



University of
St Andrews

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**School of
Physics and Astronomy**

HONOURS HANDBOOK

2023 – 2024 (Draft)

SCHOOL OF PHYSICS AND ASTRONOMY
HONOURS HANDBOOK
2023-2024

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Honours module offerings in the School of Physics and Astronomy change from year to year.

The lists in here of 2023-2024 module offerings are therefore indicative rather than definitive of what will be offered in future years. Nevertheless, the number and range of modules offered in 2023-2024 is broadly illustrative of the number and range of modules offered in any given year.

Introduction

This handbook provides information about honours degree programmes offered by the School of Physics and Astronomy, and about module- and School-specific policy. It should be read in conjunction with the University's centrally published [student handbook](#) and as such contains mostly School-specific information, although with many links to the University handbook.

The School's Honours programmes are for students in third year (Junior Honours), fourth year (Senior Honours) and fifth year (MPhys/MSci final year, we've yet to come up with a snappy name!) of an honours degree and comprise:

- (a) the BSc single Honours degrees in Astrophysics and Physics
- (b) the BSc joint Honours degrees in Physics and one of Computer Science, Philosophy, and Mathematics
- (c) the MPhys Integrated Masters single Honours degrees in Astrophysics, Physics, and Theoretical Physics
- (d) the MPhys Integrated Masters joint Honours degree in Theoretical Physics and Mathematics
- (e) the MSci Integrated Masters joint Honours degree in Physics and Chemistry

A separate handbook for 1000- and 2000-level modules provides full information about the modules in Physics and Astronomy for sub-honours students. Both handbooks are available online.

Honours students are expected to have read and understood what is in this document. If there are any discrepancies between this document and those published by the University, the latter takes precedence. Please ask staff if you have any queries. I am always happy to meet with our students to discuss any aspects of their study here.

Paul Cruickshank, Director of Teaching for the School of Physics and Astronomy physdot@st-andrews.ac.uk, ext 3296, JF Allen Building (Physics & Astronomy) room 305.

2023-20224 Honours Handbook, 2023_08_28, PASC

Advice and support

If you need advice, feel free to contact any member of academic or administrative staff in the School; they may be able to help you directly or should be able to tell you who to contact for particular advice. Please feel free to ask questions of your lecturers, tutors, lab demonstrators, or advisers of studies. In some cases earlier sections of this handbook suggest who might be the most appropriate person to speak with.

For general queries on academic and other issues, your Adviser of Studies, the School's Wellbeing Officers (panda_wellbeing@st-andrews.ac.uk), or the School's Director of Teaching (physdot@st-andrews.ac.uk) may be good people to start with. If you wish to speak with your Adviser of Studies and they're not available, the School's Director of Teaching is an appropriate alternative.

For advice and support on any issue, including academic, financial, international, personal or health matters, or if you are unsure of who to go to for help, you can contact [Student Services](#) through the Advice and Support Centre. They are located at 79 North Street, and the main contact number is 01334 462020, and email is theasc@st-andrews.ac.uk.

If you would like to book an appointment with a Student Services Adviser, please use the [Student Services enquiry form](#).

If there is a problem, please talk with the School or Student Services sooner rather than later.

There is more on special circumstances later in this handbook under [absence, special circumstances and extensions](#).

On the School web pages you can find advice under "[Who can advise or help me?](#)", and for University-provided advice and support, please see the [University Student Handbook](#).

Aims of our Teaching Programmes

- To provide a systematic functional knowledge and understanding of core physical concepts, principles and theories, and some of their applications.
- To provide specialist functional knowledge and understanding relevant to the degree programme, for example in astrophysics, theoretical physics, or physics.
- To provide access to physics and astronomy at the frontiers, capitalising on the strengths of the research undertaken in the School.
- To develop proficiency in the analysis of complex physical problems and the use of mathematical and other appropriate techniques to solve them.
- To develop the ability of students to organise their knowledge in a way that they can articulate the big ideas from the various modules, and can see the inter-relationship of material from different modules. Students should develop the ability to filter their knowledge in such a way that they can access the information that they need to apply to a particular problem or learning situation.
- To provide the ability to plan, execute under supervision, analyse and report upon the results of an experiment or investigation.
- To provide experience and expertise in experimental investigations for all students at the earlier stages of the programme. At least for students on the *Physics* degree programme to develop these skills further in the Honours years. At least for students on the *Astrophysics* degree programmes to develop competence in observational and computational techniques in astronomy. At least for *Physics* students to develop skills in the use of computers for control, data acquisition, and data analysis in experimental investigations.
- To develop the professional skills of teamwork, independent learning, information retrieval, critical analysis, and the communication of scientific concepts in writing and orally.
- To develop the ability to be a self-directed learner, including fostering a healthy intellectual curiosity in this and other disciplines, and the ability to determine one's own learning needs and to organise one's own learning.
- To enthuse students about the discipline and its applications, and to develop their confidence in their work using the discipline.
- To provide students in the School with an educational and social environment which encourages them to become informed, responsible, and respected members of society.
- To provide opportunities and support for all students to reach their full potential during their studies.

Honours entry requirements

Please see the University's [programme requirements](#) and [policy on Entry to Honours](#) which are the definitive statements on what the standard requirements are.

Students entering honours are expected to have 240 pre-honours credits (for accelerated-entry students 120 of these may be "advanced standing" credits").

To progress to an MPhys or MSci Honours programme involving Physics or Astrophysics, the standard entry conditions detailed in the University's [programme requirements](#) apply to all students entering Honours after October 2022.

Bachelor's and Integrated Masters degrees

The School offers programmes leading to:

BSc degrees

4 years duration (3 years for students who choose direct entry to 2000 level), normally 120 credits per year, total 480 credits.

MPhys and MSci degrees

5 years duration (4 years for students who choose direct entry to 2000 level), normally 120 credits per year, total 600 credits.

In all cases, our Integrated Masters degrees are distinguished from Bachelor's degrees by the following:

- Integrated Masters programmes involve a greater number of credits, amounting in the MPhys and MSci to one year's extra study for the same entry points.
- The final year project for an Integrated Masters degree is more ambitious and/or research orientated than that for a Bachelor's degree.
- Integrated Masters degree programmes involve modules at 5000 level which are more specialised and advanced.

Since Integrated Masters programmes are more demanding than those leading to a Bachelor's degree, a particularly good performance at 2000-level is required. We recognise that some high attaining students will choose to take the BSc degree, as this may be more appropriate for certain career paths.

External references

The School's degree programmes are designed with reference to the [QAA Subject Benchmark Statement](#) and the UK Institute of Physics specification of "The Physics Degree".

The School's teaching and assessment is monitored by external examiners. These are experienced academics from other UK physics and astronomy departments. They are consulted on significant changes to the teaching programme, and they attend module boards to monitor fairness in the assessment process and to ensure that academic standards at St Andrews are at an appropriate level compared with other UK physics and astronomy departments.

QAA and SCQF requirements

Honours modules classified as 3000, 4000 or 5000 level correspond to SCQF levels of 9, 10, and 11 respectively. Modules are allocated credits, where each credit point should correspond to approximately 10 hours of work for the average student at that level. 5000-level modules are regarded as being appropriate for both postgraduate MSc students and students in the final year of an Integrated Masters programme.

Coordinators and advisers

The Advisers of Study for years 3, 4, and 5 are listed in Appendix 1. They are available to be consulted on any academic queries which may arise during the year, and provide advice at the start of each session on selection of modules. Any subsequent changes in module registration can only be done in consultation with your adviser and *need to be completed within the first week of teaching of the relevant semester*. Any changes thereafter would also need the permission of the Associate Dean. For each year group one of the advisers is also the year coordinator.

Should you wish to meet with your adviser, and they are not available, the School's Director of Teaching may be able to assist.

Selection of modules

The definitive statements of what modules are required for each degree programme can be found in the University's published [programme requirements](#).

Appendices later in this handbook list the modules available this session and show the selection of those that provides the recognised programme for each of the degrees.

In addition to the compulsory modules listed, students normally have a free choice from the remaining modules, subject to satisfying the prerequisites for each module and to timetable restrictions. It should be noted that 5000-level modules are normally available only to MPhys and MSci students who are in their final year of study. Some modules from the School of Mathematics and Statistics may also be of interest.

Details of the honours modules to be given, together with teaching aims and prerequisites for each module, will be available from the University's [module catalogue](#).

