>Modules include:</td>
</tr>
<tr>
<td>Survey Sampling</td>
<td>Calculus in the Mathematical and Physical Sciences</td>
</tr>
<tr>
<td>Linear Algebra 2</td>
<td>Linear Algebra in the Mathematical and Physical Sciences</td>
</tr>
<tr>
<td>Data Structures &amp; Algorithms</td>
<td>Mathematical Analysis</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**YEAR 4**

**REFINE YOUR KNOWLEDGE**

<table>
<thead>
<tr>
<th>STATISTICS – Modules include:</th>
<th>MATHEMATICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statistics Research Project</td>
<td>Modules include:</td>
</tr>
<tr>
<td>Actuarial Statistics</td>
<td>Calculus of Several Variables</td>
</tr>
<tr>
<td>Stochastic Models</td>
<td>Computational Science</td>
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<tr>
<td></td>
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</tr>
</tbody>
</table>

## BSc (Honours) Statistics

<table>
<thead>
<tr>
<th>MSc (Taught)</th>
<th>PhD</th>
<th>Industry</th>
<th>Conversion Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSc Statistics</td>
<td>Students can pursue a PhD in universities in Ireland or abroad in areas as diverse as bayesian statistics, pharmacetical, medical and educational statistics, epidemiology, econometrics, environmental and ecological modelling</td>
<td>Data Analytics and Business Analytics</td>
<td>Professional Master of Education (PME)</td>
</tr>
<tr>
<td>MSc Actuarial Science</td>
<td>Data Science</td>
<td>Graduate Diploma in Actuarial Science</td>
<td></td>
</tr>
<tr>
<td>MSc Meteorology</td>
<td>Pharmaceutical</td>
<td>MSc Quantitative Finance</td>
<td></td>
</tr>
<tr>
<td>MSc Data Analytics</td>
<td>Actuarial Science</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Conversion Courses

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Master of Education (PME)</td>
<td>Graduate Diploma in Actuarial Science</td>
</tr>
<tr>
<td>MSc Quantitative Finance</td>
<td></td>
</tr>
</tbody>
</table>

*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. Modules are subject to change each year.

---

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twitter.com/ucdscience

---

www.ucd.ie/myucd/statistics/
# Applied Mathematics, Mathematics & Education

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

## Sample pathway to become an Applied Mathematics and Mathematics teacher

<table>
<thead>
<tr>
<th>Year</th>
<th>Engage with the Principles</th>
<th>Choose Your Subjects</th>
<th>Refine Your Knowledge</th>
<th>Prepare for Professional Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year 1</strong></td>
<td><strong>Education</strong> Modules include: Mathematics &amp; Science Education &amp; Communication&lt;br&gt;<strong>Applied Mathematics</strong> Modules include: Applied Mathematics: Mechanics and Methods&lt;br&gt;Applications of Differential Equations&lt;br&gt;<strong>Mathematics</strong> Modules include: Linear Algebra&lt;br&gt;Numbers and Functions&lt;br&gt;Calculus&lt;br&gt;Mathematical Analysis&lt;br&gt;Statistical Modelling</td>
<td><strong>One Small-Group Project</strong>&lt;br&gt;<strong>Elective Module</strong></td>
<td><strong>Education</strong> Modules include: Education for Democracy&lt;br&gt;Science and Mathematics Pedagogy&lt;br&gt;<strong>Applied Mathematics</strong> Modules include: Computational Science&lt;br&gt;Vector, Integral and Differential Calculus&lt;br&gt;Oscillations in Mechanical Systems&lt;br&gt;Classical Mechanics and Special Relativity</td>
<td><strong>Education</strong> Modules include: Pedagogical Approaches to Mathematics and Science&lt;br&gt;Psychology for Teaching and Learning&lt;br&gt;<strong>School Placement</strong> Modules include: Post-Primary Placement&lt;br&gt;Peer-Assisted Tutoring&lt;br&gt;<strong>Applied Mathematics</strong> Modules include: Analytical Mechanics&lt;br&gt;Fluid Mechanics&lt;br&gt;Partial Differential Equations&lt;br&gt;<strong>Mathematics</strong> Modules include: Calculus of Several Variables&lt;br&gt;Groups, Rings and Fields&lt;br&gt;Linear Algebra</td>
</tr>
</tbody>
</table>

