

## 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

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

\*Apart from students on Integrated Masters degrees.

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

This School also allows 'Qualified Entry to Honours' as defined in:

[Entry to Honours](#)

### 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 <http://www.st-andrews.ac.uk/studyabroad/outgoingstudents/AcademicInformation/>).

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

## Physics & Astronomy - Programme Requirements 2014/15 - November 2014

<b>Astrophysics - Single Honours BSc</b>	
First Year:	80 credits: AS1001 <b>and</b> MT1002 <b>and</b> PH1011 <b>and</b> 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: AS2001 <b>and</b> PH2011 <b>and</b> PH2012 - with passes at grade 11 or better in all; <b>and</b> an average grade of 11 or better in MT2001 or (MT2501 and MT2503)
Third Year:	105 credits: AS3013 <b>and</b> PH3007 <b>and</b> PH3012 <b>and</b> PH3014 <b>and</b> PH3061 - PH3062 <b>and</b> PH3080 <b>and</b> 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 <b>and</b> PH4022 <b>and</b> 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.	

<b>Astrophysics - Single Honours BSc - for those who entered the University in 2013/4</b> <b>Direct entry to second year</b> for approved candidates with 120 advanced standing credits	
Second Year:	20 credits: MT1002; 110 credits: AS1001 <b>and</b> MT2001 <b>and</b> PH2011 <b>and</b> PH2012 - with passes at grade 11 or better in all.
Third Year:	105 credits: AS3013 <b>and</b> PH3007 <b>and</b> PH3012 <b>and</b> PH3014 <b>and</b> PH3061 <b>and</b> PH3062 <b>and</b> PH3080 <b>and</b> PH3081; 15 credits: AS2101 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 <b>and</b> PH4022 <b>and</b> 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.	

<b>Astrophysics - Single Honours BSc for those who enter the University in 2014/5</b> <b>Direct entry to second year</b> for approved candidates with 120 advanced standing credits	
Second Year:	At least 75 credits: AS1101 <b>and</b> [AS2001 or AS2101] <b>and</b> PH2011 <b>and</b> PH2012 - with passes at grade 11 or better in each 30 credits: (MT2501 and MT2503) with passes in each and a mean grade of 11 or better Passes in additional modules if necessary to get at least 120 credits.
Third Year:	105 credits: AS3013 <b>and</b> PH3007 <b>and</b> PH3012 <b>and</b> PH3014 <b>and</b> PH3061 <b>and</b> PH3062 <b>and</b> PH3080 <b>and</b> 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 <b>and</b> PH4022 <b>and</b> 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.	

## Physics & Astronomy - Programme Requirements 2014/15 - November 2014

### Astrophysics – Single Honours MPhys

First Year:	80 credits: AS1001 <b>and</b> MT1002 <b>and</b> PH1011 <b>and</b> 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: [AS2001 or AS2101] <b>and</b> PH2011 <b>and</b> PH2012 - with passes at grade 15 or better in all; <b>and</b> an average grade of 15 or better in MT2001 or (MT2501 and MT2503). Additional credits if needed to give at least 120 credits for the year.
Third Year:	105 credits: AS3013 <b>and</b> PH3007 <b>and</b> PH3012 <b>and</b> PH3014 <b>and</b> PH3061 <b>and</b> PH3062 <b>and</b> PH3080 <b>and</b> 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 <b>and</b> AS4012 <b>and</b> PH4022 <b>and</b> PH4037 <b>and</b> 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.

### Astrophysics – Single Honours MPhys for those who entered the University in 2013/4 Direct entry to second year for approved candidates with 120 advanced standing credits

Second Year:	20 credits: MT1002; 110 credits: AS1001 <b>and</b> MT2001 <b>and</b> PH2011 <b>and</b> PH2012 - with passes at grade 15 or better in all.
Third Year:	105 credits: AS3013 <b>and</b> PH3007 <b>and</b> PH3012 <b>and</b> PH3014 <b>and</b> PH3061 <b>and</b> PH3062 <b>and</b> PH3080 <b>and</b> PH3081; 15 credits: AS2101 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 <b>and</b> AS4012 <b>and</b> PH4022 <b>and</b> PH4037 <b>and</b> 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 & Astronomy - Programme Requirements 2014/15 - November 2014

### Astrophysics – Single Honours MPhys for those who entered the University in 2014/15 Direct entry to second year for approved candidates with 120 advanced standing credits