Students should note that where they choose modules that do not have exams, they may need to work more hours per week per credit on those modules during the non-exam part of the semester than on modules where work is also expected in the revision and exam weeks. Please consider this carefully if choosing multiple such modules in a single semester.

The University permits students on an honours programme to take a small number of credits from pre-honours modules during their Honours years. This is known as “dipping down”. The School recommends that our Honours students “dip down” only where necessary for interest or need. The School does not normally permit Honours students to “dip down” in their final semester of study.

Students are normally expected to take most of their “choice” honours modules from AS and PH modules (and that of their joint degree other subject where appropriate). For a single Honours BSc degree student we normally expect at least 210 honours credits during the honours programme from AS and PH and programme-specified MT modules. Relevant MT honours modules are also likely to be approved by a student's Adviser of Studies (MT modules are now included in the online advising system). The same is the case for a student in the first two years of an MPhys programme.

Tutorials

Students some Junior Honours (third-year) modules benefit from small- or large-group tutorials, which are compulsory. For other Honours lecture modules, the lecture timetable for each module will include slots used for whole-class tutorial purposes. These tutorials will normally be taken by the module instructors.

Transferable and professional skills

The acquisition of transferable or “professional” skills should be an important goal for students in higher education. Such skills include the ability to apply existing knowledge to solve new problems; expertise in finding and evaluating information; the ability to communicate effectively orally and in writing; the building of mathematical models; the ability to work in a team and demonstrate leadership; organisation of one’s own work, resilience, creativity, recognising skill needs and achievements, making and taking opportunities, and the assumption of responsibility for one's own learning. Many of these skills are developed in the normal course of honours study.

The module PH3014 Transferable Skills for Physicists, which is spread over the JH year, is designed to lead students through a wide range of activities which will help develop their transferable skills to an advanced level, while at the same time exploring aspects of physics and astronomy of interest to them. These activities include the writing of a review article, and practice in giving a talk on a chosen topic in physics or astronomy. The latter is done in the context of a student conference, usually held at the Burn House, Edzell. PH3014 is a compulsory part of the teaching programme for all single-honours students in their JH year.

Much of the first semester of study in PH3014 forms part of PH4040 Nuclear and Particle Physics with Advanced Skills, which is a compulsory module for many of our joint degree students. MSci Chemistry and Physics students have some of this in PH4043 Studies in Physics and Chemistry.

Practical work

Physics

The aims of laboratory work at honours level are:

- to familiarise students with a wide range of experimental techniques and equipment,
- to strengthen understanding of important physical concepts,
- to develop sound practice in planning of experiments, risk assessment, record keeping, data handling and evaluation, error analysis, drawing evidence-based conclusions, and identifying future work.

Each of the lab modules PH3101 Physics Laboratory 1 and PH4105 Physics Laboratory 2 is divided into five sub-modules: these consist of experiments and demonstrations illustrating a particular aspect of experimental physics. The laboratory classes run in the afternoons. The assessment mechanism can vary between sub-modules, but will be drawn from material in the lab notebook, written reports on the demonstrations and on the experiments, presentations, and short tests. Details are given in the lab handbook. One of the lab modules will also include an assessed formal report in the style of a scientific journal paper.

Astrophysics

The aims of the astrophysics “laboratory” modules are to equip students with skills in the field of observation, measurement, data analysis, computer programming and modelling, and report writing. All students take AS3013 Computational Astrophysics in the second semester of JH, and may take AS4025 Observational Astrophysics in the first semester of SH. Essential supervision and assistance are provided, but students are encouraged to work independently.

Theoretical Physics

Students on the theoretical physics programmes are not required to take laboratory modules, but, subject to the permission of their adviser and the timetable, may do so if they wish.

Projects

Honours students in the School normally undertake an individual project in their final year. The information below is associated primarily with AS and PH projects: in some cases joint-degree students will take a project or similar module in their other School.

All penultimate year students are encouraged to attend the project poster session held late in Semester 2 to see what sorts of things may be explored in final year projects.

A list of possible projects available in this School, giving details of references and suggested programmes, is provided part way through Semester 1. Each project, which may combine the elements of a review, research, and development in varying proportions, is carried out under the supervision of a member of academic staff and leads to the presentation of a written report.

As part of the assessment of the project, each student is required to give a brief presentation on the results of the project and to answer questions put by members of staff.

Although all projects are two-semester long, most of the work is normally carried out in Semester 2. A short pre-project report is required from all project students early in Semester 2, and this can serve as a useful background for planning the research. The final project reports are due towards the end of Semester 2, as detailed in the separate project documentation. Most MPhys students have the project as their only module in Semester 2, allowing a complete immersion in the research experience.

On several occasions a project has led to the publication of a paper in a research journal, providing an especially valuable point for inclusion in references for scholarships and employment. The School offers prizes for the best projects.

All research in all Schools of the University that involves data collection (from questionnaires etc), interviews of, interactive investigation of, experimentation upon or demonstrations involving living human subjects, tissues and / or other samples requires formal approval from the [University Teaching and Research Ethics Committee \(UTREC\)](#).

Any project that requires ethical approval from UTREC must have the letter or email of ethical approval bound into the appendix before submission.

Projects in physics, astrophysics and theoretical physics

All final year signal-Honours students undertake a project selected from a list of topics suggested by supervising staff. Suggestions from students themselves are welcomed. Projects usually involve original investigations, often undertaken in one of the research groups and sometimes involving collaboration with industrial firms. There are separate project modules for Physics, Astrophysics and Theoretical Physics programmes, although the core organisational aspects are the same.

Projects for students on joint-Honours degrees

Students in a joint-Honours programme will choose to do a project in this School or in the School of their other subject. If choosing a project in this School, we would welcome suggestions for contribution to the supervision from the other school.

Students in joint programmes are encouraged to speak with relevant staff in both schools about this choice. This is important as project choices are released at different times by different schools.

Student work

In addition to their engagement with scheduled classes, students are expected to study independently to develop their knowledge and understanding of what's taught

in their modules. Each unit of credit should correspond to 10 hours of study time in total, for the average student at that level.

For a typical 120-credit year this corresponds to a study-time commitment (including scheduled classes) of around 42 hours per week, which should allow time to engage in other activities.

If you encounter difficulties in understanding the lecture material which cannot easily be resolved, for example, by reference to textbooks or discussion with classmates, you are encouraged to approach your tutor in your tutorials, or the lecturer concerned.

One of the aims of our teaching programme is

To develop the ability to be a self-directed learner, including fostering a healthy intellectual curiosity in this and other disciplines, and the ability to determine one's own learning needs and to organise one's own learning,

so students are expected and encouraged to use information in the library and online to help their studies, as well as discussing physics with other students and with staff.

The School encourages students to form groups that can meet on a regular basis to discuss the work being covered in the teaching programme. When tackling assignments, students should try to distinguish between mutually supportive and helpful collaboration and inappropriate copying from each other or the internet. Copying will bring little gain in understanding or skills, and may lead to action under the University's Good Academic Practice Policy.

Examinations

Most modules involve an examination held at the end of the semester. The School's exam papers normally have no choice of questions.

Students should note that their exams may be close together, and so should work to be on top of the entire semester's material well before the examination weeks start. This is also good study practice – you want this material and its understanding to stick for future work, and not just cram-then-forget. Although we run degree programmes that are assessed module by module, the knowledge and skills developed in one module are often needed in subsequent modules.

For the 2023-2024 session we expect that all examinations for Physics and Astronomy modules examinations will be timed and invigilated assessments, which will be in-person. Before sitting examinations, all students must ensure that they have read and fully understand the University's [examinations policy](#).

Exam papers are checked by School staff, and by our external examiners. Honours exam papers typically contain a mixture of “straightforward” questions (problems testing basic understanding, typically ~20%), problems of a type similar to that seen in tutorial problems (typically ~20%), “new” problems (typically ~40%), and problems requiring transfer of knowledge to new contexts (typically ~20%). Students should therefore expect some material in exams that is not immediately familiar, and which requires them to demonstrate their ability in applying their understanding and skills in “new” situations.

An exam question that aims to assess student competence in parts of the relevant module likely requires familiarity and competence with material from previous modules. Questions in an exam may address different parts of the module and questions may not be uniformly distributed from across the module.