## BSc Applied Mathematics, Mathematics & Education

**Prepared for Professional Practice**

- Group Theory<br>- Geometry<br>- Complex Analysis<br>- History of Mathematics

## MSc Mathematics and Science Education

**Qualified to Teach**

- Applied Mathematics Leaving Certificate<br>- Mathematics Leaving Certificate

---

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

---

"I was not certain of my favourite area of Science, so DN200 allowed me to sample a variety of subjects before I decided which area I wanted to focus on. By choosing the Applied Mathematics, Mathematics & Education pathway I was able to continue studying Mathematics while also learning how to best share my enthusiasm for Maths with others through teaching. School placements in both primary and secondary schools are incorporated into the course from First Year, and it took a while to get used to sitting on the other side of the teacher’s desk! I also work as a tutor in the UCD Maths Support Centre, and I enjoy meeting students studying Mathematics from all faculties and answering their questions.

Lucy Nyland, Student
Sample pathway to become a Computer Science and Mathematics teacher

**CAO Code DN200 Option Mathematical, Physical & Geological Sciences (MPG)**

**YEAR 1**
**EDUCATION**
- Modules include:
  - Mathematics & Science Education & Communication

**COMPUTER SCIENCE**
- Modules include:
  - Computer Programming I
  - Computer Programming II

**MATHEMATICS**
- Modules include:
  - Linear Algebra
  - Calculus
  - Applications of Differential Equations
  - Statistical Modelling

**YEAR 2**
**CHOOSE YOUR SUBJECTS**
*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. Modules are subject to change each year.*

**EDUCATION**
- Modules include:
  - Education for Democracy
  - Science and Mathematics Pedagogy

**COMPUTER SCIENCE**
- Modules include:
  - Introduction to Java
  - Introduction to Computer Architecture

**MATHEMATICS**
- Modules include:
  - Calculus of Several Variables
  - Groups, Rings and Fields
  - Linear Algebra
  - Computational Science
  - Vector Calculus

**YEAR 3**
**REFINE YOUR KNOWLEDGE**

**EDUCATION**
- Modules include:
  - Schools and Society

**SCHOOL PLACEMENT**
- Modules include:
  - Post-Primary Placement
  - Peer-Assisted Tutoring
  - Small Group Tutoring

**COMPUTER SCIENCE**
- Modules include:
  - Data Structures and Algorithms
  - Databases and Information Systems
  - Web Design
  - Introduction to Operating Systems

**MATHEMATICS**
- Modules include:
  - Probability Theory

**YEAR 4**
**PREPARE FOR PROFESSIONAL PRACTICE**

**EDUCATION**
- Modules include:
  - Pedagogical Approaches to Mathematics
  - Computer Science Pedagogy
  - Psychology for Teaching and Learning

**SCHOOL PLACEMENT**
- Modules include:
  - Year-Long Placement in Post-Primary School
  - Classroom Teaching
  - Broad Experience of Wider School Context

**COMPUTER SCIENCE AND MATHEMATICS**
- Modules include:
  - Information Ethics
  - Networks and Internet Systems
  - Geometry
  - Complex Analysis
  - History of Mathematics

**YEAR 5**
**BSc Computer Science, Mathematics & Education**

**PREPARE FOR PROFESSIONAL PRACTICE**

**EDUCATION**
- Modules include:
  - Research Methods
  - Professional Dissertation

**SCHOOL PLACEMENT**
- Modules include:
  - Year-Long Placement in Post-Primary School
  - Continuous Professional Development Activities
  - Further Development of Professional Practice Portfolio

**MSc Mathematics and Science Education**

**QUALIFIED TO TEACH**

- Computer Science Leaving Certificate
- Mathematics Leaving Certificate

---

*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. Modules are subject to change each year.*

Assistant Professor Aoibhinn Ní Shúilleabháin
UCD School of Mathematics and Statistics

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Computer Science is a young, exciting discipline that has revolutionised society in only a few decades. Combining Computer Science with Mathematics results in a set of principles that all students can benefit from. Professionals in every walk of life from Art to Zoology can benefit from Computer Science and Mathematics knowledge. How we teach tomorrow’s experts can help them benefit the lives of others. Those that can understand and apply computing and mathematical skills effectively, ethically, and safely will help shape society for generations to come. These are the reasons I find Computer Science and Mathematics Education so interesting and engaging. Our Computer Science, Mathematics & Education course provides a solid preparation to put you in the position of educating tomorrow’s citizens, providing them with knowledge that will not only improve their lives, but help them improve the lives of others.

