

# UCD SCIENCE

STAGE ONE GUIDE 2022-2023  
SCIENCE DN200



University College Dublin  
Ireland's Global University

# UCD SCIENCE

UCD offers the widest choice of science subjects in Ireland, with DN200 providing access to 27 degree courses in Biological, Biomedical, Biomolecular, Chemical, Mathematical, Physical and Geological Sciences, including fully accredited Science, Mathematics and Education degrees. The pathways, from the point of entry to graduation, for each of these subjects are outlined in the UCD Science prospectus which can be found at: [Undergraduate Prospectus Link](#) You have chosen one of four subject streams within DN200 depending on your scientific interests. By choosing a stream, you can tailor your study plan to focus on a particular area or sample more widely to explore your interests. You are not constrained to study only the subjects within your stream. You may change your subject stream by informing the staff in the Science Office before the registration process closes usually within the first two weeks of the trimester - the date will be advised at the start of the Autumn Trimester.

We recognise that the transition from school to university may be challenging and all our staff are committed to supporting and assisting students during their university life. This leaflet gives a summary of the choices available in first year UCD Science and, along with personal academic advice, should be used when deciding what to study in your first year. You may find that some of the terminology used is new to you. For clarification, you can access our online '[Jargon Buster](#)'. The main principles can be summarised as follows with the details of Stage 1 described later in this leaflet and details of all Stages are available on [Science Programmes Link](#)

A summary of Stage 1 modules required for DN200BBB, CCS and MPG showing core, conditional core and programme core modules for each subject can be viewed online on the [Science Student Noticeboard](#)

You may find it useful to view the Science [YouTube](#) playlist in advance of selecting your modules, where you will find information on many of the different subject areas.

The course in Stage 1 (first year) is divided into 12 modules. Students choose their modules in order to fulfil the first-year requirements for the subjects that interest them most. Students can either focus on a particular area, but must fulfil the requirements for at least 2 subjects, or choose to cover the core requirements for a wide range of subjects. **There is no competition for places in Stage 1; students are guaranteed their subjects of choice.**

- In **Stage 2 (second year)** students cover the requirements for a **minimum of 2 or 3 subjects**. Due to timetable and workload constraints not all combinations of subjects are possible in Stage 2 – but almost all combinations are possible within each of the BBB, CCS and MPG subject streams, and students can also combine many Stage 2 subjects across subject streams. The choice of Stage 2 subjects that can be combined depends on the number of core modules shared between those subjects and the extent to which other requirements have been met in Stage 1, See Tables 3, 4 & 5 on pages 36-38 in the Science Handbook. Students can study any subject in Stage 2 for which they have met the Stage 1 requirements; **you are guaranteed any subject in Stage 2 that you are qualified to take.**
- In **Stage 3 (third year) and Stage 4 (fourth year)** students study one of their Stage 2 subjects to degree level and this subject is their degree major. The selection of degree major may be competitive. In previous academic years 98% of students who completed Stage 2 got their first choice of degree major in Stage 3.
- In each of your first three years, UCD Horizons enhances the choice available so that, of your 12 modules, in Stage 1, Spring Trimester, one module may be selected from other disciplines (e.g., languages), as an 'elective'. [2 elective modules may be selected in Stages 2, & 3]. Choose your

elective carefully and consider taking a UCD Discover Module, see: [Discovery Modules](#) Information. Previously students have also chosen geology, language, philosophy, or psychology modules as electives.

Further information on electives is available on <https://www.ucd.ie/students/registration/electives/>. You may also take your elective from within the Science Programme.

## DN200 No Preference

You have chosen to keep your options open. You are advised to use Science Programme literature to choose modules that will allow you to sample from areas that interest you, while ensuring that you fulfil the requirements for subjects you may wish to study in later Stages. Some modules that are required for a specific subject may be deferred to second year (Stage 2) to increase your range of **options in first year (Stage 1) or to allow you to take introductory modules. Be aware that if you defer too many modules to Stage 2 (e.g., Programme Cores – see Table 1), you may restrict your choice of degree subjects.** The Mathematics modules have been designed to meet the needs of different subjects. Please ensure that you are taking the appropriate set of Mathematics modules. Further advice is contained within each subject area, DN200BBB, DN200CCS and DN200MPG.