Via the School’s [Current Students](#) web pages you can find for most current modules one past examination paper and one sample solution. The University’s MySaint portal gives access to the last few years of exam papers.

Students whose first language is not English may request access to an English-foreign language dictionary, provided by themselves, during examinations. Such students should contact the School’s Examinations Officer.

Honours students who fail a module (grade less than 7.0) which involves an exam, and who have achieved at least grade 4.0, will be eligible for re-assessment. Soon after the original assessment, they will be invited to re-assessment, which may take place within days of the announcement and consists of an oral examination where two examiners seek to determine if the student has sufficient command of the material to be eligible for a grade 7 pass.

The oral examination is normally conducted by an instructor who taught on the module together with a member of staff nominated by the Year Coordinator. The oral examination will normally be held in person. The reported grade for the re-assessed module cannot be any higher than 7.0.

Students who do not achieve grade 4.0 in a module, or who achieve less than grade 7.0 in a module which is entirely continuously assessed, are not eligible for re-assessment or academic credit for that 3000-, 4000-, or 5000-level module at that sitting, which can have significant impact on the degree programme.

Deferred examinations

Deferral of an assessment refers to taking it after the end of the corresponding semester. This is not a right and permission will be granted only when the School judges that genuine and compelling grounds for deferral exist.

Requests for deferred exams in Physics and Astronomy should be directed to the School's Director of Teaching, Paul Cruickshank, at physdot@st-andrews.ac.uk. Please also copy in the School's Examinations Officer panda-exams@st-andrews.ac.uk.

Deferred exams for Honours modules will have the same format as the original exam. For both semesters, deferrals will take place immediately after the Semester 2 exam diet. The dates may be found in the University's [Key Dates for Students](#), in which it's called the "extended exam diet". These exams are organised by the University's Exams Office.

If you are permitted to defer an exam, then you will be expected to be available in St Andrews at the time the deferred exam is scheduled, and to make suitable travel arrangements where necessary. You are advised to check your email regularly to ensure that you do not miss the deferred exam.

Deferrals beyond the academic year will only take place in truly exceptional circumstances and will require the approval of the Deans. The School will refer the student to Student Services, the Registry Officer (Student Support), or the appropriate Associate Dean Students (UG students) or Associate Provost Students (PGT students). Please note that deferral beyond the academic year can have significant implications for progression, and may require a leave of absence.

Academic Alerts and module requirements

The University operates a system of academic alerts, as described in the University handbook, [academic alerts](#).

The aim of the Alert system is to help students by flagging up problems before they seriously affect students' grades. Alerts will be issued by email from a member of staff within the School and will tell students what the issue is, what they are required to do and what support the University can offer. If students do not take the action required, they may get another Alert, and eventually may automatically get a grade of zero and fail that module. The system is designed to help and support students to remedy any problems or issues **before** these lead to failing a module. Alerts will never appear on a student's permanent transcript. For more information on Alerts and the categories, see the University's [policy on Academic Alerts](#) and the accompanying [guidance for students](#).

Note that a "FINAL" alert can result in a student receiving a grade of zero for the module with no right to a reassessment examination (0X). That zero will also form part of the calculation for the classification of the Honours degree, even if the module is taken and passed in a subsequent semester.

The University's [Assessment Policy and Procedures](#) contains several conditions, including that at least 75% of the assessed work in any module must be submitted for

a student to gain credit for a module. For some modules the requirement may be greater than this.

In Honours modules in physics and astronomy, attendance at and engagement with all classes (lectures, tutorials, and any specified practical work) is strongly recommended and in some cases is a requirement. In order to avoid receiving a grade of zero for the module or “FINAL” academic alert, the requirements for honours modules in the School are:

- Gain a mark on each required class test corresponding to a minimum of grade 4.0.
- For the Physics laboratory modules students must attend at least 75% of the laboratory sessions.
- For Computational Astrophysics and Observational Astrophysics, attend at least 75% of the sessions.
- For PH3014 Transferable Skills for Physicists, students must gain at least grade 4 in one of the Review Article and the Spring Conference talk assignment.
- For PH5024 Modern Topics in Condensed Matter Physics students must submit at least 75% of the tutorial/problem sheets, and be present at all the presentation sessions.
- For the final year project modules, both the pre-project review AND the final project report must be handed in before one week after their respective deadlines, and must be of a high enough standard to obtain at least 25% in their respective assessments. Additionally, attendance at and active participation in the project oral examination is required.
- For the tutorials associated with PH3007, PH3012, PH3061, PH3062, PH3081 and PH3082, students must attend at least 75% of the small-group tutorials organised for each module, and must submit on time a serious attempt at any specified tutorial work for at least 75% of the stated occasions for each module.
- For all modules which are assessed wholly or partly by continuous assessment, a requirement of the module is to achieve a grade of at least 4.0 in the continuously assessed component.

We remind students that failure to complete an exam without good cause, or attaining less than grade 4.0 in a module, may result in the failure to gain academic credit for that module in that year.

Absence, special circumstances and extensions

If you find that special circumstances are impeding your studies, you should alert the School's Director of Teaching as soon as possible. You can do this directly, or through

Student Services (theasc@st-andrews.ac.uk) or the School's Wellbeing Officers (panda_wellbeing@st-andrews.ac.uk). Please get in touch at the **first** sign of difficulties.

If, for any reason, you are unable to engage with part of a module, you should complete as soon as possible a Self-Certificate online. (See the University Student Handbook: [Self-certification](#).)

Any illness or special circumstance that affects assessed work or compulsory activity (for example tutorial, lab work, class test) **must** be noted. If you are absent from a small-group teaching session please also inform the tutor or lab head in advance if possible. If you miss assessed work or a compulsory activity you should contact the module coordinator to determine what you should do to try to fill the learning or assessment objectives. You should be aware of and act upon the University's [Academic Alerts Policy](#).

If you wish to request an extension for a piece of assessed (for credit) coursework, you should use the School's [online extension request form](#). Note that this form is specific to Physics and Astronomy: if you wish to request an extension for a module in another school, then please use the form for that school. Extensions should always be requested in advance of the deadline, save in truly exceptional circumstances. Please see the University's policy on [extenuating circumstances](#) for guidance on what does (and does not!) constitute an extenuating circumstance.

Absence from exams, which is a serious matter, due to illness or any other unavoidable reason should be reported by contacting the School **and** submitting a self-certificate as soon as possible, preferably before the exam time, and no later than three days after the exam. See the section on [deferred exams](#) later in the handbook.

It may also be possible and appropriate for the School to "S-code" a module result, which indicates that the assessment of that module has been affected by special circumstances. See the University student handbook: [Special circumstances - S-coding](#) and the University's [policy on S-coding](#).

In some cases, for example of longer-term illness, the appropriate mechanism to assist the student is a leave of absence. See the University student handbook: [Leave of absence](#). This should be discussed with an adviser at Student Services, though the School's Director of Teaching can give some advice on the process and implications. See also the University's [policy on leave of absence, re-engagement and withdrawal](#).

Coursework penalties

In those cases where work requires to be submitted for marking, a deadline will be defined in advance and one of a defined range of penalties will be applied for late submission, as per the University [policy on coursework penalties](#).

If no specific penalty is noted, then the “default” penalty of the School will be used, which is penalty A stated in the University policy. If you are unclear about the penalties associated with the late submission of any piece of assessed work, please contact the member of staff concerned.

It is particularly important that project reports are handed in on time, in view of the large number of credits attached to these modules. Students are expected to be at exams, class tests, presentations, oral assessments and other scheduled assessments, and will be given a zero if they do not attend without good reason.

Where word or page limits apply to a piece of work to be submitted, any penalties for not satisfying the criteria will be published to students in advance. If no specific penalty is noted, then the “default” penalty for this School is penalty A in the University policy.

Good academic practice, and academic misconduct

(See the University Student Handbook on [good academic practice](#).) Academic integrity is fundamental to the values promoted by the University. All students must exhibit good academic practice and should familiarise themselves with the University [policy on good academic practice](#) and its [guidance on the policy](#).

“Not knowing” the regulations is not regarded as an acceptable excuse for academic misconduct. The University takes academic misconduct offences extremely seriously, and penalties even for first offences can be severe.

Proof reading

The University has a [policy on proof reading for language correction](#).

