

School of Physics & Astronomy

Important Entry Information: Entry to first year is the standard entry route, and the route which can provide the broadest education, and which can give most flexibility in final choice of degree. Students who are aiming for a degree in Physics or Astrophysics and who enter with good Advanced Highers or A-levels or equivalent in Physics and Mathematics may apply for an accelerated entry route to the programme, which can reduce the length of the BSc Honours programme to three years and the MPhys programme to four years. The special Physics and Astronomy (Gateway) first year allows subsequent progression to the second year of all the single-honours degree programmes in the School, and the joint degrees with the School of Mathematics.

Entry to Honours

BSc. Students who attain an average of grade 11.0 or above at the first sitting in each of the requisite 2000-level module combinations and who meet all other programme requirements will be given automatic offers of entry into Honours programmes*.

Students permitted automatic entry to Honours* will only be permitted to trail one module to a maximum of 30 sub-honours

credits into Honours.

*Apart from students on Integrated Masters degrees.

This School also allows 'Qualified Entry to Honours' as defined in: [Entry to Honours](#)

MPhys or MSci. Students who attain an average grade of 15 or above at the first sitting in each of the requisite 2000-level combinations, and who meet all the other programme requirements will be permitted automatic entry into MPhys or MSci Honours programmes. It is not permitted to trail any modules or credits in to the start of the honours programme in Integrated Masters degrees.

BSc Honours

The general requirements are 480 credits over a period of normally four years (and not more than five years) or part-time equivalent, of which the final two years form an approved Honours programme of 240 credits, of which 90 credits are at 4000 level and at least a further 120 credits at 3000 and/or 4000 levels.

MPhys Honours

The general requirements are 600 credits over a period of normally five years (and not more than six years) or part-time equivalent, of which the final three years form an approved Honours programme of at least 360 credits, of which 120 credits are at 5000 level and at least 210 credits are at 3000 and/or 4000 levels.

MSci Honours

The general requirements are 600 credits over a period of normally five years (and not more than six years) or part-time equivalent, of which the final three years form an approved Honours programme of at least 360 credits, of which 120 credits are at 5000 level and at least 210 credits are at 3000 and/or 4000 levels.

Study Abroad: In the case of students who spend part of the Honours programme on a recognised Study Abroad scheme, the Programme Requirements will be amended to take into account overseas courses which are approved by the relevant St Andrews School in the Learning Agreement.

(see www.st-andrews.ac.uk/studyabroad/outgoingstudents/AcademicInformation/).

Accreditation: All the BSc, MSci, and MPhys Honours degrees described in this section of the catalogue are accredited by the UK Institute of Physics.

Physics & Astronomy - Programme Requirements 2015/6 - August 2015

Astrophysics - Single Honours BSc

First Year:	80 credits: AS1001 and MT1002 and PH1011 and PH1012. <i>(Students without prerequisite for MT1002 will take MT1001 in Semester 1.)</i> Other 1000-level modules to give at least 120 credits for the year.
Second Year:	120 credits: Grade 11 or better in AS2001 and an average grade of 11 or better in PH2011 and PH2012 with passes in both; and an average grade of 11 or better in MT2001 or (MT2501 and MT2503 with passes in both)
Third Year:	105 credits: AS3013 and PH3007 and PH3012 and PH3014 and PH3061 - PH3062 and PH3080 and PH3081; 15 credits: AS4010 (either Third Year or Fourth Year – any necessary equivalent credits to be selected in the year AS4010 not taken - with the approval of the Adviser of Studies.)
Fourth Year:	50 credits: AS4103 and PH4022 and PH4037; 30 credits: AS4011 - AS4012, AS4015, AS4025, PH4031 40 further credits: AS3000 - AS4999, PH3000 - PH4109, ID4001 or modules in other subjects or levels with the approval of the Adviser of Studies.
In total, at least 210 credits must be achieved at 3000 and 4000 level with at least 90 of these at 4000 level.	