## DN200 BBB – Biological, Biomedical and Biomolecular Sciences

You have chosen to focus your studies on the Biological, Biomedical and Biomolecular disciplines. This will lead to a degree in one of the following subjects

- |                                    |                 |
|------------------------------------|-----------------|
| ■ Biochemistry & Molecular Biology | ■ Pharmacology  |
| ■ Cell and Molecular Biology       | ■ Physiology    |
| ■ Environmental Biology            | ■ Plant Biology |
| ■ Genetics                         | ■ Neuroscience  |
| ■ Microbiology                     | ■ Zoology       |
| ■ Biology, Mathematics & Education |                 |

There are a number of modules you must take to continue studying in this area (Table 1). In addition to Biology, you must complete two modules of Mathematics and a module of Chemistry. You are not limited to these subjects. You may choose modules from other areas to widen the choices available to you.

If you are sure of your interest in Biological disciplines, **we recommend that you take additional modules in first year (Stage 1) that are required for your degree (Programme Cores – see Table 1)** or select modules that deepen your knowledge in this area. **If you defer too many Programme Cores, this may limit some of your options in Stage 2.**

If you are interested in keeping your options open regarding pursuing a degree in the Chemical, Mathematical, Physical or Geological Sciences you should carefully read the DN200 CCS and DN200 MPG sections and seek academic advice if necessary, e.g. by submitting your query on [Ask Science Connector form](#)

## DN200 CCS – Chemistry and Chemical Sciences

You have chosen to focus your studies on the Chemical Sciences. This will lead to a degree in one of the following subjects:

- |  |  |
|--|--|
| ■ Chemistry  | ■ Chemistry with Biophysical Chemistry     |
| ■ Chemistry with Environmental & Sustainable Chemistry |  |
| ■ Chemistry, Mathematics and Education                 | ■ Medicinal Chemistry and Chemical Biology |

There are a number of modules you must take to continue studying in these areas (Table 1). In addition to Chemistry, you must complete two modules of Mathematics and may be required to take a module

in Biology. You are not limited to these subjects. You may choose modules from other areas to widen the choices available to you. If you are sure of your interest in Chemistry and Chemical Sciences, we recommend you take additional modules in first year (Stage 1) that are required for your degree (Programme Cores – see Table 1) or select modules that deepen your knowledge in this area. **If you defer too many Programme Cores, this may limit some of your options in Stage 2.** If you are not required to take CHEM00010, seek academic advice as you could consider taking CHEM20080 in Trimester 1.

If you are interested in keeping your options open regarding pursuing a degree in the Biological, Mathematical, Physical or Geological Sciences you should carefully read the DN200 BBB and DN200 MPG sections and seek academic advice if necessary, e.g. by submitting your query on [Ask Science Connector form](#)

### DN200 MPG – Mathematical, Physical and Geological Sciences

You have chosen to focus your studies on the Mathematical and/or Physical and/or Geological Sciences. This will lead to a degree in one of the following subjects:

- |   |  |
|---|--|
| ■ Geology                                     | ■ Applied & Computational Mathematics      |
| ■ Physics                                     | ■ Statistics                               |
| ■ Physics with Astronomy & Space Science      | ■ Mathematics                              |
| ■ Theoretical Physics                         | ■ Financial Mathematics                    |
| ■ Physics, Mathematics and Education          | ■ Applied Maths, Mathematics and Education |
| ■ Computer Science, Mathematics and Education |  |

Each subject has specific modules that you are required to take to progress in this area, although a number of modules are common to all subjects (Table 1). Some of these modules may be deferred to second year (Stage 2) if you wish to explore your interests in other subjects within this area or more broadly within science or if you are required to take introductory modules. You are not limited to these subjects. You may choose modules from other areas to widen the choices available to you.

If you are sure of your interest in these subjects, **we recommend you select additional modules in first year (Stage 1) that are required for your degree (Programme Cores – see Table 1)** or select modules that deepen your knowledge in this area. **If you defer too many Programme Cores, this may limit some of your options in Stage 2.** To be eligible to take a degree in the Physical Sciences, any student who did not achieve at least an O1 or H5 in Leaving Certificate Mathematics **MUST TAKE MATH00010** and achieve an A-. Students who are required to take MATH00010 and wish to progress into one of the Physical Science degrees **MUST TAKE MATH 10400 in the Summer Trimester as a substitute for MATH10350**. Students not required to take MATH00010 **MUST TAKE** either MATH10310 or MATH10350 in Stage 1.

To be eligible to take a degree in Geology, students must take either GEOL10060 **OR** GEOL10020 (**or both modules**) in Stage 1. Students who wish to take Stage 2 Geology are also strongly recommended to take GEOL 10030.

You should note that the requirement for Mathematics within DN200 MPG varies and you should make sure that you are taking the correct set of Mathematics modules for your chosen subjects. Please seek academic advice to confirm your choices if you are in any doubt.

