



University
of Glasgow | School of Physics
& Astronomy



Physics and Astronomy Honours

Course Information Guide 2019-20

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1 Welcome statement from Head of School

As the Head of School of Physics and Astronomy, I would like to welcome you to physics and astronomy honours. The School prides itself in providing an excellent and supportive learning and teaching environment that is fully integrated with our research: in your lectures, laboratories and project work you will have the opportunity to interact with world-leading researchers working at the cutting edge of a wide range of fields of physics and astronomy, who are tackling some of the biggest contemporary challenges in science and technology.

All of our undergraduate degree programmes and most of our postgraduate taught masters programmes are accredited or recognised by the Institute of Physics and our teaching was highly commended in our most recent Periodic Subject Review by the Senate of the University. Our teaching has also attracted enthusiastic endorsement in recent years from our students in the National Student Survey and other surveys and barometers.

The School is firmly committed to supporting equally the careers and development of all its students and staff, as exemplified by our receipt of an Athena Swan Silver award for our support of women's careers. We value the diversity of our student body and recognise that this diversity improves the quality of our work by allowing students to bring a range of skills and viewpoints to inform and enhance their collective achievements. We therefore expect that all staff and students will work productively and professionally together in an atmosphere of mutual respect.

To support this, all our staff and graduate students undertake equality and diversity training, our lab guides include a code of conduct for students, supplementing the University policy <https://www.gla.ac.uk/myglasgow/senateoffice/studentcodes/staff/studentconductstaff/>, and we support the University's Dignity at Work and Study policy <https://www.gla.ac.uk/myglasgow/humanresources/equalitydiversity/dignityworkstudyover/>. You can be assured that any instances of bullying, harassment, or offensive language or behaviour will be both taken seriously by the School and treated with sensitivity. Points of support for students are your adviser of studies, your Class Head and Lab Head, and in addition the School has two appointed Equality and Diversity offices (currently Mrs Angela Eden and Prof Stephen McVitie), to whom students may speak in confidence.

Although many of our classes are large in number, our teaching staff are friendly and approachable; if you have any questions about your course please don't hesitate to speak to them. They will do their very best to help.

I hope that you enjoy your time with us in the School of Physics and Astronomy and I wish you success with your current and future studies.

Best wishes



Professor Martin Hendry
Head of School

2 General information and introduction

This short guide aims to help students and advisors choose appropriate degree programmes in Physics and Astronomy. It outlines the degrees available, explains their structure and content and gives details of the compulsory and elective (optional) courses that make up each degree programme. More detailed descriptions can be found in the Physics & Astronomy Degree Programme and Course Specifications, available via the online course catalogue¹.

3 Degrees offered

The School of Physics and Astronomy offers a range of Master in Science (MSci) and Bachelor of Science (BSc) Honours degree programmes. We also offer designated BSc degrees. All of our Physics Honours and MSci degrees are accredited by the Institute of Physics.

3.1 MSci Honours degrees

Our MSci Honours degrees are "Integrated Masters" degrees, normally awarded after five years of study. In the Honours (3rd, 4th and 5th) years, students undertake a total of at least 360 course credits, of which at least 120 are at Masters M-Level and the remainder are at Honours H-level. All MSci degrees include a 40-credit M-level project. For Combined Honours degrees the project can be carried out in either subject with the remaining course credits split evenly between the two subjects.

Single Honours MSci Degrees	Combined Honour MSci Degrees
Physics	Astronomy and Physics
Physics with Astrophysics	Mathematics and Physics
Theoretical Physics	Computing Science and Physics
Chemical Physics	Astronomy and Mathematics
Chemical Physics with Work Placement	

3.2 BSc Honours degrees

BSc Honours degrees are carried out over four years of study and require 240 course credits at H-level: 120 in 3rd year and 120 in 4th year. For Combined Honours degrees the course credits are normally split equally between each subject. All Physics BSc Honours degrees include an H-level project: 30 credits for Single Honours degrees and 20 credits for Combined Honours degrees.

Single Honours BSc Degrees	Combined Honour BSc Degrees
Physics	Astronomy and Physics
Physics with Astrophysics ²	Mathematics and Physics
Theoretical Physics	Computing Science and Physics
Chemical Physics ³	Astronomy and Mathematics
	Arts and Physics

¹ See <http://www.gla.ac.uk/coursecatalogue/> and <http://www.gla.ac.uk/services/senateoffice/programmesearch/>
Full details of regulations can be found at the Senate website:
<https://www.gla.ac.uk/myglasgow/senateoffice/policies/uniregs/>

² Physics with Astrophysics students take a 20-credit physics project and a 10-credit astronomy lab project.

³ Chemical Physics students take a 40-credit project in either physics (PHYS4053P) or chemistry. Note that these degrees are administered by the School of Chemistry.

3.3 Designated BSc degrees

Designated BSc degrees (BSc DD) are carried out over three years and students must complete a minimum of 120 course credits each year. To qualify for a designated degree in Physics, students must complete at least 80 credits of Level 3 Physics courses with a grade point average of 9 on the 22 point scale (average D3).

Combined designated degrees students must complete at least 40 credits of Level 3 courses, with a grade point average of 9 (D3 or higher), in each of the subjects separately. Designated BSc degrees may be taken in Physics, Physics with Astrophysics, Chemical Physics, Physics & Astronomy or Physics/Astronomy jointly with another subject. They are not accredited by the Institute of Physics and do not require any project work.

Designated BSc Degrees
Physics
Physics with Astrophysics
Chemical Physics
Astronomy and Physics
Physics or Astronomy with another subject

3.4 Entrance and progression requirements

To be admitted to any Level 3 course in Physics or Astronomy you must first meet the appropriate generic requirements for the College of Science and Engineering, together with any supplementary requirements for the degrees of BSc or MSci, as set out in the Senate regulations⁴.

