

9.1 First Year – Semester 1

MPhys/BSc Programmes (These are the same in Y1 and Y2).

Students take 60 credits per semester ^[1] as specified below. All courses are 10 credits unless otherwise indicated.

Courses marked with (M) require a higher than average aptitude for maths.

Programme	PHYS10071	PHYS10101	PHYS10121	PHYS10191	Lab.	Additional Core	Option
Physics	✓	✓	✓	✓	✓	✗	See List
Physics with Astrophysics	✓	✓	✓	✓	✓	✗	See List
Physics with Study in Europe	✓	✓	✓	✓	✓	Language Course ^[2]	✗
Physics with Theoretical Physics	✓	✓	✓	✓	✓ Incl PHYS10181B and PHYS10181F	PHYS10471(M)	✗
Mathematics and Physics ^[1]	✗	✓	✓	✗	✓ Incl PHYS10181B and PHYS10181F	MATH10111 (15 credits) MATH10121 (20 credits)	✗

Physics Core Courses	
PHYS10071	Mathematics 1
PHYS10101	Dynamics
PHYS10121	Quantum Physics and Relativity
PHYS10191	Introduction to Astrophysics and Cosmology
PHYS10180	First Year Laboratory (20 credits)
	<i>Including:</i>
PHYS10181B	Computing and Data Analysis
PHYS10181F	Special Topics in Physics

Additional Core	
PHYS10471(M)	Random Processes in Physics
MATH10111	Foundations of Pure Mathematics (15 credits)
MATH10121	Calculus and Vectors (20 credits)

Additional Programme Information

[1] Mathematics and Physics: Students take 65 credits in semester 1 and 55 credits in semester 2.

[2] Physics with Study in Europe: Students take a language course appropriate in level to their initial knowledge of the language. LEAP courses are 10 credits in S1 and 10 credits in S2. Students in Physics with Study in Europe who begin with limited language skills may have to do extra work to reach the appropriate level by the end of first year. Students who have already reached the appropriate standard will be excused the language course and will be required to choose alternative course units.

[3] Physics, Physics with Astrophysics, Physics with Study in Europe: Students do PHYS10181F in S1 and their laboratory work in S2.

S1 Options List

Students with an option choose 1 course from the following and are responsible for checking that they fulfil any course pre-requisites and that any options taken do not clash with other courses.

Physics Option List 1	
PHYS10461	Physics in Everyday Life
PHYS10471(M)	Random Processes in Physics

External Option List 1E	
BMAN10011	Fundamentals of Management
ECON10221	Microeconomics 1
HSTM10221	Science and the Modern World

Foreign Language Options

10 credits in S1 and 10 credits in S2 may be taken by honours Physics students.

[See Section 8.6 The LEAP \(Language Experience for All\) Programme](#)

Business and Management Options

[See section 8.7 MBS Business and Management for all programmes \(BMaP\)](#)

Tutorials

All students (except Mathematics and Physics) have 2 tutorials each week in both semesters. Supervision classes are available for Maths students. Mathematics and Physics students attend 1 physics tutorial each week.

9.2 First Year – Semester 2

MPhys/BSc Programmes (These are the same in Y1 and Y2).

Students take 60 credits per semester as specified below. All courses are 10 credits unless otherwise indicated.

Courses marked with (M) require a higher than average aptitude for maths.

Programme	PHYS10302	PHYS10342	PHYS10352	PHYS10372	Lab.	Additional Core	Option
Physics	✓	✓	✓	✓	✓	×	See list
Physics with Astrophysics	✓	✓	✓	✓	✓	PHYS10672(M) or PHYS10692	×
Physics with Study in Europe	✓	✓	✓	✓	✓	Language Course	×
Physics with Theoretical Physics	✓	✓	✓	✓	×	PHYS10672(M)	See List
Mathematics and Physics ^[1]	✓	✓	✓	×	×	MATH10212 (15 credits) MATH11222	×

Physics Core Courses	
PHYS10302	Vibrations and Waves
PHYS10342	Electricity and Magnetism
PHYS10352	Properties of Matter
PHYS10372	Mathematics 2
PHYS10180	First Year Laboratory, including:
PHYS10182C	Circuits

Additional Core	
PHYS10672(M)	Advanced Dynamics
PHYS10692	Physics of the Solar System
MATH10212	Linear Algebra (15 credits)
MATH11222	Calculus & Applications

Additional Programme Information

[1] Mathematics and Physics: See programme information in semester 1.