Astrophysics - Single Honours BSc

Direct entry to second year for approved candidates with 120 advanced standing credits

Second Year:	At least 75 credits: AS1101 and Grade 11 or better in [AS2001 or AS2101] and an average of grade 11 or better in PH2011 and PH2012 with passes in both 30 credits: (MT2501 and MT2503) with passes in each and an average of grade of 11 or better Passes in additional modules if necessary to get at least 120 credits.
Third Year:	105 credits: AS3013 and PH3007 and PH3012 and PH3014 and PH3061 and PH3062 and PH3080 and PH3081; 15 credits: AS4010 (either Third Year or Fourth Year – any necessary equivalent credits to be selected in the year AS4010 not taken - with the approval of the Adviser of Studies.)
Fourth Year:	50 credits: AS4103 and PH4022 and PH4037; 30 credits: AS4011 - AS4012, AS4015, AS4025, PH4031 40 further credits: AS3000 - AS4999, PH3000 - PH4109, ID4001 or modules in other subjects or levels with the approval of the Adviser of Studies.
In total at least 210 credits must be achieved at 3000 and 4000 level with at least 90 of these at 4000 level.	

Astrophysics – Single Honours MPhys

First Year:	80 credits: AS1001 and MT1002 and PH1011 and PH1012. <i>(Students without prerequisite for MT1002 will take MT1001 in Semester 1.)</i> Other 1000-level modules to give at least 120 credits for the year
Second Year:	At least 105 credits: Grade 15 or better in [AS2001 or AS2101] and an average grade of 15 or better in PH2011 and PH2012 with passes in both; and an average grade of 15 or better in MT2501 and MT2503 with passes in both. <i>Additional credits if needed to give at least 120 credits for the year.</i>
Third Year:	105 credits: AS3013 and PH3007 and PH3012 and PH3014 and PH3061 and PH3062 and PH3080 and PH3081; 15 credits: AS4010 (either Third Year or Fourth Year – any necessary equivalent credits to be selected in the year AS4010 not taken - with the approval of the Adviser of Studies.)
Fourth Year:	65 credits: AS4011 and AS4012 and PH4022 and PH4037 and PH4038; 30 credits in two of: AS4015, AS4025, PH4031; At least 25 further credits, which may include ID4001.
Fifth Year:	60 credits: AS5101; At least 30 credits: AS5001 - AS5003;
Further credits: AS3000 - AS4099, PH3000 - PH4109, PH5000 - PH5099 or modules in other subjects with the approval of the Adviser of Studies, to a total of at least 360 across Third, Fourth and Fifth Years, of which at least 330 credits must be achieved at 3000, 4000 and 5000 level with at least 120 of these at 5000 level.	

Physics & Astronomy - Programme Requirements 2015/6 - August 2015

Astrophysics – Single Honours MPhys	
Direct entry to second year for approved candidates with 120 advanced standing credits	
Second Year:	At least 110 credits: AS1101 and grade 15 or better in [AS2001 or AS2101] and an average of grade 15 or better in PH2011 and PH2012 with passes in both; and an average of grade 15 or better in MT2501 and MT2503 with passes in both. <i>Additional modules if needed to give at least 120 credits over the year</i>
Third Year:	105 credits: AS3013 and PH3007 and PH3012 and PH3014 and PH3061 and PH3062 and PH3080 and PH3081; 15 credits: AS4010 (either Third Year or Fourth Year – any necessary equivalent credits to be selected in the year AS4010 not taken - with the approval of the Adviser of Studies.)
Fourth Year:	65 credits: AS4011 and AS4012 and PH4022 and PH4037 and PH4038; 30 credits in two of: AS4015, AS4025, PH4031; At least 25 further credits which may include ID4001.
Fifth Year:	60 credits: AS5101; At least 30 credits: AS5001 - AS5003; Further credits: AS3000 - AS4099, PH3000 - PH4109, PH5000 - PH5099 or modules in other subjects with the approval of the Adviser of Studies, to a total of 360 across Third, Fourth and Fifth Years, of which at least 330 credits must be achieved at 3000, 4000 and 5000 level with at least 120 of these at 5000 level.