Unless forbidden in the assignment instructions, our School permits the use of proof reading for language correction under the conditions of this policy. Please note that there is a major difference between proof reading for language correction at sentence-level and wholesale restructuring of written work or “ghost writing”. The latter two may lead to hearings under the University’s [policy on good academic practice](#).

The 0-20 grading scale – Honours Physics and Astronomy

The University uses a 20-point [Common Reporting Scale](#) for module grades.

The minimum grade for which credit for a module is awarded (i.e. a bare pass) is 7.0.

The University applies a common formula for the calculation of the award of Honours classifications. Degrees are classified using a credit-weighted calculation of grades achieved for Honours-level modules (3000-level and above) taken during an approved Honours programme. Details are published in the University's [policy on Honours classification](#).

When the University runs the degree classification system, a credit-weighted mean grade of 16.5 over the appropriate (and all passed) honours modules will result in a first classification, independent of the median grade. Similarly, a credit-weighted mean grade of 13.5 is enough to result in an upper second, and 10.5 a lower second. These thresholds apply to the degree programme and are noted on the table on a following page.

Thus, while 7.0 is a pass in a module and credit for the module will be awarded, achievement at just this level will not permit the award of a good Honours degree.

In the School of Physics and Astronomy, normal practice is to assess submitted work in terms of percentage marks, combine various components where needed, and then convert the final module percentage mark to the module grade by a mapping procedure. In Honours modules that include marks from both a module exam and continuous assessment, the overall mark is normally determined by the weightings given to these two components as published in the [University course catalogue](#).

The current mapping scheme normally adopted by the School for converting percentage marks to grades at Honours level is as follows, **and is different to the mapping used for our 1000-level and 2000-level modules**.

Grade 5.0 corresponds to 25%, grade 7.5 to 38%, grade 16.5 to 74% and grade 20.0 to 100%. Between these fixed points, linear conversions apply.

Thus 36% is mapped onto grade 7.1, and 50% is mapped into grade 10.5. This is shown in a different (and approximate) form below, where the classification boundaries are shown for the credit-weighted mean grades over a complete honours programme. The credit gained, fail, and re-assessment boundaries are for a single module. In principle the module board, which includes the external examiner, has the authority to change the mapping for any module. However, we aim not to need to do so, and this happens relatively rarely.

Any grade followed by the letter S on a transcript indicates that the performance of the student in that module was affected by special circumstances, for example illness. A "D" on a transcript shows that the assessment has been deferred to a later time. A "Z" shows that the grade has yet to be determined.

%	grade	%	grade	%	grade
15	3.0	50	10.5 2II, threshold	85	18.0
16	3.2	51	10.8	86	18.1
17	3.4 no re-	52	11.0	87	18.3
18	3.6 assessment	53	11.3	88	18.4
19	3.8 possible	54	11.5	89	18.5
20	4.0 reassessment	55	11.8	90	18.7
21	4.2 possible	56	12.0	91	18.8
22	4.4	57	12.3	92	18.9
23	4.6	58	12.5	93	19.1
24	4.8	59	12.8	94	19.2
25	5.0	60	13.0	95	19.3
26	5.2	61	13.3 2II, top	96	19.5
27	5.4	62	13.5 2I, threshold	97	19.6
28	5.6	63	13.8	98	19.7
29	5.8	64	14.0	99	19.9
30	6.0	65	14.3	100	20.0
31	6.2	66	14.5		
32	6.3	67	14.8		
33	6.5	68	15.0		
34	6.7	69	15.3		
35	6.9 fail	70	15.5		
36	7.1 credit gained	71	15.8		
37	7.3	72	16.0		
38	7.5 3 rd , threshold	73	16.3 2I, top		
39	7.8	74	16.5 first class		
40	8.0	75	16.6		
41	8.3	76	16.8		
42	8.5	77	16.9		
43	8.8	78	17.0		
44	9.0	79	17.2		
45	9.3	80	17.3		
46	9.5	81	17.4		
47	9.8	82	17.6		
48	10.0	83	17.7		
49	10.3 3 rd , top	84	17.8		

Progression

Progression within an honours programme

For progression into the Senior Honours (fourth) year of an MPhys programme, it will normally be necessary for honours students to achieve in Junior Honours (third year) modules a credit-weighted mean of at least 13.5, with all modules passed. The student will normally need to have at least 115 credits from their JH year. A candidate who fails to satisfy the examiners may be recommended to switch from a MPhys degree to a BSc.

Theoretical Physics students need to have particularly high levels of competence in mathematical physics to thrive on these programmes. For this reason, those on the MPhys Theoretical Physics and MPhys Mathematics and Theoretical Physics programmes should be able to demonstrate acceptable performance in such modules by mid-way through the JH year. In this case, “acceptable” would normally entail gaining at least grade 13.5 in each of PH3061 Quantum Mechanics 1, PH3081 Maths for Physicists, and MT3501 Linear Maths (where taken), and a mean of 13.5 over all the modules taken in first semester of Junior Honours. For those on the joint degree programme the review will normally involve input from both Schools.

At the end of Junior Honours, students on either MPhys programme involving Theoretical Physics are expected to have obtained at least grade 13.5 in each of PH3061 Quantum Mechanics 1, PH3062 Quantum Mechanics 2, PH4038 Lagrangian and Hamiltonian Dynamics, and PH3007 Electromagnetism. Additionally, those on the programmes involving Theoretical Physics will have their grades monitored at the end of semester one of Senior Honours. Those who have not been reaching grades of 13.5 and above in Senior Honours will be subject to a review process and may be advised or required to change to the BSc degree even at this late stage.

Moving from BSc honours to MPhys honours programmes at end of JH

Those who have obtained entry to the BSc honours programme and who do sufficiently well in JH may be permitted to move to the MPhys cohort should they wish. Those seeking access to an MPhys programme from a BSc programme in this School, including the joint degrees with Mathematics, will have any request considered after the results from both semester one and two are known. There is a 15.0 grade threshold for permitting movement, and this will be based on the credit-weighted mean of all honours modules with AS or PH codes, plus adviser-approved Honours MT modules.

Deans' List

The University has an annual award for academic excellence, promoted by the Deans of the University. Details can be found in the University Student Handbook: [Deans' list](#).

Medals and prizes

At each level (Junior Honours, Senior Honours and year 5) a class medal is awarded annually to each of the highest graded students of Physics, Theoretical Physics, and Astrophysics, provided that at least one student in each category is deemed worthy of the award (credit weighted mean is at first class level).

In addition, the following prizes are awarded:

William David Brodie Prize (normally three awards). Awarded to the three students in the Junior Honours class (in any of the School's degree programmes) with the most outstanding results.

Neil Arnott Prize (normally three awards). Awarded to the three students with the most outstanding results in the Senior Honours class in Physics, which for this purpose includes Theoretical Physics.

Scott Lang Prize. Awarded to the Senior Honours student in Astrophysics with the most outstanding results.

Brewster Prize. Awarded to the student with the most outstanding results in the final year of any one of the Integrated Masters degrees (MPhys or MSci), in the School of Physics and Astronomy.

In all cases awards are based on the highest credit-weighted mean grade from the School's modules achieved during the year. If there is more than one "best student" in a category, then the medal or prize is shared.

Since joint honours students are presumed to be eligible also for prizes offered in the other subject, the policy of the School is that the monetary amount of a prize awarded to any student in this category is halved. In all cases for students to be eligible for a prize or medal from this School they must be taking at least 45 AS and/or PH credits that session.

Feedback, and access to examination scripts

See University Student Handbook: [Feedback on assessed work](#). You should be able to receive routine feedback on any work that you are asked to submit. Part of the learning process is reflecting on this feedback and making note of what aspects of your work process you wish to repeat in future assignments, and what improvements you should strive for in the future. If you are not clear from any written or oral comments what are the issues involved, please discuss this with the person who marked the work, or if this is not possible then with the relevant module coordinator. Work submitted for tutorials may be discussed in the relevant tutorial. Generic feedback to students after an exam is usually posted on Moodle.

Students may see their examination scripts after the assessment process has been completed. Students wishing to do this should contact their module coordinator in the first instance.

Appeals and complaints

The University is committed to ensuring as high a quality student experience as possible while studying at St Andrews. Occasionally things may go wrong and if you are experiencing a difficulty, or are dissatisfied with your academic experience, you should raise concerns as soon as possible. See the University Student Handbook: [Academic appeals and complaints](#).