S2 Options List

Students with an option choose 1 course from the following and are responsible for checking that they fulfil any course pre-requisites and that any options taken do not clash with other courses.

Physics Option List 2	
PHYS10622	Physics of Energy Sources
PHYS10672(M)	Advanced Dynamics
PHYS10692	Physics of the Solar System
PHYS10792	Introduction to Data Science

External Option List 2E	
ECON10252	Macroeconomics 1

Foreign Language Options

10 credits in S1 and 10 credits in S2 may be taken by honours Physics students.

[See Section 8.6 The LEAP \(Language Experience for All\) Programme](#)

Business and Management Options

[See section 8.7 MBS Business and Management for all programmes \(BMAP\)](#)

Tutorials (Refer to semester 1)

9.3 Second Year – Semester 3

MPhys/BSc Programmes (These are the same in Y1 and Y2).

Students take 60 credits per semester as specified below. All courses are 10 credits unless otherwise indicated.

Courses marked with (M) require a higher than average aptitude for maths.

Programme	PHYS20101	PHYS20141	PHYS20161	PHYS20171	Lab.	Additional Core	Option
Physics	✓	✓	✓	✓	✓	✗	See List
Physics with Astrophysics	✓	✓	✓	✓	✓	PHYS20491	✗
Physics with Study in Europe	✓	✓	✓	✓	* ^[1]	PHYS20401(M) Language Course ^[1]	✗
Physics with Theoretical Physics	✓	✓	✓	✓	✓ Not PHYS20181E	PHYS20401(M)	✗
Physics with Philosophy	✓	✓	✗	✓	✓ Not PHYS20181E	PHIL20611 or PHIL20271 (20 credits)	✗
Mathematics and Physics ^[2]	✓	✓	✗	✗	* Not PHYS20181E	MATH20111, MATH20401 (20 credits)	PHYS20280 or MATH20201 ^[2]

Note * indicates a choice of courses to be made.

Physics Core Courses		Additional Core and Programme-Specific Options	
PHYS20101	Introduction to Quantum Mechanics	PHYS20401(M)	Lagrangian Dynamics
PHYS20141	Electromagnetism	PHYS20491	Galaxies
PHYS20161	Introduction to Programming for Physicists	MATH20111	Real Analysis
PHYS20171	Mathematics of Waves and Fields	MATH20201	Algebraic Structures 1
PHYS20180	Second Year Laboratory (Double unit S3 & S4, 20 credits)	MATH20401	Partial Differential Equations and Vector Calculus (20 credits)
PHYS20181E	Amplifiers and Feedback	PHIL20611	Phenomenology (20 credits)
PHYS20280	Second Year Laboratory (S3 only, 10 credits)	PHIL20271	Philosophy of Mind (20 credits)

Additional Programme Information

[1] Physics with Study in Europe: Students who have already reached a satisfactory level in their language in 1st year and who are not doing a language course will do lab; otherwise a language course is taken instead.

[2] Mathematics and Physics: Students usually take EITHER MATH20201, MATH20212 and PHYS20280 (S4) OR PHYS20280 (S3), MATH20122 and MATH20502.

S3 Options List

Students with an option choose 1 from the following and are responsible for checking that they fulfil any course pre-requisites and that any options taken do not clash with other courses.

Physics Option List 3	
PHYS20401(M)	Lagrangian Dynamics
PHYS20491	Galaxies
EART23001	Atmospheric Physics & Weather

External Option List 3E	
BIOL10511	Biodiversity
ECON10221	Microeconomics 1
HSTM10221	Science and the Modern World
MCEL10001	Exploring Enterprise

Foreign Language Options

10 credits in S1 and 10 credits in S2 may be taken by honours Physics students.

[See Section 8.6 The LEAP \(Language Experience for All\) Programme](#)

Business and Management Options

[See section 8.7 MBS Business and Management for all programmes \(BMAP\)](#)

University College Options

[See Section 8.8 University College](#)

Tutorials

All students attend one physics tutorial each week in both semesters. Physics with Study in Europe students also attend Physics in a Foreign Language tutorials as part of their programme in the second year. Physics with Philosophy students will be told about tutorial arrangements and students must register themselves on tutorials.

