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This booklet (Version 16 2019) 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, 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 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 (3-months) or longer placements in industry for specific disciplines (5-6 months).

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.
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 26 different subjects.

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

**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.

**Semester**
The academic year is divided into semesters. Undergraduate programmes in UCD have two semesters. Semester 1 runs from September to December and Semester 2 runs from January to May.

**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 (MPC) and No Preference (NPF). Streams are used to categorise the 26 different subjects available as degree options available 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.
Information on Classes

Module
A self-contained unit of teaching and learning, which is usually studied over one semester. 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 (In-Programme Electives) or allow you to explore subjects outside of your area of study (General Electives). 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.
### Science Careers Map

This is a summary of some of the opportunities for graduates:

- **Pharmaceuticals, Biotechnology, Medical Devices, Clinical Trials, Chemical Industry & Hospitals**
- **Energy, Climate Conservation & Environment**
- **Natural Resources**
- **Computing, Risk, Finance & Analytics**
- **Semiconductor, Nanotechnology, Meteorology & Space Industry**
- **Further Education & Research**

### Degrees

<table>
<thead>
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<th>Natural Resources</th>
<th>Energy, Climate Conservation &amp; Environment</th>
</tr>
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<tbody>
<tr>
<td>- BSc Geology</td>
<td>- BSc Biochemistry &amp; Molecular Biology</td>
</tr>
<tr>
<td>- BSc Environmental Biology</td>
<td>- BSc Cell &amp; Molecular Biology</td>
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<td>- BSc Genetics</td>
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<td>- BSc Microbiology</td>
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<td>- BSc Chemistry with Environmental &amp; Sustainable Chemistry</td>
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<td></td>
<td>- BSc Medicinal Chemistry &amp; Chemical Biology</td>
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</tbody>
</table>

### Careers

#### Natural Resources

- Environmental Consultant
- Environmental Officer
- Plant Scientist
- Conservation Scientist
- Environmental Manager
- Emissions Control Manager
- Photovoltaic Engineer

#### Energy, Climate Conservation & Environment

- QA/QC Analyst
- Analytical Chemist
- Microbiologist
- Environmental Scientist
- Clinical Research Associate
- Biochemist
- Medical Physicist

The information given is a guide only and does not bind the University in any way.
Science Careers Map

The sectors and job titles below are examples only. Each BSc and BAFS degree maps to different jobs, depending on the qualification and skills required for a particular job.

* Includes Professional Placement

Computing, Risk, Finance & Analytics

Degrees
- BSc Computer Science
- BSc Applied & Computational Mathematics
- BAFS Actuarial & Financial Studies*
- BSc Financial Mathematics
- BSc Mathematics

Careers
- BSc Mathematical Science
- BSc Statistics
- BSc Physics
- BSc Theoretical Physics
- BSc Physics with Astronomy & Space Science

Semiconductor, Nanotechnology, Meteorology & Space Industry

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

Careers
- Depending on the degree, careers include:
  - Semiconductor Engineer
  - Meteorologist
  - Medical Device Engineer
  - Materials Scientist
  - Radiation Protection Officer

Further Education & Research

Degrees
- PME Science/Maths Teacher
- MSc, PhD – Academia/Research
- Graduate Veterinary Medicine
- Graduate Medicine
- Graduate Entry to Pharmacy

Careers
- Depending on the degree, careers include:
  - Science Teacher
  - Medical Doctor
  - Vet
  - Pharmacist

The information given is a guide only and does not bind the University in any way.
UCD Science, Computer Science and Actuarial & Financial Studies Internships

We are committed to helping our students prepare for their careers throughout their time studying at UCD.

Plan Your Career Path

First Year – Get Involved
- Visit the Career Development Centre in your first year. [www.ucd.ie/careers](http://www.ucd.ie/careers)
- Check out modules that cover career and professional development and identify modules you might like to take over the coming years.
- Consider the elective module “Prepare for your Future Career”.

Second and Third Year – Explore Your Career Options
- There is a career development lecture included in biology, biomolecular, maths and chemistry modules in second year which will introduce you to career planning.
- The Career Centre has 562 companies on their database. Identify company talks or workshops you’d like to attend.
- Consider an internship or work placement during your studies.
- Develop a CV and cover letter plus develop your interview skills.

Fourth Year
- Research job opportunities and graduate studies.
- Attend career fairs at UCD or at GradIreland, usually held in the RDS, Dublin.
- Check all deadlines for PhD funding opportunities and for MSc courses. Some are in the first semester of your fourth year so plan ahead.
- Find out which companies have graduate programmes.

Internship Programmes
- We have recently introduced a Professional Science Placement that allows you to validate credits by completing a Summer Internship (3-months) or depending on specific disciplines a longer placement in industry (5-6 months). Third year students can avail of the Placement programme in the following disciplines:
  - Chemistry
  - Biomolecular and Biomedical Science
  - Biology and Environmental Science
  - Computer Science
  - Mathematics
  - Earth Science
  - Physiology
- The Actuarial and Financial Studies degree has a 6 month professional placement built into the programme where students have the opportunity to work in industry.
- Our internship manager, Carla Naltchayan, prepares students for the application process which is competitive in the same way as applying for a graduate course or your first job and sources internship opportunities in each sector.
- Science, Mathematics & Education degrees also have a teaching placement built into the programmes, where students have the opportunity to work with schools and teachers.

What Our Students Say

Béga Murray, Genetics
I completed a six-month internship at the European Molecular Biological Laboratory (EMBL) in Heidelberg, Germany. I worked within the Korbel group of the Genome Biology Unit. This group focuses on genomic structural variants, both the underlying mechanisms and resulting phenotypic effects. I was interested in this group due to their combined use of computational and laboratory techniques for performing their research.

Clíodhna Connolly, Computer Science
I completed a Summer Internship with Deloitte 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.

You can read the full blog posts about our students’ internships experiences at [www.myucdblog.com/category/science/](http://www.myucdblog.com/category/science/)
Ireland at a Glance

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

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
- Allianz

Over 1000

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

9 OUT OF 10 GLOBAL PHARMACEUTICAL CORPORATIONS

- Genzyme
- Lilly
- Johnson & Johnson
- Bayer
- GlaxoSmithKline
- Wyeth
- Pfizer
- Schering-Plough
- Abbott

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

The 10 Top Ten

“Born on the Internet” companies are based in Ireland

- Facebook
- Google
- eBay
- Skype
- PayPal

Worldwide security software companies are located in Ireland

Overseas companies have chosen Ireland as their strategic location in Europe.
The DN230 Actuarial & Financial Studies course will prepare you for a professional career in the actuarial or financial professions.

Maximum exemptions
from Core Technical series examinations (CT1:8) as well as the Core Applications CA1 examination of the Institute and Faculty of Actuaries. The Institute and Faculty of Actuaries, which accredits this programme, are currently in the process of updating its syllabus and hence the titles and contents of the subjects listed are subject to change. For ongoing updates on this process please see https://www.actuaries.org.uk/studying/curriculum-2019.

Frequently Asked Questions

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

A: Students must successfully complete 15 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. The UCD Actuarial & Financial Studies programme offers the maximum exemptions available from the professional exams.

**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 at the Society of Actuaries at web.actuaries.ie

**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 are secured through a competitive process.

Further information on becoming an actuary is available at the Society of Actuaries at web.actuaries.ie
Actuarial & Financial Studies
CAO code: DN230

Sample pathway for a degree in Actuarial & Financial Studies *

**YEAR 1**

**ENAGE WITH THE PRINCIPLES**

**ACTUARIAL & FINANCIAL STUDIES**
Topics include:

- Linear Algebra
- Advanced Calculus
- Statistical Modelling
- Introduction to Actuarial & Financial Studies
- Fundamentals of Actuarial Business Theory
- Introduction to Programming
- Financial Accounting
- Math Modelling
- Principles of Finance
- Two Elective modules

**YEAR 2**

**BROADEN YOUR KNOWLEDGE**

**ACTUARIAL & FINANCIAL STUDIES**
Topics include:

- Economic History
- Financial & Actuarial Mathematics
- Probability Theory
- Inferential Statistics
- Advanced Corporate Finance
- Statistics
- Fundamentals of Actuarial Mathematics
- Two Elective modules

**YEAR 3**

**REFINE YOUR KNOWLEDGE**

**ACTUARIAL & FINANCIAL STUDIES** – Topics include:

- Investing, Investment, Psychology and Trading
- Models – Stochastic Models
- Time Series Analysis
- Models – Survival
- Information Management for Actuaries
- Workplace Skills
- BAFS Professional Work Placement (at least 6 months)
- One Elective module

**YEAR 4**

**REFINE YOUR KNOWLEDGE**

**ACTUARIAL & FINANCIAL STUDIES**
Topics include:

- Ethics, professionalism and risk regulation
- Actuarial Statistics
- Actuarial Risk Management
- Financial and Actuarial Mathematics
- Actuarial Mathematics
- One Elective Module
- One Option

**BAFS (Honours) Actuarial and Financial Studies**

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<td>Life</td>
<td>Students can pursue a PhD in Ireland or abroad in areas as diverse as: Mathematics, Statistics and Actuarial studies</td>
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<tr>
<td>Pensions</td>
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<td><strong>MSc Mathematical Sciences</strong></td>
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<tr>
<td>Investment</td>
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<td><strong>MSc Mathematics</strong></td>
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<td>Health</td>
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<td><strong>MSc Statistics</strong></td>
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<td>General Insurance</td>
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<td>Banking or Finance</td>
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<td>Trading</td>
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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. Topics are subject to change each year.