Second Year:	At least 110 credits: AS1101 <b>and</b> [AS2001 <b>or</b> AS2101] <b>and</b> PH2011 <b>and</b> PH2012 - with passes at grade 15 or better in all; <b>and</b> an average of grade 15 or better in MT2501 and MT2503. Additional modules if needed to give at least 120 credits over the year
Third Year:	105 credits: AS3013 <b>and</b> PH3007 <b>and</b> PH3012 <b>and</b> PH3014 <b>and</b> PH3061 <b>and</b> PH3062 <b>and</b> PH3080 <b>and</b> 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 <b>and</b> AS4012 <b>and</b> PH4022 <b>and</b> PH4037 <b>and</b> 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 <b>and</b> PH1012 <b>and</b> MT1002. <i>(Students without prerequisite for MT1002 will take MT1001 in Semester 1.)</i> Additional credits to a total of at least 120
Second Year:	90 credits: PH2011 <b>and</b> PH2012 with passes at grade 11 or better in both; <b>and</b> an average of grade 11 or better in [MT2001 or (MT2501 and MT2503)]. Additional credits to a total of at least 120
Third Year:	105 credits: PH3007 <b>and</b> PH3012 <b>and</b> PH3014 <b>and</b> PH3061 <b>and</b> PH3062 <b>and</b> PH3080 <b>and</b> PH3081 <b>and</b> 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 <b>and</b> PH4037 <b>and</b> PH4039 <b>and</b> PH4105 <b>and</b> 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 for those who entered the University in 2013/4

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

Second Year:	20 credits: MT1002; 90 credits: PH2011 <b>and</b> PH2012 <b>and</b> MT2001 - with passes at grade 11 or better in all. Additional credits to a total of at least 120
Third Year:	105 credits: PH3007 <b>and</b> PH3012 <b>and</b> PH3014 <b>and</b> PH3061 <b>and</b> PH3062 <b>and</b> PH3080 <b>and</b> PH3081 <b>and</b> 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 <b>and</b> PH4037 <b>and</b> PH4039 <b>and</b> PH4105 <b>and</b> 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 2014/15 - November 2014

### Physics - Single Honours BSc for those who enter the University in 2014/5

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

Second Year:	90 credits: PH2011 <b>and</b> PH2012 with passes at grade 11 or better in both; <b>and</b> an average of grade 11 or better in MT2501 and MT2503. <i>Additional credits to a total of at least 120</i>
Third Year:	105 credits: PH3007 <b>and</b> PH3012 <b>and</b> PH3014 <b>and</b> PH3061 <b>and</b> PH3062 <b>and</b> PH3080 <b>and</b> PH3081 <b>and</b> 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 <b>and</b> PH4037 <b>and</b> PH4039 <b>and</b> PH4105 <b>and</b> 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 2014/15 - November 2014

### Physics - Joint Honours BSc

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

#### 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 with passes at grade 11 or better in each; **and** an average of grade 11 or better in MT2001 or (MT2501 and MT2503).  
 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 CS4098, PY4698, PY4699 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: 90 credits: PH2011 **and** PH2012 **and** MT2001 - with passes at grade 11 or better in all;  
 (2013/4) 30 credits: MT2002 **or** MT2003 - with a pass at grade 11 or better.

Second Year: 60 credits: PH2011 **and** PH2012 with passes at grade 11 or better;  
 (2014/5) 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 4 2000-level MT Modules

Third and Fourth Years (Maths):  
 30 credits in two of: MT3501, MT3503, MT3504;  
 15 credits: MT3600 **or** MT3601;  
 15 credits: MT4111 **or** MT 4112 (unless PH3080 taken);  
 15 credits: MT4599 (in Fourth Year only);  
 45 further credits: MT3000 - MT4999.

Third Year (Physics): **EITHER (if MT2003 taken in Second Year):**  
 50 credits: PH3007 **and** PH3012 **and** PH3061 **and** PH3062;  
 10 credits: PH3080 (unless MT4111 **or** MT4112 taken).  
**OR (if MT2003 not taken in Second Year):**  
 50 credits: PH3012 **and** PH3061 **and** PH3062 **and** PH3081;  
 10 credits: PH3080 (unless MT4111 **or** MT4112 taken).

Fourth Year (Physics): **EITHER (if MT2003 taken in Second Year):**  
 25 credits: PH4022 **and** PH4039;  
 At least 30 further credits: AS3000-AS5999, ID4001, PH3000 - PH4110, PH5000 - PH5099.  
**OR (if MT2003 not taken in Second Year):**  
 40 credits: PH3007 **and** PH4022 **and** PH4039;  
 At least 15 further credits: AS3000 - AS5999, ID4001, PH3000 - PH4110, PH5000 - PH5099.

