



OLLSCOIL NA GAILLIMHÉ  
UNIVERSITY OF GALWAY

Bachelor of Science Degree  
College of Science and Engineering  
2024/2025

# Bachelor of Science Degree

[www.universityofgalway.ie/science-engineering/](http://www.universityofgalway.ie/science-engineering/)





Year 1	Year 2	Year 3	Year 4
<b>[60 Credits]</b>	<b>[60 Credits]</b>	<b>[60 Credits]</b>	<b>[60 Credits]</b>
<p>Choose four of the following modules: Each module is 15 Credits.</p> <p>At least one of:</p> <ul style="list-style-type: none"> <li>MP180 Applied Mathematics</li> <li>MA180 Mathematics</li> <li>MA161 Mathematical Studies</li> </ul> <p>At least two of:</p> <ul style="list-style-type: none"> <li>BO101 Biology</li> <li>CH101 Chemistry</li> <li>CS102 Computer Science</li> <li>PH101 Physics</li> </ul> <p>Eligibility to Year 2 pathways of study require certain combinations of Year 1 modules, see page 26.</p>	<p>Choose at least two pathways from:</p> <ul style="list-style-type: none"> <li>Anatomy</li> <li>Applied Mathematics</li> <li>Biochemistry</li> <li>Botany and Plant Science</li> <li>Chemistry</li> <li>Computing</li> <li>Data Science</li> <li>Earth and Ocean Sciences</li> <li>Mathematics</li> <li>Mathematics and Applied Mathematics</li> <li>Mathematics and Computing</li> <li>Mathematical Studies and Computing</li> <li>Medicinal Chemistry</li> <li>Microbiology</li> <li>Pharmacology</li> <li>Physics and Applied Physics</li> <li>Physics and Climate Physics</li> <li>Physiology</li> <li>Plant and AgriBiosciences</li> <li>Zoology</li> </ul> <p>Pathways will be allocated in accordance to student preferences with consideration to quota, timetable compatibility and satisfying a viable Year 3 programme of study. See page 3 and pages 30-31.</p> <p>Electives: Where the total credit of modules allocated via pathways is less than 60, modules are selected from the Year 2 elective offerings, see page 27.</p>	<p>Choose up to two pathways from:</p> <ul style="list-style-type: none"> <li>Anatomy</li> <li>Applied Mathematics</li> <li>Biochemistry</li> <li>Botany and Plant Science</li> <li>Chemistry</li> <li>Computing</li> <li>Data Science</li> <li>Earth and Ocean Sciences</li> <li>Mathematics</li> <li>Mathematics and Applied Mathematics</li> <li>Mathematics and Computing</li> <li>Mathematical Studies and Computing</li> <li>Medicinal Chemistry</li> <li>Microbiology</li> <li>Pharmacology</li> <li>Physics and Applied Physics</li> <li>Physics and Climate Physics</li> <li>Physiology</li> <li>Plant and AgriBiosciences</li> <li>Zoology</li> </ul> <p>Select <b>OPTION A or B</b></p> <p><b>Option A – Dual Pathways, retaining two options for study in Year 4.</b> <b>Option B – Single Pathway.</b></p> <p>OPTION A is REQUIRED if taking one of the following, Anatomy, Biochemistry, Botany and Plant Science, Microbiology, Pharmacology, Physiology, Plant and AgriBiosciences, or Zoology.</p> <p>Approved Year 3 study paths are provided on page 30.</p>	<p>Choose your honours degree:</p> <ul style="list-style-type: none"> <li>Anatomy</li> <li>Applied Mathematics</li> <li>Biochemistry</li> <li>Botany and Plant Science</li> <li>Chemistry</li> <li>Computing</li> <li>Data Science</li> <li>Earth and Ocean Sciences</li> <li>Mathematics</li> <li>Mathematics and Applied Mathematics</li> <li>Mathematics and Computing</li> <li>Mathematical Studies and Computing</li> <li>Medicinal Chemistry</li> <li>Microbiology</li> <li>Pharmacology</li> <li>Physics and Applied Physics</li> <li>Physics and Climate Physics</li> <li>Physiology</li> <li>Plant and AgriBiosciences</li> <li>Zoology</li> </ul>

## Allocation of 2nd Year Pathway/Elective Places:

In 2nd Year, there is a capacity limit on the places available in each pathway/elective. Students are allocated their pathways based on their overall 1st Year results and submitted pathway preferences for 2nd Year.

Details on the Procedure/Guidelines for allocating places is in the Student Guide issued to all 1st Year students and available on the web:

[https://www.universityofgalway.ie/media/collegeofscienceandengineering/First-Year-Academic-Booklet\\_print.pdf](https://www.universityofgalway.ie/media/collegeofscienceandengineering/First-Year-Academic-Booklet_print.pdf)

## Module Descriptors:

Module descriptors are available at:

Years 1 and 2: <https://www.universityofgalway.ie/course-information/programme/BS1>

Year 3: <https://www.universityofgalway.ie/course-information/programme/BS9>

Year 4: <https://www.universityofgalway.ie/course-information/programme/BS2>

## Module Options within Pathways:

Where module options are indicated within a pathway, these modules are highlighted in colour.

## Module Codes

<b>AN</b> Anatomy	<b>CS</b> Computer Science	<b>IE</b> Engineering	<b>SI</b> Physiology
<b>BG</b> Biotechnology	<b>EC</b> Economics	<b>MA</b> Mathematics / Mathematical Studies	<b>PAB</b> Plant and AgriBiosciences
<b>BI</b> Biochemistry	<b>EOS</b> Earth & Ocean Sciences	<b>MI</b> Microbiology	<b>ST</b> Statistics
<b>BM</b> Biomedical Science	<b>EV</b> Environmental Science	<b>MP</b> Applied Mathematics	<b>TI</b> Geography
<b>BO</b> Biology	<b>FR</b> French	<b>MR</b> Marine Science	<b>ZO</b> Zoology
<b>BPS</b> Botany & Plant Science	<b>GR</b> German	<b>PH</b> Physics & Applied Physics	
<b>CH</b> Chemistry	<b>HP</b> Occupational Health	<b>PM</b> Pharmacology	

# Anatomy Pathway

Year 1	Year 2	Year 3	Year 4
<b>[60 Credits]</b>	<b>[Core: 20 credits]</b>	<b>[Core: 30 credits]</b>	<b>[Core: 60 credits]</b>
<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>BO101 <b>Biology [15]</b> CH101 <b>Chemistry [15]</b> PH101 <b>Physics [15]</b></p>	<p><i>Semester 1</i></p> <p>AN2101 <b>Cells and Tissues [10]</b></p> <p><i>Semester 2</i></p> <p>AN223 <b>Embryology &amp; Development [5]</b> AN226 <b>Systems Histology [5]</b></p>	<p><i>Semester 1</i></p> <p>AN3105 <b>Gross Anatomy I [10]</b> AN326 <b>Neuroanatomy [5]</b></p> <p><i>Semester 2</i></p> <p>AN3106 <b>Gross Anatomy II [10]</b> AN3109 <b>Human Reproductive Anatomy [5]</b></p>	<p><i>Semester 1</i></p> <p>AN4101 <b>Gross Anatomy III [10]</b> AN4103 <b>Microscopy and Imaging [10]</b> AN4109 <b>Research and Communication Skills in Anatomy [5]</b> AN441 <b>Physical Anthropology [5]</b></p> <p><i>Semester 2</i></p> <p>AN4110 <b>Anatomy for Clinical Needs [5]</b> AN4107 <b>Anatomy of the Head and Neck [5]</b> AN444 <b>Research Project [20]</b></p>

Module Descriptors for Years 1 to 4 are available at: [https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course\\_outline](https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course_outline)

**Module Options within Pathways:** Where module options are indicated within a pathway, these modules are highlighted in colour.

# Applied Mathematics Pathway

Year 1	Year 2	Year 3	Year 4
[60 Credits]	[Core: 20 credits]	[Core: 30 credits]	[Core: 55 credits; Options: 5 credits]
<b>Optional Modules to be chosen in consultation with the School of Mathematical and Statistical Sciences</b>			
<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>MP180    <b>Applied Mathematics [15]</b></p>	<p><i>Semester 1</i></p> <p>MP231    <b>Mathematical Methods I [5]</b> MP236    <b>Mechanics I [5]</b></p> <p><i>Semester 2</i></p> <p>MP232    <b>Mathematical Methods II [5]</b> MP237    <b>Mechanics II [5]</b></p>	<p><i>Semester 1</i></p> <p>MP345    <b>Mathematical Methods I [5]</b> MP410    <b>Non-Linear Elasticity [5] ^</b> MP356    <b>Quantum Mechanics I [5] ^</b></p> <p><i>Semester 2</i></p> <p>MP346    <b>Mathematical Methods II [5]</b> MP491    <b>Non Linear Systems [5]</b> MP357    <b>Quantum Mechanics II [5] ^</b></p>	<p><i>Full Year - Semester 1 and Semester 2</i></p> <p>MA4101    <b>Teaching and Learning in Mathematics [5]*</b></p> <p>MM4000    <b>Final Year Project [10]</b></p> <p><i>Semester 1</i></p> <p>MP403    <b>Cosmology And General Relativity [5]</b> MA3101    <b>Euclidean and Non-Euclidean Geometry [5]</b></p> <p>MP305    <b>Modelling I [5]</b> MP356    <b>Quantum Mechanics I [5] ^</b> MA385    <b>Numerical Analysis I [5]</b> MP410    <b>Non-Linear Elasticity [5] ^</b></p> <p>MA4102    <b>Algebraic Foundations of Quantum Computing [5]*</b> MA335    <b>Algebraic Structures [5]*</b> ST313    <b>Applied Regression Models [5]*</b> ST311    <b>Applied Statistics I [5]*</b> PH466    <b>Astrophysics [5]*</b> MA302    <b>Complex Variable [5]*</b> PH334    <b>Computational Physics [5]*</b> MA3343    <b>Groups [5]*</b> ST417    <b>Introduction to Bayesian Modelling [5]*</b> MA313    <b>Linear Algebra I [5]*</b> CS3304    <b>Logic [5]*</b> MA490    <b>Measure Theory [5]*</b> MA341    <b>Metric Spaces [5]*</b> PH328    <b>Physics of the Environment I [5]*</b> MA416    <b>Rings [5]*</b> PH422    <b>Solid State Physics [5]*</b> ST413    <b>Statistical Modelling [5]*</b></p> <p><i>Semester 2</i></p> <p>MP307    <b>Modelling II [5]</b> MA378    <b>Numerical Analysis II [5]</b> MP357    <b>Quantum Mechanics II [5] ^</b></p> <p style="text-align: right;"><i>Continued...</i></p>
<p><b>Module Options within Pathways:</b> Where module options are indicated within a pathway, these modules are highlighted in colour.</p>			