Learn how actuaries understand the nature of risk and find ways to manage it

Develop the analytical skills and business knowledge necessary to design and manage programmes that control risk for the insurance and pension sectors

---

Sean Roe, Graduate

The wide recognition of the BAFS course was really useful in applying for jobs. The BAFS course was great preparation for the further actuarial exams and left me with a very sound technical knowledge in this area. Doing the work placement on the BAFS course was a huge help, and meant I could settle into the work environment very quickly.

www.ucd.ie/myucd/actuarialandfinancialstudies
The DN201 Computer Science course is mainly a software engineering degree and is suitable for students with or without previous programming experience.

**Frequently Asked Questions**

**Q: Do I need to have prior experience of programming?**

A: No. Computer Science DN201 is mainly a software engineering degree and 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.
Sample pathway for a degree in Computer Science *

**COMPUTER SCIENCE**
Topics include:
- Algorithmic Problem-Solving
- Computer Programming
- Introduction to Computer Architecture
- Formal Foundations
- Computer Science in Practice
- Software Engineering Project I
- Linear Algebra II
- Databases and Information Systems I
- Introduction to Operating Systems
- Introduction to Functional Programming

**MATHMATICS**
Topics include:
- Matrix Algebra
- Foundations of Mathematics for Computer Science
- Two Elective modules

**BROADEN YOUR KNOWLEDGE**

**COMPUTER SCIENCE** – Topics include:
- Data Structures & Algorithms
- Introduction to Java
- Discrete Mathematics
- Software Engineering Project II
- Algorithmic Problem-Solving
- Network Security
- Operating Systems
- Software Engineering Project I
- Artificial Intelligence
- Software Engineering Project II
- Compiler Construction
- Programme Construction II
- Cloud Computing
- Practical Android Programming
- Mobile App Development
- Two Elective modules

**FOCUS ON YOUR CHOSEN SUBJECT**

**COMPUTER SCIENCE** – Topics include:
- Foundations of Computing
- Networks and Internet Systems
- Object-Oriented Programming
- Software Engineering Project III
- Introduction to Artificial Intelligence
- Program Construction I
- Multimedia Security & Data Hiding
- Distributed Systems
- Advances in Wireless Networking
- Computer Graphics I
- Processor Design
- Graphs and Networks
- Information Theory
- Two Elective modules

**REFINE YOUR KNOWLEDGE**

**BSc (Honours) Computer Science**

<table>
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<th>Research</th>
<th>Industry</th>
<th>Conversion Courses</th>
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<tr>
<td>MSc Computer Science (Negotiated Learning)</td>
<td>Many graduates pursue MSc and PhD studies as well as postdoctoral research in Ireland and abroad in diverse areas such as:</td>
<td>High-Tech Sector</td>
<td>UCD Smurfit Business School postgraduate degrees, e.g., Master of Management</td>
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<tr>
<td>MSc Digital Investigation &amp; Forensic Computing</td>
<td>Artificial Intelligence</td>
<td>Financial Sector</td>
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<tr>
<td>MSc Cognitive Science</td>
<td>Software and Systems Engineering</td>
<td>Consultancies</td>
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<td>Networks and Distributed Systems</td>
<td>R&amp;D</td>
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<td>UCD Tech Start-ups</td>
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<td>Education (Third Level)</td>
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Professor Pádraig Cunningham
UDC School of Computer Science

ComputerScience@ucd.ie
+353 1 716 2483
facebook.com/UCDSScience
twitter.com/ucdscience

Caroline Keiller, Horea Catanase and Alan Fitzpatrick “visualising a goal” as part of Computer Science module Project Management.

Image by Niall Hayes © UCD

- 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 such as Windows, Unix and Linux

Ryan Kane, Student

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.

www.ucd.ie/myucd/computerscience
Sample pathway for a degree in Computer Science with Data Science

**YEAR 1**

**ENGAGE WITH THE PRINCIPLES**

**COMPUTER SCIENCE**
- Topics include:
  - Algorithmic Problem-Solving
  - Computer Programming
  - Introduction to Computer Architecture

**MATHEMATICS**
- Topics include:
  - Formal Foundations
  - Computer Science in Practice
  - Software Engineering Project I

**YEAR 2**

**BROADEN YOUR KNOWLEDGE**

**COMPUTER SCIENCE WITH DATA SCIENCE**
- Topics include:
  - Data Structures & Algorithms
  - Introduction to Java
  - Discrete Mathematics for Computer Science
  - Software Engineering Project II

**YEAR 3**

**FOCUS ON YOUR CHOSEN SUBJECT**

**COMPUTER SCIENCE WITH DATA SCIENCE**
- Topics include:
  - Data Science in Python
  - Introduction to Project Management
  - Probability Theory

**YEAR 4**

**REFINE YOUR KNOWLEDGE**

**COMPUTER SCIENCE WITH DATA SCIENCE**
- Topics include:
  - Data Science Project
  - Machine Learning
  - Cloud Computing
  - Data Mining

<table>
<thead>
<tr>
<th>MSc (Taught)</th>
<th>Research</th>
<th>Industry</th>
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<td>MSc Computer Science (Negotiated Learning)</td>
<td>Many graduates pursue MSc and PhD studies as well as postdoctoral research in Ireland and abroad in diverse areas such as:</td>
<td>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</td>
<td>UCD Smurfit Business School postgraduate degrees, e.g., Master of Management</td>
</tr>
<tr>
<td>MSc Digital Investigation &amp; Forensic Computing</td>
<td>Artificial Intelligence Software and Systems Engineering Networks and Distributed Systems</td>
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<tr>
<td>MSc Cognitive Science</td>
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</tbody>
</table>

BSc (Honours) Computer Science with Data Science

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

---

Lily Burke, Student

Technology has always fascinated me and I knew the field would offer many career options. I researched a lot of courses but DN201 stood out. I completed two software engineering internships with Intel during the summers of first and second year, as well as a five month data science internship worth 15 credits in third year. The industry experience allows you to apply your skills and having the chance to work in teams with highly talented engineers is an incredibly challenging yet rewarding experience. When I graduate, I hope to work in technical project management, or similar software engineering leadership roles.

The first year of the DN200 Science programme is designed to enable you to sample a number of subjects in your chosen area. 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.

**Did You Know?**
Students have the option to become Science and Maths teachers at post-primary level through DN200 Science via one of 4 Teaching Council approved pathways.

**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 26 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.
I entered through DN200 No Preference and in my first year had the opportunity to study Maths, Chemistry, Physics and Biology at University level. After completing modules in Biochemistry, Neuroscience, Physiology, Pharmacology and Genetics in second year, I chose to specialise in Biochemistry & Molecular Biology. 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 sciences. During my degree, I have delved into key components of Biochemistry such as metabolism, molecular basis of diseases, proteins and enzymes while also being able to maintain my love of Spanish and music through the electives I have undertaken.

Alison Howett, Student

**Sample pathway for a degree in Biochemistry & Molecular Biology**

**YEAR 1**

**BIOTECHNOLOGY**
Topics include:
- Biotechnology
- Molecular Genetics
- Molecular Biology
- Cell Biology
- Genetic Engineering
- Molecular Medicine

**CHEMISTRY & PHARMACOLOGY**
Topics include:
- Biotechnology
- Molecular Genetics
- Molecular Biology
- Cell Biology
- Genetic Engineering
- Molecular Medicine

**MATHEMATICS**
Topics include:
- Mathematics for Biotechnology
- Biotechnology
- Molecular Genetics
- Molecular Biology
- Cell Biology
- Genetic Engineering
- Molecular Medicine

**ENGAGE WITH THE PRINCIPLES**
- Two Elective modules
- One Small-Group Project

**YEAR 2**

**BIOLOGY**
Topics include:
- Principles of Biochemistry
- Molecular Genetics
- Molecular Biology
- Cell Biology
- Genetic Engineering
- Molecular Medicine

**CHEMISTRY**
Topics include:
- The Basis of Organic and Biological Chemistry
- Molecular Genetics
- Molecular Biology
- Cell Biology
- Genetic Engineering
- Molecular Medicine

**MATHEMATICS**
Topics include:
- Mathematics for Biotechnology
- Molecular Genetics
- Molecular Biology
- Cell Biology
- Genetic Engineering
- Molecular Medicine

**FOCUS ON YOUR CHOSEN SUBJECT**

**BIOCHEMISTRY & MOLECULAR BIOLOGY**
- Topics include:

**YEAR 3**

**BIOCHEMISTRY & MOLECULAR BIOLOGY**
- Topics include:

**YEAR 4**

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

**Biochemistry Research Project**
- Students can pursue a PhD in universities in Ireland or abroad in areas as diverse as medical research, drug development and biomedical science

**PhD**
- Three optional modules on topics such as cancer, genetics, microbiology and pharmacology

**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. Topics are subject to change each year.*
Cell & Molecular Biology
CAO code: DN200  Option: Biological, Biomedical and Biomolecular Science (BBB)

Sample pathway for a degree in Cell & Molecular Biology

**ENGAGE WITH THE PRINCIPLES**

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

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

**MATHEMATICS**
Topics include:
- Two Elective modules
- One Small-Group Project

**CHOSE YOUR SUBJECTS**

**CELL & MOLECULAR BIOLOGY**
Topics include:
- Biological Systems
- Principles of Cell Biology
- Principles of Genetics
- Chemistry for Biologists
- Biomolecular Laboratory Skills

**MICROBIOLOGY**
Topics include:
- Metabolic and Immune Systems
- Principles of Microbiology

**GENETICS**
Topics include:
- Principles of Genetics
- Molecular Genetics and Biotechnology

**FOCUS ON YOUR CHOSEN SUBJECT**

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

**REFINE YOUR KNOWLEDGE**

**CELL & MOLECULAR BIOLOGY** – Topics include:
- Cell Signalling
- Epithelial Transport
- Biological Imaging
- Human Genetics & Disease
- Cell Biology of Cancer
- Cell Biology of Ageing

**MSC (Taught)**

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

- 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

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

**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. Topics are subject to change each year.

Upon completion of my Cell and Molecular Biology degree, I pursued a Masters in Management at University College London, with the intention to combine both to eventually manage a venture capital trust with a pharmaceutical focus. My degree has given me the necessary skills to carefully interpret and assess existing literature, problem solve, critically evaluate, and manage my time effectively.

