



NUI Galway  
OÉ Gaillimh

College of Science

Fullscreen

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# BSc PHYSICS

Applied Physics, Astrophysics,  
Biomedical, Theoretical,



[www.nuigalway.ie/science](http://www.nuigalway.ie/science)

## Overview

Year 1	Year 2	Year 3	Year 4
<b>[60 credits]</b>	<b>[60 credits]</b>	<b>[60 credits]</b>	<b>[60 credits]</b>
<p><b>Physics and Applied Physics:</b></p> <p>There are 30 credits of Core modules.</p> <p>Choose one module to a value of 15 credits:</p> <ul style="list-style-type: none"> <li>Mathematics (Honours)</li> <li>Mathematical Studies</li> </ul> <p>Choose one module to a value of 15 credits:</p> <ul style="list-style-type: none"> <li>Biology</li> <li>Applied Mathematics</li> </ul> <p><b>Physics with Astrophysics:</b></p> <p>There are 45 credits of Core modules.</p> <p>Choose one module to a value of 15 credits:</p> <ul style="list-style-type: none"> <li>Mathematics (Honours)</li> <li>Mathematical Studies</li> </ul> <p><b>Physics with Biomedical Physics:</b></p> <p>There are 45 credits of Core modules.</p> <p>Choose one module to a value of 15 credits:</p> <ul style="list-style-type: none"> <li>Mathematics (Honours)</li> <li>Mathematical Studies</li> </ul> <p><b>Physics and Theoretical Physics:</b></p> <p>There are 45 credits of Core modules.</p> <p>Choose one module to a value of 15 credits:</p> <ul style="list-style-type: none"> <li>Mathematics (Honours)</li> <li>Mathematical Studies</li> </ul>	<p><b>Physics and Applied Physics:</b></p> <p>There are 30 credits of Core modules.</p> <p>Choose 1 pathway to a total value of 20 credits:</p> <ul style="list-style-type: none"> <li>Mathematical Studies</li> <li>Mathematics</li> </ul> <p>Choose Electives to a value of 10 credits from the list available</p> <p><b>Physics with Astrophysics:</b></p> <p>There are 60 credits of Core modules.</p> <p><b>Physics with Biomedical Physics:</b></p> <p>There are 60 credits of Core modules.</p> <p><b>Physics and Theoretical Physics:</b></p> <p>There are 40 credits of Core modules.</p> <p>Choose 1 Pathway to a total value of 20 credits:</p> <ul style="list-style-type: none"> <li>Astrophysics</li> <li>Mathematical Studies</li> <li>Mathematics</li> </ul>	<p><b>Physics and Applied Physics:</b></p> <p>There are 50 credits of Core modules.</p> <p>Choose Electives to a value of 10 credits from the list available.</p> <p><b>Physics with Astrophysics:</b></p> <p>There are 60 credits of Core modules.</p> <p><b>Physics with Biomedical Physics:</b></p> <p>There are 60 credits of Core modules.</p> <p><b>Physics and Theoretical Physics:</b></p> <p>There are 60 credits of Core modules.</p>	<p><b>Physics and Applied Physics:</b></p> <p>There are 55 credits of Core modules.</p> <p>Choose an Electives to a value of 5 credits from the list available.</p> <p><b>Physics with Astrophysics:</b></p> <p>There are 60 credits of Core modules.</p> <p><b>Physics with Biomedical Physics:</b></p> <p>There are 60 credits of Core modules.</p> <p><b>Physics and Theoretical Physics:</b></p> <p>There are 50 credits of Core modules.</p> <p>Choose 1 project to a value of 10 credits:</p> <ul style="list-style-type: none"> <li>Applied Mathematics Project</li> <li>Physics Project</li> </ul>
<p><b>Module Descriptors for Years 1 to 4 are available at: <a href="http://www.nuigalway.ie/science/undergraduate-courses/physics-with-options.html#course_outline">http://www.nuigalway.ie/science/undergraduate-courses/physics-with-options.html#course_outline</a></b></p>			