Dr Brett Becker, Faculty
Learn how to investigate the physical world from the outermost reaches of the universe to the innermost parts of the atom.

Develop skills in how to interpret the physical world, carry out experiments and compare results critically with predictions from theory.

---

**Sample pathway for a degree in Physics**

**YEAR 1**

**PHYSICS**
Modules include:
- Foundations of Physics
- Frontiers of Physics
- Thermal Physics and Materials
- Quanta, Particles and Relativity

**ENGAGE WITH THE PRINCIPLES**

**MATHEMATICS**
Modules include:
- Calculus in the Mathematical and Physical Sciences
- Linear Algebra in the Mathematical and Physical Sciences

**APPLIED & COMPUTATIONAL MATHEMATICS**
Modules include:
- Applied Mathematics: Mechanics and Methods

**YEAR 2**

**PHYSICS**
Modules include:
- Electronics and Devices
- Introductory Quantum Mechanics
- Fields, Waves and Light
- Methods for Physicists
- Thermodynamics & Statistical Physics

**CHOOSE YOUR SUBJECTS**

The subject combinations listed below are illustrative of what a student who graduates in Physics could choose in Year 2. Further subject combinations are possible depending on the choices in Year 1. Further information is available on page 19.

**PHYSICS WITH ASTRONOMY & SPACE SCIENCE**
Modules include:
- Students who chose Physics as their main subject for Second Year may also cover the requirements for Physics with Astronomy & Space Science
- Exploring the Solar System
- Astronomy & Space Science
- Galactic Cosmology

**YEAR 3**

**FOCUS ON YOUR CHOSEN SUBJECT**

**PHYSICS**
Modules include:
- Classical Mechanics & Relativity
- Optics & Lasers
- Electromagnetism
- Advanced Laboratory

**YEAR 4**

**REFINE YOUR KNOWLEDGE**

**PHYSICS**
Modules include:
- Advanced Laboratory
- Applied Quantum Mechanics
- Applied Optics
- General Relativity & Cosmology
- High Energy Particle Physics

**BSc (Honours) Physics**

<table>
<thead>
<tr>
<th>MSc</th>
<th>PhD</th>
<th>Industry</th>
<th>Conversion Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSc NanoBio Science</td>
<td>Students can pursue a PhD in universities in Ireland or abroad in areas as diverse as atomic physics, computational nanobiophysics, particle physics, biophysics, nuclear physics, medical physics, theoretical physics and astrophysics</td>
<td>Energy Technology Sector</td>
<td>Professional Master of Education (PME)</td>
</tr>
<tr>
<td>MSc Meteorology</td>
<td></td>
<td>Medical Physics &amp; Biotechnology</td>
<td>MA Economics</td>
</tr>
<tr>
<td>MSc Space Science &amp; Technology</td>
<td></td>
<td>Material Science &amp; Nanotechnology</td>
<td>Graduate Medicine</td>
</tr>
<tr>
<td>MSc Research</td>
<td></td>
<td>Geoscience &amp; Exploration</td>
<td>Master of Management</td>
</tr>
<tr>
<td>MSc Physics (NL)</td>
<td></td>
<td>ICT Industry</td>
<td></td>
</tr>
<tr>
<td>MSc Nanotechnology</td>
<td></td>
<td>Financial Sector</td>
<td></td>
</tr>
<tr>
<td>MSc Applied Mathematics &amp; Computational Physics</td>
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<td>Meteorology</td>
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<tr>
<td>MSc Computational Physics</td>
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</tbody>
</table>

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"I fell in love with Physics after discovering how much I appreciated being able to see what we learned in the classroom work first-hand in the lab. I visited to the University of Notre Dame to undertake a summer internship studying radioactive materials’ impact on the environment. I am currently in my First Year of a PhD in Particle Physics at the University of Oxford, working with the ATLAS experiment at CERN. There, I research the internal structure of protons and measure a particular decay of the W boson, which carries the force responsible for a kind of nuclear decay."