Paula Burke, Graduate

www.ucd.ie/myucd/cellandmolecularbiology

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**i**

Professor Jeremy Simpson
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twitter.com/ucdscience

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- Learn why healthy cells become cancerous, what happens at a cellular level in diseases and the basic concept of genetics
- Develop practical skills in microscopy, cellular assays and diagnostic techniques used in industry, hospitals and research labs
# Environmental Biology

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

![Rare Festoon butterfly taken on a third year field trip to Spain. Image by Professor Tasman Crowe © UCD](image)

- 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

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## Sample pathway for a degree in Environmental Biology *

<table>
<thead>
<tr>
<th>YEAR</th>
<th>BIOLOGY</th>
<th>CHEMISTRY</th>
<th>MATHEMATICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Biology in Action</td>
<td>The Basis of Organic and Biological Chemistry</td>
<td>Topics include:</td>
</tr>
<tr>
<td></td>
<td>Life on Earth</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cell Biology &amp; Genetics</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Biomedical Sciences</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>ENGLISH WITH THE PRINCIPLES</strong></td>
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</tr>
<tr>
<td>2</td>
<td><strong>ENVIRONMENTAL BIOLOGY</strong></td>
<td><strong>ZOOLOGY</strong></td>
<td><strong>PLANT BIOLOGY</strong></td>
</tr>
<tr>
<td></td>
<td>Topics include:</td>
<td>Topics include:</td>
<td>Topics include:</td>
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<tr>
<td></td>
<td>Principles of Environmental Biology and Ecology</td>
<td>Principles of Zoology</td>
<td>Principles of Plant Biology and Biotechnology</td>
</tr>
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<td></td>
<td>Biological Systems</td>
<td>Animal Behaviour</td>
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<tr>
<td></td>
<td>Evolutionary Biology</td>
<td>Molecular Genetics and Biotechnology</td>
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<tr>
<td></td>
<td>Microbial Interactions</td>
<td>Global Environmental Change</td>
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<tr>
<td></td>
<td>Global Environmental Change</td>
<td>Forests, Climate and Carbon</td>
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<tr>
<td></td>
<td>Forests, Climate and Carbon</td>
<td>Applied Plant Biology</td>
<td></td>
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<tr>
<td>3</td>
<td><strong>FOCUS YOUR CHosen SUBJECT</strong></td>
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<tr>
<td></td>
<td><strong>ENVIRO NMENTAL BIOLOGY</strong> – Topics include:</td>
<td><strong>ENVIRONMENTAL BIOLOGY</strong> – Topics include:</td>
<td><strong>ENVIRO NMENTAL BIOLOGY</strong> – Topics include:</td>
</tr>
<tr>
<td></td>
<td>Environmental Biology Research Project</td>
<td>Insect-Plant Interactions</td>
<td>Tropical Field Ecology</td>
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<td></td>
<td>Marine Community Ecology</td>
<td>Ecological Modelling and QGIS</td>
<td>Environmental Impact Assessment</td>
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<td></td>
<td>Bioassessment of Freshwaters</td>
<td>Biodiversity</td>
<td>Peatlands and Environmental Change</td>
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<tr>
<td></td>
<td>Biological Inversions</td>
<td>Foodborne Pathogens</td>
<td></td>
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<tr>
<td>4</td>
<td><strong>REFINE YOUR KNOWLEDGE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Environmental Biology Research Project</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Insect-Plant Interactions</td>
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<tr>
<td></td>
<td>Ecological Modelling and QGIS</td>
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<tr>
<td></td>
<td>Biodiversity</td>
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<tr>
<td></td>
<td>Foodborne Pathogens</td>
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</tbody>
</table>

**BSc (Taught) Environmental Biology**

<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 such as ecology, microbiology, fisheries, conservation biology, environmental management and global change</td>
<td>National Parks and Wildlife Services</td>
<td></td>
</tr>
<tr>
<td>MSc World Heritage Management</td>
<td></td>
<td>Environmental Management with State agencies, companies or consultancies</td>
<td></td>
</tr>
<tr>
<td>MSc Plant Biology &amp; Biotechnology</td>
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<td>Semi-State bodies such as the EPA and BIM and NGOs such as An Taisce</td>
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<tr>
<td></td>
<td></td>
<td>Conservation Organisations</td>
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<tr>
<td></td>
<td></td>
<td>Agriculture and Aquaculture</td>
<td></td>
</tr>
</tbody>
</table>

**Associate Professor Tom Wilkinson**  
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twitter.com/ucdscience  

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Olga Lastovetsky, Graduate

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[www.ucd.ie/myucd/environmentalbiology](http://www.ucd.ie/myucd/environmentalbiology)
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.

Image by Dr Yolanda Alvarez © UCD

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

Karen Grimes, Graduate
Microbiology
CAO code: DN200  Option: Biological, Biomedical and Biomolecular Science (BBB)

Sample pathway for a degree in Microbiology *

<table>
<thead>
<tr>
<th>YEAR 1</th>
<th>ENGAGE WITH THE PRINCIPLES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BIOLOGY</strong> Topics include:</td>
<td><strong>CHEMISTRY</strong> Topics include:</td>
</tr>
<tr>
<td>• Biology in Action</td>
<td>• The Basis of Organic and Biological Chemistry</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>
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<table>
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<tr>
<th>YEAR 2</th>
<th>CHOOSE YOUR SUBJECTS</th>
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</thead>
<tbody>
<tr>
<td><strong>MICROBIOLOGY</strong> Topics include:</td>
<td><strong>CELL &amp; MOLECULAR BIOLOGY</strong> Topics include:</td>
</tr>
<tr>
<td>• Chemistry for Biologists</td>
<td>• Biological Systems</td>
</tr>
<tr>
<td>• Molecular Genetics and Biotechnology</td>
<td>• Principles of Cell and Molecular Biology</td>
</tr>
<tr>
<td>• Biennial Laboratory Skills</td>
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</tr>
<tr>
<td>• Metabolic and Immune Systems</td>
<td></td>
</tr>
<tr>
<td>• Principles of Microbiology: Medicine, Environment and Biotechnology</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>YEAR 3</th>
<th>FOCUS ON YOUR CHOSEN SUBJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MICROBIOLOGY</strong> – Topics include:</td>
<td><strong>MICROBIOLOGY</strong> – Topics include:</td>
</tr>
<tr>
<td>• Regulation of Gene Expression</td>
<td>• Systems Microbiology</td>
</tr>
<tr>
<td>• Microbial Cell Factory</td>
<td>• Microbial Pathogenicity</td>
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<tr>
<td>• Applied Microbiology</td>
<td>• Enzyme Technology</td>
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<tr>
<td>• Microbial Diversity &amp; Growth</td>
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<td>• Microbial Physiology</td>
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<td>• Medical Microbiology</td>
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<tr>
<td></td>
<td>• Skills in Microbiology</td>
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<tr>
<td></td>
<td>• Ecology &amp; Environmental Microbiology</td>
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<table>
<thead>
<tr>
<th>YEAR 4</th>
<th>REFINE YOUR KNOWLEDGE</th>
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</thead>
<tbody>
<tr>
<td><strong>MICROBIOLOGY</strong></td>
<td><strong>BSc (Honours) Microbiology</strong></td>
</tr>
<tr>
<td>• Microbiology Research Project/Internship</td>
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</tr>
<tr>
<td>• Ecological &amp; Environmental Microbiology</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>MSc (Taught)</th>
<th>PhD</th>
<th>Industry</th>
<th>Conversion Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• MSc Biotechnology</td>
<td>• Students can pursue a PhD in universities in Ireland or abroad in areas as diverse as Biotechnology, Environmental Biology, Medical and Veterinary Sciences</td>
<td>• Pharmaceutical Companies</td>
<td>• Professional Master of Education (PME)</td>
</tr>
<tr>
<td>• MSc Biotechnology &amp; Business</td>
<td></td>
<td>• Food and food-related companies</td>
<td>• Graduate Veterinary Medicine</td>
</tr>
<tr>
<td>• MSc Environmental Management</td>
<td></td>
<td>• (Veterinary) Hospitals and related laboratories</td>
<td>• Graduate Medicine</td>
</tr>
<tr>
<td>• MSc Regulatory Affairs &amp; Toxicology</td>
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<td></td>
<td>• Medical Scientist</td>
</tr>
<tr>
<td>• MSc Plant Biology &amp; Biotechnology</td>
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<td></td>
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<tr>
<td>• MSc Biotherapeutics</td>
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</tbody>
</table>

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Emma Cullen in a Microbiology practical in the new UCD O’Brien Centre for Science.