If you are interested in keeping your options open regarding pursuing a degree in the Biological or Chemical Sciences you should carefully read the DN200 BBB and DN200 CCS sections and seek academic advice if necessary, e.g. by submitting your query on [Ask Science Connector form](#)

## Choosing Modules in Stage 1

During **Orientation Week**, academic staff from the Science Office and subject areas will be available to assist you in choosing your modules and in completing your registration.

All full-time students are required to study **twelve modules in a year** – it is recommended that you study six modules in the Autumn Trimester and six modules in the Spring Trimester. The maximum number permitted in a trimester is eight. Eleven of your Stage 1 modules must be from within science. You may take up to one non-science elective module in Stage 1 in the Spring Trimester. You are advised to consider your choice of elective module carefully. You may also take your elective from within the Science Programme.

Students are **guaranteed their subjects of choice in Stage 1** and when in Stage 2, can study any subjects that they are qualified to take and for which the required modules can be combined and timetabled.

You must take at **least two Mathematics modules during Stage 1**. Note that the modules listed in Table 1 represent the minimum level of Mathematics required, but that alternative higher-level modules may be available (see Mathematics information on **Table 3**). Students required to take MATH00010 must defer MATH10310 or MATH10350 until Stage 2.

The **wide variety of science modules available in Stage 1**, allows you to sample and experience a number of subjects, while also studying the core modules required for your discipline. **The choices you make in first year will have a bearing on your final degree subject(s)**. Make sure that you meet the core (compulsory) requirements for your subjects of choice and consider taking Programme Cores (**Table 1**) to reduce restrictions on your Stage 2 choices. The Level 0 and Level 1 modules required for entry to the degrees in the various subject areas are listed in Table 1.

All **Science laboratory and tutorial times will be automatically allocated** at the start of term after you register online to your preferred area and your optional Science modules. Once the allocation to practicals and tutorials has been made, you will be able to see and print your individual timetable.

It is **possible to take a joint degree combining two subjects**, subject to the agreement of the two disciplines concerned. The range of joint degrees available is limited and you should seek academic advice from the relevant subjects and further information from the Science Office if you wish to pursue this possibility.



**Table 1. Modules required for B.Sc. Degrees within Science (DN200)**

Degrees	Conditional Core modules that may be required (see Table 2)	Core modules that must be taken in Stage 1 (but see footnote)	Programme Cores: compulsory modules that students may take in Stage 1 or Stage 2
<b>BIOLOGICAL, BIOMEDICAL &amp; BIOMOLECULAR SCIENCES (BBB)</b>			
Biochemistry & Molecular Biology, Cell & Molecular Biology Environmental Biology Genetics Microbiology Neuroscience Pharmacology Physiology Plant Biology Zoology	BIOL00010 CHEM00010 MATH00010* PHYC10070 (only a conditional core for Neuroscience and Physiology)	SCI10010 BIOL10110 CHEM10050 MATH10290*, MATH10310*	At least two of : BIOL10130 BIOL10140 BMOL10030
Biology, Mathematics & Education	BIOL00010 CHEM00010 PHYC10070	SCI10010 BIOL10110 CHEM10050 MATH10290*, MATH10350 MATH10410 STAT10060	At least two of : BIOL10130 BIOL10140 BMOL10030
<b>CHEMISTRY &amp; CHEMICAL SCIENCES (CCS)</b>			
Chemistry, Chemistry with Biophysical Chemistry, Chemistry with Environmental and Sustainable Chemistry, Medicinal Chemistry and Chemical Biology	CHEM00010 MATH00010 BIOL00010 (only a conditional core for Biophysical Chemistry & Medicinal Chemistry)	SCI10010 CHEM10050 MATH10290*, MATH10310* BIOL10110 (only a core for Biophysical & Medicinal Chemistry)	CHEM 20140
Chemistry, Mathematics & Education	BIOL00010 CHEM00010 PHYC10070	SCI10010 CHEM10050 MATH10290*, MATH10350 MATH10410 STAT10060	CHEM 20140
<b>MATHEMATICAL, PHYSICAL &amp; GEOLOGICAL SCIENCES (MPG)</b>			
Geology	MATH00010	SCI10010 GEOL 10020*** OR GEOL10060*** GEOL 10030*** MATH10290*, MATH10310*	
Physics, Physics with Astronomy & Space Science, Theoretical Physics	ACM10080 MATH00010** PHYC10070	SCI10010 PHYC10080 MATH 10340, MATH10350 or MATH10400**	ACM10060** PHYC10050** PHYC10250 PHYC20080**
Physics, Mathematics & Education	ACM10080 BIOL00010 CHEM00010 PHYC10070	SCI10010 PHYC10080 MATH10340*, MATH10350 MATH10410, ACM10060 STAT10060,	MATH10320 PHYC10250 PHYC20080**
Applied & Computational Mathematics, Mathematics, Financial Mathematics Statistics	ACM10080 (only required for Applied and Computational Mathematics)	SCI10010 ACM10060 MATH10340, MATH 10350 STAT 10060	MATH10040, MATH10320 (Mathematics & Financial Maths) MATH10320 (Applied and Computational Mathematics and Statistics) ECON10720 (Financial Maths)
Applied Mathematics, Mathematics & Education Computer Science, Mathematics & Education	ACM10080 (only for Applied Mathematics) COMP10010 (only for Computer Science)	SCI10010 ACM10060 MATH 10340, MATH10350 MATH10410 STAT10060 COMP10020 (Comp.Science)	MATH10040 MATH10320 COMP10040 (Computer Science, Maths and Education)

