

Supplementary information for MAST students

As a MAST student you will probably be entering Cambridge University for the first time and you may well be coming from another university with a very different way of doing things. The purpose of this document is to provide important general information that is not easily found on the University's web pages (because it's obvious to students who have already spent 3 years at Cambridge and who are simply progressing to their 4th year).

1. MAST versus Part-III (MSci)

The content and assessment of the MAST course in Astrophysics are completely identical to those of the fourth year of the Masters (MSci) course conventionally referred to as Part III Astrophysics. However, please see *Item 9 Grading* for the MAST grade boundaries. Cambridge undergraduates enter Part-III from part –II (for Cambridge undergraduates Part-IA means the first year, Part-IB means the second year and Part-II means the third year).

2. The Institute of Astronomy (IoA) MAST course

Two thirds of the overall assessment is based on formal examinations of lecture courses and the other third is based on the research project. The lectures and examinations are organised and examined by the Maths and Physics Departments (although many of the most relevant courses are actually lectured by members of the IoA). The research projects are organised and assessed by the IoA. The overall assessment for each degree candidate is made by a panel of 3 examiners from within the IoA plus an examiner from outside Cambridge University.

For detailed information on the course go to the IoA web pages, click on “students”, then click on “Part III Astrophysics”. Or alternatively go directly via the following link

http://www.ast.cam.ac.uk/students/undergrad/part_iii

3. The Cambridge learning experience

A major feature of the Cambridge teaching experience is its short length – typically all the teaching takes place in three eight-week terms. The upshot of this is threefold:

- The rate at which you will be presented with new course material may be much higher than you are used to.
- Lecturers will expect you to be able to assimilate newly taught material very fast. As a result you will need to pay close attention to juggling your academic/non-academic life balance so that you do not fall behind in your work during the term.
- Lecturers will expect that you will allocate a significant fraction of the time between terms in reviewing and revising your coursework.

You may, however, find that few home students admit to this level of intense and demanding activity. For some reason a surprisingly large fraction of the British student population prefer to suggest that they are managing their studies with consummate ease and a lack of effort. Do not be fooled by this: overall, the intensity of the course is very high and you should be prepared to work hard to do well.

4. Support through your college

Within your college there will usually be two academics that will play a key role in helping you manage your way through the somewhat unfamiliar pathway to graduation. The first of these is your “Tutor” and the second will be your ‘Director of Studies or “DoS”. Your college will be able to brief you more precisely as to the support mechanisms they have in place.

Your tutor is responsible for your pastoral care, and will usually be an academic in another subject. They will be your first point of call for non-academic questions and usually will undertake this pastoral role for a number of students in your college. Your DoS is responsible for your academic progress and provides oversight and guidance on your studies. Your DoS will normally be a senior academic with a background in at least one of Maths, Physics and Astrophysics. It is usual for you to meet your Tutor and DoS at the start and end of each term to review your progress and plans for the upcoming term. In addition both may organize social events for their students at certain times in the year.

It is important that you try to develop good relationships with your Tutor and DoS. Your DoS, in particular, should be able to advise on many aspects of astrophysics, ranging from course choices, to post-graduate opportunities through to career options. You should aim to take best advantage of your DoS so as to enhance your academic opportunities while at the IoA: most, if not all, will be very happy to help.

Although you will be pursuing the same courses and examinations as the final year undergraduate students taking the part-III astrophysics course, your status in your college will be as a post-graduate student undertaking a one year programme. This distinction, i.e. between a final year undergraduate and a post-graduate student, has no consequences within the IoA since you will be following identical courses and taking identical examinations as our fourth year undergraduate students. However, within your college you will be treated differently and share the facilities and resources available to the wider cohort of post-graduate students, including those taking PhDs. Participating in both the undergraduate and post-graduate communities is something that you should aim to do, though not to the detriment of your academic studies!

5. Course content and preparation

The fourth year courses available in the MAST build on the courses that internal students will have taken in their first three years in Cambridge. It is important that you familiarise yourself with these courses from earlier years and, if need be, revise and/or learn this material prior to your arrival so that you are well prepared for the courses that you wish to undertake. Reading through the Course Handbook (which is available on-line) is a helpful way to start.

It is generally the case that in order to undertake the MAST courses successfully a local student will need to have attained grades at the 1st class or 2.1 levels (or equivalent) in their earlier years. And to do well, i.e. achieve a distinction, you will need to be in roughly the top quartile of the MAST candidates. The final year of the Cambridge Astrophysics course is thus a challenging one – but we hope this is part of the reason you have chosen to come here.

6. Supervisions

A key component of teaching in Cambridge is the “supervision”. In Part-II astrophysics (third year) this is a face-to-face session – usually for an hour – where a pair of students meets with a staff member or graduate student to discuss progress on a given course. Such small-group teaching is intensive and often focuses on reviewing problems that students have been set and prepared written answers to earlier, and which have then been marked by the supervisor.

At the MAST level, however, supervisions usually take a different form and will vary between courses. Frequently, though, they will share the following features:

- The class size will be larger than in Part-II – typically between 6 and 12 students may attend – and so the sense will not be of a face-to-face session but rather that of a small, but interactive, class.
- Students will likely have been given a problem set to undertake, and may have been asked to submit their solutions prior to the supervision, but it is unlikely that these will have been graded.
- Students may often be asked to explain their solutions in front of the other students, and perhaps at a blackboard. This can be intimidating for some, but its educational value is that one has to come prepared and one is forced to develop skills of exposition and presentation.
- There is every chance that the supervision group will contain students with a very wide range of abilities, so for some the supervisions may focus on topics that are too hard, while for others the focus may be too easy.