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. Through my course and extracurricular activities, UCD has helped me to figure out what I want to do with my career, and when I graduate I hope to do a Masters in Biotherapeutics and Business.

Caomh Cullen, Student

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Caomh Cullen, Student

www.ucd.ie/myucd/microbiology

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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. Topics are subject to change each year.
Examining embryos at different stages of development. Image by Ciara O’Hanlon © UCD

- Learn how to employ state-of-the-art techniques to study the nervous system at the molecular, cellular and behavioural levels

I discovered that I was fascinated by the brain and nervous system, so I chose Neuroscience as my final degree subject. My course offers a combination of practical and theoretical studies, ranging from lectures on the ground-breaking research taking place in neurodegenerative disease, to monitoring my own brain waves via an electroencephalogram in the lab.

Katie O’Byrne, Student
# Pharmacology

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

## Sample pathway for a degree in Pharmacology *

<table>
<thead>
<tr>
<th>YEAR</th>
<th>ENGAGE WITH THE PRINCIPLES</th>
<th>CHOOSE YOUR SUBJECTS</th>
<th>FOCUS ON YOUR CHOSEN SUBJECT</th>
<th>REFINE YOUR KNOWLEDGE</th>
<th>CONVERSION COURSES</th>
</tr>
</thead>
</table>
| 1    | **BIOLOGY**  
Topics include:  
- Biology in Action  
- Life on Earth  
- Cell Biology & Genetics  
- Biomedical Sciences | **CHEMISTRY**  
Topics include:  
- The Basis of Organic and Biological Chemistry | **MATHMATICS**  
Topics include:  
- Mathematics for the Biological & Chemical Sciences | **PHARMACOLOGY** – Topics include:  
- Cell Signalling  
- Biostatistics  
- Drug action in body systems  
- Chemotherapeutic agents | **Two Elective modules  
One Small-Group Project** |
| 2    | **PHARMACOLOGY**  
Topics include:  
- Chemistry for Biologists  
- Molecular Genetics and Biotechnology  
- Metabolic and Immune Systems  
- Biomolecular Laboratory Skills  
- Pharmacology: Biomedical Science of Drugs | **PHYSIOLOGY**  
Topics include:  
- Introduction to Physiology  
- Organs and Systems Physiology | **MICROBIOLOGY**  
Topics include:  
- Principles of Microbiology: Medicine, Environment and Biotechnology | **PHARMACOLOGY** – Topics include:  
- Drugs used in CNS diseases  
- Advanced CNS Pharmacology  
- Toxicology  
- Molecular Pharmacology | **Two Elective modules** |
| 3    | **FOCUS ON YOUR CHOSEN SUBJECT** | **REFINE YOUR KNOWLEDGE** | **BSc (Honours) Pharmacology** | **Conversion Courses** |  |
| 4    | **FOCUS ON YOUR CHOSEN SUBJECT** | **REFINE YOUR KNOWLEDGE** | **BSc (Honours) Pharmacology** | **Conversion Courses** |  |
|      | **REFINE YOUR KNOWLEDGE** |  | **CONVERSION COURSES** |  |  |

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

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### My keen interest in biomedical science and healthcare led me to choose Pharmacology at UCD. I acquired a strong scientific background during my degree, which facilitated a smooth transition into my postgraduate studies in my MSc Biotechnology & Business (UCD). I obtained an internship in a life science venture capital firm upon graduating from my MSc and was subsequently made permanent.

Jennifer McKeever, Graduate

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**www.ucd.ie/myucd/pharmacology**

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### Associate Professor John Crean
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facebook.com/UCDScience  
twitter.com/ucdscience
Physiology

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

Sample pathway for a degree in Physiology *

**ENGAGE WITH THE PRINCIPLES**

### YEAR 1

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

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

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

### YEAR 2

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

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

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

<table>
<thead>
<tr>
<th>Two Elective modules</th>
<th>One Small-Group Project</th>
</tr>
</thead>
</table>

### YEAR 3

**FOCUS ON YOUR CHOSEN SUBJECT**

**PHYSIOLOGY** – Topics include:
- Cardiovascular System
- Biostatistics
- Experimental Physiology
- Endocrine/Reproductive Physiology

**NEUROSCIENCE** – Topics include:
- Haemostasis and Thrombosis
- Adaptation to Hypoxia
- Physiological Genomics

**MICROBIOLOGY** – Topics include:
- The Physiology of Disease
- Fundamentals of Physiological Research

### YEAR 4

**REFINE YOUR KNOWLEDGE**

**Physiology Research Project**
- Lung Function Under Stress
- Control of Vascular Resistance

**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**

**Industry**
- Pharmaceutical Research (Laboratory)
- Clinical Research Associate
- Pharmaceutical Industry Sales

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

<table>
<thead>
<tr>
<th>Two Elective modules</th>
</tr>
</thead>
</table>

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twitter.com/ucdscience

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Physiology students working on an experiment in the Conway institute. Image by Niall Hayes © UCD

- Understand normal and abnormal processes within the body in health and disease
- Explore various body organs and their functions as well as an understanding of the structure and function of key biomolecules

“
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,
Student

---

www.ucd.ie/myucd/physiology

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---
**Plant Biology**

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

---

**Sample pathway for a degree in Plant Biology**

<table>
<thead>
<tr>
<th>YEAR 1</th>
<th>ENGAGE WITH THE PRINCIPLES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BIOLOGY</strong> Topics include:</td>
<td><strong>CHEMISTRY</strong> Topics include:</td>
</tr>
<tr>
<td>Biology in Action</td>
<td>The Basis of Organic and Biological Chemistry</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>
</tbody>
</table>

<table>
<thead>
<tr>
<th>YEAR 2</th>
<th>CHOOSE YOUR SUBJECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PLANT BIOLOGY</strong> Topics include:</td>
<td><strong>ENVIRONMENTAL BIOLOGY</strong> Topics include:</td>
</tr>
<tr>
<td>Chemistry for Biologists</td>
<td>Principles of Environmental Biology and Ecology</td>
</tr>
<tr>
<td>Biological Systems</td>
<td></td>
</tr>
<tr>
<td>Principles of Plant Biology and Biotechnology</td>
<td></td>
</tr>
<tr>
<td>Biomolecular Lab Skills</td>
<td></td>
</tr>
<tr>
<td>Principles of Cell and Molecular Biology</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>YEAR 3</th>
<th>FOCUS ON YOUR CHOSEN SUBJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PLANT BIOLOGY</strong> – Topics include:</td>
<td><strong>PLANT BIOLOGY</strong> – Topics include:</td>
</tr>
<tr>
<td>Plant Diseases</td>
<td>Plant Cell Growth &amp; Signalling</td>
</tr>
<tr>
<td>Plant Form &amp; Function</td>
<td>Working with Biological Data</td>
</tr>
<tr>
<td>Plant Biotechnology</td>
<td>Genetics</td>
</tr>
<tr>
<td>Plant Growth &amp; Nutrients</td>
<td>Systems Ecology</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>YEAR 4</th>
<th>REFINE YOUR KNOWLEDGE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PLANT BIOLOGY</strong></td>
<td><strong>BSc (Honours) Plant Biology</strong></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

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---

"My UCD degree has provided me with the opportunity to work abroad and it has also allowed me to travel all over Europe and even to China as part of my current research."  
Padraic Flood, Graduate

---

Visit **www.ucd.ie/myucd/planbiology** for more information.
Zoology

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

Sample pathway for a degree in Zoology *

**YEAR 1**

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

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

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

**YEAR 2**

**CHOOSE YOUR SUBJECTS**

**ZOOLOGY**
Topics include:  
- Principles of Zoology  
- Biological Systems  
- Animal Behaviour  
- Molecular Genetics and Biotechnology  
- Chemistry for Biologists

**ENVIRONMENTAL BIOLOGY**
Topics include:  
- Principles of Environmental Biology and Ecology

**GENETICS**
Topics include:  
- Principles of Genetics  
- Metabolic and Immune Systems  
- Biomolecular Laboratory Skills

**YEAR 3**

**FOCUS ON YOUR CHOSEN SUBJECT**

**ZOOLOGY** – Topics include:  
- Systems Ecology  
- Working with Biological Data  
- Diversity of Vertebrates  
- Evolutionary Biology

**ZOOLOGY** – Topics include:  
- Functional Morphology  
- Arthropoda  
- Diversity of Invertebrates  
- Field courses in Ireland and Spain

**YEAR 4**

**REFINE YOUR KNOWLEDGE**

**ZOOLOGY**
- Zoology Research Project  
- Biological Invasions

**BSc (Honours) Zoology**

<table>
<thead>
<tr>
<th>MSc (Taught)</th>
<th>PhD</th>
<th>Industry</th>
<th>Conversion Courses</th>
</tr>
</thead>
</table>
| MSc Applied Environmental Science | 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 | National Parks and Wildlife Services  
- Semi-State bodies such as the ESB, BIM and Salmon Research Trust  
- Conservation Bodies  
- Agriculture and Aquaculture  
- Environmental Management | Professional Master of Education (PME)  
- Graduate Veterinary Medicine  
- Graduate Medicine  
- Master of Management |
| MSc World Heritage Management | MSc Plant Biology & Biotechnology |

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

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.

Adam Smith, Student

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.