If there are extenuating personal circumstances that may affect your academic performance or impact on your progression you **must** bring these to the attention of an appropriate member of staff (for example your Adviser of Studies, module coordinator, Director of Teaching, or the appropriate Associate Dean) as soon as possible and normally prior to completing any assessment. If you base a subsequent academic appeal on such extenuating personal circumstances, you will be required to provide valid reasons to explain why you failed to notify the examiners or other relevant persons of these circumstances prior to completing the assessment.

Within the School of Physics and Astronomy, any complaint or appeal should be addressed (after the informal approach has been tried) to the Director of Teaching or, if the Director of Teaching has already been involved, to the Head of School. Academic issues which could be the subject of an appeal or complaint include the effects of extenuating personal circumstances materially affecting academic performance of which the University was not aware when the academic decision was taken, and which could not reasonably have been disclosed by the student, and the improper conduct of an assessment that has material impacted on the results awarded. See the [policy on student academic appeals](#).

The Students' Association employs a [Student Advocate \(Education\)](#), Iain Cupples, whose job it is to ensure that you receive help with writing and submitting a submission. Iain can also accompany you to any hearing. He should be your first point of contact as soon as you feel you need help.

Ethics (UTREC)

All research in all Schools of the University that involves data collection (from questionnaires etc), interviews of, interactive investigation of, experimentation upon or demonstrations involving living human subjects, tissues and / or other samples requires formal approval from the [University Teaching and Research Ethics Committee \(UTREC\)](#).

It is University policy that any research involving children under 18 should be reviewed by the UTREC Child Panel and that the researcher should hold an appropriate Disclosure certificate. The principal supervisor is responsible for ensuring that the student has received the appropriate ethical clearance from UTREC and the Child Panel prior to research commencing.

It is a requirement that any undergraduate honours or Masters dissertation or PhD thesis that requires ethical approval from UTREC has the letter or email of ethical approval bound into the appendix before submission.

Diversity, respect, community

The University of St Andrews is fully committed to respect and fair treatment for everyone, eliminating discrimination and actively promoting equality of opportunity and delivering fairness to all. Please see the University [Equality, Diversity and Inclusion policy](#).

We are keen that this School continues to be a place where we all value and respect each other, and that we continue to have here a community of scholars that includes students and staff. We are keen that members of our community continue to assist and support each other.

The School's [Equality, Diversity, and Inclusion](#) Committee, which includes the School President, actively promotes this endeavour.

We are pleased to have "Juno Champion" status from the UK Institute of Physics and an Athena SWAN Silver award following submission of details of our activities aiming to provide a workplace that is good for all. Students with concerns or suggestions about equality or diversity are asked to speak to one of the committee.

Information for students

Our School's "Current students" web pages link to a range of useful information, including this handbook, timetables, the student astronomical and physical societies, booklists, internship and career information, and academic issues that are influenced by both School and University policy. The online managed learning environment supported by the University and used in this School is MySaint underpinned by MMS and Moodle.

The University's "Current students" page linked to the Home page of the University's website contains information on a wide variety of issues of interest to students. It includes for example details on academic regulations, codes of practice, employment, financial information, health, Library Services, student organisations, Student Services, student support and guidance, and access to the pre-advising system, previous examination papers and examination timetables. The University publishes its teaching, learning, and assessment policies on its central web pages.

English language support

The Academic English Service (AES) offers free language development to matriculated students. The language development is offered in several forms, ranging from one-to-one tutorials to workshop programmes and online resources. Further information is available on the [AES website](#) and [self-enrol Moodle page](#).

If you would like further information, please contact academicenglish@st-andrews.ac.uk.

Disabilities, learning differences, mental health, wellbeing

See University Student Handbook: [Disability support](#) and also the University's advice for [students with disabilities](#).

If for disability or related reasons you require support, please contact the Disability Team in Student Services via the links above. Student Services provides support for a wide range of situations.

The School's disabilities and specific learning difficulties (SpLD) coordinator is available to liaise with any of the School's students. The School will work in conjunction with Student Services to ensure that appropriate reasonable adjustments are in place for students who have registered that they have a disability. Our aim is to try to make the same or equivalent facilities and experiences and learning outcomes available to all. However, notifications and adjustments cannot always be immediate, and students are welcome to contact our disability officer directly to advise them of their situation.

Most of the JF Allen building is accessible to those with disabilities affecting mobility. This is via the main entrance and the lift located at the opposite corner of the building from the main entrance. In the event of an emergency the lift must not be used. Where students may have a problem evacuating the building in an emergency, particularly from the top floor, they should contact Environmental, Health and Safety Services who will, with the help of the School Disability Officer and Student Services, produce a Personal Emergency Evacuation Plan (PEEP). This plan will ensure that the person knows what actions to take in an emergency and also what actions the School needs to put in place to support evacuation in an emergency. An evacuation chair is located in the stairwell outside room 301, roughly above the main entrance to the building. They may be able to make their presence known to the janitor or the emergency services using the telephone there.

We recognise that not all students are comfortable with disclosing difficulties with health, disability, etc, but the team members at Student Services are an excellent resource to give advice to students and schools on allowances and support, with due regard to confidentiality. We strongly advise relevant students to contact Student Services sooner rather than later. Most students have a one-to-one consultation with a member of staff from Student Services during their time in St Andrews.

www.st-andrews.ac.uk/students/advice/disabilities/

Student Services provides individual consultations for those with concern about wellbeing and about mental health. They also run events during the year, some for students who are concerned about their own wellbeing, and some for students who would like to learn more about how to help support a friend who may have anxiety, low mood, an eating disorder, etc.

An online system called [Silver Cloud](#) is available. This is a computer-based self-help system that offers helpful programmes to address a range of issues including low mood/depression, anxiety, stress, and body image/eating worries. This system

can be used independently by students, or by students with support from a member of staff in Student Services.

We recognise that there are times when things can get tough for students. There are few people who sail through university without any problems. Please be aware that there are people here to assist you, both within the School (Wellbeing Officers, amongst others) and at Student Services. Please do communicate with them. You may also wish to speak with someone anonymously after hours, and this can be done by a call to a trained student volunteer at Nightline between 8pm and 7am in term time on 01334 462266.

<https://www.st-andrews.ac.uk/nightline/>

Work spaces

The JF Allen library is one space in the building in which students may study; this is intended to be a quiet area. Please check its availability.

The main concourse has group-study tables behind the cafeteria. These are equipped with large-screen computer monitors. The main part of the concourse may be used as a study and/or social area.

The University Library is another study space. There is a study space outside room 330. If seminar/tutorial rooms in the building are not booked out for teaching or meetings, it is normally possible to use these for work.

In all cases, please adhere to any rules on room capacity.

JF Allen library

The JF Allen library is in the Physics and Astronomy building. Some relevant books are also available as e-books.

If you have suggestions for additional physics and astronomy books that you think should be in the Library, please contact Dr Hongsheng Zhao (hz4@st-andrews.ac.uk) or email morebooks@st-andrews.ac.uk.

The Library's online reading list service enables you to find and access the books, journal articles, and other resources you are expected to use for your module. By clicking links in online reading lists you can see straight away the location and availability of books in the Library and get direct access to online resources. By

logging in you can use the features which allow you to record what resources you've used, plan ahead, and create personal study notes. You can also export citations to Endnote from reading lists.

The Library subscribes to a large number of journals, most of which are available electronically. There are two printer/photocopier/scanners in the Library, operated by your matric card. You can make payments to your account online.

To find out if your module has a reading list check the module in MMS or Moodle, or check the [Online Reading List](#) page on the Library website.

Online resources and information about books available can be searched for through the Library's [Physics and Astronomy page](#). Past examination questions for the last few years are available via MySaint, and tutorial sheets and solutions for some modules are available on Moodle or MMS.

Vicki Cormie (vhc1@st-andrews.ac.uk) is the Academic Liaison Librarian for Physics & Astronomy and is happy to be contacted for any help in using Library resources.

Computing facilities

The Physics and Astronomy PC classroom, which is next to the main entrance of the building, contains 32 PCs, a data projector, and Uniprint facilities.

IT Services operate other clusters of computers and provide training in the use of hardware and software as well as the username and password required to log on the computers and for email. Many computers in the Honours laboratory will be used by students during their lab/computational sessions, and may be used outside laboratory time by students in the School for more general work-related activity.

