EXTERNAL EXAMINER ANNUAL REPORT FORM

Guidance notes are available to support the completion of this Report and are available at http://learning.cf.ac.uk/quality/review/external-examiners/reports/.

	For completion by External Examiner:		
Name of External Examiner:	Prof. Simon Goodwin		
Home Institution / Employer of External Examiner:	University of Sheffield		
Programme and / or Subjects Covered by this Report	Physics (esp. Astronomy/Astrophysics) *Astronomy & Astrophysics modules on undergraduate programmes in the School of Physics & Astronomy*		
Academic Year / Period Covered by this Report:	2015/16	Date of Report:	28/06/16

For completion by External Examiner in the spaces provided. Please extend spaces where necessary. **Please note this Form will be published online and should not make any reference to any individual students or members of staff.**

1. Programme Structure

This will be a long report with many suggestions and recommendations and quite critical in places. But my overall view of the degree is good, the training of students in key subject and transferable skills is good, and certainly of the overall standard I would expect. Many of the modules are excellent in structure, and really enhance the student's learning. Interviewing a group of students showed a very positive view of the department and the degree, and the students had very few complaints about the general quality of their degree.

Therefore my comments should be seen as suggestions for improving what is generally a good set of degrees and ensuring high standards in all modules and clearly following the subject benchmarks (especially in the MPhys year).

2. Academic Standards

My comments here include those on the assessment process (3. below) as many are impossible to separate. Note in section 9 that some questions are answered both 'yes' and 'no' as the answer varies between different modules.

I have underlined specific recommendations.

Standards vary significantly. In most modules the material is at an appropriate level and students are required to show the appropriate depth of understanding and skills. But in some modules the level of reward seems too high for the understanding that the students actually demonstrate. Especially at MPhys level in many exam scripts I inspected students were receiving almost complete or full credit for answers that demonstrated only partial or muddled understanding. A key part of the QAA benchmarks is that students are able to communicate their understanding of complicated concepts. Therefore the students should not be given the 'benefit of the doubt' – if the answer is not completely clear and unambiguous it cannot receive full credit. I am also concerned with the number of times keywords or phrases gain credit – at levels 3, and especially 4, students should be expected to provide coherent prose explanations (the use of words like 'explain' or 'describe' in the question should implicitly include an element of coherent prose as part of the answer).

There is always some element of subjectivity in assigning marks to answers, and so it is completely inappropriate to enforce a very formulaic marks scheme to high-level modules. The complexity and depth of material being examined is high - the marks should reflect the depth of understanding demonstrated in the answer provided by the student, and this should be appropriate to the level of the module as set-out in the QAA benchmark and in the learning outcomes and assessment criteria for that module.

Learning objectives and outcomes should be clearly communicated to the students in every module. Detailed assessment criteria and how they align to these should also be provided. This should not be difficult as these *should* already exist. Externals should also see the learning objectives, outcomes and assessment criteria for each module.

Quite a few modules/lecturers already seem do this – and the students are aware of this and a frequent comment was that the best modules and lecturers provided this information to them clearly.

This is very important to allow high marks to be justified to the externals, and to justify low marks to both students and the externals.

Module reports should be produced and provided to the externals. These should cover any specific problems/issues, and an overview of the student performance.

Coursework. As externals we had no site of CA, even in modules which were 100% CA. We did not see the questions that had been asked, or examples of marked work and feedback. This means we had absolutely no oversight on those aspects, and even entire modules. Examples of CA, their objectives and outcomes and assessment criteria should be provided to the externals. This should include examples of graded work and feedback.

Many modules, especially MPhys, had extremely high CA averages (into the 80s and 90s). Quite possibly these were appropriate assessments at which the students performed very well and the marks were fully justified. However with no oversight I suspect some (many?) were too easy/too generously marked. All CA needs reviewing to make sure that it is of an appropriate level and difficulty.

The MPhys project. By far the single most significant component of the MPhys degree is the project – worth 60 final year credits. Given its critical importance to the final degree it is absolutely vital that this module has clear objectives and outcomes and assessment criteria and that the mark given can be fully justified with evidence. As it stands I have many concerns about this component.

The quantity and quality of work required to achieve a high mark vary significantly between projects. Some projects (astronomy projects in particular) had extremely high marks which could not be justified by the evidence provided to me.