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

## Physics & Astronomy - Programme Requirements 2014/15 - November 2014

### Physics - Mathematics Joint Honours BSc

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

#### Physics and Mathematics - Joint Honours BSc: Direct entry to second year

**Second Year:** 90 credits: PH2011 and PH2012 and MT2001 - with passes at grade 11 or better in all;  
(2013/4) 30 credits: MT2002 or MT2003 - with a pass at grade 11 or better.

**Second Year:** 60 credits: PH2011 and PH2012 with passes at grade 11 or better;  
(2014/5) 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 4 2000-level MT Modules

#### Third and Fourth Years (Maths):

30 credits in two of: MT3501, MT3503, MT3504;  
15 credits: MT3600 or MT3601;  
15 credits: MT4111 or MT 4112 (unless PH3080 taken);  
15 credits: MT4599 (in Fourth Year only);  
45 further credits: MT3000 - MT4999.

#### Third Year (Physics): EITHER (if MT2003 taken in Second Year):

50 credits: PH3007 and PH3012 and PH3061 and PH3062;  
10 credits: PH3080 (unless MT4111 or MT4112 taken).

OR (if MT2003 not taken in Second Year):

50 credits: PH3012 and PH3061 and PH3062 and PH3081;  
10 credits: PH3080 (unless MT4111 or MT4112 taken).

#### Fourth Year (Physics): EITHER (if MT2003 taken in Second Year):

25 credits: PH4022 and PH4039;  
At least 30 further credits: AS3000-AS5999, ID4001, PH3000 - PH4110, PH5000 - PH5099.

OR (if MT2003 not taken in Second Year):

40 credits: PH3007 and PH4022 and PH4039;

At least 15 further credits: AS3000 - AS5999, ID4001, PH3000 - PH4110, PH5000 - PH5099.

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

### Physics – Single Honours MPhys

**First Year:** 60 credits: PH1011 **and** PH1012 **and** MT1002.  
*(Students without prerequisite for MT1002 will take MT1001 in Semester 1.)*  
Additional credits to give at least 120 total

**Second Year:** 90 credits: PH2011 **and** PH2012 with passes at grade 15 or better in both; **and** an average of grade 15 or better in MT2001 or (MT2501 and MT2503).  
Additional credits to give at least 120 total

**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 & Astronomy - Programme Requirements 2014/15 - November 2014

### Physics – Single Honours MPhys for those who entered the University in 2013/4

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

Second Year:	20 credits: MT1002; 90 credits: PH2011 <b>and</b> PH2012 <b>and</b> MT2001 - with passes at grade 15 or better in all. Additional credits to give at least 120 total
Third Year:	105 credits: PH3007 <b>and</b> PH3012 <b>and</b> PH3014 <b>and</b> PH3061 <b>and</b> PH3062 <b>and</b> PH3080 <b>and</b> PH3081 <b>and</b> 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 <b>and</b> PH4037 <b>and</b> PH4038 <b>and</b> PH4039 <b>and</b> 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 for those who enter the University in 2014/5

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

Second Year:	90 credits: PH2011 <b>and</b> PH2012 with passes at grade 15 or better in each; <b>and</b> an average of grade 15 or better in MT2501 and MT2503. Additional credits if necessary to give a total of at least 120
Third Year:	105 credits: PH3007 <b>and</b> PH3012 <b>and</b> PH3014 <b>and</b> PH3061 <b>and</b> PH3062 <b>and</b> PH3080 <b>and</b> PH3081 <b>and</b> 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 <b>and</b> PH4037 <b>and</b> PH4038 <b>and</b> PH4039 <b>and</b> 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 2014/15 - November 2014