MSci Honours	Entrance Requirements	Progress to 4 th year	Progress to 5 th year
Physics	Physics 2 at B3 or higher; Mathematics 2A, 2B, 2D at an average of B3 or higher.	An average of C3 or higher over all 3 rd year courses.	An average of C3 or higher over all 3 rd and 4 th year courses; PHYS 5047P at D3 or higher.
Theoretical Physics	Physics 2 at B3 or higher; Mathematics 2A, 2B, 2D at an average of B3 or higher; Physics 2T at D3 or higher.	An average of C3 or higher over all 3 rd year courses.	An average of C3 or higher over all 3 rd and 4 th year courses; PHYS 5047P at D3 or higher.
Physics with Astrophysics	Physics 2 at B3 or higher; Mathematics 2A, 2B, 2D at an average of B3 or higher; Astronomy 1 at D3 or higher.	An average of C3 or higher over all 3 rd year courses.	An average of C3 or higher over all 3 rd and 4 th year courses; PHYS 5047P at D3 or higher.
Chemical Physics; Chemical Physics with work placement	Physics 2 at B3 or higher; Chemistry 2X, 2Y each at B3 or higher; Mathematics 2A, 2B at an average of D3 or higher.	An average of C3 or higher over all 3 rd year courses.	An average of C3 or higher over all 3 rd and 4 th year courses, including WP project.
Combined Physics or Astronomy Degrees	Physics 2 at B3 or higher (for Combined Physics) OR Astronomy 2 at B3 or higher (for Combined Astronomy); Mathematics 2A, 2B, 2D ⁵ at an average of B3 or higher; Requirements of other subject.	An average of C3 or higher over all 3 rd year courses; Requirements of other subject.	An average of C3 or higher over all 3 rd and 4 th year courses; Requirements of other subject.

⁴ See <https://www.gla.ac.uk/myglasgow/senateoffice/policies/uniregs/>

⁵ Mathematics 2D is not required for Combined Computing Science and Physics.

There are further School entrance and progression requirements, listed below, which depend on the particular degree programme being followed. For progression into 4th year, grades achieved at any Level 3 resit exams will be used to calculate a student's average grade⁶. Note however that the grades achieved in the first exam sitting will be used to determine the final degree classification.

BSc Honours	Entrance Requirement	Progression to 4th year
Physics	Physics 2 at C3 or higher; Mathematics 2A, 2B, 2D at an average of D3 or higher	An average of D3 or higher over all 3 rd year courses.
Theoretical Physics	Physics 2 at C3 or higher; Mathematics 2A, 2B, 2D at an average of D3 or higher; Physics 2T at D3 or higher.	An average of D3 or higher over all 3 rd year courses.
Physics with Astrophysics	Physics 2 at C3 or higher; Mathematics 2A, 2B, 2D at an average of D3 or higher; Astronomy 1 at D3 or higher.	An average of D3 or higher over all 3 rd year courses.
Chemical Physics	Physics 2 at C3 or higher; Chemistry 2X, 2Y each at C3 or higher; Mathematics 2A, 2B at an average of D3 or higher.	An average of D3 or higher over all 3 rd year courses.
Combined Physics or Astronomy Degrees	Physics 2 at C3 or higher (for Combined Physics) OR Astronomy 2 at C3 or higher (for Combined Astronomy); Mathematics 2A, 2B, 2D at an average of D3 ⁷ or higher; Requirements of other subject.	An average of D3 or higher over all 3 rd year courses. Requirements of other subject.

BSc Designated	Entrance Requirement
Physics	Physics 2 at D3 or higher; Mathematics 2A, 2B, 2D at an average of D3 or higher.
Physics with Astrophysics	Physics 2 at D3 or higher; Mathematics 2A, 2B, 2D at an average of D3 or higher; Astronomy 1 at D3 or higher.
Chemical Physics	No entrance permitted ⁸ .
Combined Physics or Astronomy Degrees	Physics 2 at D3 or higher (for Combined Physics) OR Astronomy 2 at D3 or higher (for Combined Astronomy); Mathematics 2A, 2B, 2D ⁷ at an average of D3 or higher; Requirements of other subject.

⁶ See also the section on Examination and Assessment Arrangements, in part 9 of this guide.

⁷ Mathematics 2D is not required for Combined Computing Science and Physics.

⁸ Students unable to progress on a Chemical Physics degree plan should contact the Class Head for advice.

4 Requirements for the award of BSc and MSci degrees

The award of Designated BSc degrees is based on students' performance over their first, second and third years. A grade point average (GPA) of at least 9 is required, with a number of additional conditions that have to be met for the degree to be designated in specific subject disciplines. Full details can be found in the University Calendar.

Honours BSc and MSci degrees are awarded on the basis of performance in the Honours years only. Students must have completed all compulsory courses and the minimum number of elective courses for each degree programme. For MSci degree programmes, students must have completed 120 credits at M-level. It is students' responsibility to ensure that their degree programmes contain the correct number and mix of courses. In the case of any uncertainty, students should consult their Advisor of Studies or the appropriate year Class Head.

Honours degrees are classified depending on the average mark obtained for qualifying honours courses. Students with an overall average mark corresponding to grades A1 to A5 will be awarded a first class honours degree. Where the overall mark corresponds to grades B1 to B3, C1 to C3 or D1 to D3, the degree will be upper second class, lower second class or third class, respectively. Normally only marks from the first diet of examination for each course are counted when calculating a student's final degree classification. Marks from any 3rd year resit examinations undertaken will only count towards the final degree classification in cases where medical or compassionate exemption from the June diet of examinations was granted by the relevant Examination Board. There will be **no** resit examinations for any courses undertaken at Level 4 or Level 5. Again, further details of these regulations are given in the University Calendar.