A good project should involve significant elements of problem solving – not just following instructions or some standard procedure. [Designing (and building) an experiment or piece of equipment. Writing algorithimically complicated code/modifying existing code at a deep level. Detailed statistical analysis of results (with tools written by the student). Analytic calculations involving learning new mathematical skills to solve.]

There should be much less emphasis on results and much more on process. Many project reports I read included little (or no) description of the process to justify a mark for around 500 hours work.

The front page of the project paperwork includes 'objectives' but they are usually very curt and the majority are not actually learning objectives. They were also not reflected in the assessment (or no evidence was provided that they were). Project learning objectives should be proper learning objectives and reflected in the assessment.

A significant proportion of the mark is the supervisor's assessment of the student's performance. This was often extremely high (almost always a first, and often >80%). No evidence for this was given other than a few paragraphs. I would recommend that project diaries are kept by the student and are included in the assessment and as evidence of the process. They should be keeping detailed records anyway, so this should take no extra effort. This would also provide evidence in situations where there are no (or few) results through no fault of the student.

The main evidence we saw as external examiners was the project report. The assessment criteria for these were vague at best. The assessment criteria must be much more complete as to what is required in various aspects for particular marks. Obviously every project is different, but generic assessment criteria should be produced and/or each project could have its own modified criteria agreed before the start of the project.

Several projects I examined provided little or no evidence for a performance at the level suggested by the mark. The balance between elements can (and should) vary from project-to-project but I expect:

Introductions/background should demonstrate an in-depth understanding of appropriate primary sources. Clear guidance should be provided on what level of prior knowledge can be assumed of the reader (e.g. I do not expect to read 2 pages of first year astronomy in an MPhys report).

Procedure is the most important part of the project. Project reports should include detailed information to allow the reader to reproduce the work. A clear guide to the analysis, plans, user manual, description of the algorithm or whatever is appropriate to the project. Evidence of tests/sanity checks etc. should be provided. Aspects can be included as appendices - but evidence of process and understanding of this process must be present.

What constitutes 'Results' depends on the project, but if they are important then context and meaning must be clearly given as well as a discussion of errors, assumptions, and potential problems/limitations.

On the evidence presented to me several projects seem to involve using a standard code to analyse pre-existing data. I had no evidence that the student understood how the standard software worked, or really understood the data (or anything to evidence to me that they had not just acted as a 'data processor'). This lack of evidence of depth or understanding fails to justify the mark, and is unfair on the student (quite possibly they did understand far more than was evidenced, but they were given no opportunity to demonstrate this).

The feedback provided often failed to match the grade. In particular, the supervisor's assessment often supported very high marks with phrases such as 'they attended all meetings'. This should be expected of the students, and is not support for marks of >80%.

MPhys projects require a complete overhaul of assessment procedures and guidelines. This is crucial, as to a good first approximation an MPhys student's final mark is their project mark.

Clear guidance needs to be provided to both students and staff as to what constitutes plagiarism and clear formal procedures need to be in place to deal with cases. In the project this could result in a failed degree, and so the seriousness of plagiarism needs to be made clear, and procedures followed to give a strong case if challenged.

In summary, most modules and projects seem to be at the appropriate level. I think the various flavours of physics/astrophysics provide the students with a good degree and training in a wide range of 'hard' and 'soft' skills. However, there is often a significant lack of guidance to both students and external examiners as to what is being assessed, why, and how grades are assigned. All modules and components require proper learning objectives, outcomes and assessment criteria: all marks need justifying and evidencing, and shown to be at an appropriate level.

3. The Assessment Process

See above. Many comments on assessment procedures included in section 2.

4. Year-on-Year Comments

This was my first year as external examiner.

5. Preparation / Induction Activity (for new External Examiners only)

Was unable to attend, but material provided online or by email was good and useful.

6. Noteworthy Practice and Enhancement

'Soft' skills training seems to be excellent.

7. Comments on the Examination of Master's Dissertations (External Examiners for postgraduate Master's Programmes only, see also 9.23-9.29 below)

N/A.

8. Appointment Overview (for retiring External Examiners only)

N/A.

9. Annual Report Checklist

Please include appropriate comments within Sections 1-8 above for any answer of 'No'.

