Ollscoil na Gaillimhe
University of Galway

Bachelor of Science Degree
College of Science and Engineering
2025/2026

BSc PHYSICS

www.universityofgalway.ie/science-engineering/

Overview

BSc Physics 2024
College of Science and Engineering,
University of Galway

Year 1	Year 2	Year 3	Year 4
[60 Credits]	**[60 Credits]**	**[60 Credits]**	**[60 Credits]**
Universal to all streams: There are 45 credits of Core modules. Choose one module to a value of 15 credits: Mathematics (Honours) Mathematical Studies	**Physics and Applied Physics:** There are 30 credits of Core modules. Choose 1 pathway to a total value of 20 credits: Mathematical Studies Mathematics Choose Electives to a value of 10 credits from the list available **Physics with Astrophysics:** There are 60 credits of Core modules. **Physics with Biomedical Physics:** There are 60 credits of Core modules. **Physics and Climate Physics:** There are 40 credits of Core modules. Choose 1 Pathway to a total value of 20 credits: Chemistry Earth and Ocean Sciences **Physics and Theoretical Physics:** There are 40 credits of Core modules. Choose 1 Pathway to a total value of 20 credits: Astrophysics Mathematical Studies Mathematics	**Physics and Applied Physics:** There are 50 credits of Core modules. Choose Electives to a value of 10 credits from the list available. **Physics with Astrophysics:** There are 60 credits of Core modules. **Physics with Biomedical Physics:** There are 60 credits of Core modules. **Physics and Climate Physics:** There are 60 credits of Core modules. **Physics and Theoretical Physics:** There are 60 credits of Core modules.	**Physics and Applied Physics:** There are 55 credits of Core modules. Choose one Elective to a value of 5credits from the list available. **Physics with Astrophysics:** There are 60 credits of Core modules. **Physics with Biomedical Physics:** There are 60 credits of Core modules. **Physics and Climate Physics:** There are 55 credits of Core modules. Choose one Elective to a value of 5 credits from the list available. **Physics and Theoretical Physics:** There are 45 credits of Core modules. Choose 1 project to a value of 10 credits: Final Year Project Project Theoretical Physics Choose one Elective to a value of 5 credits: Algebraic Foundations of Quantum Computing Modelling I

Module Descriptors for Years 1 to 4 are available at: https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/bachelorofsciencephysics-degreeoptionsinappliedastrophysicsbiomedicalclimatetheoretical/#course_outline

Overview

Physics and Applied Physics

Physics with Astrophysics

Physics with Biomedical Physics

Physics with Climate Physics

Physics and Theoretical Physics

BSc Physics – Stream: Physics and Applied Physics

BSc Physics 2025/26
College of Science and Engineering,
University of Galway

Year 1	Year 2	Year 3	Year 4
[Core: 45 credits; Options: 15 credits]	**[Core: 30 credits; Options: 10 credits; Pathway: 20 credits]**	**[Core: 50 credits; Options: 10 credits]**	**[Core: 55 credits; Options: 5 credits]**
Full Year – Semester 1 and Semester 2 PH101 Physics [15] PH1104 Frontiers in Physics [15] MP180 Applied Mathematics [15] MA180 Mathematics (Honours) [15]* MA161 Mathematical Studies [15]*	*Semester 1* MP231 Mathematical Methods I [5] PH2113 Energy, Forces and Motion in Physics [5] PH2114 Modern Physics [5] CS2101 Programming for Science and Finance [5]* ST2001 Statistics in Data Science I [5]* MP236 Mechanics I [5]* PH2111 Makerspace Creative Technologies I [5]* *Semester 2* PH2115 Electricity and Magnetism [5] MP232 Mathematical Methods II [5] PH2116 Computational Physics [5] CS211 Programming and Operating Systems [5]* ST2002 Statistics in Data Science II [5]* MP237 Mechanics II [5]* PH2108 Scaling Big Ideas [5]* *Continued…*	*Full Year – Semester 1 and Semester 2* PH3101 Experimental and Computational Physics [15] *Semester 1* MP345 Mathematical Methods I [5] PH338 Properties of Materials [5] PH333 Quantum Physics [5] PH331 Wave Optics [5] MP305 Modelling I [5]* PH328 Physics of the Environment I [5]* ST311 Applied Statistics I [5]* PH222 Astrophysical Concepts [5]* PH2111 Makerspace Creative Technologies I [5]* *Semester 2* MP346 Mathematical Methods II [5] PH335 Nuclear and Particle Physics [5] PH337 Thermal Physics [5] PH329 Physics of the Environment II [5]* PH2108 Scaling Big Ideas [5]* PH362 Stellar Astrophysics [5]* MP307 Modelling II [5]* ST312 Applied Statistics II [5]*	*Full Year – Semester 1 and Semester 2* PH4102 Final Year Project [20] PH4101 Physics Problem Solving [5] *Semester 1* PH424 Electromagnetism and Special Relativity [5] PH421 Quantum Mechanics [5] PH422 Solid State Physics [5] PH428 Atmospheric Physics & Climate Change [5]* PH430 Biophotonics [5]* *Semester 2* PH423 Applied Optics & Imaging [5] PH425 Lasers & Spectroscopy [5] PH429 Nanotechnology [5] PH4109 Exoplanets and Planet Formation [5]*
* Select one 15-credit module	* Select modules to a value of 10 credits – 5 credits per semester. Select 1 Pathway to a value of 20 credits.	* Select modules to a value of 10 credits – 5 credits per semester	* Select one 5-credit module

