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OLLSCOIL NA GAILLIMHÉ
UNIVERSITY OF GALWAY

Bachelor of Science Degree
College of Science and Engineering
2026/2027

Bachelor of Science Degree

www.universityofgalway.ie/science-engineering/



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[60 Credits]	[60 Credits]	[60 Credits]	[60 Credits]
Choose four of the following modules: Each module is 15 Credits. At least one of: MP180 Applied Mathematics MA180 Mathematics MA161 Mathematical Studies At least two of: BO101 Biology CH101 Chemistry CS1102 Computing and Data Science PH101 Physics Eligibility to Year 2 pathways of study require certain combinations of Year 1 modules, see page 26, <i>Year 2 Pathways</i>.	Choose at least two pathways from: Anatomy Pharmacology Physiology Medicinal Chemistry Chemistry Biochemistry Microbiology Green Biosciences (PAB) Botany and Plant Science Zoology Earth and Ocean Sciences Physics and Climate Physics Physics and Applied Physics Applied Mathematics Mathematics Computing Data Science Mathematical Studies and Computing Mathematics and Computing Mathematics and Applied Mathematics 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, <i>Pathway Selection</i>, and pages 30-31, <i>Year 3 Streams</i>. Electives: Where the total credit of modules allocated via pathways is less than 60, modules are selected from the Year 2 elective offerings, see pages 27-29, <i>Year 2 Electives</i>.	Choose up to two pathways from: Anatomy Pharmacology Physiology Medicinal Chemistry Chemistry Biochemistry Microbiology Plant and AgriBiosciences (Green Biosciences) Botany and Plant Science Zoology Earth and Ocean Sciences Physics and Climate Physics Physics and Applied Physics Applied Mathematics Mathematics Computing Data Science Mathematical Studies and Computing Mathematics and Computing Mathematics and Applied Mathematics Select OPTION A or B Option A – Dual Pathways, retaining two options for study in Year 4. Option B – Single Pathway. OPTION A is REQUIRED if taking one of the following, Anatomy, Pharmacology, Physiology, Biochemistry, Microbiology, Plant and AgriBiosciences (Green Biosciences), Botany and Plant Science, or Zoology. Approved Year 3 study paths are provided on page 30, <i>Year 3 Streams</i>.	Choose your honours degree: Anatomy Pharmacology Physiology Medicinal Chemistry Chemistry Biochemistry Microbiology Plant and AgriBiosciences (Green Biosciences) Botany and Plant Science Zoology Earth and Ocean Sciences Physics and Climate Physics Physics and Applied Physics Applied Mathematics Mathematics Computing Data Science Mathematical Studies and Computing Mathematics and Computing Mathematics and Applied Mathematics

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Pathway Selection

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/science-engineering/studentinformation/undergraduatestudentinformation/studentinformationgy301science/>

<https://stories.universityofgalway.ie/student-hub-college-of-science-engineering/index.html#group-section-Course-Info-MZUMRK2avx>

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

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

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Anatomy Pathway

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

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Pharmacology Pathway

Year 1	Year 2	Year 3	Year 4
[60 Credits]	[Core: 20 credits]	[Core: 30 credits]	[Core 60 credits]
Full Year – Semester 1 and Semester 2 BO101 Biology [15] CH101 Chemistry [15] PH101 Physics [15]	Semester 1 PM209 Applied Concepts in Pharmacology [5] PM208 Fundamental Concepts in Pharmacology [5] Semester 2 PM210 Molecular Pharmacology and Signalling [10]	Semester 1 PM309 Drugs and Disease I [10] PM311 Introduction to Toxicology [5] Semester 2 PM3103 Advanced Pharmacology [5] PM3102 Neuropharmacology [5] PM3101 Pharmacology in Practice [5]	Semester 1 PM431 Research Project [20] PM432 Experimental Pharmacology [10] Semester 2 PM435 Advanced Technologies for Therapeutics [5] PM436 Advanced Toxicology [5] PM433 Drug Development and Emerging Therapies [10] PM434 Molecular Pharmacology and Therapeutics [10]
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Physiology Pathway

Year 1	Year 2	Year 3	Year 4
[60 Credits]	[Core: 20 credits]	[Core: 30 credits]	[Core: 60 credits]
Full Year – Semester 1 and Semester 2 BO101 Biology [15] CH101 Chemistry [15] PH101 Physics [15]	Semester 1 SI2101 Introductory Physiology [10] Semester 2 SI2102 Systems Physiology [10]	Full Year – Semester 1 and Semester 2 SI3104 Experimental Physiology [10] Semester 1 SI3103 Endocrinology & Reproduction [5] SI311 Neurophysiology [5] Semester 2 SI3105 Cardio-respiratory Physiology [5] SI3106 Immunology [5]	Semester 1 SI4103 Integrative Physiology [10] SI4104 Pathophysiology of Disease [10] SI4105 Communication Skills [10] Semester 2 SI4106 Therapeutics of Disease [10] SI435 Project [20]
Module Descriptors for Years 1 to 4 are available at: 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.			