5 Exit routes and transfer arrangements for Honours degrees

There is considerable flexibility for students to switch between Honours MSci, Honours BSc and Designated BSc degrees as they progress. There are also several opportunities to switch between different Single Honours Degrees.

No student will be admitted to 4th year unless they already have sufficient credits to graduate with a Designated BSc degree and no student will be admitted to 5th year of an Honours MSci degree unless they already have sufficient credits to graduate with an Honours BSc degree. This means that all students who enter 4th year are already guaranteed a Designated BSc degree and all those who enter 5th year are already guaranteed a BSc Honours degree.

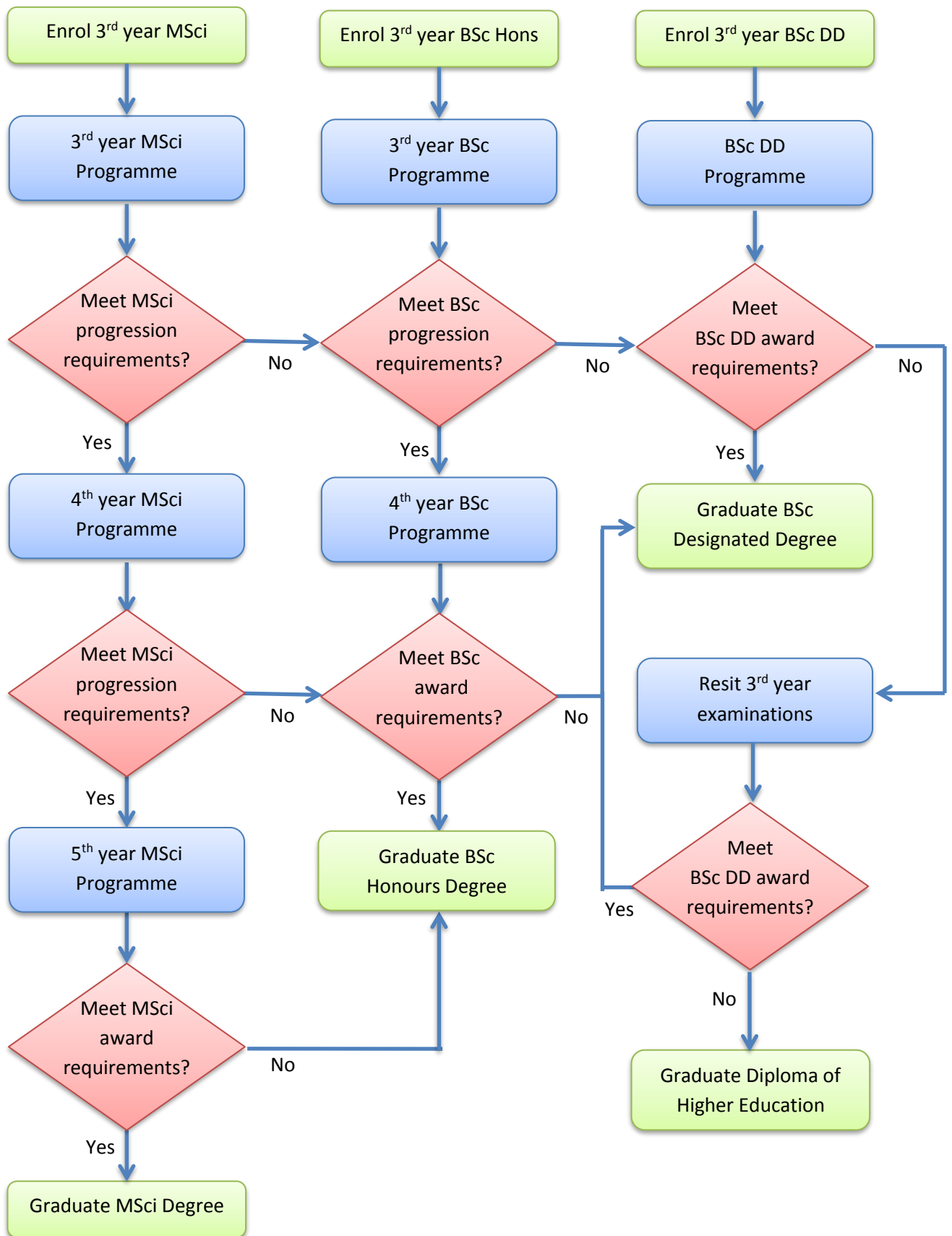
3rd year students who do not meet the requirements for a Designated BSc degree in the May/June degree examination diet will be offered resit examinations to allow them a second chance to do so.

Transfer between Honours MSci, Honours BSc and Designated BSc degree programmes may be permitted for Physics, Physics with Astrophysics, Chemical Physics, Combined Physics and Combined Astronomy students, subject to certain conditions being met as indicated below.

Students following the MSci Theoretical Physics programme can in principle switch to either the Physics MSci or the Physics BSc programmes at the end of 3rd year. Allowance will be made for differences between the courses already taken and those specified in the normal programme requirements. Students proposing to make such a switch should check their course choices with the Physics 4/5 Class Head.

Transfer from a Designated BSc degree to a BSc Honours Degree or from a BSc Honours Degree to an MSci Honours Degree is solely at the discretion of the Head of School. However, such a transfer may be granted if the student shows significant progress in his/her performance during 3rd year. In considering applications for transfer the guidelines that will be followed are:

- For a 3rd year student who was initially only eligible for entry into a Designated BSc degree programme, but who then achieves an average of C3 or higher over all 3rd year courses at the first sitting, transfer to a BSc Honours Degree would normally be granted. If the student achieves an average between D3 and D1 at the first sitting, transfer to a BSc Degree may be permitted at the discretion of the Head of School.
- For a 3rd year student who was initially only eligible for entry into a BSc Honours degree programme, but who then achieves an average of B3 or higher over all 3rd year courses at the first sitting, transfer to an MSci Degree would normally be granted. If the student achieves an average between C3 and C1 at the first sitting, transfer to an MSci Degree may be permitted at the discretion of the Head of School.
- For a 3rd year student who was initially eligible for entry into an MSci Honours degree programme, but chose to pursue a BSc degree programme, and who then achieves an average of C3 or higher at the first sitting over all 3rd year courses (for a 3rd year student) or transfer to an MSci Degree at the beginning of 4th year, would normally be granted.
- Transfers between degree programmes could be permitted in other circumstances at the discretion of the Head of School.