Eimear Conroy, Graduate

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**www.ucd.ie/myucd/physics**

Associate Professor Emma Sokell
UCD School of Physics
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twitter.com/ucDScience

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Sample pathway for a degree in Physics with Astronomy & Space Science

### ENGAGE WITH THE PRINCIPLES

**PHYSICS**
- Modules include:
  - Foundations of Physics
  - Frontiers of Physics
  - Astronomy & Space Science
  - Thermal Physics and Materials
  - Quanta, Particles and Relativity

**MATHEMATICS**
- Modules include:
  - Calculus in the Mathematical and Physical Sciences
  - Linear Algebra in the Mathematical and Physical Sciences

**APPLIED & COMPUTATIONAL MATHEMATICS**
- Modules include:
  - Applied Mathematics: Mechanics and Methods

### CHOOSING YOUR SUBJECTS

The subject combinations listed below are illustrative of what a student who graduates in Physics with Astronomy & Space Science could choose in Year 2. Further subject combinations are possible depending on the choices in Year 1. Further information is available on page 19.

**PHYSICS WITH ASTRONOMY & SPACE SCIENCE**
- Modules include:
  - Electronics and Devices
  - Introductory Quantum Mechanics
  - Fields, Waves and Light
  - Exploring the Solar System
  - Methods for Physicists
  - Students also study the following topics in Mathematics:
    - Calculus of Several Variables
    - Vector Integral & Differential Calculus
    - Computational Science

**PHYSICS**
- Modules include:
  - Students who choose Physics with Astronomy & Space Science as their main subject for Second Year also cover the requirements for Physics
  - Thermodynamics & Statistical Physics
  - Computational Science

### FOCUS ON YOUR CHOSEN SUBJECT

**PHYSICS WITH ASTRONOMY & SPACE SCIENCE**
- Modules include:
  - Classical Mechanics & Relativity
  - Stellar Astrophysics & Astronomical Techniques
  - Optics and Lasers

**PHYSICS**
- Modules include:
  - Two Elective modules

### REFINING YOUR KNOWLEDGE

**PHYSICS WITH ASTRONOMY & SPACE SCIENCE**
- Modules include:
  - General Relativity & Cosmology
  - Applied Quantum Mechanics
  - Nuclear Physics
  - Computational Biophysics

**PHYSICS**
- Modules include:
  - Two Elective modules

---

**BSc (Honours) Physics with Astronomy & Space Science**

- MSc
  - NanoBio Science
  - Meteorology
  - Space Science & Technology
  - Research
  - Physics (NL)
  - Nanotechnology
  - Applied Mathematics & Computational Physics
  - Computational Physics

- PhD
  - Students can pursue a PhD in universities in Ireland or abroad in areas as diverse as space science, astrophysics, atomic physics, computational nanobio physics, particle physics, biophysics, nuclear physics, medical physics and theoretical physics

- Industry
  - Space Industry
  - Medical Physics & Biotechnology
  - Energy Technology Sector
  - Meteorology
  - ICT Industry
  - Financial Sector
  - Geoscience & Exploration
  - Material Science & Nanotechnology

- Conversion Courses
  - Professional Master of Education (PME)
  - MA in Economics
  - Graduate Medicine
  - Master of Management

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*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. Modules are subject to change each year.

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**Develop practical skills by making astronomical observations using a variety of telescopes**

During my degree, I had the amazing opportunity of being on the team that built I-LOFAR, a research grade radio telescope. For my final year project, I went to Teide Observatory in Tenerife where I observed star clusters with two optical telescopes which was an amazing experience. I completed a Research MSc on EIRSAT-1, Ireland’s first satellite, which is being built in UCD. I have begun a PhD in UCD continuing to work on EIRSAT-1 and I will also be working on gamma-ray burst science which involves studying some of the most violent explosions in the universe.

Rachel Dunwoody,
Graduate

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www.ucd.ie/myucd/physicswithastronomyandspacescience

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Associate Professor John Quinn
UCD School of Physics
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[Image of Dr Antonio Martin-Carrillo on the final year Astronomy Field Trip to Teide Observatory.]
## Theoretical Physics

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

---

### Sample pathway for a degree in Theoretical Physics *

#### YEAR 1

**ENGAGE WITH THE PRINCIPLES**

- **PHYSICS**
  - Modules include:
    - Foundations of Physics
    - Frontiers of Physics
    - Thermal Physics and Materials
    - Quanta, Particles and Relativity

- **MATHEMATICS**
  - Modules include:
    - Calculus in the Mathematical and Physical Sciences
    - Linear Algebra in the Mathematical and Physical Sciences

- **APPLIED & COMPUTATIONAL MATHEMATICS**
  - Modules include:
    - Applied Mathematics: Mechanics and Methods
    - Applications of Differential Equations

#### YEAR 2

**CHOOSE YOUR SUBJECTS**

The subject combinations listed below are illustrative of what a student who graduates in Theoretical Physics could choose in Year 2. Further subject combinations are possible depending on the choices in Year 1. Further information is available on page 19.