9.4 Second Year – Semester 4

MPhys/BSc Programmes (These are the same in Y1 and Y2).

Students take 60 credits per semester as specified below. All courses are 10 credits unless otherwise indicated.

Courses marked with (M) require a higher than average aptitude for maths.

Programme	PHYS20252	PHYS20312	PHYS20352	Lab.	Additional Core	Option
Physics	✓	✓	✓	✓	x	2 from List
Physics with Astrophysics	✓	✓	✓	✓	PHYS20692	1 from List
Physics with Study in Europe	✓	✓	✓	✓	Language Course, PHYS20672(M)	x ^[1]
Physics with Theoretical Physics	✓	✓	✓	x	PHYS20672(M), PHYS20872	1 from List
Physics with Philosophy	✓	✓	✓	x	PHIL20042 or PHIL20242 (20 credits)	1 from List
Mathematics and Physics	✓	✓	✓	*	MATH29142	MATH20122 and MATH20502, or MATH20212 and PHYS20280 ^[3]

Note * indicates a choice of courses to be made.

Physics Core Courses	
PHYS20252	Fundamentals of Solid State Physics
PHYS20312	Wave Optics
PHYS20352	Statistical Mechanics
PHYS20180	Second Year Laboratory (Double Unit S3 & S4, 20 credits)
PHYS20280	Second Year Laboratory (S4 only, 10 credits)

Additional Core and Programme-Specific Options	
HSTM20282	Information visions: past, present and future
PHYS20672(M)	Complex Variables and Vector Spaces
PHYS20692	Astrophysical Processes
PHYS20872	Theory Computing Project
MATH20122	Metric Spaces
MATH20212	Algebraic Structures II
MATH20502	Fluid Mechanics
MATH29142	Complex Analysis
PHIL20042	Formal Logic (20 credits)
PHIL20242	20 th Century Analytical Philosophy (20 credits)

Additional Programme Information

[1] **Physics with Study in Europe:** If students do not need to take a language course then they have an option.

[2] **Physics with Theoretical Physics:** May not take PHYS20762.

[3] **Mathematics and Physics:** See S3 notes.

S4 Options List

Students with an option or options choose from the following courses and are responsible for checking that they fulfil any course pre-requisites and that any options taken do not clash with other courses. Not more than 20 credits of level 1 options may be taken in second year.

Physics Option List 4	
PHYS10622	Physics of Energy Sources
PHYS10672(M)	Advanced Dynamics
PHYS10692	Physics of the Solar System
PHYS10792	Introduction to Data Science
PHYS20612	Introduction to Photonics
PHYS20672(M)	Complex Variables and Vector Spaces
PHYS20692	Astrophysical Processes
PHYS20762	Computational Physics

External Option List 4E	
HSTM20282	Information visions: past, present and future
MATH20502	Fluid Mechanics
MATH20912	Introduction to Financial Mathematics
MCEL10002	Entrepreneurial Skills

Business and Management Options

[See section 8.7 MBS Business and Management for all programmes \(BMAP\)](#)

University College Options

[See Section 8.8 University College](#)

General Physics Paper

All students sit a General Physics Paper (PHYS20040/20240) in May/ June as part of the assessment for second year. The questions are based on the core physics units in Year 1 and in semester 3. Your tutor can help you to prepare for this paper.

Tutorials (Refer to Y2 semester 3)

Physics with Philosophy students will be told about tutorial arrangements and students must register themselves on tutorials.

9.5 BSc Third Year – Semester 5

Students take 60 credits per semester as specified below. All courses are 10 credits unless otherwise indicated.

No student may take more than 30 credits of external options, or more than 20 credits of level 2 options, in year 3.

Courses marked with (M) require a higher than average aptitude for maths.