---

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www.ucd.ie/myucd/zoology
I have always had an interest in Mathematics and a curiosity for the world around us. The DN200 Science course therefore really appealed to me as it allowed me to explore a diverse range of modules in first and second year before deciding on a degree path. I chose to specialise in Biology and Mathematics Education as I am passionate about teaching and love the idea of studying science and education in an integrated manner. I also enjoy getting involved around campus and have made some amazing friends through volunteering with the Science Society and the Maths Sparks programme. In fact, the wide range of opportunities, amazing facilities and level of engagement and support from the academic staff make coming to UCD the best decision I ever made.

Emily Lewanowksi-Breen, Student

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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. Topics are subject to change each year.
Chemistry
CAO code: DN200 Option: Chemistry & Chemical Sciences (CCS)

Sample pathway for a degree in Chemistry *

<table>
<thead>
<tr>
<th>YEAR</th>
<th>CHEMISTRY</th>
<th>MATHMATICS</th>
<th>MEDICINAL CHEMISTRY &amp; CHEMICAL BIOLOGY</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The Basis of Organic and Biological Chemistry, The Basis of Physical Chemistry, The Molecular World</td>
<td>Mathematics for the Biological &amp; Chemical Sciences</td>
<td>One Small-Group Project</td>
<td>Two Elective modules</td>
</tr>
<tr>
<td>2</td>
<td>The Basis of Inorganic Chemistry, Organic Chemistry, Physical Chemistry, Inorganic Chemistry</td>
<td>Molecular Genetics and Biotechnology, Principles of Biochemistry, Medicinal Chemistry &amp; Chemical Biology, Pharmacology: Biomedical Science of Drugs, Biomolecular Laboratory Skills</td>
<td>Two Elective modules</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Quantum Mechanics, Carbonyl Chemistry &amp; Synthesis, Chemical Kinetics, Mechanism &amp; Stereochemistry</td>
<td>Instrumental Analysis, Organometallic &amp; Solid State Chemistry, Main Group Chemistry &amp; Bonding, Symmetry &amp; Computational Chemistry</td>
<td>Two Elective modules</td>
<td></td>
</tr>
</tbody>
</table>

FOCUS ON YOUR CHOSEN SUBJECT

<table>
<thead>
<tr>
<th>CHEMISTRY – Topics include:</th>
<th>MEDICINAL CHEMISTRY &amp; CHEMICAL BIOLOGY – Topics include:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry Research Project</td>
<td>Instrumental Analysis</td>
</tr>
<tr>
<td>Methods in Organic Synthesis</td>
<td>Molecular Genetics and Biotechnology</td>
</tr>
<tr>
<td>Chemical Thermodynamics</td>
<td>Principles of Biochemistry</td>
</tr>
<tr>
<td></td>
<td>Medicinal Chemistry &amp; Chemical Biology</td>
</tr>
<tr>
<td></td>
<td>Pharmacology: Biomedical Science of Drugs</td>
</tr>
<tr>
<td></td>
<td>Biomolecular Laboratory Skills</td>
</tr>
</tbody>
</table>

REFINE YOUR KNOWLEDGE

<table>
<thead>
<tr>
<th>CHEMISTRY – Topics include:</th>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry Research Project</td>
<td>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.</td>
</tr>
<tr>
<td>Methods in Organic Synthesis</td>
<td>2nd level or 3rd level Teaching</td>
</tr>
<tr>
<td>Chemical Thermodynamics</td>
<td>State Labs such as the Forensic laboratory</td>
</tr>
<tr>
<td></td>
<td>ESB and Bord Gáis</td>
</tr>
<tr>
<td></td>
<td>Environmental Protection Agency</td>
</tr>
<tr>
<td></td>
<td>Medical device industry</td>
</tr>
<tr>
<td></td>
<td>Patent law</td>
</tr>
<tr>
<td></td>
<td>Healthcare industry</td>
</tr>
</tbody>
</table>

BSc (Honours) Chemistry

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

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Preparation an experiment in Chemistry.

- 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 chemistry industries

DN200 allowed me to sample subjects from across Biology, Chemistry, Physics and Geology and I decided Chemistry was the subject for me. I was drawn to the laboratory aspect of the degree, and the small class sizes offered. The lecturers are involved and aim to provide us with the skills we will need following graduation. Elective modules afforded me the opportunity to try areas outside of my degree, the most enjoyable of which has been the UCD Philharmonic Choir. Following graduation, I hope to expand my skill set further by applying the knowledge of Chemistry I’ve acquired throughout my degree to an analytical role in an industrial laboratory.

Eimear Madden, Student

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

www.ucd.ie/myucd/chemistry
Chemistry with Biophysical Chemistry
CAO code: DN200  Option: Chemistry & Chemical Sciences (CCS)

Sample pathway for a degree in Chemistry with Biophysical Chemistry*

<table>
<thead>
<tr>
<th>YEAR</th>
<th>CHEMISTRY</th>
<th>Topics include:</th>
<th>MATHEMATICS</th>
<th>Topics include:</th>
<th>BIOLOGY</th>
<th>Topics include:</th>
</tr>
</thead>
</table>
| 1    | 1. The Basis of Organic and Biological Chemistry  
      2. The Basis of Physical Chemistry  
| 2    | 1. Biophysical Chemistry  
      2. Physical Chemistry  
      3. Inorganic Chemistry  
      4. Organic Chemistry |                       | 1. Students who choose Chemistry with Biophysical Chemistry as their main subject for second year also cover the requirements for Chemistry. |                       |                       |                       |
| 3    | 1. Instrumental Analysis  
      2. Carbonyl Chemistry & Synthesis  
      3. Quantum Mechanics  
      4. Mechanism & Stereochemistry  
      2. Main Group Chemistry & Bonding  
      3. Symmetry & Computational Chemistry  
      4. Optional modules in Biomolecular, Organic and Inorganic Chemistry |                       | 1. Two Elective modules |                       |
| 4    | 1. Biophysical Chemistry Research Project  
      2. Metals in Biology  
      3. Electrochemistry |                       | 1. Biophysical Chemistry  
      2. Advanced Kinetics and Thermodynamics  

FOCUS ON YOUR CHOSEN SUBJECT

<table>
<thead>
<tr>
<th>CHEMISTRY WITH BIOPHYSICAL CHEMISTRY</th>
<th>Topics include:</th>
</tr>
</thead>
</table>
| 1. Biophysical Chemistry Research Project  
      2. Metals in Biology  
      3. Electrochemistry |                       |

REFINE YOUR KNOWLEDGE

<table>
<thead>
<tr>
<th>BSc (Honours) Chemistry with Biophysical Chemistry</th>
</tr>
</thead>
</table>
| 1. Biophysical Chemistry Research Project  
      2. Metals in Biology  
      3. Electrochemistry |                       |

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

www.ucd.ie/myucd/biophysicalchemistry

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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**

**ENGAGE WITH THE PRINCIPLES**

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

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

**CHEMISTRY WITH ENVIRONMENTAL & SUSTAINABLE CHEMISTRY**  
Topics include:
- Environmental and Sustainable Chemistry
- Inorganic Chemistry
- Physical Chemistry
- Environmental Geology

**Year 2**

**CHOOSE YOUR SUBJECTS**

**CHEMISTRY**  
Topics include:
- The Basis of Inorganic Chemistry
- Organic Chemistry
- Chemical Biology
- Biophysical Chemistry

**CHEMISTRY WITH ENVIRONMENTAL & SUSTAINABLE CHEMISTRY**  
Topics include:
- Environmental and Sustainable Chemistry
- Inorganic Chemistry
- Physical Chemistry
- Environmental Geology

**FOCUS ON YOUR CHOSEN SUBJECT**

**CHEMISTRY WITH ENVIRONMENTAL & SUSTAINABLE CHEMISTRY**  
Topics include:
- Quantum Mechanics
- Carbonyl Chemistry & Synthesis
- Self-Assembly of Biomolecules
- Mechanism & Stereochemistry

**Year 3**

**REFINE YOUR KNOWLEDGE**

**CHEMISTRY WITH ENVIRONMENTAL & SUSTAINABLE CHEMISTRY**  
Topics include:
- Instrumental Analysis
- Organometallic & Solid State Chemistry
- Main Group Chemistry & Bonding
- Symmetry & Computational Chemistry

**CHEMISTRY W/H ENVIRONMENTAL & SUSTAINABLE CHEMISTRY**  
Topics include:
- Quantum Mechanics
- Carbonyl Chemistry & Synthesis
- Self-Assembly of Biomolecules
- Mechanism & Stereochemistry

**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 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

**Associate Professor James Sullivan**

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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. Topics are subject to change each year.*

**Learn the basis of 'Green Chemistry' and what happens, at a molecular level, when chemicals interact with the environment**

**Discover techniques to produce energy and commodity chemicals sustainably**

"Currently my research spans Environmental Chemistry, where we study catalysts to remove pollutants from car exhausts, Green Chemistry, where we improve processes used in polymer production, and Chemistry in Sustainable Energy generation, which focuses on materials for solar hydrogen production and storage and synthesis of biofuel."

