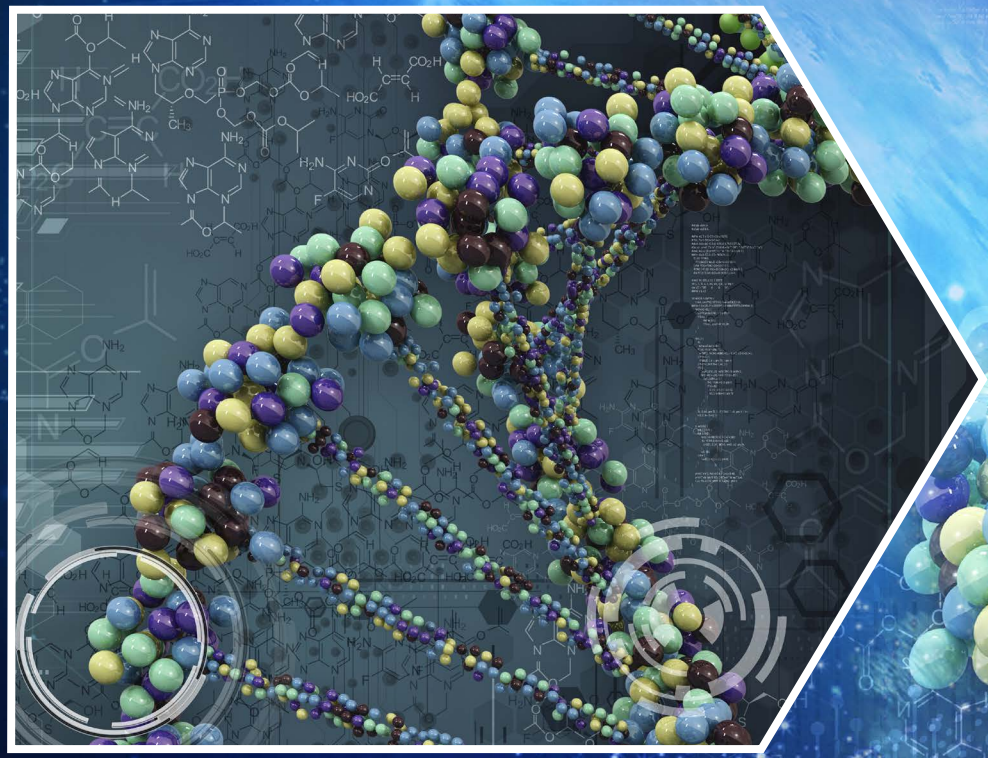
NUI Galway
OÉ Gaillimh

College of Science and Engineering
2022/2023

BSc MATHEMATICAL SCIENCE



www.nuigalway.ie/science-engineering

(V.1)

Overview

Overview

Modules

Electives

Year 1	Year 2	Year 3	Year 4
[60 Credits]	**[60 credits]**	**[60 credits]**	**[60 credits]**
There are 45 credits of Core modules. Choose one module to a value of 15 credits: Biology Chemistry: The World of the Molecule Physics	There are 30 credits of Core modules. Choose a minimum of 10 credits of Core Option modules: MA2286: Differential Forms and MA2287: Complex Analysis or MP231: Mathematical Methods I and MP232: Mathematical Methods II Students must take [MA2286 and MA2287] or [MP231 and MP232], but are encouraged to take all 4 modules. Choose 1 Pathway or Electives to a total value of 10 or 20 Credits (depending on value of Core Option modules taken above).	Choose a minimum of 40 Credits from the Core Options list. Choose a maximum of 20 Credits from the Electives list.	There are 10 Credits of Core modules. Choose a minimum of 30 Credits from the Core Options list. Choose a maximum of 20 Credits from the Electives list.