Flow diagram showing possible outcomes for students following Physics and Astronomy Degree Programmes

6 Content and structure of degree programmes

Each Honours degree programme in Physics & Astronomy contains a combination of compulsory and elective (optional) lecture and practical courses. Lecture courses are either 10 or 15 credits and comprise 18 or 27 contact hours respectively. Two additional tutorial classes may be added for specialist courses in 4th and 5th year. All Astronomy lecture courses are 15 credits whereas most Physics courses are 10 credits.

All courses are either at Honours level (H-level) or at Masters level (M-level). M-level courses are of a higher standard than H-level courses, and provide a level of knowledge which is beyond that required for a BSc degree. In many cases they are a useful and relevant preparation for research in Physics or Astronomy. H-level courses are open to all Honours students. However, M-level courses can only be taken by students following MSci Honours degree programmes.

All Honours Physics degree programmes are accredited by the Institute of Physics (IOP) and include a “Core of Physics”. The courses that make up this “Core of Physics” are included as compulsory courses for all Single and Combined Honours Physics degree programmes.

6.1 Physics core H-level lecture courses

The following H-level courses contain material required for the IOP “Core of Physics”. These courses are coded Red and are compulsory for all Single and Combined Honours Physics students.

Catalogue	Lecture course	Credits	Prerequisite
PHYS 4011	Mathematical Methods 1	10	
PHYS 4031	Waves & Diffraction	10	
PHYS 4025	Quantum Mechanics	10	
PHYS 4030	Thermal Physics	10	
PHYS 4004	Electromagnetic Theory 1	10	
PHYS 4028	Solid State Physics	10	
PHYS 4015	Nuclear & Particle Physics	10	
PHYS 4002	Atomic Systems	10	PHYS 4025

6.2 Physics core practical courses

All Single and Combined Honours Physics degree programmes contain a core 3rd year laboratory course and a final year project which teach essential laboratory and transferable skills relevant to the IOP “Core of Physics”. Some alternative choices are available depending on the particular degree programme taken. All these courses are at H-level, except the MSci project which is M-level. Again these courses are coded Red as all Honours Physics students take one of these choices.

Catalogue	Practical course	Credits	Level	Prerequisite
PHYS 4009 or PHYS 4008	Physics 3 Laboratory Physics 3 Computational Lab	20 20	H H	
PHYS 4023P PHYS 4022P PHYS 4053P PHYS 5009P	BSc Combined Honours Project BSc Single Honours Project BSc Chemical Physics Project MSci M-Project	20 30 40 40	H H H M	PHYS 4009 or PHYS 4008

6.3 Other physics H-level lecture courses

The following H-level lecture courses (coded Blue) are also offered. These are compulsory for some degree programmes, but are elective or excluded for other programmes.

Catalogue	Lecture course	Credits	Prerequisite
PHYS 4003	Circuits & Systems	10	
PHYS 4014	Laser and Non-Linear Optics	10	
PHYS 4013	Medical Imaging	10	
PHYS 4017	Numerical Methods	10	
PHYS 4018	Particle Physics	10	PHYS 4015
PHYS 4016	Nuclear Physics	10	PHYS 4015
PHYS 4027	Semiconductor Physics	10	PHYS 4028
PHYS 4010	Magnetism & Superconductivity	10	PHYS 4028
PHYS 4005	Electronic Signal Transmission	10	PHYS 4004
PHYS 4012	Mathematical Methods 2	10	PHYS 4011
PHYS 4006	Energy and the Environment	10	
PHYS 4034	Physics Education & Communication	10	
PHYS 4026	Quantum Theory	10	PHYS 4025
PHYS 4045	Peer-to-peer in Physics	10	

Note: Medical Imaging is given as a 16 lecture course with two associated 3-hour practical workshops. Numerical Methods is given as a 14 lecture course with five associated 3-hour practical workshops. Physics Education & Communication is a course in which students gain experience of working as teaching assistants in secondary schools. The course is assessed through a reflective journal, teacher assessment, oral presentation and a final report. Peer-to-peer in Physics provides students with the opportunity to gain academic credit whilst acting as tutors in the School's Peer-to-Peer tutorial scheme. Students attend 6 lectures where they will study the pedagogy underlying peer teaching, as well as learn how to act as a tutor, carry out a literature review, provide critical feedback and reflect critically on their own performance. The course is assessed through a reflective journal, a literature review, peer observation and a final report.

6.4 Physics M-level lecture courses

The following M-level advanced lecture courses are only available to MSci Honours students. These are compulsory for some MSci degree programmes, but are elective or excluded for other MSci

Catalogue	Lecture course	Credits	Prerequisite
PHYS 5014	Relativistic Quantum Fields	10	PHYS 4002
PHYS 5005	Electromagnetic Theory 2	10	PHYS 4004
PHYS 5016	Statistical Mechanics	10	PHYS 4030
PHYS 5035	Imaging & Detectors	10	
PHYS 5004	Dynamics, Electrodynamics & Relativity	10	
PHYS 5007	Groups & Symmetries	10	
PHYS 5002	Quantum and Atom Optics	10	
PHYS 5038	Nuclear Power Reactors	10	
PHYS 5037	Environmental Radioactivity	10	
PHYS 5039	Quantum Information	10	

programmes. These are coded Yellow. MSci students may also take the Engineering course ENG 5298 Lasers and Integrated Optics, subject to timetable constraints.

