

# BSC (HONS) MATHEMATICAL SCIENCES AND PHYSICS

## Programme Requirements

Code	Title	Credits
<b>Year 1</b>		<b>60</b>
CK407 ( <a href="https://ucc-ie-public.courseleaf.com/programmes/bscms/">https://ucc-ie-public.courseleaf.com/programmes/bscms/</a> )		
or		
CK408 ( <a href="https://ucc-ie-public.courseleaf.com/programmes/bscpy/">https://ucc-ie-public.courseleaf.com/programmes/bscpy/</a> )		
<b>Year 2</b>		
Students take <b>60</b> credits as follows:		
<i>Core Modules</i>		
AM2052	Mathematical Modelling	5
AM2060	Object Oriented Programming with Applications	5
AM2071	Transform and Variational Methods	5
MA2072	Complex Analysis	5
MA2051	Mathematical Analysis I	5
MA2055	Linear Algebra	5
MA2071	Multivariable Calculus	5
PY2101	Classical Mechanics	5
PY2102	Introduction to Quantum Physics	5
PY2103	Electrostatics and Magnetostatics	5
PY2106	Introduction to Astrophysics and Special Relativity	5
PY2107	Experimental Physics I	5
<b>Year 3</b>		
Students take <b>60</b> credits as follows – all listed core modules ( <b>35</b> credits) and <b>25</b> credits of elective modules:		
<i>Core Modules</i>		
MA3064	Measure Theory and Integration	5
AM3051	Vector and Tensor Methods	5
PY2104	Introduction to Thermodynamics and Statistical Physics	5
PY3102	Quantum Mechanics	5
PY3103	Electromagnetism	5
PY3104	Statistical Thermodynamics	5
PY3107	Experimental Physics II	5
<i>Elective Modules</i>		
Students take modules to the value of <b>10</b> credits from the following:		<b>10</b>
PY3101	Optics (5) <sup>1</sup>	
PY3105	Introduction to Condensed Matter Physics (5) <sup>1</sup>	
PY3106	Nuclear and Particle Physics (5) <sup>1</sup>	
PY3109	Observational Astrophysics (5)	
Plus modules to the value of <b>15</b> credits from the following:		<b>15</b>
AM3052	Introduction to Fluid Mechanics and Wave Theories (5)	
AM3063	Partial Differential Equations with Applications I (5)	
AM3064	Topics in Applied Mathematics (5)	
AM3065	Dynamical Systems and Bifurcation Theory (5)	
AM2061	Computer Modelling and Numerical Techniques (5)	
MA2054	Ordinary Differential Equations (5)	

MA3052	Ring and Field Theory (5)	
MA3056	Metric Spaces and Topology (5)	
MA3062	Introduction to Modern Algebra (5)	
MA3063	Introduction to Differential Geometry (5)	
ST2054	Probability and Mathematical Statistics (10)	
<b>Year 4</b>		
Students take <b>60</b> credits as follows – all listed core modules ( <b>10</b> credits) and <b>50</b> credits of elective modules from the following lists:		
<i>Project</i>		
MS4090	Mathematical Sciences Project	10
or PY4115	Research Project	
<i>Elective Modules</i>		
Students take modules to the value of <b>25</b> credits from Lists A and B:		<b>25</b>
<i>List A</i> <sup>2</sup>		
AM3052	Introduction to Fluid Mechanics and Wave Theories (5)	
AM3063	Partial Differential Equations with Applications I (5)	
AM3064	Topics in Applied Mathematics (5)	
AM3065	Dynamical Systems and Bifurcation Theory (5)	
MA3052	Ring and Field Theory (5)	
MA3056	Metric Spaces and Topology (5)	
ST3053	Stochastic Modelling I (5)	
<i>List B</i>		
AM4063	Partial Differential Equations with Applications II (5)	
AM4064	Perturbation and Asymptotic Methods (5)	
AM4065	Network Science with Applications (5)	
MA4052	Functional Analysis (5)	
MA4058	Measure Theory and Martingales (5)	
MA4062	Topics in Modern Algebra (5)	
MA4063	Topics in Differential Geometry (5)	
MF4054	Stochastic Analysis (5)	
Students take modules to the value of <b>25</b> credits from Lists C and D:		<b>25</b>
<i>List C</i> <sup>2</sup>		
PY3101	Optics (5) <sup>1</sup>	
PY3105	Introduction to Condensed Matter Physics (5) <sup>1</sup>	
PY3106	Nuclear and Particle Physics (5) <sup>1</sup>	
<i>List D</i>		
PY4102	Advanced Quantum Mechanics (5)	
PY4103	Advanced Electromagnetism (5)	
PY4104	Advanced Condensed Matter Physics (5)	
PY4105	Atomic and Molecular Physics (5)	
PY4106	Relativistic Quantum Theory (5)	
PY4108	Introduction to Lasers and Photonics (5)	
PY4109	Advanced Computational Physics (5)	
PY4110	Stars and the Interstellar Medium (5)	
PY4111	Galactic and Extragalactic Astrophysics (5)	
PY4112	Gravitation and Cosmology (5)	
PY4113	Experimental Physics III (5)	
PY4117	Quantum Optics (5)	

PY4118 Physics of Semiconductor Devices (5)

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**Total Credits** **240**

<sup>1</sup> At least 2 of these 3 modules must be taken during years 3 and 4.

<sup>2</sup> A total of at most 15 credits may be taken from the combination of Lists A and C, and only modules not previously taken may be chosen

## Examinations

Full details and regulations governing Examinations for each programme will be contained in the *Marks and Standards Book* and for each module in the *Book of Modules*.