### Physics and Chemistry - Joint Honours MSci

First Year:	100 credits: CH1401 <b>and</b> CH1402 <b>and</b> MT1002 <b>and</b> PH1011 <b>and</b> 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 <b>and</b> CH2701 -with an average of grade 15 or better. 60 credits: PH2011 <b>and</b> PH2012 - with passes at grade 15 or better in each 30 credits: an average of grade 15 or better in MT2001 or (MT2501 and MT2503)
Third or Fourth Year* (Chemistry):	120 credits: CH3431 <b>and</b> CH3441 <b>and</b> CH3512 <b>and</b> CH3514 <b>and</b> CH3615 <b>and</b> CH3712 <b>and</b> CH3717 <b>and</b> CH3721 <b>and</b> CH4713 <b>and</b> CH4714 <b>and</b> CH4715.
Third or Fourth Year* (Physics):	120 credits: PH3007 <b>and</b> PH3012 <b>and</b> PH3061 <b>and</b> PH3062 <b>and</b> PH3082 <b>and</b> PH3101 <b>and</b> PH4022 <b>and</b> PH4037 <b>and</b> PH4039.
Fifth Year:	<b>EITHER</b> 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. <b>OR</b> 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 <b>and</b> PH1012 <b>and</b> MT1002. <i>(Students without prerequisite for MT1002 will take MT1001 in Semester 1.)</i> Additional credits as required to get at least 120
Second Year:	60 credits: PH2011 <b>and</b> PH2012 with passes at grade 15 or better in each <b>30 credits: an average of grade 15 or better in</b> [MT2001 or (MT2501 and MT2503)] - Additional credits if necessary to give at least 240 total pre-honours
Third Year:	105 credits: PH3007 <b>and</b> PH3012 <b>and</b> PH3014 <b>and</b> PH3061 <b>and</b> PH3062 <b>and</b> PH3080 <b>and</b> PH3081 <b>and</b> PH4038; 15 credits: MT3501
Fourth Year:	60 credits: PH4022 <b>and</b> PH4037 <b>and</b> PH4028 <b>and</b> PH4039 <b>and</b> 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 <b>and</b> 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 2014/15 - November 2014

### Theoretical Physics – Single Honours MPhys For those who entered the University in 2013/14

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

Second Year:	20 credits: MT1002; 60 credits: PH2011 <b>and</b> PH2012 with at least grade 15 in each 30 credits: an average of grade 15 or better in [MT2001 or (MT2501 and MT2503)] - Additional credits if necessary to reach at least 120
Third Year:	105 credits: PH3007 <b>and</b> PH3012 <b>and</b> PH3014 <b>and</b> PH3061 <b>and</b> PH3062 <b>and</b> PH3080 <b>and</b> PH3081 <b>and</b> PH4038; 15 credits: MT3501.
Fourth Year:	60 credits: PH4022 <b>and</b> PH4037 <b>and</b> PH4028 <b>and</b> PH4039 <b>and</b> 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 <b>and</b> 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 – Single Honours MPhys For those who entered the University in 2014/15

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

Second Year:	60 credits: PH2011 <b>and</b> PH2012 with passes at grade 15 or better in each. 30 credits: <b>average grade of 15 or better</b> [MT2501 and MT2503] - Additional credits as required to get at least 120.
Third Year:	105 credits: PH3007 <b>and</b> PH3012 <b>and</b> PH3014 <b>and</b> PH3061 <b>and</b> PH3062 <b>and</b> PH3080 <b>and</b> PH3081 <b>and</b> PH4038; 15 credits: MT3501.
Fourth Year:	60 credits: PH4022 <b>and</b> PH4037 <b>and</b> PH4028 <b>and</b> PH4039 <b>and</b> 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 <b>and</b> 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 <b>and</b> PH1012 <b>and</b> MT1002. <i>(Students without prerequisite for MT1002 will take MT1001 in Semester 1.)</i> Additional credits as required to reach 120.
Second Year: (2013/4)	90 credits: PH2011 <b>and</b> PH2012 <b>and</b> MT2001 - with passes at grade 15 or better in all. 30 credits: MT2002 <b>or</b> MT2003.
Second Year: (2014/5)	60 credits: PH2011 <b>and</b> PH2012 with passes at 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 4 2000-level MT modules
Third Year:	<b>EITHER (if MT2003 taken in Second Year):</b> 50 credits: PH3007 <b>and</b> PH3012 <b>and</b> PH3061 - PH3062; 30 credits: MT3501 <b>and</b> MT3504; At least 10 credits: MT4111 <b>or</b> MT4112 <b>or</b> PH3080; 15 credits: PH4038. 15 further credits: any MT, PH or AS Honours module. <b>OR (if MT2003 not taken in Second Year):</b> 50 credits: PH3012 <b>and</b> PH3061 - PH3062 <b>and</b> PH3081; 30 credits: MT3501 <b>and</b> MT3504; At least 10 credits: MT4111 <b>or</b> MT4112 <b>or</b> PH3080; 15 credits: PH4038. 15 further credits: MT3000 - MT4598 <b>or</b> MT4600 - MT4699.
Fourth Year:	<b>EITHER (if MT2003 taken in Second Year):</b> 40 credits: PH4022 <b>and</b> PH4032 <b>and</b> PH4039; At least 20 further credits: AS3000 – AS4999, PH3000 - PH4109, ID4001; At least 60 further credits: MT3000 - MT4598, MT4600 - MT4699, MT5000 - MT5899. <b>OR (if MT2003 not taken in Second Year):</b> 70 credits: PH3007 <b>and</b> PH4022 <b>and</b> PH4032 <b>and</b> PH4039; At least 45 further credits: MT3000 - MT4598, MT4600 - MT4699, MT5000 - MT5899.
Fifth Year:	At least 40 credits: MT5999 <b>or</b> 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 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 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 2014/15 - November 2014

