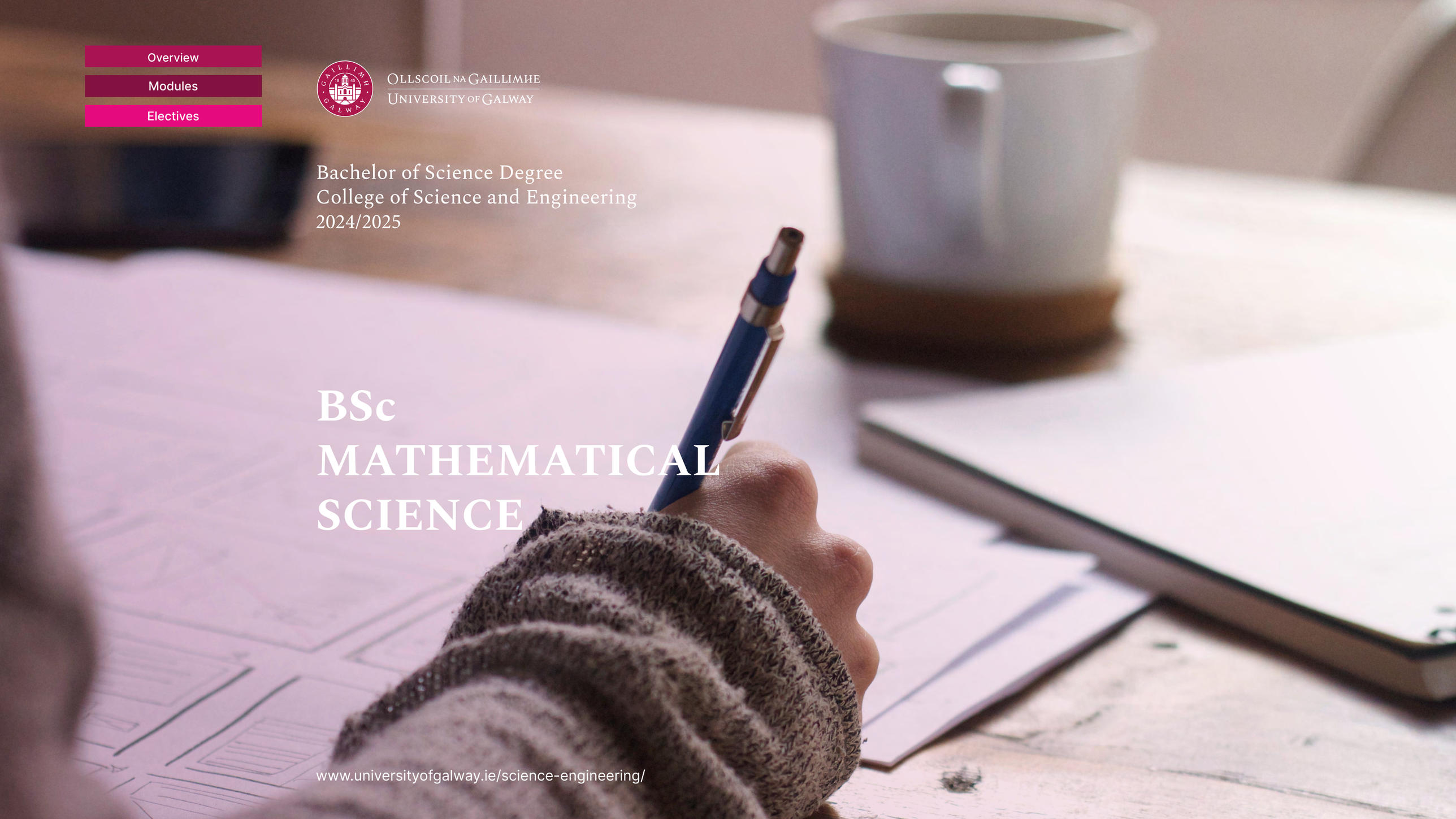
Ollscoil na Gaillimhe
University of Galway