- **THEORETICAL PHYSICS**
  - Modules include:
    - Electronics and Devices
    - Introductory Quantum Mechanics
    - Fields, Waves and Light
    - Methods for Physicists
    - Calculus of Several Variables
    - Oscillations and Waves
    - Classical Mechanics and Special Relativity
    - Vector Integral and Differential Calculus
    - Computational Science

- **PHYSICS**
  - Modules include:
    - Students who choose Theoretical Physics as their main subject for Second Year also cover the requirements for Physics.

#### YEAR 3

**FOCUS ON YOUR CHOSEN SUBJECT**

- **THEORETICAL PHYSICS** – Modules include:
  - Analytical Mechanics
  - Partial Differential Equations
  - Electromagnetism
  - Foundations of Fluid Mechanics

- **PHYSICS**
  - Modules include:
    - Quantum Mechanics
    - Functions of One Complex Variable
    - Advanced Laboratory
    - Quantum Theory of Condensed Matter

#### YEAR 4

**REFINE YOUR KNOWLEDGE**

- **THEORETICAL PHYSICS** – Modules include:
  - Theoretical Physics Project
  - Advanced Quantum Mechanics
  - Advanced Mathematical Methods
  - High Energy Particle Physics

- **PHYSICS**
  - Modules include:
    - Nuclear Physics
    - General Relativity & Cosmology
    - Computational Biophysics
    - Relativistic Quantum Mechanics

- **BSc (Honours) Theoretical Physics**

<table>
<thead>
<tr>
<th>MSc</th>
<th>PhD</th>
<th>Industry</th>
<th>Conversion Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSc NanoBio Science</td>
<td>Students can pursue a PhD in universities in Ireland or abroad in areas as diverse as theoretical physics, atomic physics, computational nanobiophysics, particle physics, biophysics, nuclear physics, medical physics and astrophysics</td>
<td>Financial Sector</td>
<td>Professional Master of Education (PME)</td>
</tr>
<tr>
<td>MSc Meteorology</td>
<td></td>
<td>ICT industry</td>
<td>MA Economics</td>
</tr>
<tr>
<td>MSc Space Science &amp; Technology</td>
<td></td>
<td>Material Science &amp; Nanotechnology</td>
<td>Graduate Medicine</td>
</tr>
<tr>
<td>MSc Research</td>
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<td>Medical Physics and Biotechnology</td>
<td>Master of Management</td>
</tr>
<tr>
<td>MSc Physics (NL)</td>
<td></td>
<td>Geoscience &amp; Exploration</td>
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</tbody>
</table>

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*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. Modules are subject to change each year.*
### Sample pathway to become a Physics and Mathematics teacher *

**YEAR 1**

**EDUCATION**
- Modules include:
  - Mathematics & Science Education & Communication

**PHYSICS**
- Modules include:
  - Foundations of Physics
  - Frontiers of Physics

**MATHEMATICS**
- Modules include:
  - Linear Algebra
  - Calculus
  - Applications of Differential Equations
  - Statistical Modelling

**SCIENCE**
- Modules include:
  - Biology
  - Chemistry

**YEAR 2**

**CHOOSE YOUR SUBJECTS**

The subject combinations listed below are illustrative of what a student who graduates in Physics, Mathematics & Education could choose in Year 2. Further subject combinations are possible depending on the choices in Year 1. Further information is available on page 19.