Programme	PHYS30101 or PHYS30201(M) ^[1]	PHYS30121	Lab/ Dissertation ^[2]	PHYS20161	Option
Physics/Physics with Professional Placement	✓	✓	✓✓	✗	2 from lists 5 and 5(2) and 5E
Physics with Astrophysics	✓	✓	✓✓	✗	2 from lists 5 and 5(2), to include PHYS20401 or PHYS30511
Physics with Theoretical Physics	PHYS30201(M)	✓	✓ (Dissertation)	✗	3 from lists 5 and 5E, to include at least one of PHYS30471(M), PHYS30441(M) and MATH35001
Physics with Philosophy	✓	✓	✓ (Lab)	✗	1 from lists 5 or 5(2) or 5E, and 1 Philosophy Option (20 credits)
Mathematics and Physics ^[3]	✓	✓	✗	✓	30 credits of Mathematics Options OR 1 from (PHYS20401, PHYS30051 or PHYS30441) and 20 credits of Mathematics options

Physics Core Courses	
PHYS30101	Applications of Quantum Physics or
PHYS30201(M)	Mathematical Fundamentals of Quantum Mechanics
PHYS30121	Introduction to Nuclear and Particle Physics
PHYS30180	Third Year Laboratory (Double Unit 20 credits)
PHYS30280	Third Year Laboratory
PHYS30880	BSc Dissertation

Additional Core and Programme-Specific Options	
PHYS20161	Introduction to Programming for Physicists
PHYS20401	Lagrangian Dynamics
PHYS30441(M)	Electrodynamics
PHYS30471(M)	Introduction to Nonlinear Physics
PHYS30511	Nuclear Fusion and Astrophysical Plasmas
MATH35001	Viscous Fluid Flow

Additional Programme Information

[1] No student may take both PHYS30101 and PHYS30201, or both PHYS30141 and PHYS30441

[2] **Laboratory.** Each ✓ indicates 10 credits, either two 6 week lab experiments (PHYS30180/30280) or a BSc Dissertation project (PHYS30880); the timing varies.

Physics and Physics with Astrophysics students do two lab experiments and a BSc Dissertation. The timing will depend on the dissertation chosen.

[3] The Maths options for Maths/Physics students are discussed in [Section 7.2 Mathematics and Physics \[BSc, MMath&Phys\]](#). Students must take at least 50 level-three or higher credits in each of Maths and Physics.

[4] Physics with Philosophy students will be told about tutorial arrangements and students must register themselves on tutorials.

S5 Options List

Students with an option or options choose from the following courses and are responsible for checking that they fulfil any course pre-requisites. Students can take courses with a one hour clash providing they have completed a Course Unit Clash Disclaimer form.

Physics Options List 5:	
PHYS30051	Condensed Matter Physics
PHYS30141	Electromagnetic Radiation
PHYS30441(M)	Electrodynamics
PHYS30471(M)	Introduction to Nonlinear Physics
PHYS30511(A)	Nuclear Fusion and Astrophysical Plasmas
PHYS30611	Lasers and Photonics
MATH35001	Viscous Fluid Flow

Physics Options from Y2 List 5 (2):	
PHYS20401(M)	Lagrangian Dynamics

External Option List (level 3) 5E (3):	
MATH34001	Applied Complex Analysis (Prerequisite: PHYS20672)
MCEL30001	Tools and Techniques for Enterprise

Foreign Language Options

Studied as 10 credits in S5 and 10 credits in S6, but the course should normally be Level 2 or above

[See Section 8.6 The LEAP \(Language Experience for All\) Programme](#)

University College Options

[See Section 8.8 University College](#)

Examples Classes

Examples classes are held to cover PHYS30051, PHYS30101 / 30201, PHYS30121 and PHYS30141 / 30441 in Semester 5. Attendance at these classes is monitored.

9.6 BSc Third Year – Semester 6

Students take 60 credits per semester. All courses are 10 credits unless otherwise indicated.

You may not take more than 30 credits of external options, nor more than 20 credits of level 2 options, in year 3.

Courses marked with (M) require a higher than average aptitude for maths. [Courses marked (M) or (A) may count towards the MPhys fourth year requirements for Physics with Theoretical Physics or Astrophysics respectively, see MPhys 4th year syllabus]

Programme	Lab or Dissertation ^[1]	Core	Options ^[1]
Physics/Physics with Professional Placement	✓	1 from list 6C	4 from lists 6C or 6 or 6E(2) or 6E(3)
Physics with Astrophysics	✓	PHYS30392, PHYS30692	3 from lists 6C or 6 or 6E(2) or 6E(3)
Physics with Theoretical Physics	✓ (Lab)	PHYS30672(M), 1 from list 6C	3 from lists 6C or 6 or 6E(2) or 6E(3)
Physics with Philosophy	✓ (Dissertation)	1 Philosophy Option (20 credits), PHYS41702 and 1 from list 6C	1 from list 6C or 6
Mathematics and Physics ^[2]	PHYS30880 or MATH30022	2 from (lists 6C and 6 and PHYS30280)	30 credits, comprising at least 20 credits of Mathematics Options and at most 1 from lists 6C or 6 or 6E(2) or 6E(3)