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[60 Credits]	[Core: 40 credits]	[Core: 60 credits]	[Core 50 credits; Options: 10 credits]
Full Year – Semester 1 and Semester 2 BO101 Biology [15] CH101 Chemistry [15]	Semester 1 BO201 Molecular and Cellular Biology (MCB) [5] CH204 Inorganic Chemistry [5] CH203 Physical Chemistry [5] PM209 Applied Concepts in Pharmacology [5] PM208 Fundamental Concepts in Pharmacology [5] Semester 2 CH2101 Medicinal Chemistry [5] CH202 Organic Chemistry [5] CH205 Analytical and Environmental Chemistry [5]	Semester 1 CH326 Analytical Chemistry & Molecular Structure [5] CH333 Experimental Chemistry I [5] CH311 Organic Chemistry [5] CH332 Drug Design & Drug Discovery [10] PM311 Introduction to Toxicology [5] Semester 2 CH3101 Computers and Chemical Research [10] CH334 Experimental Chemistry II [5] CH307 Inorganic Chemistry [5] CH313 Physical Chemistry [5] CH3103 Validation in the Pharmaceutical and Medical Device Industry [5]	Semester 1 CH451 Practical Skills Development [5] CH4101 Research Investigation [20] CH448 Spectroscopic and Physical Methods and Applications [5] Semester 2 CH446 Bioinorganic and Inorganic Medicinal Chemistry [5] CH438 Bioorganic Chemistry [5] CH4118 Current Topics in Medicinal Chemistry [5] CH4113 Organic Chemistry [5] CH445 Advanced Inorganic Chemistry [5]* CH429 Physical Chemistry 1 [5]* CH432 Physical Chemistry 2 [5]* * Select two elective modules from CH429, CH432, and CH445.
Module Descriptors for Years 1 to 4 are available at: 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.			

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Chemistry Pathway

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

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

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Microbiology Pathway

Year 1	Year 2	Year 3	Year 4
[60 Credits]	[Core: 20 credits]	[Core: 30 credits]	[Core 50 credits; Options: 10 credits]
<i>Full Year – Semester 1 and Semester 2</i> BO101 Biology [15] CH101 Chemistry [15]	<i>Semester 1</i> MI202 Laboratory Skills in Microbiology I [5] BO201 Molecular and Cellular Biology (MCB) [5] <i>Semester 2</i> MI203 Laboratory Skills in Microbiology II [5] MI204 Microbes and the Environment [5]	<i>Semester 1</i> MI323 Food and Industrial Microbiology [5] MI3101 Microbial Genomics [5] MI326 Microbial Metabolic and Molecular Systems [5] <i>Semester 2</i> MI322 Environmental Microbiology [5] MI324 Immunology and Recombinant Techniques [5] MI325 Microbial Infectious Diseases [5]	<i>Semester 1</i> MI405 Project [20] MI4104 Scientific Communication [5] <i>Semester 2</i> MI4103 Environmental Biotechnology [5] MI437 Bacterial Pathogenesis [5] MI4105 Problem Solving Paper [5] MI4106 Glycosciences and Recombinant Protein Production [5] MI439 The Meaning of Life: Bioinformatics [5] MI4101 Host Microbe Interactions [5]* MI4102 Microbial Ecosystems & Systems Biology [5]* MI4107 Microbiomes Underpinning Agriculture [5]*
			* Select two 5 credit modules
Module Descriptors for Years 1 to 4 are available at: 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.			

Green Biosciences Pathway (Plant and AgriBiosciences)

Year 1	Year 2	Year 3	Year 4
[60 Credits]	[Core: 20 credits]	[Core: 20 credits; Options: 10 credits]	[Core: 50 credits; Options: 10 credits]
<i>Full Year – Semester 1 and Semester 2</i> BO101 Biology [15]	<i>Semester 1</i> BO202 Evolution and the Tree of Life [5] BO201 Molecular and Cellular Biology(MCB) [5] <i>Semester 2</i> PAB2101 AgriBiosciences [5] MI204 Microbes and the Environment [5]	<i>Semester 1</i> PAB3102 AgriBiosciences for Sustainable Global Development [5] PAB3101 Soil Sciences [5] BSS2103 Introduction to Sustainability 1 [5] *	<i>Full Year – Semester 1 and Semester 2</i> PAB4106 Current Topics in Plant and AgriBiosciences [5] PAB4105 AgriBiosciences Internship Project[20]** PAB4101 PAB Research Project [20]**
		<i>Semester 2</i> PAB3103 Plant and Agricultural Genetics [5] PAB3104 Systems Biology of Plant-Environment Interactions [5] AG2105 Farming for a Circular Bioeconomy [5] * BSS2104 Introduction to Sustainability 2 [5] *	<i>Semester 1</i> PAB4103 Climate Change, Plants & Agriculture [5] PAB4102 Plant Genetics and Systems Biology [5] PAB4108 Food and Climate Change [5] PAB4109 Research Training Placement [5] *
			<i>Semester 2</i> PAB4104 Plant and Agri-Biotechnologies [5] MI4107 Microbiomes Underpinning Agriculture [5] AG2105 Farming for a Circular Bioeconomy [5] * BSS2104 Introduction to Sustainability 2 [5] *
		*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