# Applied Mathematics Pathway

Year 1	Year 2	Year 3	Year 4
			<p>Semester 2</p> <p>MA4344 Advanced Group Theory [5]*            ST312 Applied Statistics II [5]*            CS402 Cryptography [5]*            MA3491 Fields and Applications [5]*            MA482 Functional Analysis [5]*            PH329 Physics of the Environment II [5]*            CS319 Scientific Computer [5]*            ST4120 Causal Inference [5]*            MA342 Topology [5]*</p>
		<p>^ These modules are only available every 2nd Year. Alternative modules are offered next academic year.</p>	<p>* Select one 5-credit module.            ^ These modules are only available every 2nd Year. Alternative modules are offered next academic year.</p>

Module Descriptors for Years 1 to 4 are available at: [https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course\\_outline](https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course_outline)

**Module Options within Pathways:** Where module options are indicated within a pathway, these modules are highlighted in colour.

# Biochemistry Pathway

Year 1	Year 2	Year 3	Year 4
<b>[60 Credits]</b>	<b>[Core: 20 credits]</b>	<b>[Core: 30 Credits]</b>	<b>[Core: 60 credits]</b>
<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>BO101 <b>Biology [15]</b> CH101 <b>Chemistry [15]</b> PH101 <b>Physics [15]</b></p>	<p><i>Semester 1</i></p> <p>BO201 <b>Molecular and Cellular Biology (MCB) [5]</b> BI208 <b>Protein Structure and Function [5]</b></p> <p><i>Semester 2</i></p> <p>BI206 <b>Gene Technologies and Molecular Medicine [5]</b> BI207 <b>Metabolism and Cell Signalling [5]</b></p>	<p><i>Semester 1</i></p> <p>BI309 <b>Cell Biology [5]</b> BO3101 <b>Developmental Biology [5]</b> BI319 <b>Molecular Biology [5]</b></p> <p><i>Semester 2</i></p> <p>BI313 <b>Cell Signalling [5]</b> BI317 <b>Human Molecular Genetics [5]</b> BI321 <b>Protein Biochemistry [5]</b></p>	<p><i>Full Year - Semester 1 and Semester 2</i></p> <p>BI453 <b>Biochemistry Research Project [15]*</b> BG4101 <b>Advanced skills and Employability for Biotechnologists [15]*</b></p> <p>BI446 <b>Current Topics in Bioscience [5]</b> BI447 <b>Literature Review and Presentation [10]</b> BI451 <b>Research Paper Analysis [5]</b></p> <p><i>Semester 1</i></p> <p>BI452 <b>Biochemistry Principles and Experimental Design [5]</b> BI445 <b>Biomolecules [5]</b> BI448 <b>Modern Biotechnologies [5]</b></p> <p><i>Semester 2</i></p> <p>BI429 <b>Advanced Chromosome Biology [5]</b> BI449 <b>Molecular and Cellular Biology [5]</b></p>
			Assigned one of BI453 or BG4101.

Module Descriptors for Years 1 to 4 are available at: [https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course\\_outline](https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course_outline)

**Module Options within Pathways:** Where module options are indicated within a pathway, these modules are highlighted in colour.



# Botany and Plant Science Pathway

Year 1	Year 2	Year 3	Year 4
<b>[60 Credits]</b>	<b>[Core: 20 credits]</b>	<b>[Core: 25 Credits, Options: 5 Credits]</b>	<b>[Core: 45 credits; Options: 15 credits]</b>
<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>BO101 <b>Biology [15]</b></p>	<p><i>Semester 1</i></p> <p>BO202 <b>Evolution and the Tree of Life [5]</b> BPS202 <b>Fundamentals in Aquatic Plant Science [5]</b> BO201 <b>Molecular and Cellular Biology (MCB) [5]</b></p> <p><i>Semester 2</i></p> <p>BPS203 <b>Plant Diversity, Physiology and Adaptation [5]</b></p>	<p><i>Full Year - Semester 1 and Semester 2</i></p> <p>BPS3101 <b>Techniques in Field Ecology and Conservation [5]*</b></p> <p><i>Semester 1</i></p> <p>ZO415 <b>Biometry [5]</b> BPS3102 <b>Plant Resources and Ecosystems [5]</b> BPS3103 <b>Plant Function [5]</b></p> <p><i>Semester 2</i></p> <p>BPS3107 <b>Plants, Atmosphere and Environment throughout Earth History [5]</b> BPS3104 <b>Plant Interactions [5]</b></p>	<p><i>Full Year - Semester 1 and Semester 2</i></p> <p>BPS4101 <b>Major Research Project [20]</b> ZO414 <b>Advanced Zoology Topics [5]*</b> ZO418 <b>Phylogenetics &amp; Conservation [5]*</b></p> <p><i>Semester 1</i></p> <p>BPS4106 <b>Botany and Plant Science Literature Review and Presentation [5]</b> BPS402 <b>Current Topics in Algal Research [5]</b> BPS4107 <b>Plant Cell Biology and Biochemistry [5]</b> EOS418 <b>Applied Field Hydrogeology [5]*</b> BI445 <b>Biomolecules [5]*</b> ZO4102 <b>Biostatistics for Natural Sciences [5]</b> BI448 <b>Modern Biotechnologies [5]*</b></p> <p><i>Semester 2</i></p> <p>BPS405 <b>Ecology and Conservation Issues [5]</b> BPS4104 <b>Primary Productivity and Global Change [5]</b> AR347 <b>Palaeoecology - Reconstructing Past Environments [5]*</b> EOS409 <b>Biophysical Interactions in the Ocean [5]*</b> EOS407 <b>History of Life [5]*</b> ZO416 <b>Integrative Zoology [5]*</b> BI449 <b>Molecular and Cellular Biology [5]*</b> EOS422 <b>Sedimentary Basins [5]*</b></p>
			* Select remaining modules to a value of 15 credits.

Module Descriptors for Years 1 to 4 are available at: [https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course\\_outline](https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course_outline)

**Module Options within Pathways:** Where module options are indicated within a pathway, these modules are highlighted in colour.



# Chemistry Pathway

Year 1	Year 2	Year 3	Year 4
[60 Credits]	[Core: 20 credits]	[Core: 40 Credits]	[Core: 60 credits]
<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>CH101 <b>Chemistry [15]</b></p>	<p><i>Semester 1</i></p> <p>CH204 <b>Inorganic Chemistry [5]</b> CH203 <b>Physical Chemistry [5]</b></p> <p><i>Semester 2</i></p> <p>CH205 <b>Analytical and Environmental Chemistry [5]</b> CH202 <b>Organic Chemistry [5]</b></p>	<p><i>Semester 1</i></p> <p>CH326 <b>Analytical Chemistry &amp; Molecular Structure [5]</b> CH333 <b>Experimental Chemistry I [5]</b> CH311 <b>Organic Chemistry [5]</b></p> <p><i>Semester 2</i></p> <p>CH3101 <b>Computers and Chemical Research [10]</b> CH334 <b>Experimental Chemistry II [5]</b> CH307 <b>Inorganic Chemistry [5]</b> CH313 <b>Physical Chemistry [5]</b></p>	<p><i>Semester 1</i></p> <p>CH451 <b>Practical Skills Development [5]</b> CH4101 <b>Research Investigation [20]</b> CH448 <b>Spectroscopic and Physical Methods and Applications [5]</b></p> <p><i>Semester 2</i></p> <p>CH445 <b>Advanced Inorganic Chemistry [5]</b> CH446 <b>Bioinorganic and Inorganic Medicinal Chemistry [5]</b> CH438 <b>Bioorganic Chemistry [5]</b> CH4113 <b>Organic Chemistry [5]</b> CH429 <b>Physical Chemistry 1 [5]</b> CH432 <b>Physical Chemistry 2 [5]</b></p>

Module Descriptors for Years 1 to 4 are available at: [https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course\\_outline](https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course_outline)

**Module Options within Pathways:** Where module options are indicated within a pathway, these modules are highlighted in colour.