Associate Professor James Sullivan, Staff
3 0

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

Sample pathway for a degree in Medicinal Chemistry & Chemical Biology

**ENgage with the principles**

**Year 1**

**Chemistry**
Topics include:
- The Basis of Organic and Biological Chemistry
- The Basis of Physical Chemistry
- The Basis of Inorganic Chemistry
- The Molecular World

**Year 2**

**Choose your subjects**

**Year 3**

**Medicinal Chemistry & Chemical Biology**
Topics include:
- Molecular Genetics and Biotechnology
- Principles of Biochemistry
- Medicinal Chemistry & Chemical Biology
- Pharmacology: Biomedical Science of Drugs

**Year 4**

**Focus on your chosen subject**

**Medicinal Chemistry & Chemical Biology** – Topics include:
- Chemical Biology of Natural Products
- Chemical Biology of Macromolecules
- Carbonyl Chemistry & Synthesis
- Medicinal Chemistry

**Medicinal Chemistry & Chemical Biology** – Topics include:
- Biomolecular Laboratory Skills
- Organic Chemistry
- Physical Chemistry
- Inorganic Chemistry

**Refine your knowledge**

**Medicinal Chemistry & Chemical Biology** – Topics include:
- Structure Determination & Heterocyclic Chemistry
- Microbial Cell Factory/Chemists
- Mechanism & Stereochemistry
- Biochemist’s Toolkit

**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. Topics are subject to change each year.

---

Tricia Madden, Student

“UV determination of enzyme kinetics is a key step in the design of industrially relevant biocatalysts.”

---

www.ucd.ie/myucd/medicinalchemistryandchemicalbiology

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**i**

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---
**Sample pathway to become a Chemistry and Mathematics teacher**

**Year 1**

**EDUCATION**
- Mathematics & Science Education & Communication

**CHEMISTRY**
- Introductory Chemistry
- Organic Chemistry and Chemical Biology

**MATHEMATICS**
- Linear Algebra
- Calculus
- Statistical Modelling

**SCIENCE**
- Biology
- Physics

**Year 2**

**EDUCATION**
- Education Issues and Ideas
- Science and Mathematics Pedagogy

**CHEMISTRY**
- Physical Chemistry
- Organic Chemistry
- Inorganic Chemistry

**MATHEMATICS**
- Calculus of Several Variables
- Mathematical Modelling
- Analysis

**Year 3**

**EDUCATION**
- Collaborative Pedagogy in Mathematics Education
- Schools and Society

**SCHOOL PLACEMENT**
- Post-Primary Placement
- Peer-Assisted Tutoring
- Small Group Teaching

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

**MATHEMATICS**
- Algebraic Structures
- Probability Theory
- Geometry

**Year 4**

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

**PREPARE FOR PROFESSIONAL PRACTICE**

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

**MATHEMATICS**
- Differential Equations with Computer Algebra
- Geometry
- Complex Analysis
- History of Mathematics

**Year 5**

**EDUCATION**
- Research Methods
- Professional Dissertation

**PREPARE FOR PROFESSIONAL PRACTICE**

**SCHOOL PLACEMENT**
- 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**
- Chemistry Leaving Certificate
- Mathematics Leaving Certificate
- Science Junior Certificate

---

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---

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---

Group work in an active learning environment classroom.

---

"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"
**Applied & Computational Mathematics**

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

---

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

**YEAR 1**

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

**математика**
- Calculus in the Mathematical and Physical Sciences
- Mathematical Analysis
- Linear Algebra in the Mathematical and Physical Sciences

**MATHMATICS**
- Mathematical Modelling in the Sciences
- Introduction to Statistical Modelling
- Two Elective modules
- One Small-Group Project

---

**YEAR 2**

**APPLIED & COMPUTATIONAL MATHEMATICS**  
**Topics include:**
- Computational Science
- Vector Integral and Differential Calculus
- Oscillations in Mechanical Systems
- Classical Mechanics and Special Relativity

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

**MATHMATICS**
- Two Elective modules

---

**YEAR 3**

**FOCUS ON YOUR CHOSEN SUBJECT**

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

**математика**
- Advanced Mathematical Methods
- Foundations of Fluid Mechanics
- Foundations of Quantum Mechanics

**MATHMATICS**
- Two Elective modules

---

**YEAR 4**

**REFINE YOUR KNOWLEDGE**

**APPLIED & COMPUTATIONAL MATHEMATICS**  
**Topics include:**
- Applied & Computational Mathematics Research Project
- Differential Geometry
- General Relativity and

**математика**
- Cosmology
- Numerical Algorithms
- Electrodynamics and Gauge Theory

**MATHMATICS**
- Environmental Fluid Mechanics
- Stochastic Methods
- Functional Analysis

**Two Elective modules

---

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

**MSc (Taught)**

- MSc Data & Computational Science
- MSc Mathematical Science
- MSc Climate Change & Impact
- MSc Applied Mathematics & Theoretical Physics
- MSc Computational Physics

**PhD**

- 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
  - Integrable Systems
  - General Relativity

**Industry**

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

**Conversion Courses**

- Professional Master of Education (PME)
- Graduate Engineering
- Masters of Management

---

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---

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---

**Shane Walsh, Student**

---

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

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

Sample pathway for a degree in Financial Mathematics

<table>
<thead>
<tr>
<th>YEAR 1</th>
<th>MATHEMATICS</th>
<th>Topics include:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Calculus in the Mathematical and Physical Sciences</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Linear Algebra in the Mathematical and Physical Sciences</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Numbers and Functions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mathematical Analysis</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>YEAR 2</th>
<th>STATISTICS</th>
<th>Topics include:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Statistical Modelling</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>YEAR 2</th>
<th>FINANCIAL MATHEMATICS</th>
<th>Topics include:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Foundations of Financial Mathematics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Business Economics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Calculus of Several Variables</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Linear Algebra</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Theory of Games</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Principles of Finance</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>YEAR 3</th>
<th>FINANCIAL MATHEMATICS – Topics include:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Metric Spaces</td>
</tr>
<tr>
<td></td>
<td>Measure Theory and Integration</td>
</tr>
<tr>
<td></td>
<td>Time Series</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>YEAR 4</th>
<th>FINANCIAL MATHEMATICS – Topics include:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quantitative Methods</td>
</tr>
<tr>
<td></td>
<td>Bayesian Analysis</td>
</tr>
<tr>
<td></td>
<td>Advanced Computational Science</td>
</tr>
<tr>
<td></td>
<td>Financial Economics</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Conversion Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Master in Education (PME)</td>
</tr>
<tr>
<td>MSc Computer Science (conversion)</td>
</tr>
</tbody>
</table>

FOCUS ON YOUR CHOSEN SUBJECT

FINANCIAL MATHEMATICS

- Fundamentals of Actuarial and Financial Mathematics
- Computational Finance
- Partial Differential Equations

REFINE YOUR KNOWLEDGE

FINANCIAL MATHEMATICS

- Quantitative Methods
- Bayesian Analysis
- Advanced Computational Science
- Financial Economics

- Monte Carlo Inference
- Stochastic Analysis

BSc (Honours) Financial Mathematics

<table>
<thead>
<tr>
<th>MSc (Taught)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSc Mathematics</td>
</tr>
<tr>
<td>MSc Mathematical Science</td>
</tr>
<tr>
<td>MSc Statistics</td>
</tr>
<tr>
<td>MSc Actuarial Science</td>
</tr>
<tr>
<td>MSc Business Analytics</td>
</tr>
<tr>
<td>MSc Data Analytics</td>
</tr>
<tr>
<td>MSc Quantitative Finance</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PhD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduates can pursue a PhD in algorithmic trading, or stochastic differential equations, for example.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantitative positions in the financial sector</td>
</tr>
<tr>
<td>Risk modelling in banking and insurance</td>
</tr>
<tr>
<td>Computing in business, technology, research and academia</td>
</tr>
<tr>
<td>Trainee Actuary</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Conversion Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Master in Education (PME)</td>
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<tr>
<td>MSc Computer Science (conversion)</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. Topics are subject to change each year.

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 that price financial products

The course provides a thorough preparation on the main topics of Mathematical Finance. The contents of the various modules do not neglect any aspect of the wide range of skills required to work in today’s financial sector, from the rigour required by the purest Mathematical Theories to the most important applications of Bayesian Statistics, Stochastic Analysis and Numerical Methods needed by practitioners in the Financial Industry.

Dr Adamaria Perrotta, Staff

Dr Adamaria Perrotta
UCD School of Mathematics and Statistics

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www.ucd.ie/myucd/financialmathematics
Mathematics

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

Master the language and concepts of modern mathematical thinking

Develop a high level of competence in its applications

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.