Physics Core Courses	
PHYS30180	Third Year Laboratory (wks 1-6 or 7-12) (S5 & S6 20 credits)
PHYS30280	Third Year Laboratory (wks 1-6 or 7-12)
PHYS30880	BSc Dissertation

Additional Core and Programme-Specific Options	
PHYS30392(A)	Cosmology
PHYS30672(M)	Mathematical Methods for Physics
PHYS30692(A)	Stars and Stellar Evolution
PHYS40202(M)	Advanced Quantum Mechanics
PHYS41702	Physics and Reality
MATH30022	Project

Additional Programme Information

[1] Laboratory. Each ✓ indicates 10 credits, either a 6 week lab experiment (PHYS30180/30280) or a BSc Dissertation project (PHYS30880); the timing varies.

Physics and Physics with Astrophysics students do two lab experiments, and a BSc Dissertation. The timing will depend on the dissertation chosen.

[2] The Maths options for Maths/Physics students are discussed in [Section 7.2 Mathematics and Physics \[BSc, MMath&Phys\]](#). Students must take at least 50 level-three or higher credits in each of Maths and Physics.

[3] Physics with Philosophy students will be told about tutorial arrangements and students must register themselves on tutorials.

S6 Options List

Students with an option or options choose from the following courses and are responsible for checking that they fulfil any course pre-requisites. Students can take courses with a one hour clash providing they have completed a Course Unit Clash Disclaimer form.

Core for MPhys; list 6C:	
PHYS30392(A)	Cosmology
PHYS40222	Particle Physics
PHYS40322	Nuclear Physics

Physics Option List 6:	
PHYS30632	Physics of Medical Imaging
PHYS30652	Physics of Fluids
PHYS30672(M)	Mathematical Methods for Physics
PHYS30692(A)	Stars and Stellar Evolution
PHYS30732	Physics of Living Processes
PHYS30762	Object-Oriented Programming in C++
PHYS31692(A)	Exoplanets
PHYS40202(M)	Advanced Quantum Mechanics
PHYS40422	Applied Nuclear Physics
PHYS40712	Semiconductor Quantum Structures
PHYS41702	Physics and Reality
EART30362	Climate and Energy
EART39102	Meteorology and Atmospheric Physics
MATH35012	Wave Motion

Foreign Language Options

Study of a foreign language as 10 credits in S5 and 10 credits in S6, but the course should normally be Level 2 or above

[See Section 8.6 The LEAP \(Language Experience for All\) Programme](#)

University College Options

[See Section 8.8 University College](#)

General Physics Paper

All students sit a General Physics Paper (PHYS30010/30210) in May/ June as part of the final examinations. The questions are based on the core physics units in Year 1, Year 2 and semester 5.

Examples Classes

Examples classes are held to cover general physics and PHYS30392, PHYS40222 and PHYS40322 in Semester 6. Attendance at these classes is monitored.

External Option List 6E (2):	
HSTM20282	Information visions: past, present and future

External Option List 6E (3):	
COMP39112	Quantum Computing
EART30232	Comparative Planetology
HSTM31212	The Nuclear Age
MATH39032	Mathematical Modelling in Finance
MCEL30002	Tools and Techniques for Enterprise
MCEL30012	Advanced Technology Enterprise (follow-on from MCEL30001)
MCEL30022	Interdisciplinary Sustainable Development

9.7 MPhys Third Year – Semester 5

Students take 60 credits as specified below. All courses are 10 credits unless otherwise indicated.

You may not take more than 30 credits of external options, nor more than 20 credits of level 2 options, in year 3.