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Botany and Plant Science Pathway

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

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Zoology Pathway

Year 1	Year 2	Year 3	Year 4
[60 Credits]	[Core: 20 credits]	[Core: 20 credits; Options: 10 credits]	[55 credits; Options: 5 credits]
Full Year – Semester 1 and Semester 2 BO101 Biology [15]	Semester 1 ZO2102 Invertebrate Zoology Form and Function [10] Semester 2 ZO2103 Vertebrate Zoology Form and Function [10]	Semester 1 ZO317 Evolutionary Biology [5] ZO415 Biometry [5]* BO3101 Developmental Biology [5]* EOS3103 Palaeontology and Evolution [5]* ZO3101 Marine Habitat [5]* Semester 2 ZO315 Applied Ecology [5] ZO320 Concepts in Population and Community Ecology [5] AN223 Embryology & Development [5]* ZO318 Geographic Information Systems and Biostatistics [5]*	Full Year – Semester 1 and Semester 2 ZO418 Phylogenetics & Conservation [5] Semester 1 ZO4102 Biostatistics for Natural Sciences [5] ZO417 Marine & Coastal Ecology [5] ZO4101 Research Project in Zoology [20] BI445 Biomolecules [5]* BPS402 Current Topics in Algal Research [5]* EOS402 Global Change [5]* BI448 Modern Biotechnologies [5]* BPS4107 Plant Cell Biology and Biochemistry [5]* Semester 2 ZO4103 Animals in Captivity [5] ZO416 Integrative Zoology [5] ZO425 Literature Review and Presentation [10] MI4103 Environmental Biotechnology [5]* MI437 Bacterial Pathogenesis [5]* BPS405 Ecology and Conservation Issues [5]* EOS407 History of Life [5]* MI4102 Microbial Ecosystems & Systems Biology [5]* BI449 Molecular and Cellular Biology [5]* ZO419 Practical Skills in Zoology [5]* BPS4104 Primary Productivity and Global Change [5]* ZO4104 Zoonotic Diseases [5]* MI4106 Glycosciences and Recombinant Protein Production [5]*
		* Select two 5-credit modules *ZO415 is a required module for students not having ST2002 in Year 2.	*Select remaining modules to a value of 5 credits
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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]
No pre-requisites	<i>Semester 1</i>	<i>Semester 1</i>	<i>Full Year – Semester 1 and Semester 2</i>
	EOS213 Introduction to Ocean Science [10]	EOS305 Introduction to Applied Field Hydrology [5]	EOS4106 Fieldskills in Oceanography [5]*
	<i>Semester 2</i>	EOS3107 Minerals, magmas and Metamorphism [10]*	<i>Semester 1</i>
	EOS2102 The Earth: From Core to Crust [10]	EOS3103 Palaeontology and Evolution [5]	EOS4107 Advanced Fieldskills [5] EOS418 Applied Field Hydrogeology [5] EOS402 Global Change [5]
		EOS323 Sediments and the Sedimentary Record [5]	EOS4102 EOS Minor Final Year Project [10]* EOS403 Final Year Project [20]* BPS402 Current Topics in Algal Research [5]* BPS4107 Plant Cell Biology and Biochemistry [5]* PAB4103 Climate Change, Plants & Agriculture [5]*
		<i>Semester 2</i>	ZO418 Phylogenetics & Conservation [5]*
		EOS3104 Fieldskills Training [5] EOS3101 Geological Structures and Maps [5]	<i>Semester 2</i>
		EOS304 Aquatic Geochemistry [5]*	EOS409 Biophysical Interactions in the Ocean [5] EOS4101 Earth Observation and Remote Sensing [5] EOS407 History of Life [5] EOS422 Sedimentary Basins [5]
		EOS3102 Environmental and Marine Geophysical Remote Sensing [5] EOS303 Ocean Dynamics [5]	BPS3107 Plants, Atmosphere and Environment throughout Earth History [5]* BPS4104 Primary Productivity and Global Change [5]* EOS4105 Economic Geology: principles, practice and sustainability [5]*
		* See Year 3 advisory supplement for electives listing, and listings for dual pathway configuration.	* Assigned one project module: EOS403 [20] or EOS4102 [10] If allocated EOS4102, select elective modules to a value of 10 credits.
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Physics and Climate Physics Pathway