## BSc Physics – Stream: Physics and Applied Physics

Year 1	Year 2	Year 3	Year 4
<b>[Core: 30 credits; Options: 30 credits]</b>	<b>[Core: 30 credits; Options: 10 credits; Pathway: 20 credits]</b>	<b>[Core: 50 credits; Options: 10 credits]</b>	<b>[Core: 55 credits; Options: 5 credits]</b>
<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>PH101 Physics [15]</p> <p>PH109 Physics Special Topics [10]</p> <p><b>One of:</b></p> <p>MA180 Mathematics (Honours) [15]*</p> <p>MA161 Mathematical Studies [15]*</p> <p><b>One of:</b></p> <p>BO101 Biology [15]*</p> <p>MP180 Applied Mathematics [15]*</p> <p>-----</p> <p><u>Semester 1</u></p> <p>CS103 Computer Science [5]</p>	<p><u>Semester 1</u></p> <p>MP231 Mathematical Methods I [5]</p> <p>PH2101 Mechanics and Electromagnetism [5]</p> <p>MP236 Mechanics I [5]*</p> <p>PH2102 Physics Laboratory and Problem Solving I [5]</p> <p>CS2101 Programming for Science and Finance [5]</p> <p>ST2001 Statistics in Data Science I [5]*</p> <p>-----</p> <p><u>Semester 2</u></p> <p>MP232 Mathematical Methods II [5]</p> <p>MP237 Mechanics II [5]*</p> <p>PH2104 Physics Laboratory and Problem Solving II [5]</p> <p>CS211 Programming and Operating Systems [5]*</p> <p>ST2002 Statistics in Data Science II [5]*</p> <p>PH2103 Thermodynamics &amp; Atomic Physics [5]</p>	<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>PH3101 Experimental and Computational Physics [15]</p> <p>-----</p> <p><u>Semester 1</u></p> <p>ST311 Applied Statistics I [5]*</p> <p>PH222 Astrophysical Concepts [5]*</p> <p>MP345 Mathematical Methods I [5]</p> <p>MP305 Modelling I [5]*</p> <p>PH328 Physics of the Environment I [5]*</p> <p>PH338 Properties of Materials [5]</p> <p>PH333 Quantum Physics [5]</p> <p>PH331 Wave Optics [5]</p> <p>-----</p> <p><u>Semester 2</u></p> <p>ST312 Applied Statistics II [5]*</p> <p>MP346 Mathematical Methods II [5]</p> <p>MP307 Modelling II [5]*</p> <p>PH335 Nuclear and Particle Physics [5]</p> <p>PH329 Physics of the Environment II [5]*</p> <p>PH362 Stellar Astrophysics [5]*</p> <p>PH337 Thermal Physics [5]</p>	<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>PH427 Practical Work (Including Project) [20]</p> <p>PH4101 Physics Problem Solving [5]</p> <p>-----</p> <p><u>Semester 1</u></p> <p>PH423 Applied Optics &amp; Imaging [5]</p> <p>PH428 Atmospheric Physics &amp; Climate Change [5]*</p> <p>PH430 Biophotonics [5]*</p> <p>PH421 Quantum Mechanics [5]</p> <p>PH422 Solid State Physics [5]</p> <p>-----</p> <p><u>Semester 2</u></p> <p>PH424 Electromagnetism and Special Relativity [5]</p> <p>PH466 Astrophysics [5]*</p> <p>PH425 Lasers &amp; Spectroscopy [5]</p> <p>PH429 Nanotechnology [5]</p>
		<i>Continued...</i>	