Lockers

The School has a limited number of lockers available for rent (£10 annual fee plus £10 deposit). If interested, please contact the Building Manager, Dr Andrew Bunting, asb8@st-andrews.ac.uk.

Student-Staff Council and School President

The Student-Staff Council (SSC) has representatives for students in each level of study, postgraduate representatives, and members of staff. Its primary purpose is

to serve as a forum for the discussion of academic issues, but it also oversees some of the social facilities available in the building and some student activities. The SSC normally meets twice per semester. Meeting minutes may be accessed from the School's [Student Staff Council](#) web page.

The SSC is chaired by the School Student President, who is elected by students at the end of the previous session. For 2023-24 the School President is Anna Conti, and may be contacted by email at physicspresident@st-andrews.ac.uk.

Student representatives are elected from honours year and subject groups, and normally hold office for the whole academic year. Representatives discuss teaching matters with the Year Co-ordinator, and report to meetings of the Council on the issues raised and the action taken. All students are encouraged to discuss any issues directly with the relevant module coordinators or other members of teaching staff, but may also raise concerns or comments with their class reps or the School President for transmission to the relevant member of staff and/or Student Staff Council.

The Vacation Awards Committee disburses grants to students studying in the School who wish to pursue worthwhile projects during the Summer vacation. The Social Committee is responsible for the organisation of some social events which may take place during the year.

Research colloquia

These are held approximately weekly, normally at 10:00 on Friday. The topics of these talks are wide ranging, often reflecting the research interests of the School and covering exciting new developments in the general area of physics and astronomy. Honours students are welcome to attend. Some research groups have lunchtime seminars, and relevant students are encouraged to attend these.

SUPA Lectures

The Scottish Universities Physics Alliance uses video-conferencing to deliver presentations in its graduate school. Some of our level five lectures are video-conferenced for this purpose. Students who wish to attend SUPA lectures that are not given by our School are welcome to seek permission to do so.

Centre for Educational Enhancement and Development (CEED) Resources

The University's Centre for Educational Enhancement and Development (CEED) can provide additional input to help students develop the skills they need for their academic studies and beyond See the University Student Handbook: [CEED](#).

More information is also available on the [CEED web pages](#).

Programme-specific fees

There are no additional fees for labs in the School. Students in the Transferable Skills for Physicists module are normally expected to attend the Burn Conference, and are asked to make a contribution towards the costs of the weekend away (probably around £40). In line with University policy, the School expects its students to purchase a small number of textbooks as part of their study.

Careers and research

The [University Careers Centre](#), situated opposite the Students Union building, is available for students to explore career options. It has an online and physical library detailing various career opportunities as well as job vacancies. Careers fairs and seminars take place each year. You can access relevant job vacancies, book careers appointments, sign up to employer events and much more via the [Careers Centre's website](#).

All students are encouraged to talk with a Careers Adviser during their JH year. The School's liaison officer with the Careers Centre is shown in the key contacts page later in this handbook.

All our degree programmes give opportunities for developing skills and knowledge that may be valuable for postgraduate study and future careers. All modules can provide experiences helpful for employability. Modules PH3014, PH4040, and PH4043 aim to develop research and communication skills, amongst others. The final year project can be a particularly valuable place to develop and evidence skills in research, communication, teamwork, initiative, and planning.

It is important to make plans regarding your career early during your degree programme, certainly by your penultimate year. Some positions may need summer vacation work experience, and some research applications have early deadlines. Representatives from industrial firms and Government laboratories visit the University through the session under the auspices of the Careers Centre. Members of staff in the School will be available to give specialised advice on request, and may agree to write references on your behalf. Students are assumed to have authorised any member of staff whom they have asked for a reference to release personal information about them on a confidential basis.

When thinking about job opportunities it may be helpful to you to consider the following areas where you could pursue a career with a background in physics or astronomy: (a) in industry or an industrial research association, (b) in government agencies, (c) in university laboratories, (d) in teaching, (e) in hospitals, (f) in the

armed services, (g) in the commercial and financial sectors, (h) in environmental studies. A good honours degree could qualify you for a job in any of these groups.

If you wish to continue advanced studies with an eye to working in a high technology industry, then you might consider a vocational MSc course. A wide range of MSc courses is available in universities, including the MSc in Astrophysics here. Success in such courses can often lead to your being accepted to continue your studies for a PhD, if you so wish.

UK-domiciled students who graduate with a First Class or upper Second Class honours degree are eligible to apply for funding from UK research councils as research students for a PhD degree, either here or elsewhere in the UK. Eligibility for funding in other countries will vary. Should you choose to remain in St Andrews, you will find a School that is very successful in securing external funding for a wide range of research activities in areas such as condensed matter physics, photonics, theoretical physics, observational and theoretical astronomy, biophysics, and ultra-low temperature magnetism, and having direct contact with many industrial concerns. Full information on the research activities of the School, and information about sources of grants and scholarships, is available on the [School's Research web pages](#).

If you hope to do research in another university or institute of higher education you should contact the department in which you wish to work. It is important to think carefully about what areas of research would interest you. Attending the departmental colloquia (10:00 on Fridays) can help you gain insight into areas of current research activity. Reading publications such as the Institute of Physics "Physics World", and the American Physical Society "Physics Today" are also excellent sources of such information. Advice on which universities are active in your chosen field may be obtained from appropriate staff members in our School.

We run in the School some events about careers and postgraduate study, and we recommend that you look out for communications about these and attend where relevant. The University Careers Centre also runs several useful events that are worth attending.

It is important that, after graduation, you should respond to any enquiry from the Careers Centre regarding your current occupation. Responses to such enquiries form the basis of statistical information supplied to the central body which assembles data for the UK Higher Education System, thereafter used by news media for the construction of university league tables.

Finding referees

Students are likely to wish to use members of academic staff as referees in job applications. To this end, they are advised to cultivate a professional relationship with appropriate staff members. The more a member of staff knows about a student, the more useful a reference they can write. It is thus most likely that a student's project supervisor or a tutor would be in a good position to write a reference. Students should seek the permission of staff members to use them as referees before naming them. Potential referees may ask for written statements from students authorizing disclosure. Student attitude and attainment through their time at St Andrews can be relevant, which may be another reason for working hard throughout the degree programme.

Health and safety

The Head of the School of Physics and Astronomy is responsible for health and safety within the School and its buildings and requires all persons who enter the buildings for any purpose to take reasonable care of the health and safety of themselves and of others. The School Safety Officer is listed in the key contacts section later in this handbook. The School's safety policy is available from the [School web page](#).

Lists of first aiders, their locations, and their contact numbers, are displayed on notices in the building. If you require first aid, please contact a first aider, or ask any member of staff to do this for you. Mrs Linda Cousins in the School Office is one of the first aiders.

First aid boxes are located at the main entrance, in the School Office, outside room 301, outside the honours teaching labs, and at the lift entrances. The nearest first aid box is noted on the first aid notices around the building. An emergency evacuation chair for those with mobility difficulties is in the corridor outside room 301.

Anyone in the JF Allen building outside the time during which there is janitor cover should sign in and out in the late working book at the janitors' desk.

Appendix 1 - Key Contacts/Coordinators

School Level		Room	Email
Head of School	Prof Ian Bonnell	215	hospanda
Director of Research	Prof Peter Wahl	207	physdor
Director of PG Research Studies	Prof Vivienne Wild	308	physdopg
Director of Taught PG Studies	Dr Paul Cruickshank	305	physdopgt
Secretary (teaching matters)	Mrs Linda Cousins	211	physics
School Senior Secretary	Ms Lesley Aitken	211	physics

Advisers of Studies

General Degree Students	Drs Cyganowski, Mazilu, Kohnle, Varela, Rost as in pre-honours		
Junior Honours	Prof Graham Smith	219	gms
	Prof Moira Jardine	318	mmj
Senior Honours	Prof Natalia Korolkova	317	nvk
	Dr Hamid Ohadi	332	ho35
5000 Level	Dr Sebastian Schulz	310	sas35

Some module and programme coordinators

Physics labs	Dr Cameron Rae	214	cfr
Overall Project Coordinator	Prof Phil King	208	pdk6
Physics projects	Prof Phil King	208	pdk6
Theoretical Physics projects	Prof Jonathan Keeling	213	jmjk
Astrophysics projects	Dr Martin Dominik	242	md35

Other

Examination Officer	Prof Brendon Lovett	205	panda-exams
Disabilities Coordinator	Mrs Linda Cousins	211	physics
Study Abroad Adviser	Dr Charles Baily	310	crb6
Health and Safety Officer	Dr Andrew Bunting	244	asb48
First Aid	Mrs Linda Cousins et al	211	physics
S-coding etc requests	Dr Paul Cruickshank	305	physdot
Wellbeing Officer	Dr Sebastian Schulz	343	panda_wellbeing
Wellbeing Officer	Dr Lucy Hadfield	304	panda_wellbeing
Equality, Diversity & Inclusion	Dr Janet Lovett	243	physeqdiv
Library Rep	Dr Hongsheng Zhao	316A	hz4
Careers Officer	Prof Graham Smith	219	gms
School Student President	Anna Conti		physicspresident

For full contact details of all School staff, please see the [School's People web page](#).