Module Descriptors for Years 1 to 4 are available at: https://www.nuigalway.ie/science-engineering/undergraduateprogrammes/mathematical-science.html#course_outline

BSc Mathematical Science

Overview

Modules

Electives

Year 1	Year 2	Year 3	Year 4
[Core: 45 credits; Electives: 15 credits]	**[Core: 30 credits; Core options: 10 or 20 credits; Electives: 10 or 20 credits]**	**[Core options: minimum of 40 credits; Electives: maximum of 20 credits]**	**[Project: 10 credits; Core options: min of 30 credits; Electives: max of 20 credits]**
Full Year – Semester 1 and Semester 2	***Semester 1***	***Semester 1***	***Full Year – Semester 1 and Semester 2***
MP180 **Applied Mathematics [15]**	MA2286 **Differential Forms [5]***	ST313 **Applied Regression Models [5]***	MM4000 **Final Year Project [10]**
MA180 **Mathematics (Honours) [15]**	MA284 **Discrete Mathematics [5]**	MA3101 **Euclidean and Non-Euclidean Geometry [5]***	***Semester 1***
Semester 1	MP231 **Mathematical Methods I [5]***	MA3343 **Groups [5]***	MP403 **Cosmology and General Relativity [5]***
CS103 **Computer Science [5]**	MP236 **Mechanics I [5]**	MP345 **Mathematical Methods I [5]***	MA3101 **Euclidean and Non-Euclidean Geometry [5]***
ST1111 **Probability Models [5]**	ST2003 **Random Variables [5]**	MA341 **Metric Spaces [5]***	ST417 **Introduction to Bayesian Modelling [5]***
Semester 2	***Semester 2***	MP410 **Non Linear Elasticity [5]^**	MA490 **Measure Theory [5]***
ST1112 **Statistical Methods [5]**	MA283 **Linear Algebra [5]**	MA385 **Numerical Analysis I [5]***	MP305 **Modelling I [5]***
	MA2287 **Complex Analysis [5]***	MP356 **Quantum Mechanics I [5]^**	MP410 **Non Linear Elasticity [5]^**
	MP237 **Mechanics II [5]**	***Semester 2***	MA385 **Numerical Analysis I [5]***
	MP232 **Mathematical Methods II [5]***	MA3491 **Fields and Applications [5]***	MP356 **Quantum Mechanics I [5]^**
	ST2004 **Statistical Inference [5]**	MP346 **Mathematical Methods II [5]***	MA416 **Rings [5]***
		MP491 **Non Linear Systems [5]***	***Semester 2***
		MA378 **Numerical Analysis II [5]***	MA4344 **Advanced Group Theory [5]***
		MP357 **Quantum Mechanics II [5]^**	MA3491 **Fields and Applications [5]***
		MA342 **Topology [5]***	MA482 **Functional Analysis [5]***
		ST412 **Stochastic Processes [5]^**	MP307 **Modelling II [5]***
			MA378 **Numerical Analysis II [5]***
			MP357 **Quantum Mechanics II [5]^**
			ST412 **Stochastic Processes [5]^**
	* Select a minimum of two 5-credit modules	* Select a minimum of eight 5-credit modules. ^ These modules run on a two-year cycle. Alternative modules are offered next academic year.	* Select a minimum of six 5-credit modules ^ These modules run on a two-year cycle. Alternative modules are offered next academic year.

Module Descriptors for Years 1 to 4 are available at: https://www.nuigalway.ie/science-engineering/undergraduateprogrammes/mathematical-science.html#course_outline

BSc Mathematical Science – Electives

Year 1

[Electives: 15 credits]

Full Year – Semester 1 and Semester 2

BO101 **Biology [15]**

CH130 **Chemistry: The World of the Molecule [15]**

PH101 **Physics [15]**

Year 2

[Electives: maximum of 20 credits]