# Computing Pathway

Year 1	Year 2	Year 3	Year 4
[60 Credits]	[Core: 20 credits]	[Core: 20 credits; Options: 10 credits]	[Core: 40 credits; Options: 20 credits]
<b>Optional Modules to be chosen in consultation with the School of Mathematical and Statistical Sciences</b>			
<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>CS102    <b>Computer Science [15]</b></p>	<p><i>Semester 1</i></p> <p>CT2101    <b>Object Oriented Programming 1 [5]</b> CS2101    <b>Programming for Science and Finance [5]</b></p> <p><i>Semester 2</i></p> <p>CT2102    <b>Object Oriented Programming 2 [5]</b> CS211    <b>Programming and Operating Systems [5]</b></p>	<p><i>Semester 1</i></p> <p>CS3304    <b>Logic [5]</b> CT3535    <b>Object Oriented Programming [5]</b></p> <p>CT511    <b>Databases [5]*</b> MA215    <b>Mathematical Molecular Biology I [5]*</b> MP305    <b>Modelling I [5]*</b> CT331    <b>Programming Paradigms [5]*</b></p> <p><i>Semester 2</i></p> <p>CT2108    <b>Networks and Data Communications I [5]</b> CS319    <b>Scientific Computing [5]</b></p> <p>MA216    <b>Mathematical Molecular Biology II [5]*</b> MP307    <b>Modelling II [5]*</b> CT411    <b>Multimedia Development [5]*</b></p>	<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>MM4000    <b>Final Year Project [10]</b></p> <p><i>Semester 1</i></p> <p>CS4102    <b>Geometric Foundations in Data Analysis I [5]</b> CT336    <b>Graphics And Image Processing [5]</b> CT4101    <b>Machine Learning [5]</b></p> <p>MA4102    <b>Algebraic Foundations of Quantum Computing [5]*</b> CT318    <b>Human Computer Interaction [5]*</b> MP305    <b>Modelling I [5]*</b> CT4100    <b>Information Retrieval [5]*</b> MA385    <b>Numerical Analysis I [5]*</b> CT331    <b>Programming Paradigms [5]*</b></p> <p><i>Semester 2</i></p> <p>CS402    <b>Cryptography [5]</b> CS4103    <b>Geometric Foundations in Data Analysis II [5]</b> CS4423    <b>Networks [5]</b></p> <p>CT414    <b>Distributed Systems and Cooperative Computing [5]*</b> CT421    <b>Artificial Intelligence [5]*</b> MP307    <b>Modelling II [5]*</b> MA378    <b>Numerical Analysis II [5]*</b> CT548    <b>Object Oriented Software Design &amp; Development [5]*</b></p>
		* Select two 5-credit modules	* Select four 5-credit modules

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**Module Options within Pathways:** Where module options are indicated within a pathway, these modules are highlighted in colour.



# Data Science Pathway

Year 1	Year 2	Year 3	Year 4
[60 Credits]	[Core: 40 credits]	[Core: 30 credits; Options: 30 credits]	[Core: 50 credits; Options: 10 credits]
<b>Optional Modules to be chosen in consultation with the School of Mathematical and Statistical Sciences</b>			
<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>MA180 <b>Mathematics [15]</b> CS102 <b>Computer Science [15]</b></p>	<p><i>Statistics– Semester 1</i></p> <p>ST1111 <b>Probability Models [5]</b></p> <p><i>Statistics– Semester 2</i></p> <p>ST1112 <b>Statistical Methods [5]</b></p> <p><i>Computing - Semester 1</i></p> <p>CS2101 <b>Programming for Science and Finance [5]</b> CT2101 <b>Object Oriented Programming 1 [5]</b></p> <p><i>Computing - Semester 2</i></p> <p>CT2102 <b>Object Oriented Programming 2 [5]</b></p> <p><i>Mathematics - Semester 1</i></p> <p>MA284 <b>Discrete Mathematics [5]</b> MA2286 <b>Differential Forms [5]</b></p> <p><i>Mathematics - Semester 2</i></p> <p>MA283 <b>Linear Algebra [5]</b></p>	<p><i>Statistics– Semester 1</i></p> <p>ST311 <b>Applied Statistics [5]</b> ST2003 <b>Random Variables [5]</b></p> <p><i>Statistics– Semester 2</i></p> <p>ST312 <b>Applied Statistics 2 [5]</b> ST2004 <b>Statistical Inference [5]</b></p> <p><i>Computing - Semester 1</i></p> <p>CT511 <b>Databases [5]</b> CS3304 <b>Logic [5] *</b> CT3535 <b>Object Oriented Programming [5]*</b> CT331 <b>Programming Paradigms [5] *</b></p> <p><i>Computing– Semester 2</i></p> <p>CS319 <b>Scientific Computing [5]</b> CT411 <b>Multimedia Development [5]*</b> CT2108 <b>Networks and Data Communications [5]*</b> CS211 <b>Programming and Operating Systems [5]*</b></p> <p><i>Mathematics - Semester 1</i></p> <p>MA215 <b>Mathematical Molecular Biology [5]*</b> MP305 <b>Modelling I [5]*</b></p> <p><i>Mathematics - Semester 2</i></p> <p>MA2287 <b>Complex Variables [5] *</b> MA216 <b>Mathematical Molecular Biology II [5] *</b> MP307 <b>Modelling II [5] *</b></p>	<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>MM4000 <b>Final Year Project [10]</b></p> <p><i>Statistics– Semester 1</i></p> <p>ST413 <b>Statistical Modelling [5]</b> ST417 <b>Bayesian Modelling [5]</b></p> <p><i>Statistics– Semester 2</i></p> <p>ST4120 <b>Causal Inference [5]*</b> ST4140 <b>Modern Statistical Methods [5]</b></p> <p><i>Computing - Semester 1</i></p> <p>CT4101 <b>Machine Learning [5]</b> MA4102 <b>Algebraic Foundations of Quantum Computing [5]*</b> CS4102 <b>Geometric Foundations of Analysis I [5]*</b> CT336 <b>Graphics and Image Processing [5]*</b> CT318 <b>Human Computer Interaction [5]*</b> CT4100 <b>Information Retrieval [5]*</b></p> <p><i>Computing - Semester 2</i></p> <p>CS402 <b>Cryptography [5]</b> CS4423 <b>Networks [5]</b> CT421 <b>Artificial Intelligence [5] *</b> CT414 <b>Distributive and Cooperative Systems [5]</b> CS4103 <b>Geometric Foundations of Analysis II [5]*</b> MA461 <b>Probabilistic Models for Molecular Biology [5] *</b></p>
		*Select remaining modules to the value of 30 credits.	* Select remaining modules to a value of 10 credits.

Module Descriptors for Years 1 to 4 are available at: [https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course\\_outline](https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course_outline)

**Module Options within Pathways:** Where module options are indicated within a pathway, these modules are highlighted in colour.

# Earth and Ocean Sciences Pathway

Year 1	Year 2	Year 3	Year 4
[60 Credits]	[Core: 40 credits]	[Core: 35 credits; Options: 10 credits]	[Core: 40 credits; Options: 20 credits]
<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>BO101 <b>Biology [15]</b> CH101 <b>Chemistry [15]</b> PH101 <b>Physics [15]</b></p>	<p><i>Semester 1</i></p> <p>EOS213 <b>Introduction to Ocean Science [10]</b></p> <p><i>Semester 2</i></p> <p>EOS2102 <b>The Earth: From Core to Crust [10]</b></p>	<p><i>Semester 1</i></p> <p>EOS305 <b>Introduction to Applied Field Hydrology [5]</b></p> <p>EOS3107 <b>Minerals, magmas and Metamorphism [10]*</b></p> <p>EOS3103 <b>Palaeontology and Evolution [5]</b></p> <p>EOS323 <b>Sediments and the Sedimentary Record [5]</b></p> <p><i>Semester 2</i></p> <p>EOS3104 <b>Fieldskills Training [5]</b> EOS3101 <b>Geological Structures and Maps [5]</b></p> <p>EOS304 <b>Aquatic Geochemistry [5]*</b></p> <p>EOS3102 <b>Environmental and Marine Geophysical Remote Sensing [5]</b> EOS303 <b>Ocean Dynamics [5]</b></p>	<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>EOS4106 <b>Fieldskills in Oceanography [5]*</b></p> <p><i>Semester 1</i></p> <p>EOS4107 <b>Advanced Fieldskills [5]</b> EOS418 <b>Applied Field Hydrogeology [5]</b> EOS402 <b>Global Change [5]</b></p> <p>EOS4102 <b>EOS Minor Final Year Project [10]*</b> EOS403 <b>Final Year Project [20]*</b> BPS402 <b>Current Topics in Algal Research [5]*</b> BPS4107 <b>Plant Cell Biology and Biochemistry [5]*</b> PAB4103 <b>Climate Change, Plants &amp; Agriculture [5]*</b> ZO418 <b>Phylogenetics &amp; Conservation [5]*</b></p> <p><i>Semester 2</i></p> <p>EOS409 <b>Biophysical Interactions in the Ocean [5]</b> EOS4101 <b>Earth Observation and Remote Sensing [5]</b> EOS407 <b>History of Life [5]</b> EOS422 <b>Sedimentary Basins [5]</b></p> <p>BPS3107 <b>Plants, Atmosphere and Environment throughout Earth History [5]*</b> BPS4104 <b>Primary Productivity and Global Change [5]*</b> EOS4105 <b>Economic Geology: principles, practice and sustainability [5]*</b></p>
			* Assigned one project module: EOS403 [20] or EOS4102 [10] If allocated EOS4102, select elective modules to a value of 10 credits.