Year 1	Year 2	Year 3	Year 4
[60 Credits]	[Core: 40 credits; Options: 20 credits]	[Core: 60 credits]	[Core: 60 credits]
Full Year – Semester 1 and Semester 2 PH101 Physics [15]	Semester 1 PH2113 Energy, Forces and Motion in Physics [5] PH2114 Modern Physics [5] MP231 Mathematical Methods I [5] MG3113 Megatrends [5] Semester 2 PH2115 Electricity and Magnetism [5] PH2116 Computational Physics [5] BSS2104 Introduction to Sustainability I [5] MP232 Mathematical Methods II [5]	Full Year – Semester 1 and Semester 2 PH3101 Experimental and Computational Physics [15] Semester 1 MP345 Mathematical Methods I [5] PH328 Physics of the Environment I [5] PH338 Properties of Materials [5] PH333 Quantum Physics [5] PH337 Thermal Physics [5] Semester 2 MP346 Mathematical Methods II [5] PH329 Physics of the Environment II [5] PH335 Nuclear and Particle Physics [5] PH331 Wave Optics [5]	Full Year – Semester 1 and Semester 2 PH4102 Final Year Project [20] PH4101 Physics Problem Solving [5] Semester 1 PH428 Atmospheric Physics & Climate Change [5] PH421 Quantum Mechanics [5] PH422 Solid State Physics [5] Semester 2 PH424 Electromagnetism and Special Relativity [5] PH425 Lasers & Spectroscopy [5] EOS4101 Remote Sensing [5] EOS303 Ocean Dynamics [5]

Module Descriptors for Years 1 to 4 are available at: 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.

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Physics and Applied Physics Pathway			
Bachelor of Science Degree Course Outline 2026 College of Science and Engineering, University of Galway			
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Year 1	Year 2	Year 3	Year 4
[60 Credits]	[Core: 20 credits]	[Core: 40 credits]	[Core: 55 credits; Options: 5 credits]
Full Year – Semester 1 and Semester 2 PH101 Physics [15]	Semester 1 PH2113 Energy, Forces and Motion in Physics [5] PH2114 Modern Physics [5] Semester 2 PH2115 Electricity and Magnetism [5] PH2116 Computational Physics [5]	Full Year – Semester 1 and Semester 2 PH3101 Experimental and Computational Physics [15] Semester 1 PH338 Properties of Materials [5] PH333 Quantum Physics [5] PH337 Thermal Physics [5] Semester 2 PH335 Nuclear and Particle Physics [5] PH331 Wave Optics [5]	Full Year – Semester 1 and Semester 2 PH4102 Final Year Project [20] PH4101 Physics Problem Solving Semester 1 PH423 Applied Optics & Imaging [5] PH421 Quantum Mechanics [5] PH422 Solid State Physics [5] PH428 Atmospheric Physics & Climate Change [5]* PH430 Biophotonics [5]* Semester 2 PH424 Electromagnetism and Special Relativity [5] PH425 Lasers & Spectroscopy [5] PH429 Nanotechnology [5] PH4109 Exoplanets and Planet Formation [5]*
			* 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 Module Options within Pathways: Where module options are indicated within a pathway, these modules are highlighted in colour.			

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

Applied Mathematics Pathway

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			Semester 2
			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]*
		^ These modules are only available every 2nd Year. Alternative modules are offered next academic year.	* Select one 5-credit module. ^ These modules are only available every 2nd Year. Alternative modules are offered next academic year.
Module Descriptors for Years 1 to 4 are available at: 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.			