Physics - Single Honours BSc	
First Year:	60 credits: PH1011 and PH1012 and MT1002. <i>(Students without prerequisite for MT1002 will take MT1001 in Semester 1.)</i> <i>Additional credits to a total of at least 120</i>
Second Year:	90 credits: PH2011 and PH2012 both passed with an average of grade 11 or better; and an average of grade 11 or better in MT2501 and MT2503 with passes in both. <i>Additional credits to a total of at least 120</i>
Third Year:	105 credits: PH3007 and PH3012 and PH3014 and PH3061 and PH3062 and PH3080 and PH3081 and PH3101; 15 credits: AS3000 - AS4999, PH3000 - PH4109, MT3501, or modules in other subjects or levels with the approval of the Adviser of Studies.
Fourth Year:	80 credits: PH4022 and PH4037 and PH4039 and PH4105 and PH4111; 40 further credits: AS3000 - AS4999, PH3000 - PH4109, ID4001 or modules in other subjects or levels with the approval of the Adviser of Studies.
In total, at least 210 credits must be achieved at 3000 and 4000 level with at least 90 of these at 4000 level.	

Physics - Single Honours BSc	
Direct entry to second year for approved candidates with 120 advanced standing credits	
Second Year:	90 credits: PH2011 and PH2012 passed with an average of grade 11 or better; and an average of grade 11 or better in MT2501 and MT2503 with passes in both. <i>Additional credits to a total of at least 120</i>
Third Year:	105 credits: PH3007 and PH3012 and PH3014 and PH3061 and PH3062 and PH3080 and PH3081 and PH3101; 15 credits: AS3000 - AS4999, PH3000 - PH4109, MT3501, or modules in other subjects or levels with the approval of the Adviser of Studies.
Fourth Year:	80 credits: PH4022 and PH4037 and PH4039 and PH4105 and PH4111; 40 further credits: AS3000 - AS4999, PH3000 - PH4109, ID4001 or modules in other subjects or levels with the approval of the Adviser of Studies.
In total, at least 210 credits must be achieved at 3000 and 4000 level with at least 90 of these at 4000 level.	

Physics & Astronomy - Programme Requirements 2015/6 - August 2015

Physics - Joint Honours BSc

Physics and one of: Computer Science, Logic & Philosophy of Science^L, Mathematics, Philosophy.

^LNot available to entrants from 2015/16 due to renaming of degree programme.

Physics element of Physics - Joint Honours BSc (except Joint with Mathematics):

First Year: 60 credits: PH1011 **and** PH1012 **and** MT1002.

(Students without prerequisite for MT1002 will take MT1001 in Semester 1.)

Requirements for the other subject, and if necessary additional credits to total of 120

Second Year: 90 credits: PH2011 **and** PH2012 both passed with an average of grade 11 or better; **and** an average of grade 11 or better in MT2501 **and** MT2503 with passes in both.

Requirements for the other subject

Third Year: 60 credits: PH3012 **and** PH3061 **and** PH3062 **and** PH3080 **and** PH3081.

Fourth Year: 15 credits: PH3007;

15 credits: PH4040;

30 credits: PH4111 (unless one of PH4796, CS4098, CS4796, PY4698, PY4699, PY4794 is taken);

Further credits may be taken from AS3000 - AS4999, PH3000 - PH4109, ID4001 or modules in other subjects with the approval of the Adviser of Studies.

In total, 240 credits must be achieved at 3000 and 4000 level with at least 90 of these at 4000 level.

Physics and Mathematics - Joint Honours BSc:

First Year: 60 credits: PH1011 **and** PH1012 **and** MT1002.

(Students without prerequisite for MT1002 will take MT1001 in Semester 1.)

Additional credits if needed up to 120

Second Year: 60 credits: PH2011 **and** PH2012 both passed with an average of grade 11 or better; 30 credits: MT2501 and MT2503

30 credits: in one of either (MT2502 and MT2505) or (MT2506 and MT2507) passed with an average grade of 11 or better in the four 2000-level MT Modules

Third Year: 60 credits: MT3501 **and** PH3007 **and** PH3061 **and** PH3062 **and** PH3080;

For those who took MT2502 and MT2505 in second-year: 45 credits: MT3502 **and** MT3505 **and** PH3081

For those who took MT2506 and MT2507 in second-year: 30 credits: MT3504 **and** (MT3503 **or** MT3506)

Further credits to a total of 120 credits: Normally chosen from PH and MT Honours modules.