Caitríona Byrne, Student

www.ucd.ie/myucd/mathematics

Associate Professor Christopher Boyd
UCD School of Mathematics and Statistics
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Sample pathway for a degree in Mathematics *

YEAR 1

ENGAGE WITH THE PRINCIPLES

MATHEMATICS
Topics include:
- Calculus in the Mathematical and Physical Sciences
- Numbers & Functions
- Linear Algebra in the Mathematical and Physical Sciences
- Mathematical Analysis
- Introduction to Applications of Differential Equations
- Introduction to Statistical Modelling
- Two Elective modules
- One Small-Group Project

YEAR 2

CHOOSE YOUR SUBJECTS

MATHMATICS
Topics include:
- Linear Algebra 2
- Calculus of Several Variables
- Groups, Rings & Fields

APPLIED & COMPUTATIONAL MATHEMATICS (OPTIONAL)
Topics include:
- Computational Science
- Vector Integral and Differential Calculus
- Oscillations and Waves
- Classical Mechanics and Special Relativity

STATISTICS (OPTIONAL)
Topics include:
- Probability Theory
- Stochastic Models
- Two Elective modules

YEAR 3

FOCUS ON YOUR CHOSEN SUBJECT

MATHEMATICS – Topics include:
- Galois Theory
- Functions of One Complex Variable
- Cryptography
- Number Theory
- Metric Spaces
- Algorithms
- Set Theory
- Mathematical Logic
- Two Elective modules

YEAR 4

REFINE YOUR KNOWLEDGE

MATHEMATICS – Topics include:
- Mathematics Research Project
- Differential Geometry
- Combinatorics
- Numerical Analysis
- Measure Theory
- Ring Theory
- Functional Analysis
- Group Theory
- Applied Matrix Theory
- Topology
- Coding Theory
- Stochastic Analysis

BSc (Honours) Mathematics

- MSc Mathematical Science
- MSc Actuarial Science
- Students can pursue a PhD in universities in Ireland or abroad
- Banking & Finance
- Mathematical Modelling
- Information and Communications Technology
- Actuarial Science
- Professional Master of Education (PME)
- Masters in Actuarial Science
- MSc Business Analytics
- MSc Quantitative Finance

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

www.ucd.ie/mymaths
STATISTICS
Topics include:
- Applications of Differential Equations
- Statistical Modelling
- Research Methods for Science

YEAR 1

Sample pathway for a degree in Statistics *

ENGLISH WITH THE PRINCIPLES

STATISTICS
Topics include:
- Calculus in the Mathematical and Physical Sciences
- Linear Algebra in the Mathematical and Physical Sciences
- Mathematical Analysis
- Numbers & Functions

MATHMATICS
Topics include:
- Two Elective modules
- One Small-Group Project

CHOOS YOUR SUBJECTS

STATISTICS
Topics include:
- Probability Theory
- Inferential Statistics
- Linear Models

MATHMATICS
Topics include:
- Calculus of Several Variables
- Computational Science

FOCUS ON YOUR CHOSEN SUBJECT

STATISTICS – Topics include:
- Time Series
- Survival Models
- Bayesian Analysis
- Design of Experiments

MATHMATICS – Topics include:
- Two Elective modules

REFINE YOUR KNOWLEDGE

BSc (Honours) Statistics

MSc (Taught)
- MSc Statistics
- MSc Actuarial Science
- MSc Meteorology
- MSc Data Analytics (Online)

PhD
- Students can pursue a PhD in universities in Ireland or abroad in areas as diverse as Bayesian Statistics, Pharmaceutical, Medical and Educational Statistics, Epidemiology, Econometrics, Environmental and ecological modelling

Industty
- Data Analytics and Business Analytics
- Data Science
- Pharmaceutical
- Actuarial Science
- Banking & Finance
- Insurance
- CSO

Conversion Courses
- Professional Master of Education (PME)
- Graduate Diploma in Actuarial Science
- MSc Quantitative Finance

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

Professor Nial Friel
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A map of Ireland showing radon in Irish dwellings.
Map by the EPA’s Office of Radiological Protection

Learn how statistics is used in areas as diverse as biotechnology, finance, marketing, science, medicine and even psychology.

The data analytics I have learned are currently some of the most highly sought after skills by employers, and can be applied to a broad range of areas including finance, insurance, marketing and pharmaceutical companies. If it wasn’t for the flexibility of the UCD Science programme I would never have ventured into Statistics, and would have missed out on the chance to enter into the area of Mathematics I now love.

Melanie Dwayne, Student

www.ucd.ie/myucd/statistics

“
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 for a degree in Physics *

**YEAR 1**

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

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

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

---

**YEAR 2**

**PHYSICS**
Topics include:
- Electronics and Devices
- Introductory Quantum Mechanics
- Fields, Waves and Light
- Methods for Physicists

Physics students also study the following topics in Mathematics:
- Calculus of Several Variables
- Vector Integral & Differential Calculus
- Computational Science

**PHYSICS WITH ASTRONOMY & SPACE SCIENCE**
Topics include:
- Thermodynamics & Statistical Physics
- Nuclear Physics
- Quantum Mechanics
- Stellar Astrophysics & Astronomical Techniques

Students who chose Physics as their main subject for second year may also cover the requirements for Physics with Astronomy and Space Science
- Astronomy & Space Science
- Exploring the Solar System

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**YEAR 3**

**FOCUS ON YOUR CHOSEN SUBJECT**

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

**PHYSICS WITH ASTRONOMY & SPACE SCIENCE** – Topics include:
- General Relativity & Cosmology
- High Energy Particle Physics
- Computational Biophysics
- Theoretical Astrophysics
- Condensed Matter Physics

---

**YEAR 4**

**REFINE YOUR KNOWLEDGE**

**PHYSICS**
- Advanced Laboratory
- Applied Quantum Mechanics
- Advanced Quantum Mechanics
- Applied Optics

**PHYSICS WITH ASTRONOMY & SPACE SCIENCE**
- Advanced Laboratory
- Applied Quantum Mechanics
- Advanced Quantum Mechanics
- Applied Optics

**BSc (Honours) Physics**

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

- PhD
- 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

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

- Conversion Courses
- Professional Master of Education (PME)
- MA Economics
- 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. Topics are subject to change each year.

---

**Associate Professor Emma Sokell**
UCD School of Physics

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---

**I have the opportunity to learn about topics such as quantum mechanics and nuclear physics. I particularly enjoy being able to combine this theoretical foundation with computer programming and hands-on work in the lab, where we have the chance to recreate experiments from scientific papers. In the summer of my second year, I completed my first research internship with the School of Physics along with a group of other undergraduates. As part of this project, I worked closely with lecturers in the School to write programmes to solve equations describing white dwarf and neutron stars. I found this placement hugely beneficial as it gave me my first taste of real scientific research.**

Eimear Conroy, Student

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**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

---

www.ucd.ie/myucd/physics
Develop practical skills by making astronomical observations using a variety of telescopes

I came into DN200 expecting to end up in Biology but I am now in my final year of Physics with Astronomy and Space Science. The degree allowed me to try Chemistry, Biology and Physics modules and I enjoyed the challenge of Physics the most. During this degree, I have completed two internships. One based in education and the other involved building I-LOFAR, a research grade radio telescope. Just this year, I went to Teide Observatory in Tenerife where I observed star clusters with two optical telescopes and which was an amazing experience. In my final semester, I am doing a Medical Physics module which has sparked a new passion aside from astronomy as it allows me to unite my interests in biology and physics.

Rachel Dunwoody, Student
Sample pathway for a degree in Theoretical Physics

**Year 1**

**Engage with the principles**

**Physics**
- Foundations of Physics
- Frontiers of Physics
- Thermal Physics and Materials
- Quanta, Particles and Relativity

**Mathematics**
- Calculus in the Mathematical and Physical Sciences
- Linear Algebra in the Mathematical and Physical Sciences

**Applied & Computational Mathematics**
- Applied Mathematics: Mechanics and Methods
- Applications of Differential Equations

**Year 2**

**Choose your subjects**

**Theoretical Physics**
- Oscillations and Waves
- Classical Mechanics and Special Relativity
- Vector Integral and Differential Calculus
- Computational Science

**Physics**
- 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**
- Analytical Mechanics
- Partial Differential Equations
- Electromagnetism
- Foundations of Fluid Mechanics

**Theoretical Physics – Topics include:**
- Thermodynamics & Statistical Physics
- Quantum Mechanics
- Functions of One Complex Variable
- Advanced Laboratory

**Year 4**

**Refine your knowledge**

**Theoretical Physics**
- Theoretical Physics Project
- Applied Quantum Mechanics
- Advanced Mathematical Methods
- High Energy Particle Physics

**Theoretical Physics – Topics include:**
- Nuclear Physics
- General Relativity & Cosmology
- Quantum Theory of Condensed Matter

**BSc (Honours) Theoretical Physics**

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

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

**Conversion Courses**
- Professional Master of Education (PME)
- MA 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. Topics are subject to change each year.*

---

**Associate Professor Vladimir Lobaskin**

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**Professor Adrian Ottewill**

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twitter.com/ucdscience

---

Theoretical Physics

Theoretical Physics allowed me to keep and combine aspects from both Applied Mathematics and Physics, with a wide choice of modules including thermodynamics, computational science, biophysics, and astrophysics. With a degree in Theoretical Physics, there are plenty of job opportunities ranging from working with computers, in meteorology, in the finance sector, even in further research in labs around the world. Theoretical Physics has a high emphasis on group work, which I had direct experience with working in a computational biophysical chemistry lab while studying abroad in California during my third year.

Eoin Ó Laighléis, Graduate
## Sample pathway to become a Physics and Mathematics teacher

### Choose Your Subjects

**Education**
- Mathematics & Science Education & Communication

**Physics**
- Foundations of Physics
- Frontiers of Physics

**Mathematics**
- Linear Algebra
- Calculus
- Applications of Differential Equations
- Statistical Modelling

**Science**
- Biology
- Chemistry
- One Small-Group Project
- Elective Modules

## Refine Your Knowledge

**Education**
- Education Issues and Ideas
- Science and Mathematics Pedagogy

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

**Mathematics**
- Vector Integral and Differential Calculus
- Calculus of Several Variables
- Analysis

**Science**
- Biology
- Chemistry
- One Small-Group Project
- Elective Modules

## Prepare for Professional Practice

**BSc Physics, Mathematics & Education**
- Post-Primary Placement
- Peer-Assisted Tutoring
- Small Group Tutoring

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

**Physics and Mathematics**
- Classical Mechanics and Relativity
- Quantum Mechanics
- Electromagnetism
- Nuclear Physics
- Laboratory Skills

**Science**
- Particle Physics
- Differential Equations with Computer Algebra
- Geometry
- Complex Analysis
- History of Mathematics

## 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. Topics are subject to change each year.*

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**www.ucd.ie/myucd/physmathed**

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"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.