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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]
Optional Modules to be chosen in consultation with the School of Mathematical and Statistical Sciences			
<i>Full Year – Semester 1 and Semester 2</i> MA180 Mathematics [15]	<i>Semester 1</i> MA284 Discrete Mathematics [5] MA2106 Real Analysis [5] <i>Semester 2</i> MA283 Linear Algebra [5] MA2287 Complex Analysis [5]	<i>Semester 1</i> MA3101 Euclidean and Non-Euclidean Geometry [5] MA3343 Groups [5] MA341 Metric Spaces [5] <i>One of:</i> ST2001 Statistics for Data Science I [5]* ST2003 Random Variables [5]* ST311 Applied Statistics I [5]* <i>Semester 2</i> MA3491 Fields and Applications [5] MA378 Numerical Analysis II [5] MA342 Topology [5] <i>One of:</i> ST2002 Statistics for Data Science II [5]* ST2004 Statistical Inference [5]* ST312 Applied Statistics II [5]*	<i>Full Year – Semester 1 and Semester 2</i> MM4000 Final Year Project [10] MA4101 Teaching and Learning in Mathematics [5]* <i>Semester 1</i> MA490 Measure Theory [5] MA416 Rings [5] MA4102 Algebraic Foundations of Quantum Computing [5]* ST313 Applied Regression Models [5]* ST311 Applied Statistics [5]* MP403 Cosmology and General Relativity [5]* CS4102 Geometric Foundations in Data Analysis I [5]* ST417 Introduction to Bayesian Modelling [5]* MA437 Introduction to Mathematical Research Topics I [5]* CS3304 Logic [5]* MP345 Mathematical Methods I [5]* MP305 Modelling I [5]* MP366 Electromagnetism [5] MA385 Numerical Analysis I [5]* ST413 Statistical Modelling [5]* <i>Semester 2</i> MA482 Functional Analysis [5] MA4344 Advanced Group Theory [5] MA495 Actuarial Mathematics: Life Contingencies II [5]* ST312 Applied Statistics II [5]* CS402 Cryptography [5]* MA418 Differential Equations with Financial Derivatives [5]* CS4103 Geometric Foundations in Data Analysis II [5]*
<i>Continued...</i>			
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
			MA438 Introduction to Mathematical Research Topics II [5]* MP346 Mathematical Methods II [5]* MP307 Modelling II [5]* ST4140 Modern Statistical Methods [5]* CS4423 Networks [5]* MP491 Nonlinear Systems [5]* CS319 Scientific Computer [5]* ST4120 Causal Inference [5]*
			* 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

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

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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]
Optional Modules to be chosen in consultation with the School of Mathematical and Statistical Sciences			
<i>Full Year – Semester 1 and Semester 2</i> CS1102 Computing and Data Science [15]	<i>Semester 1</i> CT2101 Object Oriented Programming 1 [5] CS2101 Programming for Science and Finance [5] <i>Semester 2</i> CT2102 Object Oriented Programming 2 [5] CS211 Programming and Operating Systems [5]	<i>Semester 1</i> CS3304 Logic [5] CT3535 Object Oriented Programming [5] CT511 Databases [5]* MA215 Mathematical Molecular Biology I [5]* MP305 Modelling I [5]* CT331 Programming Paradigms [5]* <i>Semester 2</i> CT2108 Networks and Data Communications I [5] CS319 Scientific Computing [5] MA216 Mathematical Molecular Biology II [5]* MP307 Modelling II [5]* CT411 Multimedia Development [5]*	<i>Full Year – Semester 1 and Semester 2</i> MM4000 Final Year Project [10] <i>Semester 1</i> CS4102 Geometric Foundations in Data Analysis I [5] CT4109 Image Processing & Computer Vision [5] CT4101 Machine Learning [5] MA4102 Algebraic Foundations of Quantum Computing [5]* CT318 Human Computer Interaction [5]* MP305 Modelling I [5]* CT4100 Information Retrieval [5]* MA385 Numerical Analysis I [5]* CT331 Programming Paradigms [5]* <i>Semester 2</i> CS402 Cryptography [5] CS4103 Geometric Foundations in Data Analysis II [5] CS4423 Networks [5] CT4108 Distributed Systems & Coop Computing [5]* CT421 Artificial Intelligence [5]* MP307 Modelling II [5]* MA378 Numerical Analysis II [5]* CT548 Object Oriented Software Design & Development [5]*
		* Select two 5-credit modules	* Select four 5-credit modules
Module Descriptors for Years 1 to 4 are available at: 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.			