Semester 1

BO201 **Molecular and Cellular Biology [5]**

BI208 **Protein Structure and Function [5]**

CS2101 **Programming for Science and Finance [5]**

CT2101 **Object Oriented Programming I [5]**

MA215 **Mathematical Molecular Biology I [5]**

Semester 2

CS211 **Programming and Operating Systems [5]**

CT2102 **Object Oriented Programming II [5]**

MA216 **Mathematical Molecular Biology II [5]**

MA2111 **Anailís [5]**

MA2993 **Mathematics of Finance [5]**

BIOCHEMISTRY PATHWAY **20 credits**

Semester 1

BO201 **Molecular and Cellular Biology [5]**

BI208 **Protein Structure and Function [5]**

Semester 2

BI206 **Gene Technologies and Molecular Medicine [5]**

BI207 **Metabolism and Cell Signalling [5]**

Continued…

Year 3

[Electives: maximum of 20 credits]

Semester 1

CS3304 **Logic [5]**

CT3535 **Object Oriented Programming [5]**

CT511 **Databases [5]**

MA215 **Mathematical Molecular Biology I [5]**

MA2286 **Differential Forms [5]**

MA3991 **Actuarial mathematics: Cashflow models [5]**

MP231 **Mathematical Methods I [5]**

MP305 **Modelling I [5]**

PH222 **Astrophysical Concepts [5]**

PH328 **Physics of the Environment I [5]**

PH341 **Measurement of Health Hazards at Work [5]**

Semester 2

CS319 **Scientific Computing [5]**

CT2108 **Networks and Data Communications I [5]**

CT411 **Multimedia Development [5]**

MA216 **Mathematical Molecular Biology II [5]**

MA2111 **Anailís [5]**

MA2287 **Complex Analysis [5]**

MA461 **Probabilistic Models for Molecular Biology [5]**

MP232 **Mathematical Methods II [5]**

MP307 **Modelling II [5]**

Continued…

Year 4

[Electives: maximum of 20 credits]

Full Year – Semester 1 and Semester 2

MA4101 **Teaching and Learning in Mathematics [5]**

Semester 1

CS3304 **Logic [5]**

CS4102 **Geometric Foundations of Data Analysis I [5]**

CT336 **Graphics And Image Processing [5]**

CT4101 **Machine Learning [5]**

CT318 **Human Computer Interaction [5]**

MA437 **Introduction to Mathematical Research Topics I [5]**

MA4102 **Algebraic Foundations of Quantum Computing [5]**

Semester 2

CS4103 **Geometric Foundations of Data Analysis II [5]**

MP491 **Non Linear Systems [5]**

ST4140 **Modern Statistical Methods [5]**

CS319 **Scientific Computing [5]**

CS402 **Cryptography [5]**

CS4423 **Networks [5]**

CT548 **Object Oriented Software Design and Development [5]**

MA418 **Differential Equations with Financial Derivatives [5]**

MA438 **Introduction to Mathematical Research Topics II [5]**

Continued…

	CHEMISTRY PATHWAY **20 credits** ***Semester 1*** CH204 **Inorganic Chemistry [5]** CH203 **Physical Chemistry [5]** --- ***Semester 2*** CH205 **Analytical and Environmental Chemistry [5]** CH202 **Organic Chemistry [5]** **COMPUTING PATHWAY** **20 credits** ***Semester 1*** CT2101 **Object Oriented Programming I [5]** CS2101 **Programming for Science and Finance [5]** --- ***Semester 2*** CT2102 **Object Oriented Programming II [5]** CS211 **Programming and Operating Systems [5]** **PHYSICS AND APPLIED PHYSICS PATHWAY** **20 credits** ***Semester 1*** PH2105 **Mechanics and Thermodynamics [5]** PH2102 **Physics Laboratory and Problem Solving I [5]** --- ***Semester 2*** PH2106 **Atomic Physics and Electromagnetism [5]** PH2104 **Physics Laboratory and Problem Solving II [5]**	PH329 **Physics of the Environment II [5]** PH362 **Stellar Astrophysics [5]** ST4120 **Causal Inference [5]**	MA461 **Probabilistic Models for Molecular Biology [5]** MA495 **Actuarial Mathematics: Life Contingencies II [5]** ST4120 **Causal Inference [5]**

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