Module Descriptors for Years 1 to 4 are available at: [https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course\\_outline](https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course_outline)

**Module Options within Pathways:** Where module options are indicated within a pathway, these modules are highlighted in colour.



# Mathematics Pathway

Year 1	Year 2	Year 3	Year 4
[60 Credits]	[Core: 20 credits]	[Core: 30 credits; Options: 10 credits]	[Core: 30 credits; Options: 30 credits]
<b>Optional Modules to be chosen in consultation with the School of Mathematical and Statistical Sciences</b>			
<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>MA180 <b>Mathematics [15]</b></p>	<p><i>Semester 1</i></p> <p>MA284 <b>Discrete Mathematics [5]</b> MA2286 <b>Differential Forms [5]</b></p> <p><i>Semester 2</i></p> <p>MA283 <b>Linear Algebra [5]</b> MA2287 <b>Complex Analysis [5]</b></p>	<p><i>Semester 1</i></p> <p>MA3101 <b>Euclidean and Non-Euclidean Geometry [5]</b> MA3343 <b>Groups [5]</b> MA341 <b>Metric Spaces [5]</b></p> <p><i>One of:</i></p> <p>ST2001 <b>Statistics for Data Science I [5]*</b> ST2003 <b>Random Variables [5]*</b> ST311 <b>Applied Statistics I [5]*</b></p> <p><i>Semester 2</i></p> <p>MA3491 <b>Fields and Applications [5]</b> MA378 <b>Numerical Analysis II [5]</b> MA342 <b>Topology [5]</b></p> <p><i>One of:</i></p> <p>ST2002 <b>Statistics for Data Science II [5]*</b> ST2004 <b>Statistical Inference [5]*</b> ST312 <b>Applied Statistics II [5]*</b></p>	<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>MM4000 <b>Final Year Project [10]</b> MA4101 <b>Teaching and Learning in Mathematics [5]*</b></p> <p><i>Semester 1</i></p> <p>MA490 <b>Measure Theory [5]</b> MA416 <b>Rings [5]</b> MA4102 <b>Algebraic Foundations of Quantum Computing [5]*</b> ST313 <b>Applied Regression Models [5]*</b> ST311 <b>Applied Statistics [5]*</b> MP403 <b>Cosmology and General Relativity [5]*</b> CS4102 <b>Geometric Foundations in Data Analysis I [5]*</b> ST417 <b>Introduction to Bayesian Modelling [5]*</b> MA437 <b>Introduction to Mathematical Research Topics I [5]*</b> CS3304 <b>Logic [5]*</b> MP345 <b>Mathematical Methods I [5]*</b> MP305 <b>Modelling I [5]*</b> MP366 <b>Electromagnetism [5]</b> MA385 <b>Numerical Analysis I [5]*</b> ST413 <b>Statistical Modelling [5]*</b></p> <p><i>Semester 2</i></p> <p>MA482 <b>Functional Analysis [5]</b> MA4344 <b>Advanced Group Theory [5]</b> MA495 <b>Actuarial Mathematics: Life Contingencies II [5]*</b> ST312 <b>Applied Statistics II [5]*</b> CS402 <b>Cryptography [5]*</b> MA418 <b>Differential Equations with Financial Derivatives [5]*</b> CS4103 <b>Geometric Foundations in Data Analysis II [5]*</b></p> <p style="text-align: right;"><i>Continued...</i></p>
<p><b>Module Options within Pathways:</b> Where module options are indicated within a pathway, these modules are highlighted in colour.</p>			

# Mathematics Pathway

Year 1	Year 2	Year 3	Year 4
			<p>MA438 Introduction to Mathematical Research Topics II [5]*</p> <p>MP346 Mathematical Methods II [5]*</p> <p>MP307 Modelling II [5]*</p> <p>ST4140 Modern Statistical Methods [5]*</p> <p>CS4423 Networks [5]*</p> <p>MP491 Nonlinear Systems [5]*</p> <p>MA461 Probabilistic Models for Molecular Biology [5]*</p> <p>CS319 Scientific Computer [5]*</p> <p>ST4120 Causal Inference [5]*</p>
			* Select optional modules to a value of 30 credits.

Module Descriptors for Years 1 to 4 are available at: [https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course\\_outline](https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course_outline)

**Module Options within Pathways:** Where module options are indicated within a pathway, these modules are highlighted in colour.



# Mathematics and Applied Mathematics Pathway

Year 1	Year 2	Year 3	Year 4
[60 Credits]	[Core: 40 credits]	[Core: 50 credits; Options: 10 credits]	[Core: 60 credits]
<b>Optional Modules to be chosen in consultation with the School of Mathematical and Statistical Sciences</b>			
<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>MP180 <b>Applied Mathematics [15]</b> MA180 <b>Mathematics (Honours) [15]</b></p>	<p><i>Mathematics – Semester 1</i></p> <p>MA2286 <b>Differential Forms I [5]</b> MA284 <b>Discrete Mathematics [5]</b></p> <p><i>Mathematics – Semester 2</i></p> <p>MA283 <b>Linear Algebra [5]</b> MA2287 <b>Complex Analysis [5]</b></p> <p><i>Applied Mathematics – Semester 1</i></p> <p>MP231 <b>Mathematical Methods I [5]</b> MP236 <b>Mechanics I [5]</b></p> <p><i>Applied Mathematics – Semester 2</i></p> <p>MP237 <b>Mechanics II [5]</b> MP232 <b>Mathematical Methods II [5]</b></p>	<p><i>Semester 1</i></p> <p>MA3101 <b>Euclidean and Non-Euclidean Geometry [5]</b> MA3343 <b>Groups [5]</b> MP345 <b>Mathematical Methods I [5]</b> MP410 <b>Non-Linear Elasticity [5] ^</b> MP356 <b>Quantum Mechanics I [5] ^</b></p> <p><i>One of:</i></p> <p>ST2001 <b>Statistics for Data Science I [5]*</b> ST2003 <b>Random Variables [5]*</b> ST311 <b>Applied Statistics I [5]*</b></p> <p><i>Semester 2</i></p> <p>MA3491 <b>Fields and Applications [5]</b> MP346 <b>Mathematical Methods II [5]</b> MP491 <b>Non Linear Systems [5]</b> MA342 <b>Topology [5]</b> MP357 <b>Quantum Mechanics II [5] ^</b></p> <p><i>One of:</i></p> <p>ST2002 <b>Statistics for Data Science II [5]*</b> ST2004 <b>Statistical Inference [5]*</b> ST312 <b>Applied Statistics II [5]*</b></p>	<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>MM4000 <b>Final Year Project [10]</b></p> <p><i>Semester 1</i></p> <p>MP410 <b>Non-Linear Elasticity [5] ^</b> MA490 <b>Measure Theory [5]</b> MP305 <b>Modelling I [5]</b> MP356 <b>Quantum Mechanics I [5] ^</b> MA416 <b>Rings [5]</b></p> <p><i>Semester 2</i></p> <p>MA4344 <b>Advanced Group Theory [5]</b> MA482 <b>Functional Analysis [5]</b> MP307 <b>Modelling II [5]</b> MA378 <b>Numerical Analysis II [5]</b> MP357 <b>Quantum Mechanics II [5] ^</b></p>
		<p>* Select modules to a value of 10 credits. ^ These modules are only available every 2nd Year. Alternative modules are offered next academic year.</p>	<p>^ These modules are only available every 2nd Year. Alternative modules are offered next academic year.</p>

Module Descriptors for Years 1 to 4 are available at: [https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course\\_outline](https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course_outline)

**Module Options within Pathways:** Where module options are indicated within a pathway, these modules are highlighted in colour.