### Theoretical Physics and Mathematics - Joint Honours MPhys for those who entered in 2013/4 Direct entry to second year for approved candidates with 120 advanced standing credits

Second Year:	<p><b>EITHER</b> 20 credits: MT1002; 90 credits: PH2011 <b>and</b> PH2012 <b>and</b> MT2001 - with passes at grade 15 or better in all. At least 10 further credits at 1000 or 2000 level. OR 90 credits: PH2011 <b>and</b> PH2012 <b>and</b> MT2001 - with passes at grade 15 or better in all. 30 credits: MT2002 <b>or</b> MT2003</p>
Third Year:	<p><b>EITHER (if MT2003 taken in Second Year):</b> 50 credits: PH3007 <b>and</b> PH3012 <b>and</b> PH3061 - PH3062; 30 credits: MT3501 <b>and</b> MT3504; At least 10 credits: MT4111 <b>or</b> MT4112 <b>or</b> PH3080; 15 credits: PH4038. At least 15 further credits: any MT, PH or AS Honours module. <b>OR (if MT2003 not taken in Second Year):</b> 50 credits: PH3012 <b>and</b> PH3061 - PH3062 <b>and</b> PH3081; 30 credits: MT3501 <b>and</b> MT3504; At least 10 credits: MT4111 <b>or</b> MT4112 <b>or</b> PH3080; 15 credits: PH4038. 15 further credits: MT3000 - MT4598 <b>or</b> MT4600 - MT4699.</p>
Fourth Year:	<p><b>EITHER (if MT2003 taken in Second Year):</b> 40 credits: PH4022 <b>and</b> PH4032 <b>and</b> PH4039; At least 20 further credits: AS3000 – AS4999, PH3000 - PH4109, ID4001; At least 60 further credits: MT3000 - MT4598, MT4600 - MT4699, MT5000 - MT5899. <b>OR (if MT2003 not taken in Second Year):</b> 70 credits: PH3007 <b>and</b> PH4022 <b>and</b> PH4032 <b>and</b> PH4039; At least 45 further credits: MT3000 - MT4598, MT4600 - MT4699, MT5000 - MT5899.</p>
Fifth Year:	<p>At least 40 credits: MT5999 <b>or</b> 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 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 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).</p>
	<p>In total, at least 330 credits must be achieved at 3000, 4000 and 5000 level with at least 120 of these at 5000 level.</p>

## Physics & Astronomy - Programme Requirements 2014/15 - November 2014

### Theoretical Physics and Mathematics - Joint Honours MPhys for those who enter 2014/5 Direct entry to second year for approved candidates with 120 advanced standing credits

Second Year:	60 credits: PH2011 <b>and</b> PH2012 with passes at grade 15 or better in all. 30 credits: MT2501 and MT2503 30 credits: in one of either (MT2502 and MT2505) or (MT2506 and MT2507). Passed with an average of grade 15 or better in the 4 2000-level MT modules
Third Year:	50 credits: PH3012 <b>and</b> PH3061 <b>and</b> PH3062 <b>and</b> PH4038 30 credits: MT3501 <b>and</b> MT3504; 15 credits: PH3081 (unless MT2506 and MT2507 were taken in second year) 15 credits: PH3007 (if MT2506 and MT2507 were taken in second year) At least 10 credits: MT4111 <b>or</b> MT4112 <b>or</b> PH3080 Further credits: any MT, PH or AS Honours modules
Fourth Year:	70 credits: PH3007 (unless taken in Third Year) <b>and</b> PH4022 <b>and</b> PH4032 <b>and</b> PH4039; Further credits: any MT, PH, AS Honours modules or ID4001
Fifth Year:	At least 40 credits: MT5999 <b>or</b> 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: any MT, PH or AS Honours modules At least 145 credits 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) At least 145 credits 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).