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Year 1	Year 2	Year 3	Year 4
[Core: 45 credits; Options: 15 credits]	**[Core: 30 credits; Options: 10 credits; Pathway: 20 credits]**	**[Core: 50 credits; Options: 10 credits]**	**[Core: 55 credits; Options: 5 credits]**
	MATHEMATICAL STUDIES PATHWAY* *Semester 1* MA211 Calculus I [5]* MA284 Discrete Mathematics [5]* *Semester 2* MA212 Calculus II [5]* MA203 Linear Algebra [5]* **MATHEMATICS PATHWAY*** *Semester 1* MA2286 Differential Forms [5]* MA284 Discrete Mathematics [5]* *Semester 2* MA2287 Complex Analysis [5]* MA283 Linear Algebra [5]*		
* Select two 15-credit modules	* Select modules to a value of 10 credits – 5 credits per semester. Select 1 Pathway to a value of 20 credits.	* Select modules to a value of 10 credits – 5 credits per semester	* Select one 5-credit module

Module Descriptors for Years 1 to 4 are available at: https://www.universityofgalway.ie/science-engineering/undergraduateprogrammes/bachelorofsciencephysics-degreeoptionsinappliedastrophysicsbiomedicalclimatetheoretical/#course_outline

Overview

Physics and Applied Physics

Physics with Astrophysics

Physics with Biomedical Physics

Physics with Climate Physics

Physics and Theoretical Physics

BSc Physics – Stream: Physics and Astrophysics

BSc Physics 2025/26
College of Science and Engineering,
University of Galway

Year 1	Year 2	Year 3	Year 4
[Core: 45 credits; Options: 15 credits]	**[Core: 60 credits]**	**[Core: 60 credits]**	**[Core: 60 credits]**
Full Year – Semester 1 and Semester 2 PH101 Physics [15] PH1104 Frontiers in Physics [15] MP180 Applied Mathematics [15] MA180 Mathematics (Honours) [15]* MA161 Mathematical Studies [15]*	*Semester 1* PH222 Astrophysics Concepts [5] MP231 Mathematical Methods I [5] MP236 Mechanics I [5] PH2113 Energy, Forces and Motion in Physics [5] PH2114 Modern Physics [5] CS2101 Programming for Science and Finance [5] *Semester 2* MP232 Mathematical Methods II [5] MP237 Mechanics II [5] PH223 Observational Astronomy [5] CS211 Programming and Operation Systems [5] PH2115 Electricity and Magnetism [5] PH2116 Computational Physics [5]	*Full Year – Semester 1 and Semester 2* PH363 Astronomical Data Analysis [5] PH3101 Experimental and Computational Physics [15] *Semester 1* MP345 Mathematical Methods I [5] PH338 Properties of Materials [5] PH333 Quantum Physics [5] PH331 Wave Optics [5] *Semester 2* MP346 Mathematical Methods II [5] PH335 Nuclear and Particle Physics [5] PH362 Stellar Astrophysics [5] PH337 Thermal Physics [5]	*Full Year – Semester 1 and Semester 2* PH4102 Final Year Project [20] PH4101 Physics Problem Solving [5] *Semester 1* MP403 Cosmology and General Relativity [5] PH424 Electromagnetism and Special Relativity [5] PH421 Quantum Mechanics [5] PH422 Solid State Physics [5] *Semester 2* PH4109 Exoplanets and Planet Formation [5] PH423 Applied Optics & Imaging [5] PH425 Lasers & Spectroscopy [5]
* Select one 15-credit module			