# Mathematics and Computing Pathway

Year 1	Year 2	Year 3	Year 4
[60 Credits]	[Core: 40 credits]	[Core: 40 credits; Options: 20 credits]	[Core 55 credits; Options: 5 credits]
<b>Optional Modules to be chosen in consultation with the School of Mathematical and Statistical Sciences</b>			
<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>MA180 <b>Mathematics [15]</b> CS102 <b>Computer Science [15]</b></p>	<p><i>Mathematics – Semester 1</i></p> <p>MA2286 <b>Differential Forms I [5]</b> MA284 <b>Discrete Mathematics [5]</b></p> <p><i>Mathematics – Semester 2</i></p> <p>MA283 <b>Linear Algebra [5]</b> MA2287 <b>Complex Analysis [5]</b></p> <p><i>Computing – Semester 1</i></p> <p>CT2101 <b>Object Oriented Programming 1 [5]</b> CS2101 <b>Programming for Science and Finance [5]</b></p> <p><i>Computing – Semester 2</i></p> <p>CT2102 <b>Object Oriented Programming 2 [5]</b> CS211 <b>Programming and Operating Systems [5]</b></p>	<p><i>Semester 1</i></p> <p>MA3101 <b>Euclidean and Non-Euclidean Geometry [5]</b> MA3343 <b>Groups [5]</b> CS3304 <b>Logic [5]</b> CT3535 <b>Object Oriented Programming [5]</b> CT511 <b>Databases [5]*</b> CT331 <b>Programming Paradigms [5]*</b></p> <p><i>One of:</i></p> <p>ST2001 <b>Statistics for Data Science I [5]*</b> ST2003 <b>Random Variables [5]*</b> ST311 <b>Applied Statistics I [5]*</b></p> <p><i>Semester 2</i></p> <p>MA3491 <b>Fields and Applications [5]</b> CT2108 <b>Networks and Data Communications I [5]</b> CS319 <b>Scientific Computing [5]</b> MA342 <b>Topology [5]</b> CT411 <b>Multimedia Development [5]*</b></p> <p><i>One of:</i></p> <p>ST2002 <b>Statistics for Data Science II [5]*</b> ST2004 <b>Statistical Inference [5]*</b> ST312 <b>Applied Statistics II [5]*</b></p>	<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>MM4000 <b>Final Year Project [10]</b></p> <p><i>Semester 1</i></p> <p>CS4102 <b>Geometric Foundations in Data Analysis I [5]</b> CT4101 <b>Machine Learning [5]</b> MA490 <b>Measure Theory [5]</b> MA416 <b>Rings [5]</b> MA4102 <b>Algebraic Foundations of Quantum Computing [5]*</b> CT318 <b>Human Computer Interaction [5]*</b> MA437 <b>Introduction to Mathematical Research [5]*</b> CT4100 <b>Information Retrieval [5]*</b> MA385 <b>Numerical Analysis I [5]*</b> CT331 <b>Programming Paradigms [5]*</b></p> <p><i>Semester 2</i></p> <p>MA4344 <b>Advanced Group Theory [5]</b> CS402 <b>Cryptography [5]</b> MA482 <b>Functional Analysis [5]</b> CS4103 <b>Geometric Foundations in Data Analysis II [5]</b> MA378 <b>Numerical Analysis II [5]</b> CT421 <b>Artificial Intelligence [5]*</b> CT414 <b>Distributed Systems and Cooperative Computing [5]*</b> CS4423 <b>Networks [5]*</b> CT548 <b>Object Oriented Software Design and Development [5]*</b> MA461 <b>Probabilistic Methods in Bioinformatics [5]*</b></p>
		* Select modules to the value of 20 credits	* Select remaining modules to a value of 5 credits.

Module Descriptors for Years 1 to 4 are available at: [https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course\\_outline](https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course_outline)

**Module Options within Pathways:** Where module options are indicated within a pathway, these modules are highlighted in colour.

# Mathematical Studies and Computing Pathway

Year 1	Year 2	Year 3	Year 4
[60 Credits]	[Core: 40 credits]	[Core: 50 credits; Options: 10 credits]	[Core 50 credits; Options: 10 credits]
<b>Optional Modules to be chosen in consultation with the School of Mathematical and Statistical Sciences</b>			
<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>CS102 <b>Computer Science [15]</b> MA161 <b>Mathematical Studies [15]</b> or MA180 <b>Mathematics [15]</b></p>	<p><i>Mathematical Studies – Semester 1</i></p> <p>MA211 <b>Calculus I [5]</b> MA284 <b>Discrete Mathematics [5]</b></p> <p><i>Mathematical Studies – Semester 2</i></p> <p>MA203 <b>Linear Algebra [5]</b> MA212 <b>Calculus II [5]</b></p> <p><i>Computing – Semester 1</i></p> <p>CT2101 <b>Object Oriented Programming 1 [5]</b> CS2101 <b>Programming for Science and Finance [5]</b></p> <p><i>Computing – Semester 2</i></p> <p>CT2102: <b>Object Oriented Programming 2 [5]</b> CS211 <b>Programming and Operating Systems [5]</b></p>	<p><i>Semester 1</i></p> <p>MA335 <b>Algebraic Structures [5]</b> MA302 <b>Complex Variable [5]</b> MA313 <b>Linear Algebra I [5]</b> CS3304 <b>Logic [5]</b> CT3535 <b>Object Oriented Programming [5]</b> ST2001 <b>Statistics for Data Science I [5]</b> CT511 <b>Databases [5]*</b> CT331 <b>Programming Paradigms [5]*</b></p> <p><i>Semester 2</i></p> <p>CT2108 <b>Networks and Data Communications I [5]</b> CS319 <b>Scientific Computing [5]</b> CS3101 <b>Software for Mathematical Scientists and Educators [5]</b> ST2002 <b>Statistics for Data Science II [5]</b> CT411 <b>Multimedia Development [5]*</b></p>	<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>MM4000 <b>Final Year Project [10]</b></p> <p><i>Semester 1</i></p> <p>MA3101 <b>Euclidean and Non-Euclidean Geometry [5]</b> CS4102 <b>Geometric Foundations in Data Analysis I [5]</b> MA3343 <b>Groups [5]</b> CT4101 <b>Machine Learning [5]</b> ST311 <b>Applied Statistics I [5]*</b> CT318 <b>Human Computer Interaction [5]*</b> CT4100 <b>Information Retrieval [5]*</b> MA341 <b>Metric Spaces [5]*</b> MA385 <b>Numerical Analysis I [5]*</b> CT331 <b>Programming Paradigms [5]*</b></p> <p><i>Semester 2</i></p> <p>MA4344 <b>Advanced Group Theory [5]</b> CS402 <b>Cryptography [5]</b> CS4103 <b>Geometric Foundations in Data Analysis II [5]</b> MA342 <b>Topology [5]</b> CT421 <b>Artificial Intelligence [5]*</b> ST312 <b>Applied Statistics II [5]*</b> CT414 <b>Distributed Systems and Cooperative Computing [5]*</b> CS4423 <b>Networks [5]*</b> MA378 <b>Numerical Analysis II [5]*</b> CT548 <b>Object Oriented Software Design and Development [5]*</b></p>
		* Select modules to the value of 10 credits	* Select remaining modules to a value of 10 credits.

Module Descriptors for Years 1 to 4 are available at: [https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course\\_outline](https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course_outline)

**Module Options within Pathways:** Where module options are indicated within a pathway, these modules are highlighted in colour.



# Medicinal Chemistry Pathway

Year 1	Year 2	Year 3	Year 4
[60 Credits]	[Core: 40 credits]	[Core: 60 credits]	[Core 55 credits; Options: 5 credits]
<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>BO101 <b>Biology [15]</b> CH101 <b>Chemistry [15]</b> PH101 <b>Physics [15]</b></p>	<p><i>Semester 1</i></p> <p>BO201 <b>Molecular and Cellular Biology (MCB) [5]</b> CH204 <b>Inorganic Chemistry [5]</b> CH203 <b>Physical Chemistry [5]</b> PM209 <b>Applied Concepts in Pharmacology [5]</b> PM208 <b>Fundamental Concepts in Pharmacology [5]</b></p> <p><i>Semester 2</i></p> <p>CH2101 <b>Medicinal Chemistry [5]</b> CH202 <b>Organic Chemistry [5]</b> CH205 <b>Analytical and Environmental Chemistry [5]</b></p>	<p><i>Semester 1</i></p> <p>CH326 <b>Analytical Chemistry &amp; Molecular Structure [5]</b> CH333 <b>Experimental Chemistry I [5]</b> CH311 <b>Organic Chemistry [5]</b> CH332 <b>Drug Design &amp; Drug Discovery [10]</b> PM311 <b>Introduction to Toxicology [5]</b></p> <p><i>Semester 2</i></p> <p>CH3101 <b>Computers and Chemical Research [10]</b> CH334 <b>Experimental Chemistry II [5]</b> CH307 <b>Inorganic Chemistry [5]</b> CH313 <b>Physical Chemistry [5]</b> CH3103 <b>Validation in the Pharmaceutical and Medical Device Industry [5]</b></p>	<p><i>Semester 1</i></p> <p>CH451 <b>Practical Skills Development [5]</b> CH4101 <b>Research Investigation [20]</b> CH448 <b>Spectroscopic and Physical Methods and Applications [5]</b></p> <p><i>Semester 2</i></p> <p>CH446 <b>Bioinorganic and Inorganic Medicinal Chemistry [5]</b> CH438 <b>Bioorganic Chemistry [5]</b> CH4114 <b>Current Topics in Medicinal Chemistry [10]</b> CH4113 <b>Organic Chemistry [5]</b> CH445 <b>Advanced Inorganic Chemistry [5]*</b> CH429 <b>Physical Chemistry 1 [5]*</b> CH432 <b>Physical Chemistry 2 [5]*</b></p>
			* Select one 5 credit module

Module Descriptors for Years 1 to 4 are available at: [https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course\\_outline](https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course_outline)

**Module Options within Pathways:** Where module options are indicated within a pathway, these modules are highlighted in colour.