**EDUCATION**
- Modules include:
  - Education for Democracy
  - Science and Mathematics Pedagogy

**PHYSICS**
- Modules include:
  - Quantum Mechanics
  - Electromagnetism and Optics
  - Fields, Waves and Light
  - Methods for Physicists
  - Thermal Physics

**MATHEMATICS**
- Modules include:
  - Vector Integral and Differential Calculus
  - Calculus of Several Variables
  - Analysis

**YEAR 3**

**REFINE YOUR KNOWLEDGE**

**EDUCATION**
- Modules include:
  - Teaching Second-Level Science
  - Schools and Society

**SCHOOL PLACEMENT**
- Modules include:
  - Post-Primary Placement
  - Peer-Assisted Tutoring

**PHYSICS**
- Modules include:
  - Classical Mechanics and Relativity
  - Quantum Mechanics
  - Electromagnetism
  - Nuclear Physics
  - Laboratory Skills

**MATHEMATICS**
- Modules include:
  - Algebraic Structures
  - Probability Theory

**YEAR 4**

**PREPARE FOR PROFESSIONAL PRACTICE**

**EDUCATION**
- Modules include:
  - Psychology for Teaching and Learning
  - Pedagogical Approaches to Mathematics and Science

**SCHOOL PLACEMENT**
- Modules include:
  - Year-Long Placement in Post-Primary School
  - Classroom Teaching
  - Broad Experience of Wider School Context

**PHYSICS**
- Modules include:
  - Particle Physics
  - Group Theory
  - Geometry
  - Complex Analysis
  - History of Mathematics

**MATHEMATICS**
- Modules include:
  - Particle Physics
  - Group Theory
  - Geometry
  - Complex Analysis
  - History of Mathematics

**YEAR 5**

**PREPARE FOR PROFESSIONAL PRACTICE**

**EDUCATION**
- Modules include:
  - Research Methods
  - Professional Dissertation

**SCHOOL PLACEMENT**
- Modules include:
  - Year-Long Placement in Post-Primary School
  - Continuous Professional Development Activities
  - Further Development of Professional Practice Portfolio

**BSc Physics, Mathematics & Education**

**MSc Mathematics and Science Education**

**QUALIFIED TO TEACH**

- Post-Primary School Teacher
  - Physics Leaving Certificate
  - Mathematics Leaving Certificate
  - Science Junior Certificate

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*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. Modules are subject to change each year.

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www.ucd.ie/myucd/physmathed

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Jim Rossiter, Student

The Science DN200 course was a perfect option for me as it allowed me to study all the sciences in First Year before concentrating on my chosen pathway of Physics, Maths & Education. I plan to further my studies to MSc level where I hope to qualify as a post-primary education teacher. Such is the flexibility of this course, however, that many other options are still available to me in both Maths and Physics. UCD offers many opportunities for students to get involved. I have been a member of UCD GAA club since First Year and play with the Men’s Gaelic Football Team. It is a good way of getting a break from time spent studying.

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V1 2021
## Geology

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

A broadly based BSc with emphasis on field courses and research projects in Ireland and abroad structured for a wide range of employment options in the Earth and Environmental Sectors.

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### Second Year field class in the Doolough valley, Co. Mayo.

Maria Noone, Graduate

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### Sample pathway for a degree in Geology *

#### YEAR 1

**ENGAGE WITH THE PRINCIPLES**

**GEOLOGY** – Modules include:

- Introduction to Earth Sciences
- Earth Science and Materials
- Field Geology
- Earth, Environment and Society
- Earth and Humanity
- Mathematics for the Biological & Chemical Sciences
- Scientific Enquiry

- Geology and Earth Science involve applying 'traditional' science subjects to the study of the past, present and future of the Earth System
- Explore across the range of scientific disciplines available to study in UCD

#### YEAR 2

**CHOSE YOUR SUBJECTS**

The subject combinations listed below are illustrative of what a student who graduates in Geology could choose in Year 2.

Further subject combinations are possible depending on the choices in Year 1. Further information is available on page 19.