Fourth Year: 45 credits: PH3012 **and** PH4039 **and** PH4040

15 or 30 credits: MT4599 **or** PH4111 **or** PH4796

Further credits to a total of 120 credits: usually chosen from PH and MT Honours modules and ID4001

In total, 240 credits must be achieved at 3000 and 4000 level with at least 90 of these at 4000 level. At least 100 credits must be from PH or AS modules and at least 100 credits from MT modules. ID4001 taken in the respective school counts towards the totals for PH/AS or MT.

Physics & Astronomy - Programme Requirements 2015/6 - August 2015

Physics – Single Honours MPhys

First Year:	60 credits: PH1011 and PH1012 and MT1002. <i>(Students without prerequisite for MT1002 will take MT1001 in Semester 1.)</i> <i>Additional credits to give at least 120 total</i>
Second Year:	90 credits: PH2011 and PH2012 with passes in both with an average of grade 15 or better; and an average of grade 15 or better in MT2501 and MT2503. <i>Additional credits to give at least 120 total</i>
Third Year:	105 credits: PH3007 and PH3012 and PH3014 and PH3061 and PH3062 and PH3080 and PH3081 and PH3101; 15 credits: AS3000 - AS4999, PH3000 - PH4109, MT3501, (usually PH3074) or modules in other subjects or levels with the approval of the Adviser of Studies.
Fourth Year:	65 credits: PH4022 and PH4037 and PH4038 and PH4039 and PH4105; 15 credits: PH3074, if not taken in Third Year; Further credits: AS3000 – AS4999, PH3000 - PH4109, ID4001 or modules in other subjects or levels with the approval of the Adviser of Studies, to a total of 120 credits for the Year.
Fifth Year:	60 credits: PH5101; 60 credits: AS5000 - AS5999, PH5000 - PH5099.
In total, at least 330 credits must be achieved at 3000, 4000 and 5000 level with at least 120 of these at 5000 level.	

Physics – Single Honours MPhys

Direct entry to second year for approved candidates with 120 advanced standing credits

Second Year:	90 credits: PH2011 and PH2012 passed with an average of grade 15 or better; and an average of grade 15 or better in MT2501 and MT2503 with passes in both. <i>Additional credits if necessary to give a total of at least 120</i>
Third Year:	105 credits: PH3007 and PH3012 and PH3014 and PH3061 and PH3062 and PH3080 and PH3081 and PH3101; 15 credits: AS3000 - AS4999, PH3000 - PH4109, MT3501, (usually PH3074) or modules in other subjects or levels with the approval of the Adviser of Studies.
Fourth Year:	65 credits: PH4022 and PH4037 and PH4038 and PH4039 and PH4105; 15 credits: PH3074, if not taken in Third Year; Further credits: AS3000 – AS4999, PH3000 - PH4109, ID4001 or modules in other subjects or levels with the approval of the Adviser of Studies, to a total of 120 credits for the Year.
Fifth Year:	60 credits: PH5101; 60 credits: AS5000 - AS5999, PH5000 - PH5099.
In total, at least 330 credits must be achieved at 3000, 4000 and 5000 level with at least 120 of these at 5000 level.	

Physics and Astronomy (Gateway) BSc or MPhys

First Year:	120 credits to include: PH1011, PH1012, PH1501 (unless bypassed due to maths qualifications), PH1502, PH1503, MT1002.
In subsequent years, students follow the programme requirements for the relevant degree programme onto which they progress at the start of second year.	