# Microbiology Pathway

Year 1	Year 2	Year 3	Year 4
[60 Credits]	[Core: 20 credits]	[Core: 30 credits]	[Core 60 credits]
<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>BO101 <b>Biology [15]</b> CH101 <b>Chemistry [15]</b></p>	<p><i>Semester 1</i></p> <p>MI202 <b>Laboratory Skills in Microbiology I [5]</b> BO201 <b>Molecular and Cellular Biology (MCB) [5]</b></p> <p><i>Semester 2</i></p> <p>MI203 <b>Laboratory Skills in Microbiology II [5]</b> MI204 <b>Microbes and the Environment [5]</b></p>	<p><i>Semester 1</i></p> <p>MI323 <b>Food and Industrial Microbiology [5]</b> MI3101 <b>Microbial Genomics [5]</b> MI326 <b>Microbial Metabolic and Molecular Systems [5]</b></p> <p><i>Semester 2</i></p> <p>MI322 <b>Environmental Microbiology [5]</b> MI324 <b>Immunology and Recombinant Techniques [5]</b> MI325 <b>Microbial Infectious Diseases [5]</b></p>	<p><i>Semester 1</i></p> <p>MI405 <b>Project [20]</b> MI4104 <b>Scientific Communication [5]</b></p> <p><i>Semester 2</i></p> <p>MI4103 <b>Environmental Biotechnology [5]</b> MI437 <b>Bacterial Pathogenesis [5]</b> MI4105 <b>Problem Solving Paper [5]</b> MI4102 <b>Microbial Ecosystems &amp; Systems Biology [5]</b> MI439 <b>The Meaning of Life: Bioinformatics [5]</b> MI4101 <b>Host Microbe Interactions [5]</b> MI4106 <b>Glycosciences and Recombinant Protein Production [5]</b></p>

Module Descriptors for Years 1 to 4 are available at: [https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course\\_outline](https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course_outline)

**Module Options within Pathways:** Where module options are indicated within a pathway, these modules are highlighted in colour.

# Pharmacology Pathway

Year 1	Year 2	Year 3	Year 4
[60 Credits]	[Core: 20 credits]	[Core: 30 credits]	[Core 60 credits]
<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>BO101 <b>Biology [15]</b> CH101 <b>Chemistry [15]</b> PH101 <b>Physics [15]</b></p>	<p><i>Semester 1</i></p> <p>PM209 <b>Applied Concepts in Pharmacology [5]</b> PM208 <b>Fundamental Concepts in Pharmacology [5]</b></p> <p><i>Semester 2</i></p> <p>PM210 <b>Molecular Pharmacology and Signalling [10]</b></p>	<p><i>Semester 1</i></p> <p>PM309 <b>Drugs and Disease I [10]</b> PM311 <b>Introduction to Toxicology [5]</b></p> <p><i>Semester 2</i></p> <p>PM3103 <b>Advanced Pharmacology [5]</b> PM3102 <b>Neuropharmacology [5]</b> PM3101 <b>Pharmacology in Practice [5]</b></p>	<p><i>Semester 1</i></p> <p>PM431 <b>Research Project [20]</b> PM432 <b>Experimental Pharmacology [10]</b></p> <p><i>Semester 2</i></p> <p>PM435 <b>Advanced Technologies for Therapeutics [5]</b> PM436 <b>Advanced Toxicology [5]</b> PM433 <b>Drug Development and Emerging Therapies [10]</b> PM434 <b>Molecular Pharmacology and Therapeutics [10]</b></p>
<p>Module Descriptors for Years 1 to 4 are available at: <a href="https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course_outline">https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course_outline</a></p> <p><b>Module Options within Pathways:</b> Where module options are indicated within a pathway, these modules are highlighted in colour.</p>			



# Physics and Applied Physics Pathway

Year 1	Year 2	Year 3	Year 4
<b>[60 Credits]</b>	<b>[Core: 20 credits]</b>	<b>[Core: 40 credits]</b>	<b>[Core: 55 credits; Options: 5 credits]</b>
<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>PH101    <b>Physics [15]</b></p>	<p><i>Semester 1</i></p> <p>PH2105    <b>Mechanics and Thermodynamics [5]</b> PH2109    <b>Physics Laboratory and Computational Physics I [5]</b></p> <p><i>Semester 2</i></p> <p>PH2106    <b>Atomic Physics and Electromagnetism [5]</b> PH2110    <b>Physics Laboratory and Computational Physics II [5]</b></p>	<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>PH3101    <b>Experimental and Computational Physics [15]</b></p> <p><i>Semester 1</i></p> <p>PH338    <b>Properties of Materials [5]</b> PH333    <b>Quantum Physics [5]</b> PH331    <b>Wave Optics [5]</b></p> <p><i>Semester 2</i></p> <p>PH335    <b>Nuclear and Particle Physics [5]</b> PH337    <b>Thermal Physics [5]</b></p>	<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>PH4102    <b>Final Year Project [20]</b> PH4101    <b>Physics Problem Solving</b></p> <p><i>Semester 1</i></p> <p>PH424    <b>Electromagnetism and Special Relativity [5]</b> PH421    <b>Quantum Mechanics [5]</b> PH422    <b>Solid State Physics [5]</b> <b>PH428    Atmospheric Physics &amp; Climate Change [5]*</b> <b>PH430    Biophotonics [5]*</b></p> <p><i>Semester 2</i></p> <p>PH423    <b>Applied Optics &amp; Imaging [5]</b> PH425    <b>Lasers &amp; Spectroscopy [5]</b> PH429    <b>Nanotechnology [5]</b> <b>PH4109    Exoplanets and Planet Formation [5]*</b></p>
			* Select one 5-credit module

Module Descriptors for Years 1 to 4 are available at: [https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course\\_outline](https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course_outline)

**Module Options within Pathways:** Where module options are indicated within a pathway, these modules are highlighted in colour.

# Physics and Climate Physics Pathway

Year 1	Year 2	Year 3	Year 4
<b>[60 Credits]</b>	<b>[Core: 40 credits; Options: 20 credits]</b>	<b>[Core: 60 credits]</b>	<b>[Core: 60 credits]</b>
<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>CH101 <b>Chemistry [15]</b> PH101 <b>Physics [15]</b></p>	<p><i>Semester 1</i></p> <p>PH2105 <b>Mechanics and Thermodynamics [5]</b> PH2109 <b>Physics Laboratory and Computational Physics I [5]</b> MP231 <b>Mathematical Methods I [5]</b> MG3113 <b>Megatrends [5]</b></p> <p><i>Semester 2</i></p> <p>PH2106 <b>Atomic Physics and Electromagnetism[5]</b> PH2110 <b>Physics Laboratory and Computational Physics II [5]</b> BSS2104 <b>Introduction to Sustainability I [5]</b> MP232 <b>Mathematical Methods II [5]</b></p> <p><b>Chemistry*</b> <i>Semester 1</i></p> <p>CH204 <b>Inorganic Chemistry [5]</b> CH203 <b>Physical Chemistry [5]</b></p> <p><i>Semester 2</i></p> <p>CH202 <b>Organic Chemistry [5]</b> CH205 <b>Analytical and Environmental Chemistry [5]</b></p> <p><b>Earth and Ocean Sciences*</b> <i>Semester 1</i></p> <p>EOS213 <b>Introduction to Ocean Science [10]</b></p> <p><i>Semester 2</i></p> <p>EOS2102 <b>The Earth: From Core to Crust [10]</b></p>	<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>PH3101 <b>Experimental and Computational Physics [15]</b></p> <p><i>Semester 1</i></p> <p>MP345 <b>Mathematical Methods I [5]</b> PH328 <b>Physics of the Environment I [5]</b> PH338 <b>Properties of Materials [5]</b> PH333 <b>Quantum Physics [5]</b> PH331 <b>Wave Optics [5]</b></p> <p><i>Semester 2</i></p> <p>MP346 <b>Mathematical Methods II [5]</b> PH329 <b>Physics of the Environment II [5]</b> PH335 <b>Nuclear and Particle Physics [5]</b> PH337 <b>Thermal Physics [5]</b></p>	<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>PH4102 <b>Final Year Project [20]</b> PH4101 <b>Physics Problem Solving [5]</b></p> <p><i>Semester 1</i></p> <p>PH428 <b>Atmospheric Physics &amp; Climate Change [5]</b> PH424 <b>Electromagnetism and Special Relativity [5]</b> PH421 <b>Quantum Mechanics [5]</b> PH422 <b>Solid State Physics [5]</b></p> <p><i>Semester 2</i></p> <p>PH425 <b>Lasers &amp; Spectroscopy [5]</b> EOS4101 <b>Remote Sensing [5]</b> PH4105 <b>Ocean Climate Physics [5]</b></p>
	<p>*Students can pursue this pathway in year 2 by choosing the above modules in either Chemistry, or in Earth and Ocean Sciences</p>		

Module Descriptors for Years 1 to 4 are available at: [https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course\\_outline](https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course_outline)

**Module Options within Pathways:** Where module options are indicated within a pathway, these modules are highlighted in colour.

# Physiology Pathway

Year 1	Year 2	Year 3	Year 4
<b>[60 Credits]</b>	<b>[Core: 20 credits]</b>	<b>[Core: 30 credits]</b>	<b>[Core: 60 credits]</b>
<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>BO101 <b>Biology [15]</b> CH101 <b>Chemistry [15]</b> PH101 <b>Physics [15]</b></p>	<p><i>Semester 1</i></p> <p>SI2101 <b>Introductory Physiology [10]</b></p> <p><i>Semester 2</i></p> <p>SI2102 <b>Systems Physiology [10]</b></p>	<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>SI3104 <b>Experimental Physiology [10]</b></p> <p><i>Semester 1</i></p> <p>SI3103 <b>Endocrinology &amp; Reproduction [5]</b> SI311 <b>Neurophysiology [5]</b></p> <p><i>Semester 2</i></p> <p>SI3105 <b>Cardio-respiratory Physiology [5]</b> SI3106 <b>Immunology [5]</b></p>	<p><i>Semester 1</i></p> <p>SI4103 <b>Integrative Physiology [10]</b> SI4104 <b>Pathophysiology of Disease [10]</b> SI4105 <b>Communication Skills [10]</b></p> <p><i>Semester 2</i></p> <p>SI4106 <b>Therapeutics of Disease [10]</b> SI435 <b>Project [20]</b></p>

Module Descriptors for Years 1 to 4 are available at: [https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course\\_outline](https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course_outline)  
**Module Options within Pathways:** Where module options are indicated within a pathway, these modules are highlighted in colour.