It is important that you are aware how the supervisions work and how to gain the most from them. The lecturers for each course will be able to advise you on this since they are the ones who will decide how the supervisions will be run for their course. You should be aware that different lecturers can prefer very different supervision styles and that there are no detailed norms as to how they should be run. The bottom line, though, is that supervisions require preparation for you to benefit from them fully. You may wish to discuss how best to take advantage of them with your Director of Studies.

7. Project work

A major component of the 4th year Astrophysics program is a research project. This counts towards a third of your mark. A list of projects is made available at the start of October. Students are allocated to projects on the basis of student and supervisor preference (with student preference carrying more weight). The project is organised internally within the IoA.

Internal Cambridge students will not be that familiar with the staff members or the details relating to specific projects. As a result, you will not be at any substantial disadvantage in this selection process. The key thing to remember is that you need to be proactive and both seek out the projects that interest you and convince your preferred supervisor that you are the student they need!

Project allocations are made by mid-October and you should start your project work as soon as possible thereafter subject to agreement with your supervisor. Much of your project work may take place in parallel with your attendance at lectures and taught courses. Being able to juggle project and coursework at the same time is a key skill that you will need to develop.

Project work provides a very different type of assessment of students as compared from closed-book examinations, and allows for the development of many crucial skills: independent study and decision making, specific technical skills, as well as presentational and communication skills. The very best project reports can be very good indeed – some lead directly to research publications in the refereed literature – and so we encourage all our students to use their projects as springboards for honing their research skills at the highest possible levels.

8. Examinations

As in most UK universities student performance (apart from project work) is primarily assessed on the basis of timed, closed-book examinations. These will take place at three times for you:

- In January, on return from the Christmas vacation, when you will be examined on any Physics Major Topics courses you chose to take in the first term;
- In April, on return from the Easter vacation, when you will be examined on any Physics Minor Topics courses you chose to take in the period Jan-Mar;
- In June, when all candidates will sit the Mathematics courses they chose.

Note that the majority of courses should be selected from the recommended list. Courses amounting to 3 units or fewer may be selected from the *full suite* of Part III Mathematics courses or the *allowed list* of Part III Physics courses *or a mixture* of both

You are encouraged to examine in detail the types of questions set in typical past Cambridge examination papers as these may not be in the style of the examination questions that you are used to at all. In particular you may notice that:

- Most questions do not simply ask students to reproduce a standard and/or straightforward part of their coursework. This may form part of a question, but there is usually a subsequent component that students will be completely unfamiliar with and that will test for a deeper understanding of the topic.
- There are sometimes questions that ask you to write an essay or short notes on a topic. These are specifically aimed to assess how well you have understood a topic, whether you have grasped its most essential aspects, and whether you can concisely and accurately convey that information.

9. Grading

Many MAST students arriving in Cambridge have been used to receiving very high marks (e.g. >90%) in their previous undergraduate examinations. Please go to the students webpage for the grade boundaries for the MAST Astrophysics course:

http://www.ast.cam.ac.uk/sites/default/files/Part III_MAST_Exam_Assessment.pdf

You should be aware that such high marks are attained very rarely by students in the Astrophysics class. It is seldom for anyone to score an aggregate mark of >90% and it is not unusual for a very good student (say, in the top 10% of candidates) to have an aggregate score of only 80%. A student who can get 75% of the marks in any examination paper will be a really excellent student.

Classification of the MAST

As a result of the examination, each candidate is placed in one of the following categories: Distinction, Merit, Pass, Fail or 'Other'. 'Other' may include, for example, candidates who were ill for part of the examination.

Distinction

Candidates will have demonstrated mastery over a considerable range of material. Their performance will have been such as would be expected of someone starting PhD research at a leading astrophysics, or mathematics, department.

Merit

Candidates will have performed at first class level. In the words of the criteria used for a first class in our undergraduate examinations they 'will have demonstrated a good command and secure understanding of examinable material. They will have presented standard arguments accurately and showed skill in applying their knowledge.'

Pass

Candidates will have performed at upper second class level. They will have demonstrated the ability to absorb and understand difficult material but there may remain gaps in their understanding and they may not always be able to apply their knowledge successfully.

10. Useful Cambridge University web pages

The IoA web pages contain a large amount of information on the Astrophysics course that we teach in Cambridge. As already mentioned above the most useful starting point is:

http://www.ast.cam.ac.uk/students/undergrad/part_iii

There are three other web-based services that you should be made aware of:

- CamSIS: this is the University of Cambridge's web-based system for handling student information, records and transactions, from initial contact and application all the way through to graduation. It is a single shared system, with one record per student. All transactions, processing and updates to the student's record are either carried out directly in CamSIS by University and College staff, the students themselves, or are downloaded into CamSIS by external organisations.

Typically you might use CamSIS to enrol in examinations, check your results etc. Your college will usually be responsible for introducing you to this system.

- The Physics Department Part-III pages
https://www.phy.cam.ac.uk/students/teaching/current-courses/III_overview
- The Maths Department Part-III pages
<http://www.maths.cam.ac.uk/postgrad/mathiii/>