See next page for Footnotes

### Footnotes for Table 1:

The modules highlighted in green text constitute all the compulsory modules for any subject in BBB and CCS except for the education pathways (note also Conditional Cores and Programme Cores).

The modules highlighted in purple text constitute all the compulsory modules for any subject in MPG except for the education pathways (note also Conditional Cores and Programme Cores).

- \* The following should be noted for the MATH10290 and MATH10310 modules:  
Students required to take MATH10290 can take MATH10340 instead.  
Students required to take MATH10310 can take MATH10350 instead.  
Students required to take MATH00010 must defer a Level 1 Calculus module (MATH10310 or MATH10350) until Stage 2.
- \*\* The following should be noted for students following one of the Physics Degrees:  
PHYC10050 must be taken in either Stage 1 or Stage 2 for Physics with Astronomy and Space Science (PASS). If a student is sure that they wish to pursue PASS to degree level, it is recommended that they take this module in Stage 1.  
PHYC 20080 should only be taken by students in Stage 1 if they have achieved H5 in both Mathematics and Physics at Leaving Certificate.  
ACM10060 should be taken in Stage 1 by students wishing to pursue Theoretical Physics.  
Students obliged to take MATH00010 and who gain at least an A-, may pursue Physics subjects if they take MATH10400 in the Summer Trimester of their first year. It will count towards the credits for Stage 1.
- \*\*\* To be eligible to take a degree in Geology, students must take either GEOL10060 or GEOL10020 (or both) in Stage 1.  
Students who wish to take Stage 2 Geology are strongly recommended to take GEOL10030. GEOL10030 cannot usually be taken in the same year as Stage 2 Geology because of timetable incompatibility.
- \*\*\*\* To be eligible to take a degree in the Physical Sciences, any student who did not achieve at least an O1 or H5 in Leaving Certificate Mathematics MUST TAKE MATH00010 and achieve an A-.



## Information relating to particular requirements in Stage 1

### Conditional Core modules

Some students may not have a sufficiently strong background in a subject and may be required to take an introductory module in the subject before they can take more advanced modules. Table 2 outlines the specific “prior learning” requirements associated with these modules.

**Table 2. Prior Learning Requirements**

Relevant Leaving Certificate subject	Requirement (conditional core module)	Rule
<b>Applied Mathematics</b>	ACM10080 Applied Mathematics, Methods & Applications	For the degrees where ACM10080 appears as a Conditional Core module in Table 1, students must take ACM10080 and/or have attained a minimum grade H5 in Leaving Certificate Higher Applied Mathematics (A Level; Grade C).
<b>Biology</b>	BIOL00010 Fundamentals of Biology	To take BIOL10110 students must have taken BIOL00010 or attained a minimum grade O2 or H6 in Leaving Certificate Biology (A Level; Grade D). To take BIOL10110, BIOL10130 and BIOL10140 students must have taken BIOL00010 or attained a minimum grade O2 or H6 in Leaving Certificate Biology (A Level; Grade D).
<b>Chemistry</b>	CHEM00010 Introductory Chemistry	To take CHEM10050, students must have taken CHEM00010 or have attained a minimum grade O1 or H5 in Leaving Certificate Chemistry (A Level; Grade C).
<b>Mathematics</b>	MATH00010 Introductory Mathematics	Students who did not achieve a minimum grade O1 or H5 in Leaving Certificate Mathematics (GCSE; Grade A*, A Level; Grade C) must take MATH00010 in addition to other required Mathematics modules.
<b>Physics</b>	PHYC10070 Foundations of Physics	To take PHYC10080 students must have taken PHYC10070 or attained a minimum grade of H5 in Higher Leaving Certificate Physics (A Level; Grade C).
<b>Computer Science</b>	COMP10290 Computation for Scientists	For the degrees where COMP10290 appears as a Conditional Core, students who did not achieve a minimum grade of O1 or H5 Leaving Certificate Computer Science (GCSE; Grade A*; A Level Grade C) must take COMP10290

