School of Physics and Astronomy

Examination papers: information for students

Our exam papers are normally written by the staff member(s) teaching the module, taking note of School guidance on the process. These draft exam papers go through a rigorous scrutiny process before being submitted to the University Examination Office. They are first checked by a second member of staff who has good knowledge of the module content. The paper and its marking scheme are then scrutinized by the examination officer(s) in the School before being sent out to an external examiner. The School has four external examiners, one for pre-honours physics, one for honours experimental physics, one for honours theoretical physics and one for astrophysics. External examiners are experienced members of staff from other UK Universities. Papers are only finalised after the external examiner comments have been taken into account. The external examiners are also involved in ensuring the fairness and appropriateness of the marking process.

One of the key skills in our degree programme is achieving a high level of competency in problem solving, including the ability to solve new problems that require a transfer of knowledge to new contexts. For this reason, honours students should expect some material in exams that is not immediately familiar, and which requires students to demonstrate their ability in applying their understanding and skills in “new” situations. Honours exam papers typically contain a mixture of "straightforward marks" (basic understanding, simple use of a formula ~20%), problems similar to tutorial and in-class problems (~30%), “new” problems (~30%) and problems requiring transfer of knowledge to new contexts (~20%). At pre-honours ~40% of the exam consists of “new” problems, 40% of problems in similar contexts to those seen in tutorials and workshops, and 20% questions testing more basic understanding. The Physics 2B examination will normally contain a bit more in the way of questions requiring working with material as an extension of what has been done previously.

The conversion from the percentage marks to the University 20-point reporting scale is done normally using the mapping scales published in the honours and pre-honours handbooks. While the School aims to be in a position where such mapping and the underlying marking are carried out as usual, on rare occasions the Module Board (including the external examiner) may determine that it is appropriate to amend the marking or mapping. In the very small number of cases where this happens, this information should be communicated to students as part of the generic exam feedback.

The School aims to have zero errors in examination papers. Unfortunately, there will on occasion be a typographical or other mistake in a paper, and in such instances the assessors will make appropriate compensation to the marking scheme and the matter will be discussed with the external examiner and the module board, in order to ensure that no students are disadvantaged.

In physics and astronomy, more complex concepts build on simpler concepts, and certain key concepts are used in many different areas of physics. Thus, a good understanding of all parts of a module is decisive for success in later modules. Gaps in learning in one module can have a negative impact on many later modules. We strongly advise our students to work well through the entire semester with the aim of building their capacity to work with material in a module, and to revise that material where appropriate after the module assessment has

finished. We accept that passing examinations is important, but we aim to create scientists who are competent in using physics long after the exams are over. “Cramming” shortly before exams is unlikely to lead to useful long-term learning, and very unlikely to create sufficient depth of understanding to solve the questions in the exam that involve new problems and those requiring transfer of knowledge to new contexts.

An exam question that aims to assess student competence in parts of the relevant module will also likely require familiarity and competence with material from previous modules. Questions in an exam may require competence with material from different parts of the module. There is no suggestion that in one module exam the questions should be uniformly distributed from across the module.

Some exam questions may ask students to explain a concept or to provide a derivation of a relationship starting from specific laws. In line with our wish to encourage useful learning, and with the goal of reducing memorisation requirements, we suggest that students do not attempt to memorise derivations and explanations “parrot fashion”. Instead, we ask that they seek to understand the ideas and methods involved, and get this to the stage where they can create an explanation or derivation in the exam. A full understanding of the science will also allow students better chance of success if they are asked to derive something related to, but slightly different from, what was covered in the lectures.

Tutorial work aims to develop problem solving skills in students, and to allow them to practice working in their subject. This work also helps prepare students for exams. It is important that students actively solve tutorial problems in order to develop these skills; just passively working through given solutions does not have the same educational effect and is much less effective. Being able to self-assess and evaluate your work using strategies such as checking units, considering whether the result is physically reasonable, checking limiting cases etc. are key graduate skills.

Students are advised that while attempting past exam papers can be a useful part of their work, they should not base their revision strategy on this. It is quite possible that they will get examination questions that are not similar to those that have been asked in recent years. Unless otherwise noted, all the material in lectures, tutorials, workshops, and required reading is examinable.

Students in all exams will have with their examination paper sheets showing some mathematical relationships and some physical constants. These are available in advance from the School’s web pages. Some of the mathematics reproduced there may not yet have been covered in your programme.

We aim to make available for each relevant module a set of solutions for one past examination paper. Students should solve the relevant problems *prior* to checking their own work using the solution, and give themselves feedback on their result. For good educational reasons solutions from other past papers will not be made available.

Most modules will provide generic feedback on the exam, highlighting things done well and common errors.

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