Physics & Astronomy - Programme Requirements 2015/6 - August 2015

Physics and Chemistry - Joint Honours MSci	
First Year:	100 credits: CH1401 and CH1402 and MT1002 and PH1011 and PH1012. <i>(Students without prerequisite for MT1002 will take MT1001 in Semester 1.)</i> <i>(Permission may be granted for suitably-qualified students to be exempted from PH1011 and/or PH1012 and to take some 2000-level PH credits in First Year, thus reducing the credit load in second year towards 120.)</i>
Second Year:	60 credits: CH2501 and CH2701 -with an average of grade 15 or better. 60 credits: PH2011 and PH2012 - with an average of grade 15 or better with passes in both 30 credits: an average of grade 15 or better in (MT2501 and MT2503 with passes in both)
Third or Fourth Year* (Chemistry):	120 credits: CH3431 and CH3441 and CH3512 and CH3514 and CH3615 and CH3712 and CH3717 and CH3721 and CH4713 and CH4714 and CH4715.
Third or Fourth Year* (Physics):	120 credits: PH3007 and PH3012 and PH3061 and PH3062 and PH3082 and PH3101 and PH4022 and PH4037 and PH4039.
Fifth Year:	EITHER 60 credits: PH5101; 15 further credits in one of: PH5000 - PH5999; 30 credits in three of: CH5518, CH5711 - CH5715, CH5717 - CH5718; 15 further credits: CH5000 - CH5999, PH5000 - PH5999. OR 50 credits from CH5441; 30 credits: PH5000 - PH5999; 30 credits: CH5518, CH5711 - CH5715, CH5717 - CH5718; 10 further credits: CH5000 - CH5999, PH5000 - PH5999. * Normally students will take the Chemistry modules in Junior Honours and the Physics modules in Senior Honours, students should take advice from the two Schools.
Other information: This course does not have RSC accreditation, but does have IOP accreditation.	
Theoretical Physics – Single Honours MPhys	
First Year:	60 credits: PH1011 and PH1012 and MT1002. <i>(Students without prerequisite for MT1002 will take MT1001 in Semester 1.)</i> <i>Additional credits as required to get at least 120</i>
Second Year:	60 credits: PH2011 and PH2012 with an average of grade 15 or better with passes in both 30 credits: an average of grade 15 or better in MT2501 and MT2503 with passes in both - Additional credits if necessary to give at least 240 total pre-honours
Third Year:	105 credits: PH3007 and PH3012 and PH3014 and PH3061 and PH3062 and PH3080 and PH3081 and PH4038; 15 credits: MT3501
Fourth Year:	60 credits: PH4022 and PH4037 and PH4028 and PH4039 and PH4032; Further credits: AS3000 – AS4999, PH3000 - PH4109, ID4001 or modules in other subjects or levels with the approval of the Adviser of Studies, to a total of 120 credits for the Year.
Fifth Year:	75 credits: PH5004 and PH5103; At least 15 credits: PH5002, PH5003, PH5011, PH5012. Further credits: AS5000 - AS5999, PH5000 - PH5099, to a total of 120 credits for the Year.
In total, at least 330 credits must be achieved at 3000, 4000 and 5000 level with at least 120 of these at 5000 level.	

Physics & Astronomy - Programme Requirements 2015/6 - August 2015

Theoretical Physics – Single Honours MPhys

Direct entry to second year for approved candidates with 120 advanced standing credits

Second Year:	60 credits: PH2011 and PH2012 passed with an average of grade 15 or better. 30 credits: average grade of 15 or better in [MT2501 and MT2503 with passes in both] - <i>Additional credits as required to get at least 120.</i>
Third Year:	105 credits: PH3007 and PH3012 and PH3014 and PH3061 and PH3062 and PH3080 and PH3081 and PH4038; 15 credits: MT3501.
Fourth Year:	60 credits: PH4022 and PH4037 and PH4028 and PH4039 and PH4032; Further credits: AS3000 – AS4999, PH3000 - PH4109, ID4001 or modules in other subjects or levels with the approval of the Adviser of Studies, to a total of 120 credits for the Year.
Fifth Year:	75 credits: PH5004 and PH5103; At least 15 credits: PH5002, PH5003, PH5011, PH5012. Further credits: AS5000 - AS5999, PH5000 - PH5099, to a total of 120 credits for the Year.
In total, at least 330 credits must be achieved at 3000, 4000 and 5000 level with at least 120 of these at 5000 level.	