Appendix 3 - Modules in 2023-24

Semester 1

			Expected staff	Comments
AS4025	Observational Astro	15	Drs Scholz and Hernandez Santisteban	
AS4010	Extragalactic Astro	15	Prof Wild	Compulsory for Astro
AS4011	Nebulae & Stars 1	15	Dr Wood	Compulsory for MPhys Astro
AS5001	Advanced Data Analysis	15	Prof Cameron	Also suitable for physicists! Compulsory for MPhys Astro
AS5002	Magnetofluids & Space Plasma	15	Prof Jardine	
AS5003	Contemporary Astrophysics	15	Drs Weijmans, Teixeira, Czekala	
AS5004	Cosmology	15	Dr Tojeiro	
<hr/>				
PH3061	Quantum Mechanics 1	10	Dr Kohnle	Compulsory for all programmes
PH3074	Electronics	15	Dr Cruickshank	Compulsory for MPhys Physics
PH3080	Computational Physics	10	Drs Mazilu, Gillies	Compulsory for most
PH3081	Mathematics for Physicists	15	Dr Leonhardt	Compulsory for most
PH3082	Maths for Chem/Phys	20	Drs Leonhardt, Mazilu, Gillies	PH3081 plus half of PH3080
<hr/>				
PH4027	Optoelectronics & Nonlinear Optics	15	Prof Samuel, Dr Ribierre	
PH4032	Special Relativity & Fields	15	Prof Korolkova	Compulsory for Th Phys
PH4035	Principles of Optics	15	Dr Ohadi, Prof Turnbull	
PH4036	Physics of Music	15	Dr Kemp	
PH4039	Intro to Condensed Mat Phy	15	Dr Braunecker	
PH4040	Nuclear & Particle with Adv Skills	15	Drs Kohnle, Sinclair	N&PP from PH4041 + some PH3014. Some joint programmes only
PH4041	Atomic, Nuc. & Part. Physics	15	Drs Kohnle, Cassettari	Compulsory for most
PH4105	Physics Laboratory 2	15	Dr Rae +	Compulsory for Phys

PH5004	Quantum Field Theory	15	Prof Keeling	Compulsory for Th Phys
PH5005	Laser Physics & Design	15	Drs Sinclair, Ohadi	
PH5011	General Relativity	15	Dr Dominik	
PH5012	Quantum Optics	15	Profs Korolkova, Lovett	
PH5015	Applications of QPhys	15	Dr Cassettari	
PH5016	Biophotonics	15	Drs Bruce, Varela, Annibale	
PH5023	Monte Carlo Radiation Transfer	15	Dr Wood	
PH5024	Modern Topics in Condensed Matter Physics	15	Profs King, Wahl, Dr Braunecker	
PH5025	Nanophotonics	15	Dr Schulz	

This list of module offerings is for illustrative purposes only and does not constitute a guarantee of the specific modules or module content to be offered in future years.

Semester 2

			Expected staff	Comments
AS3013	Computational Astro	15	Dr Hernandez Santisteban +	Compulsory for Astro
AS4012	Nebulae & Stars II	15	Drs Hernandez Santisteban, Czekala	Compulsory for MPhys Astro
AS4015	Grav & Accretion Physics	15	Dr Zhao	
PH3007	Electromagnetism	15	Dr Cassettari	All programmes
PH3012	Thermal & Statistical Phys	15	Drs Rost, Leonhardt	All programmes
PH3062	Quantum Mechanics 2	10	Dr Kohnle	All programmes
PH3101	Physics Laboratory 1	15	Dr Rae +	Compulsory Phys
PH4026	Signals and Information	15	Prof Smith	
PH4028	Advanced QM: Concepts & Methods	15	Prof Korolkova, Dr Leonhardt	Compulsory for TP
PH4031	Fluids	15	Dr Smith	
PH4034	Principles of Lasers	15	Dr Koenig	
PH4038	Lagrangian & H Dynamics	15	Dr Keeling	Compulsory all MPhys
PH4042	C. in Atomic Phys & Mag Res	15	Dr Lovett	
PH4043	Studies in Chemistry/Physics	5	Dr Cruickshank	Chem/Phys studentss only
PH4044	Adv Condensed Mat Phys	15	Profs Wahl, King, Dr Braunecker	

Both semesters

AS4103	Astrophysics BSc Project	30	Dr Dominik	Compulsory for Astro BSc
AS5101	Astrophysics MPhys Project	60	Dr Dominik	Compulsory for Astro MPhys
PH3014	Transferable Skills for Phys	15	Dr Sinclair +	Compulsory for all single Honours programmes

PH4111	Physics BSc Project	30	Prof King	Compulsory for Physics BSc
PH5101	Physics MPhys Project	60	Prof King	Compulsory for Phys MPhys
PH5103	Theoretical Ph. MPhys Project	60	Prof Keeling	Compulsory for TP MPhys

These lists are subject to change. When more than one staff member is listed the first person is usually expected to be the module coordinator.

Pre-requisite modules are shown in the University's [course catalogue](#). All modules need the material and skills developed in 2000-level physics and maths. Later honours modules will assume competence with the material and skills in the earlier compulsory modules.

This list of module offerings is for illustrative purposes only and does not constitute a guarantee of the specific modules or module content to be offered in future years.

Appendix 4 – Honours Programmes

The formal statements of required modules for different programmes are in the University's [Course Catalogue](#) and [Programme Requirements](#), and are also reflected in the compulsory and choice modules seen in the online advising system. This section is intended as a brief informal guide only, and should not conflict with the programme requirements.

In the tables in the following pages we list the compulsory modules for each programme. Students select additional modules, normally in physics/astrophysics or in their joint degree subject. Honours BSc degrees require a minimum of 240 credits to be gained during the two-year honours programme, of which at least 210 credits must be at 3000 and 4000 level and at least 90 credits must be at 4000 level. MPhys and MSci degrees require a minimum of 360 credits to be gained during the three-year honours programme, of which at least 330 credits must be at 3000, 4000 and 5000 level and at least 120 credits must be at 5000 level.

Almost all students will take the following core modules:

PH3061 Quantum Mechanics 1	
PH3062 Quantum Mechanics 2	
PH3081 Mathematics for Physicists	<i>Part of PH3082 for joint degree with Chemistry</i>
PH3012 Thermal and Statistical Physics	
PH3007 Electromagnetism	
PH3014 Transferable Skills for Physicists	<i>Most joint degree students cover some of this in PH4040, Chem/Phys cover some in PH4043</i>
PH4041 Atomic, Nuclear and Particle Physics	<i>For most joint degrees the nuclear and particle physics section is taken as part of PH4040</i>

The other modules taken will depend on the choice of degree programme and on student choice amongst optional modules.

The formal statement for required modules is in the University's [Course Catalogue](#) and [Programme Requirements](#), and is also reflected in the compulsory and choice modules seen in the Online Advising System.

Single Honours Degrees, Third Year, Junior Honours

Semester 1	Semester 2		
All	Physics BSc & MPhys	Th. Phys MPhys	Astro BSc & MPhys
Choice#	Physics Lab 1	Lag. & Ham. Dyn.	Comp. Astro
Maths for Physicists	PH3012 Thermal and Statistical Physics		
Quantum Mech 1	PH3007 Electromagnetism		
Comp. Physics	PH3062 Quantum Mechanics 2		
PH3014 Transferable Skills for Physicists			

AS4010 *Extragalactic Astronomy* for Astronomers, PH3074 *Electronics* for MPhys Physics, and MT3501 *Linear Mathematics II* for MPhys Theoretical Physics.