Jim Rossiter, Student"
Geology

CAO code: DN200  Option: Mathematical, Physical & Geological Sciences

Sample pathway for a degree in Geology *

**YEAR 1**

<table>
<thead>
<tr>
<th>ENGAGE WITH THE PRINCIPLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOLGY – Topics include:</td>
</tr>
<tr>
<td>Introduction to Earth Sciences</td>
</tr>
<tr>
<td>Earth Science and Materials</td>
</tr>
<tr>
<td>Earth And Humanity</td>
</tr>
<tr>
<td>Mathematics for the Biological and Chemical Sciences</td>
</tr>
<tr>
<td>Geology and Earth Science involve applying ‘traditional’ science subjects to the study of the past, present and future of the Earth System</td>
</tr>
<tr>
<td>Explore across the range of scientific disciplines available to study in UCD</td>
</tr>
</tbody>
</table>

**YEAR 2**

<table>
<thead>
<tr>
<th>CHOOSE YOUR SUBJECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOLGY – Topics include:</td>
</tr>
<tr>
<td>Earth’s Structure</td>
</tr>
<tr>
<td>Investigating Minerals</td>
</tr>
<tr>
<td>Field Geology</td>
</tr>
<tr>
<td>Global Environmental Change</td>
</tr>
<tr>
<td>Sedimentology and Palaeobiology</td>
</tr>
<tr>
<td>We do not require that students take a specific combination of additional modules</td>
</tr>
<tr>
<td>Subject to regulations, students are free to select relevant Science modules that they are interested in</td>
</tr>
</tbody>
</table>

**YEAR 3**

<table>
<thead>
<tr>
<th>FOCUS ON YOUR CHOSEN SUBJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOLGY – Topics include:</td>
</tr>
<tr>
<td>Geological Structures</td>
</tr>
<tr>
<td>Sedimentary Environments</td>
</tr>
<tr>
<td>Igneous &amp; Metamorphic Petrology</td>
</tr>
<tr>
<td>Geological Fieldwork</td>
</tr>
<tr>
<td>*Selected students have the opportunity to gain valuable workplace experience via an internship in commercial companies</td>
</tr>
<tr>
<td>Applied Palaeontology</td>
</tr>
<tr>
<td>Precambrian Geology &amp; Geotectonics</td>
</tr>
<tr>
<td>Low Temperature Geochemistry</td>
</tr>
<tr>
<td>Geomaterials and Geoenvironment</td>
</tr>
<tr>
<td>*Two Elective modules</td>
</tr>
</tbody>
</table>

**YEAR 4**

<table>
<thead>
<tr>
<th>REFINE YOUR KNOWLEDGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOLGY – Topics include:</td>
</tr>
<tr>
<td>Field Mapping Research Project</td>
</tr>
<tr>
<td>Geobiology</td>
</tr>
<tr>
<td>Basin Analysis</td>
</tr>
<tr>
<td>Petrology &amp; Ore Geology</td>
</tr>
<tr>
<td>Geological Fieldwork</td>
</tr>
<tr>
<td>Geophysics &amp; GIS</td>
</tr>
<tr>
<td>Research Seminars</td>
</tr>
<tr>
<td>Emphasis on independent learning and research, including a field-based project</td>
</tr>
<tr>
<td>Many modules contain laboratory-based projects and field-based research</td>
</tr>
<tr>
<td>Breadth of course ensures graduates have a wide range of future career options within and outside the discipline</td>
</tr>
</tbody>
</table>

**BSc (Honours) Geology**

<table>
<thead>
<tr>
<th>Other Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our Geology graduates are routinely sought for careers outside Earth Science including:</td>
</tr>
<tr>
<td>Management consultancy</td>
</tr>
<tr>
<td>Education</td>
</tr>
<tr>
<td>Financial services</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 as diverse as hydrocarbon and mineral exploration, volcanic and earthquake hazards, palaeobiology, environmental geochemistry, geophysics and climate change</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resources (oil and mineral exploration and development)</td>
</tr>
<tr>
<td>Environmental consultancy companies</td>
</tr>
<tr>
<td>Hydrogeology and water resources</td>
</tr>
<tr>
<td>Geological Surveys, Environmental Protection Agencies</td>
</tr>
<tr>
<td>Engineering Geology</td>
</tr>
<tr>
<td>Oceanography and Marine Geology</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Conversion Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master of Management</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. Topics are subject to change each year.

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Second year field class in the Doolough valley, Co. Mayo.

“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”

Maria Noone, Student

“*My Geology BSc provided me with a great understanding of geological principles, and knowledge across the spectrum of the subject. Following my degree, I secured employment with a mineral exploration company in Ireland. The strong laboratory and field components were highly enjoyable parts of the learning experience at UCD, and have been vital as my job involves exploring and prospecting in a geologically diverse region.*

Cian O’Meara, Graduate

www.ucd.ie/myucd/geology
HOW THE COURSES WORK

DN200 SCIENCE

Year 1

- Sample a range of subjects or focus on your preferred area immediately.
- We recommend that all students studying any of the Mathematical subjects to degree level should have a minimum Grade H3 in Leaving Certificate Higher Level Mathematics, or equivalent.
- Students may have to take introductory modules in Biology, Chemistry, Physics or Mathematics, depending on their secondary school results.

Year 2

- In Year 2, students must select a minimum of 2 subjects. If both subjects are selected from among Pharmacology, Neuroscience, Physiology and Genetics, students must then select an additional subject that is not in that list.
- The Year 2 subjects listed on each subject pathway page illustrate the most popular combinations for that subject.

Year 3 & 4

In Years 3 and 4, students study one of their Stage 2 subjects to degree level and this subject is their degree major.

DN200 Mathematics and Science Education Degrees

Biology, Mathematics & Education

- To teach Junior Certificate Science, students must also take modules in Chemistry and Physics. These modules can be taken in Years 1, 2 or 3.
- At the end of Year 2, students who decide not to follow a career in teaching can pursue a degree in one of the following:
  - Biochemistry and Molecular Biology
  - Environmental Biology
  - Genetics
  - Microbiology
  - Pharmacology
  - Plant Biology
  - Zoology

Chemistry, Mathematics & Education

- To teach Junior Certificate Science, students must also take modules in Biology and Physics. These modules can be taken in Years 1, 2 or 3.
- At the end of Year 2, students who decide not to follow a career in teaching can pursue a degree in Chemistry.

Physics, Mathematics & Education

- To teach Junior Certificate Science, students must also take modules in Biology and Chemistry. These modules can be taken in Years 1, 2 or 3.
- At the end of Year 2, students who decide not to follow a career in teaching can pursue a degree in Physics or Physics with Astronomy and Space Science, depending on the Physics modules they choose in Years 1 and 2.

Applied Mathematics, Mathematics & Education

- In Year 2, students must select a minimum of 2 subjects. The Year 2 subject combinations illustrate the most popular subject students choose to combine with Applied & Computational Mathematics.
The topics shown indicate the course pathways for Computer Science and Computer Science with Data Science, listing some of the topics that students can study.

- No prior knowledge of programming is required.
- Small group work is facilitated in an active learning lab that encourages students to work in teams and build their problem-solving skills.
- The BSc Computer Science with Data Science follows the same first two years as the BSc Computer Science. At the end of Year 2, students must select either Computer Science or Computer Science with Data Science as their degree subject.
- In Years 1-3, students take 10 Computer Science modules and 2 elective modules. Elective modules can be from within or outside Computer Science.

### DN201

**DN201 Computer Science**

- No prior knowledge of programming is required.
- Small group work is facilitated in an active learning lab that encourages students to work in teams and build their problem-solving skills.
- The BSc Computer Science with Data Science follows the same first two years as the BSc Computer Science. At the end of Year 2, students must select either Computer Science or Computer Science with Data Science as their degree subject.
- In Years 1-3, students take 10 Computer Science modules and 2 elective modules. Elective modules can be from within or outside Computer Science.

### DN230

**DN230 Actuarial and Financial Studies**

- The topics shown indicate the course pathway for Actuarial and Financial Studies, listing some of the topics that students can study.
- In Years 1-2, students take 10 Actuarial & Financial Studies modules and 2 elective modules. In Year 3, students take 6 Actuarial & Financial Studies modules in Semester 1. A professional work placement in a financial institution or insurance company is integrated into Semester 2 of Year 3 and equates to half the year’s work. Students may take a further elective module in Year 4.
- Should a student achieve a sufficiently high standard in the degree, they will gain some (or all) exemptions from the Core Technical series examinations (CT1:8) as well as the Core Applications CA1 examination of the Institute of Actuaries, or the Faculty of Actuaries.
- In Years 1-3, students take 10 Actuarial & Financial Studies modules and 2 elective modules.

### Useful Resources

**Visit Us**
Meet our staff and students at the UCD Science, Computer Science & Actuarial & Financial Studies Open Evening Tuesday 23 October 2018.

**Create an account**
Create an account at www.myucd.ie to get alerts when UCD Open Evenings and Events open for booking.

**Read our Student Blogs**
UCD students telling their story about UCD life in their own words at www.myucdblog.com.

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The information given is a guide only and does not bind the University in any way. Please visit www.ucd.ie/registry/admissions/ for further information on entry to UCD.