6.5 Other physics practical courses

The following practical lecture courses are offered. These are compulsory for some degree programmes, but are elective or excluded for other programmes.

Catalogue	Lecture course	Credits	Level	Prerequisite
PHYS 4021P	Physics 3 Group Project	20	H	PHYS 4009
PHYS 4029P	Physics 3 Computational Group Project	20	H	PHYS 4008
PHYS 5047P	Physics Literature Project M	20	M	PHYS 4008/9
PHYS 4007	General Physics Workshop	10	H	
PHYS 5012	Problem Solving Workshop	10	M	PHYS 4007
PHYS 5036	Detection and Analysis of Ionising Radiation	10	M	

6.6 Astronomy H-level lecture courses

Astronomy H-level lecture courses are given on a 2-year cycle and have no prerequisites. 4011, 4009, 4008 and 4005 are offered in odd years while 4010, 4006, 4013 and 4007 are offered in even years.

Catalogue	Lecture course	Credits	Scheduled
ASTRO 4011	Stellar Structure & Evolution	15	Odd Years
ASTRO 4009	High Energy Astrophysics	15	Odd Years
ASTRO 4008	Galaxies	15	Odd Years
ASTRO 4005	Heliophysics and Stellar Atmosphere	15	Odd Years
ASTRO 4010	Instruments for Optical & Radio Astronomy	15	Even Years
ASTRO 4006	Cosmology	15	Even Years
ASTRO 4013	Astronomical Data Analysis	15	Even Years
ASTRO 4007	Exploring Planetary Systems	15	Even Years

6.7 Astronomy M-level lecture courses

Astronomy M-level lecture courses are given on a 2-year cycle and have no prerequisites. 5003 and 5004 are offered in odd years while 5001 and 5002 are offered in even years.

Catalogue	Lecture Course	Credits	Scheduled
ASTRO 5004	Plasma Theory & Diagnostics	15	Odd Years
ASTRO 5003	Statistical Astronomy	15	Odd Years
ASTRO 5001	General Relativity & Gravitation	15	Even Years
ASTRO 5002	Pulsars and Supernovae	15	Even Years

6.8 Astronomy practical courses

All Astronomy Honours students take a 15-credit Astro-skills module (ASTRO 4003P) which contains an extended laboratory project (contributing 2/3 to the assessment) and an Astronomy seminar project (contributing 1/3 to the assessment) in their 3rd year. A second, similar, module (ASTRO 4004P) is taken by BSc students in their 4th year.

Catalogue	Practical Course	Credits	Prerequisite
ASTRO 4003P	Astro Skills 1	15	
ASTRO 4004P	Astro Skills 2	15	ASTRO 4003P
ASTRO 4001P	Astro Lab Project 1	10	
ASTRO 4002P	Astro Lab Project 2	10	ASTRO 4001P
ASTRO 4020P	Astro Project	20	ASTRO 4003P

All Physics with Astrophysics Honours students will take a 10-credit Lab Project (ASTRO 4001P) in their 3rd year, which does not include seminar project work. BSc Physics with Astrophysics students take a second 10-credit Lab Project (ASTRO 4002P) in their 4th year. ASTRO 4020P is a 20-credit project course for 4th year Physics & Astronomy MSci students only.

7 Timetabling

Compulsory 3rd and 4th year Physics lectures are given at 10.00 or 11.00 each day, with a few elective lecture courses given at other times. The timetabling of 5th year Physics courses is more flexible.

Astronomy lecture courses are delivered on Monday, Wednesday and Friday afternoons.

Which lecture courses may be taken is restricted by prerequisite courses and because some Physics courses are given simultaneously. Students wishing to take particular combinations of courses may have to plan ahead in order to take them in different years.

The general times of all lecture courses may be found on MyCampus at enrolment and timetable clashes are prevented by the MyCampus rules. However, this timetable is not responsive to changes during the semester, so students should consult the detailed timetable presented on Moodle under "Course Guides & Timetables" (where a copy of this guide may also be found). Timetable changes will also be announced via the Moodle class forums during the semester.

8 Compulsory and elective courses

The tables below show which courses are Compulsory (labelled C) and Elective (labelled E) for each Degree Programme. Separate tables are given for each year to help students choose appropriate courses for each year of study. The number of elective credits to be taken each year is also shown.

3 rd Year Courses		Phys	Theor Phys	Phys with Astro-phys	Chem Phys (WP)	Phys Comb, Chem Phys	Astronomy Combined		Designated BSc Degrees.		
		BSc, MSci	BSc, MSci	BSc, MSci	MSci	BSc, MSci	MSci	BSc	Phys	Combined Phys Ast	
Total credits		120	120	120	70	60	60	60	120 or 80	60	60
Elective Credits		20	30	0	0	0	15	15	120 or 80	60	60
Course	Credit										
PHYS 4011	10	C	C	C	C	C			E	E	
PHYS 4031	10	C	C	C	C	C			E	E	
PHYS 4003	10	C	E	C					E	E	
PHYS 4025	10	C	C	C	C	C			E	E	
PHYS 4030	10	C	C	C	C	C*			E	E	
PHYS 4004	10	C	C	C	C	C*			E	E	
PHYS 4014	10	E	E						E	E	
PHYS 4013	10	E	E						E	E	
PHYS 4017	10	E	E						E	E	
PHYS 4009	20	C		C	C	C			E	E	
PHYS 4021P	20	C							E	E	
PHYS 4008	20		C						E	E	
PHYS 4029P	20		C						E	E	
ASTRO 4010/11	15		E	C			C	C			E
ASTRO 4006/09	15		E	C			C	E			E
ASTRO 4008/13	15		E				E	C			E
ASTRO 4005/07	15		E				E	E			E
ASTRO 4003P	15						C	C			E
ASTRO 4001P	10			C							

All Astronomy courses are given on a 2-year cycle with ASTRO 4010, 4006, 4008 and 4005 courses in even years and ASTRO 4011, 4009, 4013 and 4007 courses in odd years.