# Plant and AgriBiosciences Pathway

Year 1	Year 2	Year 3	Year 4
<b>[60 Credits]</b>	<b>[Core: 20 credits]</b>	<b>[Core: 20 credits; Options: 10 credits]</b>	<b>[Core: 45 credits; Options: 15 credits]</b>
<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>BO101 <b>Biology [15]</b></p>	<p><i>Semester 1</i></p> <p>BO202 <b>Evolution and the Tree of Life [5]</b> BO201 <b>Molecular and Cellular Biology(MCB) [5]</b></p> <p><i>Semester 2</i></p> <p>PAB2101 <b>AgriBiosciences [5]</b> MI204 <b>Microbes and the Environment [5]</b></p>	<p><i>Semester 1</i></p> <p>PAB3102 <b>AgriBiosciences for Sustainable Global Development [5]</b> PAB3101 <b>Soil Sciences [5]</b> BSS2103 <b>Introduction to Sustainability 1 [5] *</b></p> <p><i>Semester 2</i></p> <p>PAB3103 <b>Plant and Agricultural Genetics [5]</b> PAB3104 <b>Systems Biology of Plant-Environment Interactions [5]</b> AG2105 <b>Farming for a Circular Bioeconomy [5] *</b> BSS2104 <b>Introduction to Sustainability 2 [5] *</b></p>	<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>PAB4106 <b>Current Topics in Plant and AgriBiosciences [5]</b> PAB4105 <b>AgriBiosciences Internship Project[20]**</b> PAB4101 <b>PAB Research Project [20]**</b></p> <p><i>Semester 1</i></p> <p>PAB4103 <b>Climate Change, Plants &amp; Agriculture [5]</b> PAB4102 <b>Plant Genetics and Systems Biology [5]</b> PAB4108 <b>Food and Climate Change [5]</b> PAB4109 <b>Research Training Placement [5] *</b> BSS2103 <b>Introduction to Sustainability 1 [5]*</b></p> <p><i>Semester 2</i></p> <p>PAB4104 <b>Plant and Agri-Biotechnologies [5]</b> AG2105 <b>Farming for a Circular Bioeconomy [5] *</b> BSS2104 <b>Introduction to Sustainability 2 [5] *</b></p>
		*Select options to a value of 10 ECTS	**Assigned one project module: PAB4101 [20] or PAB4105 [20] *Select remaining modules to a value of 15 Credits – list provided by PAB.

Module Descriptors for Years 1 to 4 are available at: [https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course\\_outline](https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course_outline)

**Module Options within Pathways:** Where module options are indicated within a pathway, these modules are highlighted in colour.

# Zoology Pathway

Year 1	Year 2	Year 3	Year 4
<b>[60 Credits]</b>	<b>[Core: 20 credits]</b>	<b>[Core: 20 credits; Options: 10 credits]</b>	<b>[55 credits; Options: 5 credits]</b>
<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>BO101    <b>Biology [15]</b></p>	<p><i>Semester 1</i></p> <p>BO202    <b>Evolution and the Tree of Life [5]</b> BO201    <b>Molecular and Cellular Biology(MCB) [5]</b></p> <p><i>Semester 2</i></p> <p>ZO208    <b>Invertebrate Biology [5]</b> ZO209    <b>Vertebrate Zoology [5]</b></p>	<p><i>Semester 1</i></p> <p>ZO317    <b>Evolutionary Biology [5]</b> ZO415    <b>Biometry [5]*</b> BO3101    <b>Developmental Biology [5]*</b> EOS3103    <b>Palaeontology and Evolution [5]*</b> ZO3101    <b>Marine Habitat [5]*</b></p> <p><i>Semester 2</i></p> <p>ZO315    <b>Applied Ecology [5]</b> ZO320    <b>Concepts in Population and Community Ecology [5]</b></p> <p>ZO3102    <b>Behaviour in Social Insects [5]*</b> AN223    <b>Embryology &amp; Development [5]*</b> ZO318    <b>Geographic Information Systems and Biostatistics [5]*</b></p>	<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>ZO418    <b>Phylogenetics &amp; Conservation [5]</b></p> <p><i>Semester 1</i></p> <p>ZO4102    <b>Biostatistics for Natural Sciences [5]</b> ZO417    <b>Marine &amp; Coastal Ecology [5]</b> ZO4101    <b>Research Project in Zoology [20]</b></p> <p>BI445    <b>Biomolecules [5]*</b> BPS402    <b>Current Topics in Algal Research [5]*</b> EOS402    <b>Global Change [5]*</b> BI448    <b>Modern Biotechnologies [5]*</b> BPS4107    <b>Plant Cell Biology and Biochemistry [5]*</b></p> <p><i>Semester 2</i></p> <p>ZO4103    <b>Animals in Captivity [5]</b> ZO416    <b>Integrative Zoology [5]</b> ZO425    <b>Literature Review and Presentation [10]</b></p> <p>MI4103    <b>Environmental Biotechnology [5]*</b> MI437    <b>Bacterial Pathogenesis [5]*</b> BPS405    <b>Ecology and Conservation Issues [5]*</b> EOS407    <b>History of Life [5]*</b> MI4102    <b>Microbial Ecosystems &amp; Systems Biology [5]*</b></p> <p>BI449    <b>Molecular and Cellular Biology [5]*</b> ZO419    <b>Practical Skills in Zoology [5]*</b> BPS4104    <b>Primary Productivity and Global Change [5]*</b></p> <p>ZO4104    <b>Zoonotic Diseases [5]*</b> MI4106    <b>Glycosciences and Recombinant Protein Production [5]*</b></p>
		<p>* Select two 5-credit modules *ZO415 is a required module for students not having ST2002 in Year 2.</p>	<p>*Select remaining modules to a value of 5 credits</p>

Module Descriptors for Years 1 to 4 are available at: [https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course\\_outline](https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/science-undenominated.html#course_outline)

**Module Options within Pathways:** Where module options are indicated within a pathway, these modules are highlighted in colour.

# Year 2 Pathways and their pre-requisite modules

Year 2 Pathway	Pathway Prerequisite	Pathway Credits
Anatomy (AN)	BO101 and CH101 and PH101 and [one of MA161/MA180/MP180]	20
Pharmacology (PM)	BO101 and CH101 and PH101 and [one of MA161/MA180/MP180]	20
Physiology (SI)	BO101 and CH101 and PH101 and [one of MA161/MA180/MP180]	20
Medicinal Chemistry(MDCH)	BO101 and CH101 and PH101 and [one of MA161/MA180/MP180]	40
Chemistry (CH)	CH101 and [at least one of MA161/MA180/MP180]	20
Biochemistry(BI)	BO101 and CH101 and PH101 and [one of MA161/MA180/MP180]	20
Microbiology (MI)	BO101 and CH101 and [at least one of MA161/MA180/MP180]	20
Plant and AgriBiosciences (PAB)	BO101 and [at least one of MA161/MA180/MP180]	20
Botany and Plant Science (BPS)	BO101 and [at least one of MA161/MA180/MP180]	20
Earth and Ocean Science (EOS)	BO101 and CH101 and PH101 and [one of MA161/MA180/MP180]	20
Zoology (ZO)	BO101 and [at least one of MA161/MA180/MP180]	20
Physics and Climate Physics (PHCP)	PH101 and CH101 and [at least one of MA161/MA180/MP180] <i>(Taken with either CH pathway or EOS pathway. If taken with EOS pathway, BO101 required)</i>	40
Physics and Applied Physics (PHAP)	PH101 and [at least one of MA161/MA180/MP180]	20
Mathematics (MA)	MA180	20
Applied Mathematics (MP)	MP180	20
Computing (CS)	CS102 and [at least one of MA161/MA180/MP180]	20
Data Science (DS)	CS102 and MA180	40
Mathematical Studies and Computing (MSCS)	[MA161 or MA180] and CS102	40
Zoology (ZO)	BO101	20
For details on allocation procedures, refer to Overview, page 2, and Pathway Selection, page 3.		