BSc Single Honours, Fourth Year, Senior Honours

Semester 1		Semester 2	
Physics	Astrophysics	Physics	Astrophysics
PH4041 Atomic, Nuc, & Particle Phys		Physics Project	Astro Project
Intro Cond Matt Phys	Neb. and Stars I*		
Physics Lab 2	Obs. Astro*	Choice	Grav. & Accret.*
Choice	Extragalactic Ast #	Choice	NebStars2*, Fluids*

* BSc Astronomers take at least two of *Obs. Astro.*, *Nebulae and Stars 1 and 2*, *Grav & Accretion Physics*, and *Fluids*; this can leave choice of other modules.

Normally already taken in JH and, if so, a choice here.

MPhys Single Honours, Fourth Year, Senior Honours

Semester 1			Semester 2		
Physics	Th. Physics	Astro	Physics	Th. Physics	Astro
PH4041 Atomic, Nuc, & Particle Phys			L.&H.Dyn	Adv QM	L.&H.Dyn
Intro Cond Matter Phys		Neb&Stars 1	Choice	Choice	Grav&Acc*
Phys Lab 2	Special Rel	Obs Astro*	Choice	Choice	Neb&Stars2
Electronics# or choice	Lin. Maths# or choice	Extragal# or choice	Choice	Choice	Choice inc Fluids*

*MPhys Astronomers take at least two of *AS4025 Observational Astrophysics*, *AS4015 Gravitational & Accretion Physics*, and *PH4031 Fluids*.

Normally already taken in JH and, if done so, there is a choice here.

The final year (5000 level) of the MPhys programmes has a compulsory major project (full time for Semester 2), plus a mix of compulsory and optional modules dependent on the degree programme being taken.

BSc Joint Honours Philosophy and Physics

Third year, Junior Honours

PH3061 Quantum Mechanics One 10
PH3081 Mathematics for Physicists 15
PH3080 Computational Physics 10
<i>PY3100 (Reading Phil 1) 30</i>

PH3007 Electromagnetism 15
PH3062 Quantum Mechanics Two 10
<i>30 Philosophy choice</i>

Fourth year, Senior Honours – if with Physics project

PH4040 Nuc & Particle Phys with Advanced Skills 15
Something not Phil (no 15 credit modules) eg a physics module 15
<i>Philosophy choice 30</i>

PH3012 Thermal and Stat Physics 15
Something not Phil (no 15 credit modules) eg a physics module 15
PH4111 Physics Project 30

Over two years is 90 Phil, 120 compulsory Phys, 30 something other than Phil

Fourth year, Senior Honours – if with Philosophy project

PH4040 Nuclear & Particle Phys with Advanced Skills 15
Physics choice 15
<i>30 Phil or 2 x15 credits Phys or other</i>

PH3012 Thermal and Stat Physics 15
Something not Philosophy (no 15 credit modules) 15
<i>Philosophy Project 30</i>

Over two years is at least 90 credits Phil, 120 possible; 90 compulsory Phys, 30 something other than Phil (perhaps most likely physics).

BSc Joint Honours Computer Science and Physics

This degree programme runs as per the programme with Philosophy, but with most CS modules being 15 credits there is more flexibility in the arrangement of modules. Students are required to take 60 credits of CS modules in each of the two honours years.

MSci Joint Honours Chemistry and Physics

JH is entirely Chemistry modules. SH is as follows.

Quantum Mechanics 1	10	PH3061
Maths for Chem/Phys	20	PH3082
Intro to Cond Matt Phys	15	PH4039
Atomic, Nuc & Part Phys	15	PH4041

Thermal and Stat Phys	15	PH3012
Electromagnetism	15	PH3007
Quantum Mechanics 2	10	PH3062
Studies in Chem & Phys	5	PH4043
Physics Lab 1	15	PH3101
OR Adv Cond Matt Phys	15	PH4044

The final year (5000 level) of the MSci programme has a mix of CH and PH modules, including a choice of a physics or a chemistry project.

Joint Honours Mathematics and Physics / Theoretical Physics

These joint degree programmes have a restricted choice of physics modules in order to cover the core of physics. The choice within the mathematics half is wide. We illustrate some possible pathways; others may be possible. Please note that PH3007 Electromagnetism should be taken in JH as it is a pre-requisite for Special Relativity and Fields. There are some topics that may be studied in either School, such as fluids.

Third year, Junior Honours Physics/Theoretical Physics and (Pure) Mathematics

BSc Maths/Phys	MPhys Maths/TP	BSc Maths/Phys	MPhys Maths/TP
Quantum Mech 1	Quantum Mech 1	Quantum Mech 2	Quantum Mech 2
Comp Phys	Comp Phys	Electromagnetism	Electromagnetism
Maths for Phys	Maths for Phys	<i>MT Choice</i>	Lagr & Ham Dynamics
<i>MT Choice</i>	<i>Linear Maths II</i>	<i>Rings and Fields</i>	<i>Rings and Fields</i>
<i>Real Analysis</i>	<i>Real Analysis</i>		

Fourth year, Senior Honours Physics/Theoretical Physics and Mathematics

BSc Maths/Phys	MPhys Maths/TP	BSc Maths/Phys	MPhys Maths/TP
Nucl & Part Phys with Adv Skills 15	Nucl & Part Phys with Adv Skills 15	Project – Maths 15 or Phys 30	Advanced QM* 15 (if Complex An not taken)
Choice inc Spec Rel, Intro Cond Matt Ph, <i>MT Choice</i> 15	Choice inc Spec Rel, Intro Cond Matt Ph, <i>MT Choice</i> 15	Thermal & Stat Physics 15	Thermal & Stat Physics 15
<i>Maths Choice</i> 15	<i>Maths Choice</i> 15	Choice 15	Choice 15
<i>Maths Choice</i> 15	<i>Maths Choice</i> 15	Choice 15/0	Choice 15

Third year, Junior Honours Physics/Theoretical Physics and (Applied) Mathematics

BSc Maths/Phys	MPhys Maths/TP	BSc Maths/Phys	MPhys Maths/TP
Quantum Mech 1	Quantum Mech 1	Quantum Mech 2	Quantum Mech 2
Comp Phys	Comp Phys	Electromagnetism	Electromagnetism
Maths for Phys	Maths for Phys	<i>MT Choice</i>	Lagr & Ham Dynamics
<i>Diff Eqns</i>	<i>Diff Eqns</i>	<i>MT Choice</i>	<i>MT Choice</i>
<i>MT Choice</i>	<i>Linear Maths II</i>		

Fourth year, Senior Honours Physics/Theoretical Physics and Mathematics

BSc Maths/Phys	MPhys Maths/TP	BSc Maths/Phys	MPhys Maths/TP
Nucl & Part Phys with Adv Skills 15	Nucl & Part Phys with Adv Skills 15	Project – Maths 15 or Phys 30	Advanced QM* 15 (if Complex An not taken)
Choice inc Spec Rel, Intro Cond Matt Ph, <i>MT Choice</i> 15	Choice inc Spec Rel, Intro Cond Matt Ph, <i>MT Choice</i> 15	Thermal & Stat P 15	Thermal & Stat P 15
<i>Maths Choice</i>	<i>Maths Choice</i>	Choice 15	Choice 15
<i>Maths Choice, incl Complex Analysis</i>	<i>Maths Choice</i>	Choice 15/0	Choice 15

*MPhys Maths and TP students take one or both of PH4028 Advanced Quantum Mechanics: Concepts and Methods and MT3503 Complex Analysis.

For the BSc joint degree at least 90 credits must be from PH and/or AS honours modules, and at least 90 from MT honours modules. ID4001 taken in the respective school counts towards these totals. For the MPhys joint degree the same applies, but at least 135 credits are needed in each discipline.

The final year of the MPhys programme has a mix of MT and PH modules, and includes a project in either discipline. The PH project is 60 credits.

Disclaimers

Some of the arrangements detailed in this booklet may have to be changed, and there may be errors. The School will endeavour to notify registered students of any significant updates to this document. The University's centrally published regulations will normally take precedence in any disagreement with matters stated in this handbook. If you become aware of any disagreement, please consult with Paul Cruickshank as soon as possible.

Things that are planned to be the case in session 2023-2024 may not be in place in future sessions.

PASC September 2023