Courses marked with (M) require a higher than average aptitude for maths. [Courses marked (M) or (A) may count towards the MPhys fourth year requirements for Physics with Theoretical Physics or Astrophysics respectively, see MPhys 4th year syllabus]

Programme	PHYS30101 or PHYS30201(M) ^[1]	PHYS30121	PHYS30051	PHYS30141 or PHYS30441(M) ^[1]	Lab	Option ^[1] or Additional core
Physics	✓	✓	✓	✓	✓	1 from list 5 or 5(2) or 5E
Physics with Astrophysics	✓	✓	*	✓	✓	2 from (PHYS30051 and lists 5 and 5(2)), to include PHYS20401 or PHYS30511
Physics with Theoretical Physics	PHYS30201(M)	✓	✓	PHYS30441(M)	✗	2 from lists 5 or 5(2) or 5E, to include PHYS30471(M) or MATH35001(M)
Physics with Philosophy	✓	✓	✓	✓	✗	1 Philosophy Option (20 credits)
Physics with Study in Europe ^[3]	✗	✗	✗	✗	✗	✗
Mathematics and Physics ^[1,2]	✓	✓	*	*	✗	PHYS20161, and 1 from (PHYS20401 or PHYS30051 or PHYS30441) and 20 or 25 credits of Mathematics Options

Note * indicates a choice of courses to be made.

Physics Core Courses	
PHYS30051	Condensed Matter Physics
PHYS30101	Applications of Quantum Physics
PHYS30201(M)	Mathematical Fundamentals of Quantum Mechanics
PHYS30121	Introduction to Nuclear and Particle Physics
PHYS30141	Electromagnetic Radiation
PHYS30180	Third Year Laboratory (20 credits)
PHYS30280	Third Year Laboratory (10 credits)
PHYS30441(M)	Electrodynamics

Additional Core and Programme-Specific Options	
PHYS20161	Introduction to Programming for Physicists
PHYS20401	Lagrangian Dynamics
PHYS30471(M)	Introduction to Nonlinear Physics
PHYS30511(A)	Nuclear Fusion and Astrophysical Plasmas
MATH35001	Viscous Fluid Flow

Additional Programme Information

[1] Students should consult [Section 7.1 Physics \[BSc, MPhys\]](#) about the choice of the more or less mathematical version of the quantum and electromagnetism courses.

[2] **Mathematics and Physics** Maths options, and the factors restricting the Physics options, are discussed in [Section 7.2 Mathematics and Physics \[BSc, MMath&Phys\]](#)

[3] **Physics with Study in Europe** students study abroad during their third year. Students are required to produce a year abroad report.

S5 Options List

Students with an option or options choose from the following courses and are responsible for checking that they fulfil any course pre-requisites. Students can take courses with a one hour clash providing they have completed a Course Unit Clash Disclaimer form.

Physics Core List 5C:	
PHYS30051	Condensed Matter Physics
PHYS30141	Electromagnetic Radiation
PHYS30441(M)	Electrodynamics

Physics Options List 5	
PHYS30471(M)	Introduction to Nonlinear Physics
PHYS30511(A)	Nuclear Fusion and Astrophysical Plasmas
PHYS30611	Lasers and Photonics
MATH35001	Viscous Fluid Flow

Physics Options from Y2 List 5 (2):	
PHYS20401(M)	Lagrangian Dynamics

External Option List (level 3) 5E (3):	
MATH34001	Applied Complex Analysis (Prerequisite: PHYS20672)
MCEL30001	Tools and Techniques for Enterprise

Foreign Language Options

Study of a foreign language as 10 credits in S5 and 10 credits in S6, but the course should normally be Level 2 or above.

[See Section 8.6 The LEAP \(Language Experience for All\) Programme](#)

University College Options

[See Section 8.8 University College](#)

Examples Classes

Examples classes are held to cover PHYS30051, PHYS30101 / 30201, PHYS30121 and PHYS30141 / 30441 in Semester 5. Attendance at these classes is monitored.

Tutorials

Physics with Philosophy students will be told about tutorial arrangements and students must register themselves on tutorials.