# Year 2 Electives and their pre-requisite modules

Module	Module Name	Credits	Semester	Pre-Requisites	Notes
BO201	Molecular and Cellular Biology	5	Sem 1	BO101	
BO202	Evolution and the Tree of Life	5	Sem 1	BO101	
BPS202	Fundamentals in Aquatic Plant Science	5	Sem 1	BO101	See Note 1)
EOS213	Introduction to Ocean Science	10	Sem 1	BO101 & CH101 & PH101	See Note 1)
ZO2101	Entomology	5	Sem 1	BO101	
BO2101	Scientific Writing Skills	5	Sem 1	BO101	
ST2001	Statistics for Data Science 1	5	Sem 1	none	
ST1111	Probability Models	5	Sem 1	MA180	
MA211	Calculus I	5	Sem 1	At least one of MA161, MA180 or MP180	
MA215	Mathematical Molecular Biology I	5	Sem 1	At least one of MA161 or MA180	
MA284	Discrete Mathematics	5	Sem 1	At least one of MA161, MA180 or MP180	
MP231	Mathematical Methods I	5	Sem 1	At least one of MA161, MA180 or MP180	
MP236	Mechanics I	5	Sem 1	MP180	
PM208	Fundamental Concepts in Pharmacology	5	Sem 1	BO101 & CH101 & PH101	See Note 2)
PM209	Applied Concepts in Pharmacology	5	Sem 1	PM208	See Note 2)
PH2111	Makerspace Creative Technologies I	5	Sem 1	none	
PS3108	Design Thinking	5	Sem 1	none	
PS3123	Exploring Routes to Wellbeing	5	Sem 1	none	
MG3117	Intercultural Encounters	5	Sem 1	none	
HI2155	Cultural Heritage & Public History	5	Sem 1	none	
DT2114	Fail Better: Taking Risks and Developing Resilience	5	Sem 1	none	
LN2210	Scileanna Gaeilge don Eolaíocht 1	5	Sem 1	none	

# Year 2 Electives and their pre-requisite modules

Module	Module Name	Credits	Semester	Pre-Requisites	Notes
BPS203	Plant Diversity, Physiology & Adaptation	5	Sem 2	BO101	See Note 1)
EOS2102	The Earth: From Core to Crust	10	Sem 2	BO101 & CH101 & PH101	See Note 1)
PAB2101	AgriBiosciences	5	Sem 2	BO101	See Note 1)
ST2002	Statistics for Data Science 2	5	Sem 2	ST2001	
ST1112	Statistical Methods	5	Sem 2	MA180	
MA1993	Mathematics of Finance	5	Sem 2	MA180	
MA2111	Anailís	5	Sem 2	MA180	
MA2104	Matamaitic don Inbhuanaiteacht (Mathematics for Sustainability)	5	Sem 2	none	
MA203	Linear Alegbra	5	Sem 2	At least one of MA161, MA180 or MP180	
MA212	Calculus II	5	Sem 2	At least one of MA161, MA180 or MP180	
MA216	Mathematical Molecular Biology II	5	Sem 2	At least one of MA161 or MA180	
MP232	Mathematical Methods II	5	Sem 2	At least one MA161, MA180, or MP180	
MP237	Mechanics II	5	Sem 2	MP180	
PH2108	Scaling Big Ideas	5	Sem 2	none	
AJ2114	Communicating Through Storytelling	5	Sem 2	none	
SP3211	Empathy in Action	5	Sem 2	none	
SP3212	Navigating the Digital World	5	Sem 2	none	
HI2156	Revolutionary Technologies, from Steam to Green	5	Sem 2	none	
LN2211	Scileanna Gaeilge don Eolaíocht 2	5	Sem 2	none	

# Year 2 Electives and their pre-requisite modules

Module	Module Name	Credits	Semester	Pre-Requisites	Notes
BI3103	Career Development and Employability Skills	5	Sem 1 and Sem 2	none	
FR252	French	10	Sem 1 and Sem 2	none	
GR224	Beginner's German for Science	10	Sem 1 and Sem 2	none	
GR252	German	10	Sem 1 and Sem 2	none	
GR353	German	10	Sem 1 and Sem 2	none	

Module	Module Name	Credits	Semester	Pre-Requisites	Notes
BSS2103/BSS2104	Introduction to Sustainability	5	Sem 1 or Sem 2	none	
MG3113/ MG3115	Megatrends	5	Sem 1 or Sem 2	none	
ED2103/ ED2104	Design Your Life	5	Sem 1 or Sem 2	none	
PS3109/ PS3110/ PS3111/ PS3112	Vertically Integrated Project	5	Sem 1 or Sem 2	none	See Note 3)

Note 1). Some modules are offered as electives but subject to limited places.  
 Note 2). While PM208 and PM209 are offered as electives, only students assigned to the Pharmacology Pathway take the semester 2 module PM210.  
 Conversely, students taking PM208 and/or PM209 alone without PM210 will not progress to study the Pharmacology pathway.  
 Note 3). Registration to Vertically Integrated Projects, is subject to a call for expression of interest.



# Year 3 Configurations and Year 4 progression options

Approved Year 3 Configuration		Year 2 Pre-requisites	Year 4 progression mapping options [each 60 credits]
Anatomy & Physiology	60-credits core modules	AN [20]+SI [20]	Choose between Anatomy [60] or Physiology [60]
Pharmacology & Physiology	60-credits core modules	PM [20]+SI [20]	Choose between Pharmacology [60] or Physiology [60]
Biochemistry & Microbiology	60-credits core modules	BI [20]+MI [20]	Choose between Biochemistry [60] or Microbiology [60]
Biochemistry & PlantAgriBioSciences	50-credits core modules+options	BI [20]+PAB[20]	Choose between Biochemistry [60] or PlantAgriBioSc. [60]
Microbiology & PlantAgriBioSciences	50-credits core modules+options	MI [20]+PAB [20]	Choose between Microbiology [60] or PlantAgriBioSc. [60]
Chemistry	40-credits core modules+options	CH [20]	Chemistry [60]
Medicinal Chemistry	60-credits core modules	MedCH [35]	Medicinal Chemistry [60]
Biochemistry & Chemistry	60-credits core modules	BI[20]+CH[20]	Choose between Biochemistry [60] or Chemistry [60]
Microbiology & Chemistry	60-credits core modules	MI[20]+CH[20]	Choose between Microbiology [60] or Chemistry [60]
Anatomy & Biochemistry	60-credits core modules	AN[20]+BI[20]	Choose between Anatomy [60] or Biochemistry [60]
Anatomy & Microbiology	60-credits core modules	AN[20]+MI[20]	Choose between Anatomy [60] or Microbiology [60]
Chemistry & Pharmacology	60-credits core modules	CH[20]+PM[20]	Choose between Chemistry [60] or Pharmacology [60]
Biochemistry & Pharmacology	60-credits core modules	BI[20]+PM[20]	Choose between Biochemistry [60] or Pharmacology [60]
Biochemistry & Physiology	60-credits core modules	BI[20]+SI[20]	Choose between Biochemistry [60] or Physiology [60]
Microbiology & Physiology	60-credits core modules	MI[20]+SI[20]	Choose between Microbiology [60] or Physiology [60]
Botany and Plant Science & Zoology	40-credits core modules+options	BPS[20]+ZO[20]	Choose between Botany and Plant Sc. [60] or Zoology [60]
Earth and Ocean Sciences	50-credits core modules+options	EOS [20]	Earth and Ocean Sciences [60]
Earth and Ocean Sciences & Zoology	60-credits core modules	EOS[20]+ZO[20]	Choose between Earth and Ocean Sciences [60] or Zoology [60]
Earth and Ocean Sciences & Botany and Plant Science	60-credits core modules	BPS[20]+EOS[20]	Choose between Botany and Plant Sc. [60] or Earth and Ocean Sciences [60]
Physics and Applied Physics	40-credits core modules+options	PHAP[20] or PHCP[40]	Physics and Applied Physics [60]
Physics and Climate Physics	60-credits core modules	PHCP[40]	Choose between Physics and Climate Physics [60] or Physics and Applied Physics [60]
Anatomy & Botany and Plant Science	50-credits core modules+options	AN[20]+BPS[20]	Choose between Anatomy [60] or Botany and Plant Sc.[60]
Pharmacology & Zoology	50-credits core modules+options	PM[20]+ZO[20]	Choose between Pharmacology [60] or Zoology [60]

# Year 3 Configurations and Year 4 progression options

Approved Year 3 Configuration		Year 2 Pre-requisites	Year 4 progression mapping options [each 60 credits]
Physiology & Zoology	50-credits core modules+options	SI[20]+ZO[20]	Choose between Physiology [60] or Zoology [60]
Biochemistry & PlantAgriBioSciences	50-credits core modules+options	BI[20]+BPS[20]	Choose between Biochemistry [60] or Botany and Plant Sc. [60]
Biochemistry & Zoology	50-credits core modules+options	BI[20]+ZO[20]	Choose between Biochemistry [60] or Zoology [60]
Microbiology & Zoology	50-credits core modules+options	MI[20]+ZO[20]	Choose between Microbiology [60] or Zoology [60]
Botany and Plant Science & PlantAgriBioSciences	40-credits core modules+options	BPS[20]+PAB[20]	Choose between Botany and Plant Sc.[60] or PlantAgriBioSc.[60]
Mathematics & Applied Mathematics	60-credits core modules	MA[20]+MP[20]	Mathematics and Applied Mathematics [60]
Mathematics & Computing	50-credits core modules+options	MA[20]+CS[20]	Choose between Mathematics and Computing [60] or Mathematics [60] or Computing [60]
Mathematical Studies and Computing	60-credits core modules	MSCS[40]	Choose between Math.Studies and Computing [60] or Computing [60]
Data Science	30-credits core modules+options	DS[40]	Data Science [60]
Applied Mathematics	30-credits core modules+options	MP[20]	Applied Mathematics [60]
Mathematics	40-credits core modules+options	MA[20]	Mathematics [60]
Computing	25-credits core modules+options	CS[20]	Computing [60]
<p>Access to Year 3 pathways require relevant pre-requisites from Year 2. For module listings within each Approved Year 3 Configuration, please refer to the supplementary Year 3 Guide, issued separately.</p>			