Theoretical Physics and Mathematics - Joint Honours MPhys

First Year:	60 credits: PH1011 and PH1012 and MT1002. <i>(Students without prerequisite for MT1002 will take MT1001 in Semester 1.)</i> <i>Additional credits as required to reach 120.</i>
Second Year:	60 credits: PH2011 and PH2012 passed with an average of grade 15 or better; 30 credits: MT2501 and MT2503 30 credits: in one of either (MT2502 and MT2505) or (MT2506 and MT2507) passed with an average grade of 15 or better in the four 2000-level MT modules
Third Year	75 credits: MT3501 and PH3007 and PH3061 and PH3062 and PH3080 and PH4038 For those who took MT2502 and MT2505 in second-year: 45 credits: MT3502 and MT3505 and PH3081 For those who took MT2506 and MT2507 in second-year: 30 credits: MT3504 and (MT3503 or MT3506) Further credits, if required, to a total of 120 credits: normally chosen from MT and PH Honours modules.
Fourth Year	75 credits: PH3012 and PH4028 and PH4032 and PH4039 and PH4040 Further credits to a total of 120 credits: usually chosen from MT and PH honours modules and ID4001
Fifth Year:	40 or 60 credits: MT5999 or PH5103; At least 15 credits from: PH5002, PH5003, PH5004, PH5011, PH5012 (unless already taken); At least 40 credits: MT5000 - MT5899 (unless already taken in Fourth Year); Further credits if necessary to a total of at least 145 across Third, Fourth and Fifth Years from 3000 - , 4000 - and 5000 - level MT modules (except that 30 further credits from MT2000 - MT2999 may be substituted). Further credits if necessary to a total of at least 145 across Third, Fourth and Fifth Years from 3000 - , 4000 - and 5000 - level PH and AS modules (except that 15 further credits from a physics-based ID4001 may be substituted).
In total, at least 330 credits must be achieved at 3000, 4000 and 5000 level with at least 120 of these at 5000 level.	

Physics & Astronomy - Programme Requirements 2015/6 - August 2015

Theoretical Physics and Mathematics - Joint Honours MPhys Direct entry to second year for approved candidates with 120 advanced standing credits

Second Year:	60 credits: PH2011 and PH2012 passed with an average of grade 15 or better; 30 credits: MT2501 and MT2503 30 credits: in one of either (MT2502 and MT2505) or (MT2506 and MT2507) passed with an average grade of 15 or better in the four 2000-level MT modules
Third Year	75 credits: MT3501 and PH3007 and PH3061 and PH3062 and PH3080 and PH4038 For those who took MT2502 and MT2505 in second-year: 45 credits: MT3502 and MT3505 and PH3081 For those who took MT2506 and MT2507 in second-year: 30 credits: MT3504 and (MT3503 or MT3506) Further credits, if required, to a total of 120 credits: normally chosen from MT and PH Honours modules.
Fourth Year	75 credits: PH3012 and PH4028 and PH4032 and PH4039 and PH4040 Further credits to a total of 120 credits: usually chosen from MT and PH honours modules and ID4001
Fifth Year:	40 or 60 credits: MT5999 or PH5103; At least 15 credits from: PH5002, PH5003, PH5004, PH5011, PH5012 (unless already taken); At least 40 credits: MT5000 - MT5899 (unless already taken in Fourth Year); Further credits if necessary to a total of at least 145 across Third, Fourth and Fifth Years from 3000 - , 4000 - and 5000 - level MT modules (except that 30 further credits from MT2000 - MT2999 may be substituted). Further credits if necessary to a total of at least 145 across Third, Fourth and Fifth Years from 3000 - , 4000 - and 5000 - level PH and AS modules (except that 15 further credits from a physics-based ID4001 may be substituted).
In total, at least 330 credits must be achieved at 3000, 4000 and 5000 level with at least 120 of these at 5000 level.	

Students still completing degree programmes as defined in previous Course Catalogues should discuss their module selections with their Honours Adviser(s).