## Mathematics

Students are required to take at least two modules in Mathematics (Linear Algebra and Calculus) during their degree in UCD. Mathematics teaching has been tailored to meet the requirements of different subjects. However, Mathematics is fundamental to many disciplines of modern Biology and Chemistry, and you should consider studying Mathematics to the level of your ability. You can sample the Mathematics for Physical or Mathematical Sciences modules and if you find them too challenging, you can move to Mathematics for the Sciences in the first two weeks of the Autumn Trimester without affecting your ability to complete the modules. Students must take one Mathematics module in the Autumn Trimester. If a student is required to do MATH00010 then their Calculus module must be deferred until Stage 2. If you are interested in pursuing your studies in Mathematics to a higher level, you should seek academic advice in relation to the mathematics modules you should study.



**Table 3. Mathematics Requirements**

Subjects/areas	Mathematics topics		Comment <i>(to substitute Mathematics modules, you must go to the Science Office)</i>
	Linear Algebra	Calculus	
1 Biological Biomedical and Biomolecular (excluding Education), Chemistry and Chemical Sciences (excluding Education), Geology	MATH10290	MATH10310	MATH10340 can be taken instead of MATH10290 if students want to keep Mathematical and Physical Science subjects open. MATH10350 can be taken instead of MATH10310 if students want to keep the Education degrees or Mathematical and Physical Science subjects open.
2 Biology, Mathematics & Education, Chemistry, Mathematics & Education	MATH10290	MATH10350	MATH10340 can be taken instead of MATH10290 if students want to keep Mathematical and Physical Science subjects open. MATH10350 also fulfills the requirements for all BBB, CCS and Geology subjects (see above).
3 Physics, Theoretical Physics, Physics with Astronomy and Space Science, Mathematics, Physics & Education, Mathematics, Financial Mathematics Applied and Computational Mathematics, Statistics, Mathematics, Applied Mathematics and Education Computer Science, Mathematics and Education	MATH10340	MATH10350	Students who have not attained at least a H3 in Leaving Certificate Mathematics (or equivalent) are strongly advised to consult with either the School of Physics or the School of Mathematics and Statistics – depending on their main area of interest.  For students who wish to pursue Physical Sciences, MATH10400 can be taken in the Summer Trimester instead of MATH10350 if a student has to take MATH00010 in Trimester 1 (Autumn Trimester).

### Mathematics and Science Education Degrees

The Mathematics, Science and Education Programme is a five-year programme, consisting of a four-year BSc in Science (Applied Mathematics, Biology, Chemistry, Computer Science, or Physics), Mathematics and Education followed by a one-year MSc in Mathematics and Science Education. On successful completion of the five years of the programme, you are fully qualified to teach Mathematics and either Applied Mathematics, Biology, Chemistry, Computer Science, or Physics to Higher Leaving Certificate Level in an Irish post-primary school. If your chosen Science specialisation is Biology, Chemistry, or Physics you are also fully qualified to teach Science to Junior Certificate Level. The five-year programme has been approved by the Irish Teaching Council. In the Computer Science, Mathematics and Education pathway, we have full accreditation in Mathematics and are awaiting approval from the Irish Teaching Council in Computer Science.

To meet Teaching Council approval to teach Applied Mathematics, Biology, Chemistry, Computer Science, Mathematics, Computer Science or Physics to Higher Leaving Certificate Level, you must study a minimum 60 ECTS credits of your chosen subject at third level. The Teaching Council places additional conditions on the areas of study for each subject, and the number of modules studied which must be at Level 3 or above. To ensure that a prospective teacher of Biology, Chemistry, or Physics has appropriate discipline knowledge to teach Junior Certificate Science we require that you complete at least 5 ECTS credits in each of Biology, Chemistry and Physics. The five-year Science and Mathematics Education Programme has received accreditation from the Teaching Council for each of its pathways, and you are a fully qualified teacher on graduation from the five-year programme. More details can be found in the Science Handbook on Page 28.

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