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Data Science Pathway

Year 1	Year 2	Year 3	Year 4
[60 Credits]	[Core: 40 credits]	[Core: 30 credits; Options: 30 credits]	[Core: 40 credits; Options: 20 credits]
Optional Modules to be chosen in consultation with the School of Mathematical and Statistical Sciences			
<i>Full Year – Semester 1 and Semester 2</i> MA180 Mathematics [15] CS1102 Computing and Data Science [15]	<i>Statistics– Semester 1</i> ST1111 Probability Models [5] <i>Statistics– Semester 2</i> ST1112 Statistical Methods [5] <i>Computing - Semester 1</i> CS2101 Programming for Science and Finance [5] CT2101 Object Oriented Programming 1 [5] <i>Computing - Semester 2</i> CT2102 Object Oriented Programming 2 [5] <i>Mathematics - Semester 1</i> MA284 Discrete Mathematics [5] MA2106 Real Analysis [5] <i>Mathematics - Semester 2</i> MA283 Linear Algebra [5]	<i>Statistics– Semester 1</i> ST311 Applied Statistics [5] ST2003 Random Variables [5] <i>Statistics– Semester 2</i> ST312 Applied Statistics 2 [5] ST2004 Statistical Inference [5] <i>Computing - Semester 1</i> CT511 Databases [5] CS3304 Logic [5] * CT3535 Object Oriented Programming [5]* CT331 Programming Paradigms [5] * <i>Computing– Semester 2</i> CS319 Scientific Computing [5] CT411 Multimedia Development [5]* CT2108 Networks and Data Communications [5]* CS211 Programming and Operating Systems [5]* <i>Mathematics - Semester 1</i> MA215 Mathematical Molecular Biology [5]* MP305 Modelling I [5]* <i>Mathematics - Semester 2</i> MA2287 Complex Variables [5] * MA216 Mathematical Molecular Biology II [5] * MP307 Modelling II [5] *	<i>Full Year – Semester 1 and Semester 2</i> MM4000 Final Year Project [10] <i>Statistics– Semester 1</i> ST413 Statistical Modelling [5] ST417 Bayesian Modelling [5] <i>Statistics– Semester 2</i> ST4120 Causal Inference [5]* ST4140 Modern Statistical Methods [5] <i>Computing - Semester 1</i> CT4101 Machine Learning [5] MA4102 Algebraic Foundations of Quantum Computing [5]* CS4102 Geometric Foundations of Analysis I [5]* CT4109 Image Processing & Computer Vision [5]* CT318 Human Computer Interaction [5]* CT4100 Information Retrieval [5]* <i>Computing - Semester 2</i> CS402 Cryptography [5] CS4423 Networks [5] CT421 Artificial Intelligence [5] * CT4108 Distributed Systems & Coop Computing [5]* CS4103 Geometric Foundations of Analysis II [5]*
		*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 Module Options within Pathways: Where module options are indicated within a pathway, these modules are highlighted in colour.			

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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 45 credits; Options: 15 credits]
Optional Modules to be chosen in consultation with the School of Mathematical and Statistical Sciences			
<i>Full Year – Semester 1 and Semester 2</i> CS1102 Computing and Data Science [15] MA161 Mathematical Studies [15] or MA180 Mathematics [15]	<i>Mathematical Studies – Semester 1</i> MA211 Calculus I [5] MA284 Discrete Mathematics [5] <i>Mathematical Studies – Semester 2</i> MA283 Linear Algebra [5] MA212 Calculus II [5] <i>Computing – Semester 1</i> CT2101 Object Oriented Programming 1 [5] CS2101 Programming for Science and Finance [5] <i>Computing – Semester 2</i> CT2102: Object Oriented Programming 2 [5] CS211 Programming and Operating Systems [5]	<i>Semester 1</i> MA3343 Groups [5] MA302 Complex Variable [5] MA313 Linear Algebra I [5] CS3304 Logic [5] CT3535 Object Oriented Programming [5] ST2001 Statistics for Data Science I [5] CT511 Databases [5]* CT331 Programming Paradigms [5]* <i>Semester 2</i> CT2108 Networks and Data Communications I[5] CS319 Scientific Computing [5] CS3101 Software for Mathematical Scientists and Educators [5] ST2002 Statistics for Data Science II [5] CT411 Multimedia Development [5]*	<i>Full Year – Semester 1 and Semester 2</i> MM4000 Final Year Project [10] <i>Semester 1</i> MA3101 Euclidean and Non-Euclidean Geometry [5] CS4102 Geometric Foundations in Data Analysis I [5] CT4101 Machine Learning [5] ST311 Applied Statistics I [5]* CT318 Human Computer Interaction [5]* CT4100 Information Retrieval [5]* MA341 Metric Spaces [5]* MA385 Numerical Analysis I [5]* CT331 Programming Paradigms [5]* <i>Semester 2</i> MA4344 Advanced Group Theory [5] CS402 Cryptography [5] CS4103 Geometric Foundations in Data Analysis II [5] MA342 Topology [5] CT421 Artificial Intelligence [5]* ST312 Applied Statistics II [5]* CT4108 Distributed Systems & Coop Computing [5]* CS4423 Networks [5]* MA378 Numerical Analysis II [5]* CT548 Object Oriented Software Design and Development [5]*
		* Select modules to the value of 10 credits	* 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 Module Options within Pathways: Where module options are indicated within a pathway, these modules are highlighted in colour.			