	<p><b>MATHEMATICAL STUDIES PATHWAY*</b></p> <p><u>Semester 1</u></p> <p>MA211 Calculus I [5]</p> <p>MA284 Discrete Mathematics [5]</p> <p>-----</p> <p><u>Semester 2</u></p> <p>MA212 Calculus II [5]</p> <p>MA203 Linear Algebra [5]</p> <p><b>MATHEMATICS PATHWAY*</b></p> <p><u>Semester 1</u></p> <p>MA2286 Differential Forms [5]</p> <p>MA284 Discrete Mathematics [5]</p> <p>-----</p> <p><u>Semester 2</u></p> <p>MA2287 Complex Analysis [5]</p> <p>MA283 Linear Algebra [5]</p>		
* 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
<p><b>Module Descriptors for Years 1 to 4 are available at: <a href="http://www.nuigalway.ie/science/undergraduate-courses/physics-with-options.html#course_outline">http://www.nuigalway.ie/science/undergraduate-courses/physics-with-options.html#course_outline</a></b></p>			

## BSc Physics – Stream: Physics with Astrophysics

Year 1	Year 2	Year 3	Year 4
<b>[Core: 45 credits; Options: 15 credits]</b>	<b>[Core: 60 credits]</b>	<b>[60 credits]</b>	<b>[60 credits]</b>
<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>MP180 Applied Mathematics [15]</p> <p>PH101 Physics [15]</p> <p>PH109 Physics Special Topics [10]</p> <p>MA180 Mathematics (Honours) [15]*</p> <p>MA161 Mathematical Studies [15]*</p> <p>-----</p> <p><i>Semester 1</i></p> <p>CS103 Computer Science [5]</p>	<p><i>Semester 1</i></p> <p>PH222 Astrophysical Concepts [5]</p> <p>MP231 Mathematical Methods I [5]</p> <p>PH2101 Mechanics and Electromagnetism [5]</p> <p>MP236 Mechanics I [5]</p> <p>PH2102 Physics Laboratory and Problem Solving I [5]</p> <p>CS2101 Programming for Science and Finance [5]</p> <p>-----</p> <p><i>Semester 2</i></p> <p>MP232 Mathematical Methods II [5]</p> <p>MP237 Mechanics II [5]</p> <p>PH223 Observational Astronomy [5]</p> <p>PH2104 Physics Laboratory and Problem Solving II [5]</p> <p>PH2103 Thermodynamics &amp; Atomic Physics [5]</p> <p>CS211 Programming and Operating Systems [5]</p>	<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>PH363 Astronomical Data Analysis [5]</p> <p>PH3101 Experimental and Computational Physics [15]</p> <p>-----</p> <p><i>Semester 1</i></p> <p>MP345 Mathematical Methods I [5]</p> <p>PH338 Properties of Materials [5]</p> <p>PH333 Quantum Physics [5]</p> <p>PH331 Wave Optics [5]</p> <p>-----</p> <p><i>Semester 2</i></p> <p>MP346 Mathematical Methods II [5]</p> <p>PH335 Nuclear and Particle Physics [5]</p> <p>PH362 Stellar Astrophysics [5]</p> <p>PH337 Thermal Physics [5]</p>	<p><i>Full Year – Semester 1 and Semester 2</i></p> <p>PH427 Practical Work (Including Project) [20]</p> <p>PH4101 Physics Problem Solving [5]</p> <p>-----</p> <p><i>Semester 1</i></p> <p>PH423 Applied Optics &amp; Imaging [5]</p> <p>MP403 Cosmology and General Relativity [5]</p> <p>PH421 Quantum Mechanics [5]</p> <p>PH422 Solid State Physics [5]</p> <p>-----</p> <p><i>Semester 2</i></p> <p>PH466 Astrophysics [5]</p> <p>PH424 Electromagnetism and Special Relativity [5]</p> <p>PH425 Lasers &amp; Spectroscopy [5]</p>
* Select one 15-credit module			
<b>Module Descriptors for Years 1 to 4 are available at: <a href="http://www.nuigalway.ie/science/undergraduate-courses/physics-with-options.html#course_outline">http://www.nuigalway.ie/science/undergraduate-courses/physics-with-options.html#course_outline</a></b>			