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Overview

Physics and Applied Physics

Physics with Astrophysics

Physics with Biomedical Physics

Physics with Climate Physics

Physics and Theoretical Physics

BSc Physics – Stream: Physics and Biomedical Physics

BSc Physics 2025/26
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Year 1	Year 2	Year 3	Year 4
[Core: 45 credits; Options: 15 credits]	**[Core: 60 credits]**	**[Core: 60 credits]**	**[Core: 60 credits]**
Full Year – Semester 1 and Semester 2 PH101 Physics [15] PH1104 Frontiers in Physics [15] MP180 Applied Mathematics [15] MA180 Mathematics (Honours) [15]* MA161 Mathematical Studies [15]*	*Semester 1* AN2102 Histology of the Fundamental Tissues [5] MP231 Mathematical Methods I [5] MA215 Mathematical Molecular Biology I [5] PH2113 Energy, Forces and Motion in Physics [5] PH2114 Modern Physics [5] ST2001 Statistics in Data Science I [5] *Semester 2* MP232 Mathematical Methods II [5] MA216 Mathematical Molecular Biology II [5] ST2002 Statistics in Data Science II [5] AN226 Systems Histology [5] PH2115 Electricity and Magnetism [5] PH2116 Computational Physics [5]	*Full Year – Semester 1 and Semester 2* PH3101 Experimental and Computational Physics [15] *Semester 1* MP345 Mathematical Methods I [5] PH338 Properties of Materials [5] PH333 Quantum Physics [5] PH339 Radiation & Medical Physics [5] PH331 Wave Optics [5] *Semester 2* PH340 Biomedical Physics [5] ^ MP346 Mathematical Methods II [5] PH335 Nuclear and Particle Physics [5] PH337 Thermal Physics [5]	*Full Year – Semester 1 and Semester 2* PH4102 Final Year Project [20] PH4101 Physics Problem Solving [5] *Semester 1* PH430 Biophotonics [5] PH424 Electromagnetism and Special Relativity [5] PH421 Quantum Mechanics [5] PH422 Solid State Physics [5] *Semester 2* PH423 Applied Optics & Imaging [5] PH425 Lasers & Spectroscopy [5] PH340 Biomedical Physics [5]^
* Select one 15-credit module		^ 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/bachelorofsciencephysics-degreeoptionsinappliedastrophysicsbiomedicalclimatetheoretical/#course_outline

BSc Physics – Stream: Physics with Climate Physics

BSc Physics 2025/26
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Year 1

[Core: 45 credits; Options: 15 credits]

Full Year – Semester 1 and Semester 2

PH101 Physics [15]
PH1104 Frontiers in Physics [15]
MP180 Applied Mathematics [15]

MA180 Mathematics (Honours) [15]*
MA161 Mathematical Studies [15]*

* Select one 15-credit module

Year 2

[Core: 40 credits; Options: 20 credits]

Semester 1

PH2113 Energy, Forces and Motion in Physics [5]
PH2114 Modern Physics [5]
MP231 Mathematical Methods I [5]
MG3113 Megatrends [5]

Semester 2

BSS2104 Introduction to Sustainability I [5]
MP232 Mathematical Methods II [5]
PH2115 Electricity and Magnetism [5]
PH2116 Computational Physics [5]

CHEMISTRY PATHWAY*

Semester 1

CH204 Inorganic Chemistry [5]*
CH203 Physical Chemistry [5]*

Semester 2

CH202 Organic Chemistry [5]*
CH205 Analytical and Environmental Chemistry [5]*

EARTH AND OCEAN SCIENCES PATHWAY*

Semester 1

EOS213 Introduction to Ocean Science [10]*

Semester 2

EOS2102 The Earth: From Core to Crust [10]*

* Select one 20-credit pathway

Year 3

[60 credits]

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]
PH331 Wave Optics [5]

Semester 2

MP346 Mathematical Methods II [5]
PH335 Nuclear and Particle Physics [5]
PH329 Physics of the Environment II [5]
PH337 Thermal Physics [5]