9.8 MPhys Third Year – Semester 6

Students take 60 credits per semester. All courses are 10 credits unless otherwise indicated. Courses marked with (M) require a higher than average aptitude for maths. [Courses marked (M) or (A) may count towards the MPhys fourth year requirements for Physics with Theoretical Physics or Astrophysics respectively, see MPhys 4th year syllabus]

Programme	Lab	Core	Options ^[1]
Physics	✓	All 3 from list 6C	2 from lists 6, 6E(2) or 6E(3)
Physics with Astrophysics	✓	PHYS30692 and all 3 from list 6C	1 from lists 6 or 6E(2) or 6E(3)
Physics with Theoretical Physics	✓	PHYS30672(M), PHYS40202(M) and 2 from list 6C	1 from lists 6 or 6E(2) or 6E(3)
Physics with Philosophy	✓	1 Philosophy Option (20 credits), PHYS41702 and 1 from list 6C	1 from list 6C or 6
Physics with Study in Europe [2]	✗	✗	✗
Mathematics and Physics	*	3 from (list 6C and PHYS40202(M) and Lab)	30 credits of Mathematics Options (3 x 10 level 3, or 2 x 15 level 4)

Physics Core Courses	
PHYS30180	Third Year Laboratory (20 credits)
PHYS30280	Third Year Laboratory (10 credits)
PHYS30392(A)	Cosmology
PHYS40222	Particle Physics
PHYS40322	Nuclear Physics

Additional Core and Programme-Specific Options	
PHYS30672(M)	Mathematical Methods for Physics
PHYS30692(A)	Stars and Stellar Evolution
PHYS40202(M)	Advanced Quantum Mechanics
PHYS41702	Physics and Reality

Additional Programme Information

[1] You may not take more than 30 credits of external options, nor more than 20 credits of level 2 options, in year 3.

[2] **Physics with Study in Europe** students study abroad during their third year. Students are required to produce a year abroad report.

[3] **Physics with Philosophy** students will be told about tutorial arrangements and students must register themselves on tutorials

S6 Options List

Students with an option or options choose from the following courses and are responsible for checking that they fulfil any course pre-requisites. Students can take courses with a one hour clash providing they have completed a Course Unit Clash Disclaimer form.

Core for MPhys; list 6C	
PHYS30392(A)	Cosmology
PHYS40222	Particle Physics
PHYS40322	Nuclear Physics

External Option List 6E (2):	
HSTM20282	Information visions: past, present and future

Physics Option List 6:	
PHYS30632	Physics of Medical Imaging
PHYS30652	Physics of Fluids
PHYS30672(M)	Mathematical Methods for Physics
PHYS30692(A)	Stars and Stellar Evolution
PHYS30732	Physics of Living Processes
PHYS30762	Object-Oriented Programming in C++
PHYS31692(A)	Exoplanets
PHYS40202(M)	Advanced Quantum Mechanics
PHYS40422	Applied Nuclear Physics
PHYS40712	Semiconductor Quantum Structures
PHYS41702	Physics and Reality
EART30362	Climate and Energy
EART39102	Meteorology and Atmospheric Physics
MATH35012	Wave Motion

External Option List 6E (3):	
COMP39112	Quantum Computing
EART30232	Comparative Planetology
HSTM31212	The Nuclear Age
MATH39032	Mathematical Modelling of Finance
MCEL30002	Tools and Techniques for Enterprise
MCEL30012	Advanced Technology Enterprise (follow-on from MCEL 30001)
MCEL30022	Interdisciplinary Sustainable Development

Foreign Language Options

Study of a foreign language as 10 credits in S5 and 10 credits in S6, but the course should normally be Level 2 or above

[See Section 8.6 The LEAP \(Language Experience for All\) Programme](#)

University College Options

[See Section 8.8 University College](#)

General Physics Paper

All students sit a General Physics Paper (PHYS30010/30210) in May/ June as part of the final examinations. The questions are based on the core physics units in Year 1, Year 2 and semester 5.

Examples Classes

Examples classes are held to cover general physics and PHYS30392, PHYS40222 and PHYS40322 in Semester 6. Attendance at these classes is monitored.

9.9 MPhys Programmes Fourth Year – Semesters 7 and 8

Options

Fourth year options are in lists 7, 7E, 8 and 8E below. Students can take courses with a one hour clash and are responsible for checking that they fulfil any course pre-requisites. Students can take courses with a one hour clash providing they have completed a Course Unit Clash Disclaimer form.

Options may also be chosen from lists 5, 5E(3), 6C, 6 and 6E(3), with the following constraints:

You must take at least 120 credits at level 4 in years 3 and 4 together. You may not take more than 30 credits of options from the external (E) lists in the fourth year.