		Yes (Y)	No (N)	N/A (N/A)
Programme/Course Information				
9.1	Did you receive sufficient information about the Programme and its contents, learning outcomes and assessments?		**X**	
9.2	Were you asked to comment on any changes to the assessment of the Programme?		**X**	
Draft Examination Question Papers				
9.3	Were you asked to approve all examination papers contributing to the final award?	**X**		
9.4	Were the nature, spread and level of the questions appropriate?	**X**		
9.5	Were suitable arrangements made to consider your comments?	**X**		
Marking Examination Scripts				
9.6	Did you receive a sufficient number of scripts to be able to assess whether the internal marking and classifications were appropriate and consistent?	**X**		
9.7	Was the general standard and consistency of marking appropriate?	**X**	**X**	
9.8	Were the scripts marked in such a way as to enable you to see the reasons for the award of given marks?	**X**	**X**	
9.9	Were you satisfied with the standard and consistency of marking applied by the internal examiners?	**X**	**X**	
9.10	In your judgement, did you have the opportunity to examine a sufficient cross-section of candidates' work contributing to the final assessment?	**X**		
Coursework and Practical Assessments				
9.11	Was the choice of subjects for coursework and / or practical assessments appropriate?		**?**	
9.12	Were you afforded access to an appropriate sample of coursework and / or practical assessments?		**X**	
9.13	Was the method and general standard of assessment appropriate?	**X**	**X**	
9.14	Is sufficient feedback provided to students on their assessed work?		**?**	
Clinical Examinations (if applicable)				
9.15	Were satisfactory arrangements made for the conduct of clinical assessments?			**X**
Sampling of Work				
9.16	Were you afforded sufficient time to consider samples of assessed work?	**X**		
Examining Board Meeting				
9.17	Were you able to attend the Examining Board meeting?	**X**		

		Yes (Y)	No (N)	N/A (N/A)
9.18	Was the Examining Board conducted properly, in accordance with established procedures and to your satisfaction?	**X**		
9.19	Cardiff University recognises the productive contribution of External Examiners to the assessment process and, in particular, to the work of the Examining Board. Have you had adequate opportunities to discuss the Programme and any outstanding concerns with the Examining Board or its officers?	**X**		
Joint Examining Board Meeting (if applicable)				
9.20	Did you attend a Composite Examining Board, i.e. one convened to consider the award of Joint Honours degrees?			**X**
9.21	If so, were you made aware of the procedures and conventions for the award of Joint Honours degrees?			**X**
9.22	Was the Composite Examining Board conducted according to its rules?			**X**
Examination of Master's Dissertations (if applicable)				
9.23	Did you receive a sufficient number of Dissertations to be able to assess whether the internal marking and classifications were appropriate and consistent?			**X**
9.24	Was the sample in accordance with the University's sampling guidelines (guidelines provided below)?			**X**
9.25	Were you satisfied with the standard and consistency of marking applied by the Internal Examiners?			**X**
9.26	Were you able to attend the Master's Degree (Dissertation) Stage Examining Board?			**X**
9.27	If so, was the Examining Board conducted properly and in accordance with established procedures?			**X**
9.28	Were the schemes for marking and classification correctly applied?			**X**
9.29	Were the standards of the awards recommended appropriate?			**X**

Please return this Report, preferably in a Microsoft Word format, by email to:

ExternalExaminers@cf.ac.uk

Your fee and expenses claim form and receipts, should be sent electronically to the above email address or in hard copy to:

External Examiners, Registry, Cardiff University, McKenzie House, 30-36 Newport Road, Cardiff, CF24 0DE

SAMPLING OF TAUGHT MASTER'S DISSERTATIONS BY EXTERNAL EXAMINERS

External Examiners shall be expected to see prescribed numbers and ranges of Dissertations, but not to mark them, on the following basis:

At least 10% of Dissertations for a postgraduate taught Master's Programme, or a minimum of 10 (whichever is the higher figure) must be seen by the External Examiner(s). Where the total number is less than 10, all Dissertations must be seen by the External Examiner(s) #.

Dissertations seen by External Examiners should include examples from across the whole range of achievement (i.e. Pass with Distinction, Pass, Fail).

External Examiners will retain the right to see other Dissertations at random.

Where more than one External Examiner is appointed on a Programme, at least 10% of Dissertations, or a minimum of 10 (whichever is the higher figure), should be seen collectively by the External Examiners.