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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]
Optional Modules to be chosen in consultation with the School of Mathematical and Statistical Sciences			
<i>Full Year – Semester 1 and Semester 2</i> MA180 Mathematics [15] CS1102 Computing and Data Science [15]	<i>Mathematics – Semester 1</i> MA2106 Real Analysis [5] MA284 Discrete Mathematics [5] <i>Mathematics – Semester 2</i> MA283 Linear Algebra [5] MA2287 Complex Analysis [5] <i>Computing – Semester 1</i> CT2101 Object Oriented Programming 1 [5] CS2101 Programming for Science and Finance [5] <i>Computing – Semester 2</i> CT2102 Object Oriented Programming 2 [5] CS211 Programming and Operating Systems [5]	<i>Semester 1</i> MA3101 Euclidean and Non-Euclidean Geometry [5] MA3343 Groups [5] CS3304 Logic [5] CT3535 Object Oriented Programming [5] CT511 Databases [5]* CT331 Programming Paradigms [5]* <i>One of:</i> ST2001 Statistics for Data Science I [5]* ST2003 Random Variables [5]* ST311 Applied Statistics I [5]* <i>Semester 2</i> MA3491 Fields and Applications [5] CT2108 Networks and Data Communications I[5] CS319 Scientific Computing [5] MA342 Topology [5] CT411 Multimedia Development [5]* <i>One of:</i> ST2002 Statistics for Data Science II [5]* ST2004 Statistical Inference [5]* ST312 Applied Statistics II [5]*	<i>Full Year – Semester 1 and Semester 2</i> MM4000 Final Year Project [10] <i>Semester 1</i> CS4102 Geometric Foundations in Data Analysis I [5] CT4101 Machine Learning [5] MA490 Measure Theory [5] MA416 Rings [5] MA4102 Algebraic Foundations of Quantum Computing [5]* CT318 Human Computer Interaction [5]* MA437 Introduction to Mathematical Research [5]* CT4100 Information Retrieval [5]* MA385 Numerical Analysis I [5]* CT331 Programming Paradigms [5]* <i>Semester 2</i> MA4344 Advanced Group Theory [5] CS402 Cryptography [5] MA482 Functional Analysis [5] CS4103 Geometric Foundations in Data Analysis II [5] MA378 Numerical Analysis II [5] CT421 Artificial Intelligence [5]* CT4108 Distributed Systems & Coop Computing [5]* CS4423 Networks [5]* CT548 Object Oriented Software Design and Development [5]*
		* 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 Module Options within Pathways: Where module options are indicated within a pathway, these modules are highlighted in colour.			

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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]
Optional Modules to be chosen in consultation with the School of Mathematical and Statistical Sciences			
<i>Full Year – Semester 1 and Semester 2</i> MP180 Applied Mathematics [15] MA180 Mathematics (Honours) [15]	<i>Mathematics – Semester 1</i> MA2106 Real Analysis [5] MA284 Discrete Mathematics [5] <i>Mathematics – Semester 2</i> MA283 Linear Algebra [5] MA2287 Complex Analysis [5] <i>Applied Mathematics – Semester 1</i> MP231 Mathematical Methods I [5] MP236 Mechanics I [5] <i>Applied Mathematics – Semester 2</i> MP237 Mechanics II [5] MP232 Mathematical Methods II [5]	<i>Semester 1</i> MA3101 Euclidean and Non-Euclidean Geometry [5] MA3343 Groups [5] MP345 Mathematical Methods I [5] MP356 Quantum Mechanics I [5]^ MP410 Non-Linear Elasticity [5]^ <i>One of:</i> ST2001 Statistics for Data Science I [5]* ST2003 Random Variables [5]* ST311 Applied Statistics I [5]* <i>Semester 2</i> MA3491 Fields and Applications [5] MP346 Mathematical Methods II [5] MP491 Non Linear Systems [5] MA342 Topology [5] MP357 Quantum Mechanics II [5] ^ <i>One of:</i> ST2002 Statistics for Data Science II [5]* ST2004 Statistical Inference [5]* ST312 Applied Statistics II [5]*	<i>Full Year – Semester 1 and Semester 2</i> MM4000 Final Year Project [10] <i>Semester 1</i> MP356 Quantum Mechanics I [5]^ MA490 Measure Theory [5] MP305 Modelling I [5] MP410 Non-Linear Elasticity [5] ^ MA416 Rings [5] <i>Semester 2</i> MA4344 Advanced Group Theory [5] MA482 Functional Analysis [5] MP307 Modelling II [5] MA378 Numerical Analysis II [5] MP357 Quantum Mechanics II [5] ^
		* Select modules to a value of 10 credits. ^ These modules are only available every 2nd Year. Alternative modules are offered next academic year.	^ These modules are only available every 2nd Year. Alternative modules are offered next academic year.
Module Descriptors for Years 1 to 4 are available at: 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.			