*Combined Honours students must take both PHYS 4004 and 4030 but may choose to take them in years 3 or 4 (one each).

4 th Year Courses		Physics		Theo. Physics		Physics with Astrophysics		Phys Comb, Chem Physics		Astronomy Combined	
		MSci	BSc	MSci	BSc	MSci	BSc	MSci	BSc	MSci	BSc
Degree											
Total credits		120	120	120	120	125	120	60	60	60	60
Elective credits		40	50	30	30	10	20	0	0	15	15
Course	Credit										
PHYS 4030	10							C*	C*		
PHYS 4004	10							C*	C*		
PHYS 4003	10			E	E						
PHYS 4014	10	E	E	E	E	E	E				
PHYS 4013	10	E	E	E	E	E	E				
PHYS 4017	10	E	E	E	E	E	E				
PHYS 4028	10	C	C	C	C	C	C	C	C		
PHYS 4015	10	C	C	C	C	C	C	C	C		
PHYS 4002	10	C	C	C	C	C	C	C	C		
PHYS 4018	10	E	E	E	E	E	E				
PHYS 4016	10	E	E	E	E	E	E				
PHYS 4027	10	E	E	E	E	E	E				
PHYS 4010	10	E	E	E	E	E	E				
PHYS 4005	10	E	E	E	E	E	E				
PHYS 4012	10	C	E	C	C	C	E	C			
PHYS 5005	10	C		C		E					
PHYS 4006	10	E	E	E	E	E	E				
PHYS 4034	10	E	E	E	E	E	E				
PHYS 4026	10	E	E	C	C	E	E				
PHYS 4045	10	E	E	E	E	E	E				
PHYS 5047P	20	C		C		C					
PHYS 4007	10	C	C	C	C	C	C	C			
PHYS 4023P	20						C		C		
PHYS 4022P	30		C		C						
PHYS 4053P	40								C		
ASTRO 4010/11	15	E	E	E	E	C	C			E	C
ASTRO 4006/09	15	E	E	E	E	C	C			E	E
ASTRO 4008/13	15			E	E					E	C
ASTRO 4005/07	15			E	E					E	E
ASTRO 5001/04	15			E		C				C	
ASTRO 5002/03	15			E						E	
ASTRO 4004P	15										C
ASTRO 4002P	10						C				
ASTRO 4020P	20									C***	
ASTRO 5001	15			C**							

All MSci degrees must include 120 credits of M-level courses, which are normally taken in 4th or 5th year. Honours BSc degrees must include 240 credits at H-level. Astronomy MSci Combined students must choose 15 credits of M-level elective courses in either 4th or 5th year. Due to the two-year cycle in Astronomy, MSci students can swap elective courses with approval from the class head.

*Combined Honours students must take both PHYS4004 and 4030 but may choose to take them in years 3 or 4 (one each).

**Theoretical Physics MSci students must take ASTRO 5001 in 4th or 5th year, whenever it is offered.

***ASTRO 4020P is not compulsory for Astronomy and Mathematics MSci students.

5 th Year Courses		Physics	Theoretical Physics	Physics with Astrophys	Chemical Physics (WP)	Physics Combined, Chem Phys	Astronomy Combined
Degree		MSci	MSci	MSci	MSci	MSci	MSci
Total credits		120	120	120	50 + Proj 40	40 + Proj 40	45 + Proj 40
Elective credits		70	40	40	10	30	30
Course	Credit						
PHYS 4003	10		E				
PHYS 4014	10	E	E	E			
PHYS 4013	10	E	E	E			
PHYS 4017	10	E	E	E			
PHYS 4028	10				C		
PHYS 4015	10				C		
PHYS 4002	10				C		
PHYS 4018	10	E	E	E	E		
PHYS 4016	10	E	E	E	E		
PHYS 4027	10	E	E	E	E		
PHYS 4010	10	E	E	E	E		
PHYS 4005	10	E	E	E	E		
PHYS 5014	10	E	C	E	E	E	
PHYS 5005	10			E	E	E	
PHYS 5016	10	E	C	E	E	E	
PHYS 5035	10	E	E	E		E	
PHYS 5004	10	E	C	E		E	
PHYS 4006	10	E	E	E	E	E	
PHYS 4034	10	E	E	E	E	E	
PHYS 4026	10	E		E	E		
PHYS 5007	10	E	E	E		E	
PHYS 5002	10	E	E	E		E	
PHYS 4045	10	E	E	E	E	E	
PHYS 5036	10	E	E	E	E	E	
PHYS 5038	10	E	E	E	E	E	
PHYS 5037	10	E	E	E	E	E	
PHYS 5039	10	E	E	E	E	E	
PHYS 5012	10	C	C	C	C	C	
PHYS 5009P	40	C	C	C	C	C	C
ASTRO 4010/11	15	E	E				
ASTRO 4006/09	15	E	E				
ASTRO 4008/13	15		E	C			E
ASTRO 4005/07	15		E				E
ASTRO 5001/04	15		E	C			C
ASTRO 5002/03	15		E				E
ASTRO 5001*	15		C				

All MSci degrees must include 120 credits of M-level courses. Astronomy MSci Combined students must choose 15 credits of M-level elective courses in either 4th or 5th year. Due to the two-year cycle in Astronomy, MSci students can swap elective courses with approval from the class head.

*Theoretical Physics MSci students must take ASTRO 5001 in 4th or 5th year, whenever it is offered.