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

BSc MATHEMATICAL SCIENCE



www.universityofgalway.ie/science-engineering/

Overview

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 and 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.universityofgalway.ie/science-engineering/undergraduateprogrammes/bachelorofsciencemathematicalscience/#course_outline

BSc Mathematical Science

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 MP180 **Applied Mathematics [15]** MA180 **Mathematics (Honours) [15]** *Semester 1* CS103 **Computer Science [5]** ST1111 **Probability Models [5]** *Semester 2* ST1112 **Statistical Methods [5]**	*Semester 1* MA2286 **Differential Forms [5]*** MA284 **Discrete Mathematics [5]** MP231 **Mathematical Methods I [5]*** MP236 **Mechanics I [5]** ST2003 **Random Variables [5]** *Semester 2* MA283 **Linear Algebra [5]** MA2287 **Complex Analysis [5]*** MP237 **Mechanics II [5]** MP232 **Mathematical Methods II [5]*** ST2004 **Statistical Inference [5]**	*Semester 1* ST313 **Applied Regression Models [5]*** MA3101 **Euclidean and Non-Euclidean Geometry [5]*** MA3343 **Groups [5]*** MP345 **Mathematical Methods I [5]*** MA341 **Metric Spaces [5]*** MP410 **Non-Linear Elasticity [5]*^** MA385 **Numerical Analysis I [5]*** MP356 **Quantum Mechanics 1 [5]*^** *Semester 2* MA3491 **Fields and Applications [5]*** MP346 **Mathematical Methods II [5]*** MP491 **Non Linear Systems [5]*** MA378 **Numerical Analysis II [5]*** MP357 **Quantum Mechanics II [5]*^** MA342 **Topology [5]*** ST413 **Statistical Modelling [5]***	*Full Year – Semester 1 and Semester 2* MM4000 **Final Year Project [10]** *Semester 1* MP403 **Cosmology and General Relativity [5]*** MA3101 **Euclidean and Non-Euclidean Geometry [5]*** ST417 **Introduction to Bayesian Modelling [5]*** MA490 **Measure Theory [5]*** MP305 **Modelling I [5]*** MP410 **Non-Linear Elasticity [5]*^** MA385 **Numerical Analysis I [5]*** MP356 **Quantum Mechanics 1 [5]*^** MA416 **Rings [5]*** *Semester 2* MA4344 **Advanced Group Theory [5]*** MA3491 **Fields and Applications [5]*** MA482 **Functional Analysis [5]*** MP307 **Modelling II [5]*** MA378 **Numerical Analysis II [5]*** MP357 **Quantum Mechanics II [5]*^** ST413 **Statistical Modelling [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.

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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]
MA1993 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]

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]

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]
MA2287 Complex Analysis [5]
MA461 Probabilistic Models for Molecular Biology [5]
MP232 Mathematical Methods II [5]
MP307 Modelling II [5]
PH329 Physics of the Environment II [5]
PH362 Stellar Astrophysics [5]
ST4120 Causal Inference [5]

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]
MA461 Probabilistic Models for Molecular Biology [5]
MA495 Actuarial Mathematics: Life Contingencies II [5]
ST4120 Causal Inference [5]

BSc Mathematical Science – Electives

Year 1	Year 2	Year 3	Year 4
[Electives: 15 credits]	**[Electives: maximum of 20 credits]**	**[Electives: maximum of 20 credits]**	**[Electives: maximum of 20 credits]**
	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 & APPLIED PHYSICS PATHWAY 20 credits *Semester 1* PH2105 Mechanics and Thermodynamics [5] PH2109 Physics Laboratory and Computational Physics I [5] *Semester 2* PH2106 Atomic Physics and Electromagnetism [5] PH2110 Physics Laboratory and Computational Physics II [5]		

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