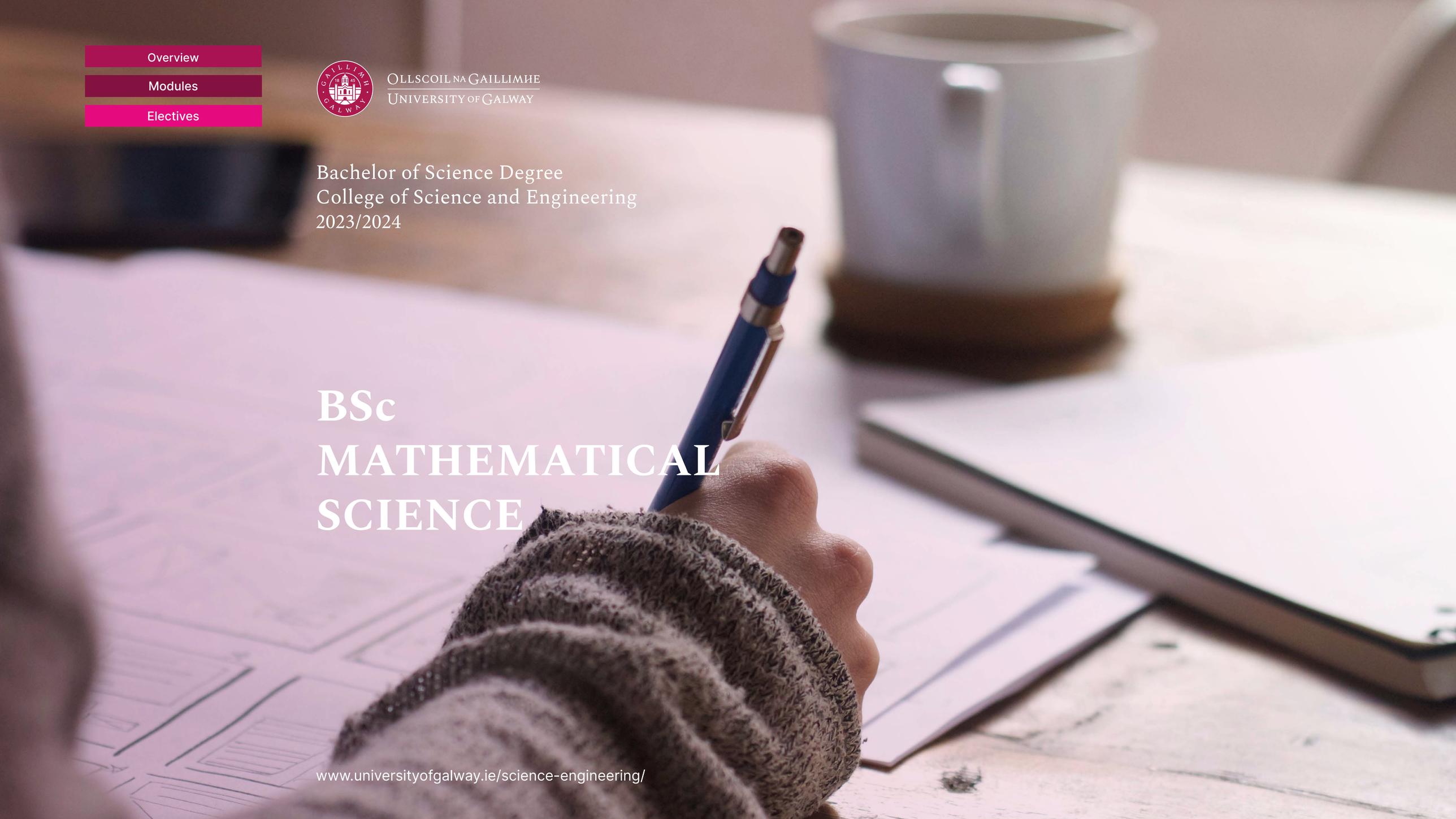
Ollscoil na Gaillimhe
University of Galway

Bachelor of Science Degree
College of Science and Engineering
2023/2024

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 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.universityofgalway.ie/science-engineering/undergraduateprogrammes/mathematical-science.html#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]*** MP366 **Electromagnetism [5]^** MA385 **Numerical Analysis I [5]*** MP494 **Partial Differential Equations [5]^** *Semester 2* MA3491 **Fields and Applications [5]*** MP346 **Mathematical Methods II [5]*** MP491 **Non Linear Systems [5]*** MA378 **Numerical Analysis II [5]*** MP365 **Fluid Mechanics [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]*** MP366 **Electromagnetism [5]^** MA385 **Numerical Analysis I [5]*** MP494 **Partial Differential Equations [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]*** MP365 **Fluid Mechanics [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]**
MA3992 **Actuarial Mathematics: Life contingencies 1, pricing and reserving[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] PH2102 Physics Laboratory and Problem Solving I [5] *Semester 2* PH2106 Atomic Physics and Electromagnetism [5] PH2104 Physics Laboratory and Problem Solving II [5]		

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