Year 4

[60 credits]

Full Year – Semester 1 and Semester 2

PH4102 Final Year Project [20]
PH4101 Physics Problem Solving [5]

Semester 1

PH428 Atmospheric Physics & Climate Physics [5]
PH424 Electromagnetism and Special Relativity [5]
PH421 Quantum Mechanics [5]
PH422 Solid State Physics [5]

Semester 2

PH425 Lasers & Spectroscopy [5]
EOS4101 Earth Observation and Remote Sensing[5]
PH4105 Ocean Climate Physics [5]

BSc Physics – Stream: Physics and Theoretical Physics

BSc Physics 2025/26
College of Science and Engineering,
University of Galway

Year 1

[Core: 45 credits; Options: 15 credits]

Full Year – Semester 1 and Semester 2

PH101 Physics [15]
PH1104 Frontiers in Physics [15]
MP180 Applied Mathematics [15]
MA180 Mathematics (Honours) [15]*
MA161 Mathematical Studies [15]*

* Select one 15-credit module

Year 2

[Core: 40 credits; Pathway: 20 credits]

Semester 1

MP231 Mathematical Methods I [5]
MP236 Mechanics I [5]
PH2113 Energy, Forces and Motion in Physics [5]
PH2114 Modern Physics [5]

Semester 2

MP232 Mathematical Methods II [5]
MP237 Mechanics II [5]
PH2115 Electricity and Magnetism [5]
PH2116 Computational Physics [5]

MATHEMATICAL STUDIES PATHWAY*

Semester 1

MA211 Calculus I [5]*
MA284 Discrete Mathematics [5]*

Semester 2

MA212 Calculus II [5]*
MA203 Linear Algebra [5]*

* Select one 20-credit pathway

Year 3

[60 credits]

Full Year – Semester 1 and Semester 2

PH3102 Experimental and Computational Physics for Theoretical Physics [10]

Semester 1

MP345 Mathematical Methods I [5]
MP366 Electromagnetism [5] ^
PH333 Quantum Mechanics [5]^
MP494 Partial Differential Equations [5]^
PH331 Wave Optics [5]

Semester 2

MP346 Mathematical Methods II [5]
MP307 Modelling II [5]
PH335 Nuclear and Particle Physics [5]
PH337 Thermal Physics [5]
MP365 Fluid Mechanics [5]^

^ These modules are only available every 2nd Year. Alternative modules are offered next academic year.

Year 4

[Core 45 credits; Option: 15 credits]

Full Year – Semester 1 and Semester 2

MM4000 Final Year Project [10]*
PH4101 Physics Problem Solving [5]

Semester 1

MA4102 Algebraic Foundations of Quantum Computing [5]*
PH428 Atmospheric Physics & Climate Change [5]
MP403 Cosmology and General Relativity [5]
MP305 Modelling I [5]*
MP494 Partial Differential Equations [5]^
MP366 Electromagnetism [5]^
PH422 Solid State Physics [5]

Semester 2

PH4107 Project Theoretical Physics [10]*
MP491 Non Linear Systems [5]
MP365 Fluid Mechanics [5]^
PH423 Applied Optics [5]

* Select one Project to a value of 10 credits.
* Select one elective to a value of 5 credits.
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BSc Physics – Stream: Physics and Theoretical Physics

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Year 1	Year 2	Year 3	Year 4
[Core: 45 credits; Options: 15 credits]	**[Core: 40 credits; Pathway: 20 credits]**	**[60 credits]**	**[Core 45 credits; Option: 15 credits]**
	MATHEMATICS PATHWAY* *Semester 1* MA2286 Differential Forms [5]* MA284 Discrete Mathematics [5]* *Semester 2* MA2287 Complex Analysis [5]* MA283 Linear Algebra [5]* **ASTROPHYSICS PATHWAY*** *Semester 1* PH222 Astrophysical Concepts [5]* CS2101 Programming for Science and Finance [5]* *Semester 2* PH223 Observational Astronomy [5]* CS211 Programming and Operating Systems [5]*		
* Select one 15-credit module	* Select 1 Pathway to a value of 20 credits.	^ These modules are only available every 2nd Year. Alternative modules are offered next academic year.	* Select one Project to a value of 10 credits. * Select one elective to a value of 5 credits. ^ These modules are only available every 2nd Year. Alternative modules are offered next academic year.

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