9 Examinations and assessment

9.1 Examinations

Examinations for 10-credit courses will last 90 minutes and those for 15-credit courses will last 120 minutes. For all honours courses examinations will comprise a series of compulsory short questions, testing basic knowledge drawn from the whole of the course, followed by a choice of two long questions that will test particular aspects of the course in greater detail.

For 10-credit courses the compulsory short questions will comprise a total of 16 marks and the chosen long question will comprise 24 marks. For 15-credit courses the compulsory short questions will comprise a total of 20 marks and the chosen long question will comprise 30 marks.

Note that resit examinations will only be offered to those Level 3 students who fail to meet the requirements for progression to Level 4 for the degree programme on which they are enrolled. In particular, students who score below D3 on some courses, but otherwise meet the progression requirements for their degree programme, will not be offered resit examinations. Moreover those students who *do* require resit examinations to achieve progression will be offered resits in *only* those courses which are assessed via a written degree examination and in which the students scored a grade of E1 or worse in the first examination diet.

9.2 Continuous assessment

We are introducing continuous assessment components into our Honours courses in a measured way. The following courses will have a continuous assessment component:

- 1) Medical Physics: there are 16 lectures and 2 three-hour laboratory practical sessions. The practical sessions will contribute 25% to the total assessment in the form of labs, simulations, reports and submitted exercises.
- 2) Numerical Methods: there are 14 lectures and 5 three-hour computer laboratory practical sessions. The computer lab sessions and exercises will contribute 25% to the total assessment.
- 3) Energy & The Environment: a case study will contribute 25% to the total assessment.
- 4) Physics Education & Communication: the course has 100% continuous assessment through a reflective journal, teacher assessment, oral presentation and a final report.
- 5) Peer-to-peer Teaching & Learning in Physics: the course has 100% continuous assessment and through a reflective journal, a literature review, peer observation and a final report.
- 6) Environmental Radioactivity: 25% of the final mark will be awarded for a critical essay and an oral presentation.
- 7) General Physics Workshop and Problem Solving Workshop will be split between a class test held in the examination period at the end of Semester 1 and an end-of-year examination. Both the class tests and the end of year examinations will be 90 minutes and students will answer four 10-mark questions out of a choice of eight. The assessment will be split 25% for the class test and 75% for the end-of-year examination.
- 8) All Physics and Astronomy practical courses have 100% continuous assessment, and are assessed by a mixture of supervisor grades, reports and oral presentations. See the relevant laboratory and project course guides for details.

Due to the nature of continuous assessment, no reassessment opportunities can be offered for elements of continuous assessment.

9.3 Aggregation of grades

Students will be awarded separate results for each lecture, laboratory, workshop or project course on the University 22-point scale. Results for all contributing courses will be averaged, weighted by the appropriate number of course credits, in order to determine the overall result for each student's degree programme. The credit-weighted averaging of individual course grades will be calculated using numerical values (on the 22-pt scale) taken to one decimal place.

Where a student undertakes *more* than the required 120 credits in a particular year, irrespective of whether this was compulsory or elected, the credit-weighted average for that student is calculated from the *actual* number of credits undertaken in that session.

9.4 Degree Classification and Discretionary Criteria

Honours MSci and Honours BSc degrees are classified into four categories (First Class, Upper Second Class, Lower Second Class and Third Class) on the basis of students' performance in Honours courses. This classification is based on the Grade Point Average (GPA) score, calculated to one decimal place, from the course results published in MyCampus of all Honours or Masters courses students take. The table below indicates the result of this process:

GPA	Degree Classification
18.0 to 22.0	First Class Honours
17.1 to 17.9	Either First Class or Upper Second Class Honours
15.0 to 17.0	Upper Second Class Honours
14.1 to 14.9	Either Upper or Lower Second Class Honours
12.0 to 14.0	Lower Second Class Honours
11.1 to 11.9	Either Lower Second Class or Third Class Honours
9.0 to 11.0	Third Class Honours
8.1 to 8.9	Either Third Class Honours or Fail
0.0 to 8.0	Fail

Between each Honours classification band there is a discretionary zone where one of two outcomes is possible. According to the University Code of Assessment, there are a number of criteria that Honours Exam boards can apply to determine the outcome. This section stipulates how these criteria will be applied in the School of Physics and Astronomy. Other Schools may take a different approach and the final classification for Combined Honours students will involve discussion and agreement between the different subject exam boards.

The following tests will be applied to Physics and Astronomy students whose GPA lies in a discretionary zone. Test (1) will be applied first. Test (2) will then be applied to any students not promoted after Test (1), etc. Students not promoted after all three tests will be awarded the lower degree classification.

(1) Course Grade Profile – if 50% or more of a student's individual Honours or Masters course marks, weighted by the relevant number of course credits, are in bands above the discretionary zone, then the student will be awarded the higher degree classification.

(2) Un-rounded Mean – the marks recorded for each course in MyCampus have previously been rounded to the nearest integer. However, the School will recalculate a GPA using the student's un-rounded marks. If this un-rounded GPA is greater than or equal to the relevant discretionary zone (18.0, 15.0, 12.0 or 9.0), then the student will be awarded the higher degree classification.

(3) Exit Velocity – If a student's final year GPA is in the range for the higher degree classification (ie. greater than or equal to 18.0, 15.0, 12.0 or 9.0 for First Class, Upper Second Class, Lower Second Class or Third Class Honours respectively) and it is 1.0 or more greater than the aggregate GPA from the previous Honours years, then the student will be awarded the higher degree classification.

Physics and Astronomy exam boards will not apply any other tests to students in the discretionary bands. Specifically, there will not be any student interviews (or vivas) conducted.

10 Attendance and adverse circumstances

Students are expected to attend all lectures, tutorials and laboratory sessions. Attendance will be monitored at tutorials and labs and may also be monitored at lectures. These attendance records will form part of the performance assessment for courses where appropriate. Attendance at all class tests and degree examinations is compulsory.