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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 [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
Green Biosciences (Plant and AgriBioscience 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)	[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 [at least one of MA161/MA180/MP180]	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)	[CS1102 or CS102] and [at least one of MA161/MA180/MP180]	20
Data Science (DS)	[CS1102 or CS102] and MA180	40
Mathematical Studies and Computing (MSCS)	[MA161 or MA180] and [CS1102 or CS102]	40
For details on allocation procedures, refer to Overview, page 2, and Pathway Selection, page 3.		

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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	none	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	
PS3109	Vertically Integrated Project	5	Sem 1	none	See Note 3)
MG3117	Intercultural Encounters	5	Sem 1	none	
CT4105	Essentials of Artificial Intelligence	5	Sem 1	none	

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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	none	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	
MA2104	Matamaitic don Inbhuanaitheacht (Mathematics for Sustainability)	5	Sem 2	none	
MA283	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	
SP3211	Empathy in Action	5	Sem 2	none	
PS3123	Exploring Routes to Wellbeing	5	Sem 2	none	

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Year 2 Electives and their pre-requisite modules

Module	Module Name	Credits	Semester	Pre-Requisites	Notes
FR252	French	10	Sem 1 and Sem 2	none	
GR140	German Language I (Beginners)	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	
BI3105/BI3106	Career Development and Employability Skills	5	Sem 1 or Sem 2	none	

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.

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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]
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]
Physiology & Zoology	50-credits core modules+options	SI[20]+ZO[20]	Choose between Physiology [60] or Zoology [60]

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Year 3 Configurations and Year 4 progression options

Approved Year 3 Configuration		Year 2 Pre-requisites	Year 4 progression mapping options [each 60 credits]
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]
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.			

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Pathways-Streams Compatibility

	<i>PReq:</i>	<i>B.C.P</i>	<i>B.C.P</i>	<i>B.C.P</i>	<i>B.C</i>	<i>C.</i>	<i>B.C.P</i>	<i>B.C</i>	<i>B.</i>	<i>B.</i>	<i>B.</i>	-	<i>P.</i>	<i>P.</i>	<i>M.</i>	<i>MP.</i>	<i>CS.</i>	<i>CS.</i>	<i>M.CS.</i>
Pathway		AN	PM	SI	MDCH	CH	BI	MI	PAB	BPS	ZO	EOS	PHCP	PHAP	MA	MP	CS	MSCS	DS
Anatomy, AN	<i>B.C.P</i>	-	2	3		0	3	3	2	3	2	0		2	0	0			
Pharmacology, PM	<i>B.C.P</i>	2	-	3	2	3	3	2	2	2	2	2		2	0	2			
Physiology, SI	<i>B.C.P</i>	3	3	-		2	3	3	0	0	0	0		0	0	0			
Medicinal Chemistry, MDCH	<i>B.C</i>		2		3	3	2					0		0	0	0			
Chemistry, CH	<i>C.</i>	0	3	2	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2
Biochemistry, BI	<i>B.C.P</i>	3	3	3	2	3	-	3	3	3	3	2		2	0	0			
Microbiology, MI	<i>B.C</i>	3	2	3		2	3	-	3	2	3	2		0	0	0	0		
Green Biosciences, PAB	<i>B.</i>	2	2	0		2	3	3	-	3	2	2		0	0	0	0		
Botany and Plant Science, BPS	<i>B.</i>	3	2	0		2	3	2	3	-	3	3		0	0	0	0		
Zoology, ZO	<i>B</i>	2	2	0		2	3	3	2	3	-	3		0	0	0	0		
Earth and Ocean Sciences, EOS	-	0	2	0	0	2	2	2	2	3	3	3	2	2	2	2	0		
Physics and Climate Physics, PHCP	<i>P.</i>					2						2	3	3		2			
Physics and Applied Physics, PHAP	<i>P.</i>	2	2	0	0	2	2	0	0	0	0	2	3	3	2	2	2	2	2
Mathematics, MA	<i>M.</i>	0	0	0	0	2	0	0	0	0	0	2		2	3	3	3		2
Applied Mathematics, MP	<i>MP.</i>	0	2	0	0	2	0	0	0	0	0	2	2	2	3	3	2	2	2
Computing, CS	<i>CS.</i>					2		0	0	0	0	0		2	3	2	3	3	2
Math. Studies and Computing, MSCS	<i>CS.</i>					2								2		2	3	3	
Data Science, DS	<i>M.CS.</i>					2								2	2	2	2		3

Note: Pathway Compatibility may be subject to change.

Legend:

PReq = "Prerequisite: 1st year module requirements" B=BO101, C=CH101, P=PH101, CS=CS102 or CS1102, MP=MP180, M=MA180

3	Year 3 option, either single pathway or dual-pathway
2	Compatible only at Year 2
-	Not approved as [single pathway+electives] at Year 3
0	Not timetable compatible at Year 2
	Restricted combination