Physics, Physics with Astrophysics, Physics with Theoretical Physics, Physics with Professional Placement

Students do 60 credits per semester. All students do PHYS40181/2 (MPhys project, 20 credits) in each semester, leaving 40 credits of options in semester 7 and 8. To qualify for Physics with Astrophysics or with Theoretical Physics, at least 30 credits must be taken in year 4 marked with (A) or (M) for Astrophysics and Theoretical Physics respectively (may include designated projects). Students who have spent year 3 abroad must take at least 90 credits of level 4 courses in the fourth year.

Physics with Study in Europe

Students do 60 credits per semester. The following are the usual rules, but they may be varied in exceptional circumstances by agreement with the Programme Director. In S7 students take PHYS40580 (level 4 version of third year lab, 10 credits) and in S8 PHYS40182 (MPhys Project, 20 credits), leaving 50 and 40 credits of options in semesters 7 and 8 respectively. As far as possible, gaps in third year core (usually Condensed Matter Physics and/or Particle and Nuclear Physics) must be covered. At least 90 credits of level 4 material must be taken in the fourth year.

Physics with Philosophy

Students do courses to a total credit rating of 120 or 125 for the year. Subject to that constraint, 55, 60 or 65 credits may be taken in each of S7 and S8. Students do either an MPhys Project (PHYS40181 or PHYS40182 (20 credits)) or a Philosophy Extended Essay (PHIL40000) (10 credits) in each of semesters 7 and 8, e.g., if PHYS40181 is taken in semester 7 then the extended essay must be taken in semester 8. Students must select their topic at the start of the academic year for PHIL40000 and must register themselves on Philosophy tutorials. Within courses labelled as Physics, one unit may be taken from a closely related subject, subject to the approval of the personal tutor and programme director. In addition to project work Physics with Philosophy students choose one of the following:

- (a) 2 units of level 6 Philosophy (30 credits) or 1 level 6 and 1 level 3 module (35 credits), and 6 units of Physics (60 credits)
- (b) 2 units of level 6 Philosophy (30 credits), 1 unit of mathematical logic (15 credits) and 5 units of Physics (50 credits)
- (c) 1 unit of level 6 Philosophy (15 credits), 2 units of mathematical logic (30 credits) and 5 units of Physics (50 credits).

Mathematics and Physics

Students do courses to a total credit rating of 120 or 125 for the year. Subject to that constraint, 55, 60 or 65 credits may be taken in each of S7 and S8. At least 50 credits in Physics and 50 credits in Mathematics over the course of the year must be taken, including MATH40011 or MATH40022 (Mathematics Project, 15 credits) and PHYS40181 or PHYS40182 (MPhys Project, 20 credits). (The two projects should be taken in different semesters). The remaining options are chosen from the lists 5, 6C, 6, 7 and 8, and Mathematics course units. PHYS30672 (M) (Mathematical Methods in Physics) cannot be taken.

Year 4 options are in lists 7, 7E, 8 and 8E. Options may also be chosen from lists 5, 5E, 6C, 6 and 6E (3), with the following constraints:

You must take at least 120 credits at level 4 in years 3 and 4 together;

You may not take more than 30 credits of options from the external (E) lists in year 4.

Option List 7:	
PHYS40411	Frontiers of Solid State Physics
PHYS40421	Nuclear Structure and Exotic Nuclei
PHYS40451	Superconductors and Superfluids
PHYS40481(M)	Quantum Field Theory
PHYS40521	Frontiers of Particle Physics 1
PHYS40571(M)	Advanced Statistical Physics
PHYS40591(A)	Radio Astronomy
PHYS40611	Frontiers of Photon Science
PHYS40631	Laser Photomedicine
PHYS40771(M,A)	Gravitation

Option List 7E:	
MCEL30011 (Level 4)	Advanced Technology Enterprise
MCEL30051	Enterprise Strategy and Marketing
HSTM33201	Climate Change and Society

Option List 8:	
PHYS40622	Nuclear Forces & Reactions
PHYS40642	Atomic Physics
PHYS40682(M)	Gauge Theories
PHYS40722	Frontiers of Particle Physics 2
PHYS40732	Biomaterials Physics
PHYS40752	Soft Matter Physics
PHYS40772(M,A)	Early Universe
PHYS40992(A)	Galaxy Formation

Option List 8E:	
MCEL30012 (level 4)	Advanced Technology Enterprise
MACE31642	Reactor Systems (PHYS40422 is a pre-requisite)