## BSc Physics – Stream: Physics and Theoretical Physics

Year 1	Year 2	Year 3	Year 4
<b>[Core: 45 credits; Options: 15 credits]</b>	<b>[Core: 40 credits; Pathway: 20 credits]</b>	<b>[60 credits]</b>	<b>[Core 50 credits; Option: 10 credits]</b>
<i>Full Year – Semester 1 and Semester 2</i>	<i>Semester 1</i>	<i>Full Year – Semester 1 and Semester 2</i>	<i>Full Year – Semester 1 and Semester 2</i>
MP180 Applied Mathematics [15]	MP231 Mathematical Methods I [5]	PH3102 Experimental and Computational Physics for Theoretical Physics [10]	MP420 Applied Mathematics Project [10]*
PH101 Physics [15]	PH2101 Mechanics and Electromagnetism [5]	-----	PH4101 Physics Problem Solving [5]
PH109 Physics Special Topics [10]	MP236 Mechanics I [5]	<i>Semester 1</i>	-----
MA180 Mathematics (Honours) [15]*	PH2102 Physics Laboratory and Problem Solving I [5]	MP366 Electromagnetism [5]^	<i>Semester 1</i>
MA161 Mathematical Studies [15]*	-----	MP345 Mathematical Methods II [5]	PH423 Applied Optics & Imaging [5]
-----	<i>Semester 2</i>	MP494 Partial Differential Equations [5]^	PH428 Atmospheric Physics & Climate Change [5]*
<i>Semester 1</i>	MP232 Mathematical Methods II [5]	PH333 Quantum Physics [5]^	MP403 Cosmology and General Relativity [5]
CS103 Computer Science [5]	MP237 Mechanics II [5]	PH331 Wave Optics [5]	MP366 Electromagnetism [5]^
	PH2104 Physics Laboratory and Problem Solving II [5]	-----	MP305 Modelling I [5]
	PH2103 Thermodynamics & Atomic Physics [5]	<i>Semester 2</i>	MP494 Partial Differential Equations [5]^
	<b>MATHEMATICAL STUDIES PATHWAY*</b>	MP365 Fluid Mechanics [5]^	PH422 Solid State Physics [5]
	<i>Semester 1</i>	MP346 Mathematical Methods II [5]	-----
	MA211 Calculus I [5]	MP307 Modelling II [5]	<i>Semester 2</i>
	MA284 Discrete Mathematics [5]	PH335 Nuclear and Particle Physics [5]	PH432 Project [10]*
	-----	PH337 Thermal Physics [5]	MP365 Fluid Mechanics [5]^
	<i>Semester 2</i>		MP491 Non Linear Systems [5]
	MA212 Calculus II [5]		
	MA203 Linear Algebra [5]		
	Continued...		

	<p><b>MATHEMATICS PATHWAY*</b></p> <p><u>Semester 1</u></p> <p>MA2286 Differential Forms [5]</p> <p>MA284 Discrete Mathematics [5]</p> <p><u>Semester 2</u></p> <p>MA2287 Complex Analysis [5]</p> <p>MA283 Linear Algebra [5]</p> <p><b>ASTROPHYSICS PATHWAY*</b></p> <p><u>Semester 1</u></p> <p>PH222 Astrophysical Concepts [5]</p> <p>CS2101 Programming for Science and Finance [5]</p> <p>-----</p> <p><u>Semester 2</u></p> <p>PH223 Observational Astronomy [5]</p> <p>CS211 Programming and Operating Systems [5]</p>		
* 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. ^ 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: [http://www.nuigalway.ie/science/undergraduate-courses/physics-with-options.html#course\\_outline](http://www.nuigalway.ie/science/undergraduate-courses/physics-with-options.html#course_outline)**