**GEOLOGY** – Modules include:

- Investigating Minerals
- Earth Structure and Geodata
- Sedimentology and Palaeobiology
- Field Geology and Mapwork
- Global Environmental Change
- Geoscience for Sustainability
- History of Life on Earth
- Medical Geology

- We do not require that students take a specific combination of additional modules...
- Subject to regulations, students are free to select relevant Science modules that they are interested in

#### YEAR 3

**FOCUS ON YOUR CHOSEN SUBJECT**

**GEOLOGY** – Modules include:

- Geological Structures
- Sedimentary environments
- Igneous Petrology
- Geological Mapping
- Geobiology
- Geosystems and Geoenergy
- Geological Fieldwork
- Metamorphic Petrology

- Low Temperature Geochemistry
- Geosynthesis
- Professional Placement - Geosciences
- Geoscience Research Project

#### YEAR 4

**REFINE YOUR KNOWLEDGE**

**GEOLOGY** – Modules include:

- Igneous and Ore Geology
- Advanced Geological Mapping
- Geological Mapping Research
- Geobiology
- Applied Geophysics
- Geological Fieldwork
- Basin Analysis
- Quaternary Geology

- Emphasis on independent learning and research, including a field-based project
- Many modules contain laboratory-based projects and field-based research
- Breadth of course ensures graduates have a wide range of future career options within and outside the discipline

### BSc (Honours) Geology

<table>
<thead>
<tr>
<th>Other Options</th>
<th>PhD</th>
<th>Industry</th>
<th>Conversion Courses</th>
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</thead>
<tbody>
<tr>
<td>Our Geology graduates are routinely sought for careers outside Earth Science including:</td>
<td>Students can pursue a PhD in universities in Ireland or abroad in areas as diverse as hydrocarbon and mineral exploration, volcanic and earthquake hazards, palaeobiology, environmental geochemistry, geophysics and climate change</td>
<td>Resources (oil and mineral exploration and development)</td>
<td>Master of Management</td>
</tr>
<tr>
<td>Management consultancy</td>
<td>Environmental consultancy companies</td>
<td>Hydrogeology and water resources</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>Geological Surveys, Environmental Protection Agencies</td>
<td>Engineering Geology</td>
<td></td>
</tr>
<tr>
<td>Financial services</td>
<td>Oceanography and Marine Geology</td>
<td></td>
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</tr>
</tbody>
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[www.ucd.ie/myucd/geology](http://www.ucd.ie/myucd/geology)

Associate Professor Julian Menuge  
UCD School of Earth Sciences

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V1 2021
UCD Science Events Calendar 2020/21
Create an account at www.myucd.ie for further information and booking

20 October 2020
UCD SCIENCE, SUSTAINABILITY, COMPUTER SCIENCE AND ACTUARIAL & FINANCIAL STUDIES OPEN EVENING FOR 2021 APPLICANTS ONLY
AUDIENCE: 6TH YEAR SECONDARY SCHOOL STUDENTS, A-LEVEL STUDENTS, QQI-FET STUDENTS AND MATURE APPLICANTS. PARENTS AND TEACHERS ARE ALSO WELCOME TO REGISTER FOR ANY ONLINE EVENT.

24 November 2020
COMPUTER SCIENCE OPEN EVENING FOR 2021 APPLICANTS ONLY
AUDIENCE: 6TH YEAR SECONDARY SCHOOL STUDENTS, A-LEVEL STUDENTS, QQI-FET STUDENTS AND MATURE APPLICANTS. PARENTS AND TEACHERS ARE ALSO WELCOME TO REGISTER FOR ANY ONLINE EVENT.

12 January 2021
QQI-FET OPEN DAY FOR ENTRY 2021 APPLICANTS TO SCIENCE DN200, SUSTAINABILITY DN240 & COMPUTER SCIENCE DN201

13 February 2021
UCD SCIENCE, SUSTAINABILITY, COMPUTER SCIENCE AND ACTUARIAL & FINANCIAL STUDIES TASTER LECTURE EVENT FOR ENTRY 2021 APPLICANTS
AUDIENCE: 6TH YEAR SECONDARY SCHOOL STUDENTS, A-LEVEL STUDENTS, QQI-FET STUDENTS AND MATURE APPLICANTS. PARENTS AND TEACHERS ARE ALSO WELCOME TO REGISTER FOR ANY ONLINE EVENT.

9 June 2021
UCD SCIENCE SUMMER SCHOOL FOR 5TH YEAR STUDENTS

10 June 2021
UCD COMPUTER SCIENCE SUMMER SCHOOL FOR 5TH YEAR STUDENTS

The format of these events will be announced in the coming months and the dates listed above are subject to change. We recommend that all students interested in studying at UCD set up their own account on the myUCD website at www.myucd.ie so they can keep up to date with all upcoming events. Please contact gary.dunne@ucd.ie if you have any queries.

Transition Year Students Event: Details about this event will be available in January 2021 on myucd.ie