If you miss an examination or an assessment submission deadline for reasons of "good cause" (see <https://www.gla.ac.uk/myglasgow/senateoffice/policies/uniregs/> for a definition of good cause), or if you believe your assessment performance has been affected by adverse circumstances, you may submit a **Good Cause Claim**, and this must be via MyCampus.

You should submit a good cause claim if you wish to request that you are given a short extension to an assessment submission deadline, if you wish a late submission penalty to be waived, or if your assessment or examination has been so affected by adverse circumstances that you wish the entire assessment to be set aside.

If requesting a deadline extension for reasons of good cause, in addition to submitting a good cause claim via MyCampus, you should also contact the Class or Lab Head as soon as possible. The Class or Labhead will make a decision on your claim.

If you request that your entire assessment is set aside, your claim will be considered by the Class or Lab Head (for continuous assessment) or by the examination board (for degree examinations). If your claim is accepted, then your assessment will not be marked.

The University's Code of Assessment states that you will either be given a reassessment opportunity at a later date or your remaining work will be assessed under the University rules for incomplete assessment. Note that reassessment opportunities are not available for all items of coursework or for any assignments where feedback has already been issued to the class. Resit examinations are provided for all non-Honours students, but Honours students will only be given an opportunity to take a resit examination if there are any non-Honours students taking a resit examination for the same course.

Please note all Good Cause Claims must be submitted within **one week** of the date of the affected assessment.

Students should note that the Code of Assessment only allows grades to be awarded on the basis of demonstrated work. The only allowed course of action is to grant a short extension to a submission deadline or to set aside the work completely. It is not possible for mitigating circumstances to be taken into account in any other way. Marks will not be adjusted to take adverse circumstances into account.

To submit a Good Cause Claim on MyCampus:

1. Go to the 'Student Centre' and select *My Good Cause* from the Academics menu.
2. Select the relevant course(s).
3. Complete the report in MyCampus (there is provision for particularly sensitive information to be provided separately, outwith the system, but a claim report must still be entered into MyCampus).
4. Add supporting evidence by uploading documents. (Scanners are available on level 3 of the University Library.) It is the responsibility of the student to keep all original documentation and submit it to the Class Head on request.

If you encounter any difficulties with this process please contact the Class Head immediately to let him or her know you have a problem with your Good Cause Claim.

What will happen to your Good Cause Claim

The Class or Lab Head will ensure that your claim is considered in accordance with University Code of Assessment, within the University Regulations, paragraphs 16.45 to 16.53 of the Fees and General Information Section⁹). The outcome of your claim will be posted into the Approval Information section on your Good Cause Claim in MyCampus. If it is accepted that your assessment was affected by good cause, the work in question will be set aside and you will (as far as is practicable) be given another opportunity to take the assessment with the affected attempt discounted.

For absences that are significant but for which a good cause claim is not being filed, students must complete a **MyCampus absence report**. A significant absence is defined to be:

- an absence of **more than seven consecutive days** during working periods
- an absence of **any duration** if it prevents a student from for example fulfilling any minimum requirement for the award of credit (e.g. missing attendance at one day of a two-day laboratory, but where the work was nonetheless submitted and therefore not involving a Good Cause claim).

All potentially significant absences should be reported as soon as is practical, by completing part 1 of the MyCampus absence report. Part 2 of the MyCampus absence report should be completed on return to university. The normal submission deadline for the completed absence report is 7 days after return to university. Documentary evidence is required when reporting any significant absence.

See also the Senate Office Absence Policy:

<http://www.gla.ac.uk/services/senateoffice/policies/studentssupport/absencepolicy/>

⁹ <https://www.gla.ac.uk/myglasgow/senateoffice/policies/assessment/codeofassessment/>

11 Student societies

PhySoc and AstroSoc are student-run societies that arrange evening lectures and events during the year. Links to these groups are provided on Moodle and you are encouraged to participate.

12 Getting help and advice

Your adviser of studies, Physics supervisor (if in 3rd or 4th year), Class and Lab Heads, lecturers and demonstrators are all here to help you and you should feel free to approach them for help and advice during the year. Particularly if you are getting into difficulties, it is very important that you talk to someone at an early stage. The university also provides counselling services and study advice, and you can find information linked from your MyGlasgow homepage:

<https://www.gla.ac.uk/myglasgow/students/>

13 If things go wrong...

We hope you will be happy in your physics studies here.

If things are not going well, please raise issues of any kind that are affecting your studies. Talk to teaching staff or your adviser as early as you can so that we can help.

The University is committed to providing an excellent experience for our students. However, if you are in the situation of having a complaint, then the University has a Complaints Procedure in line with the Scottish Public Services Ombudsman requirements. If you have a formal complaint then in the first instance please raise it with a member of staff in the area concerned. We aim to provide a response to the complaint within five working days. This is Stage 1.

If you are not satisfied with the response provided at Stage 1 you may take the complaint to Stage 2 of the procedure. Similarly, if your complaint is complex, you may choose to go straight to Stage 2. At this stage the University will undertake a detailed investigation of the complaint, aiming to provide a final response within 20 working days.

You can raise a Stage 2 complaint in the following ways:

by e-mail: complaints@glasgow.ac.uk; by phone: 0141 330 2506

by post: The Senate Office, The University of Glasgow, Glasgow, G12 8QQ

in person: The Senate Office, Gilbert Scott Building, The University of Glasgow.

Complaints do not have to be made in writing but you are encouraged to submit a completed complaint form at both Stage 1 and Stage 2. This will help to clarify the nature of the complaint and the remedy that you are seeking.

Remember that the SRC Advice Centre (Students Representative Council) is available to provide advice and assistance if you are considering making a complaint. (Tel: 0141 339 8541; e-mail: advice@src.gla.ac.uk)