

The University of Leeds

EXTERNAL EXAMINER'S REPORT

ACADEMIC YEAR: 2013– 2014

Part A: General Information

Subject area and awards being examined

Faculty / School of:	Physics and Astronomy
Subject(s):	<i>Physics</i>
Programme(s) / Module(s):	Physics, Physics with Astrophysics, Physics with Nanotechnology, Theoretical Physics
Awards (e.g. BA/BSc/MSc etc):	BSc, MPhys

Name and home Institution / affiliation of Examiner

Completed report

The completed report should be attached to an e-mail and sent as soon as possible, and no later than six weeks after the relevant meeting of the Board of Examiners, to exexadmin@leeds.ac.uk.

Alternatively you can post your report to: **Head of Quality Assurance**
Room 12:81, EC Stoner Building
The University of Leeds, Leeds LS2 9JT

Part B: Comments for the Institution on the Examination Process and Standards

Matters for Urgent Attention

If there are any areas which you think require urgent attention before the programme is offered again please note them in this box

No areas were identified that suggested that there were significant issues that required urgent attention.

However, I do have a number of recommendations that I hope will be considered for next year's examination process. These are explored below, and are primarily associated with the procedures for setting and checking papers, and for post-exam review of the papers and marks.

Only applicable in first year of appointment

Were you provided with copies of previous relevant External Examiners' reports and the response of the School to these?

N/A

For Examiners completing their term of appointment

Please comment on your experience of the programme(s) over the period of your appointment, remarking in particular on changes from year to year and the progressive development and enhancement of the learning and teaching provision, on standards achieved, on marking and assessment and the procedures of the School

My experience over the three years that I have been an external examiner has been a positive one. The procedures for checking draft papers have improved steadily, and throughout my term I have been happy with the broad level of the set papers and the performance of the candidates. This year there appears to be some evidence that the incoming students are of higher calibre than in the past and so there may be a need to review the level of the academic hurdles required in the first two years to accommodate a more talented intake.

While there has been some pushback at some of the suggestions I have made, most of the examining team have been receptive to the needs for change, and are aware that having clear and transparent procedures in place can frequently mitigate against most of the hiccups that occur from time to time.

There is one issue that has engaged me during my time as an external examiner and which I would hope is progressed in the future. This is included in the “further comments” section at the end of my report, but I will mention it here nonetheless. This rather important item goes to the core of the fairness of the examining process and is related to the means by which the students’ performance is classified.

Given that the Physics students at Leeds undertake a “modular” course, it seems fully appropriate that the overall classification is based on the numbers of modules secured at the different grades possible, with the top ranking students having to score sufficiently high grades in a minimum number of modules. However, for this to be a fair process does require that very close attention is paid to the relative levels of difficulty of the different modules a student can choose from in any given year.

If examiners inadvertently set particularly difficult (or easy) papers then this can severely disadvantage individual candidates if they have the option to not take these particular papers. My experience over the past three years has been that this particular feature of papers in any given year, i.e. that they are of broadly speaking an equal level of difficulty, has not been prioritised enough. The same problem can of course also rear its head within individual papers, where there can be very significant distributions (both in terms of the marks awarded per question and the numbers of students attempting differing questions) for otherwise equivalent questions within, e.g. a section of a paper.

At my own home institution there is an internal moderation scheme, used before the marks for any given paper are finalised, and hence well before any classification, that aims to trap “aberrant” papers. Importantly, the burden of correcting these deficiencies is laid squarely at the feet of the setters and markers of the relevant papers, and so there is a powerful incentive to these staff to pay careful attention to the level of difficulty of their questions and their marking schemes **well in advance** of the examinations. Similarly, this internal scrutiny is timetabled early enough such that, if need be, all the scripts can be re-marked without altering the dates of any key meetings.

I am not sure whether some equivalent means of scrutiny and post-examination review takes place at Leeds, but if not, then I would very much hope that this can become **an integral part** of your learning and teaching provision. One additional feature of the process we utilise at [redacted] that helps, is that all academic staff – whether they are involved in examining or not – are circulated with the “commentaries” on individual papers and so are able to learn from their colleagues’ “mistakes”.

I do believe the introduction of such a scheme of “examination performance review” would enhance the already good practices you have in place, and further safeguard the interests of your students.

Standards

1. Please indicate the extent to which the programme Aims and Intended Learning Outcomes (ILOs) were commensurate with the level of the award

- *The appropriateness of the Intended Learning Outcomes for the programme(s)/modules and of the structure and content of the programme(s);*
- *The extent to which standards are appropriate for the award or award element under consideration.*

The ILOs appeared appropriate for the levels of the awards at bachelors and masters' levels, and the overall structure and content of the programme was well suited to the eventual award(s).

The broad standards of the modules appeared appropriate for the awards under consideration, although the performance of some of the cohorts in the earlier years suggests that the examination questions set might have been too easy (see e.g. Maths 1, Maths 2).

2. Did the Aims and ILOs meet the expectations of the national subject benchmark (where relevant)?

- *The comparability of the programme(s) with similar programme(s) at other institutions and against national benchmarks and the Framework for Higher Education Qualifications.*

In comparison with the equivalent qualifications at my home institute, the Aims and ILOs were broadly speaking similar and so I believe are comparable with national benchmarks.

3. Please comment on the assessment methods and the appropriateness of these to the ILOs

- *The design and structure of the assessment methods, and the arrangements for the marking of modules and the classification of awards;*
- *The quality of teaching, learning and assessment methods that may be indicated by student performance.*

The assessment methodology was similar to that with which I am familiar – i.e. a moderate contribution from coursework and the major contribution from closed-book examinations. The early re-use of questions in re-sit papers however should be discouraged.

The arrangements for the marking of modules seemed satisfactory, but I have some comments on the post-examination assessment of the marking of papers and the mitigation of any issues related to the relative difficulties of different modules/papers. These have already been mentioned above.

The student performance in the first year maths courses was outstanding. This may reflect a better cohort, excellent teaching, or too straightforward examination papers. The real reason however should be determined and an appropriate “nudge” be applied next year.

4. Were students given adequate opportunity to demonstrate their achievement of the Aims and ILOs?

- *The academic standards demonstrated by the students and, where possible, their performance in relation to students on comparable courses;*
- *The strengths and weaknesses of the students as a cohort.*

The examination papers were reasonably effective in allowing students to demonstrate their achievements of the Aims and ILOs. The separation into short Section A questions, and longer Section B/C/D... questions is good.

There is potential merit in requesting that examiners set the majority of their longer questions with a “standard” format that might include a “relatively straightforward” initial component which most students might be able to have a good crack at, and then smaller, but more challenging components which would be used to discriminate between and assess the capabilities of the most able candidates. This would, in passing, help moderate variations in the level of difficulty between different sections in a paper. **I strongly recommend such a default structure be considered.**

The projects at bachelors and masters levels were structured so as to allow the strengths of the better students to be made evident and the students to shine. Once again, some of the Masters' level student projects were outstanding: this was very nice to see.

Overall the students showed a wide range of ability in the examinations with some scoring very highly and others more poorly. The first year mathematics marks were very good. The results at master's level were generally better than in the early years, which is to be expected for these self-selecting, more focused and likely capable students.

5. For Examiners responsible for programmes that include clinical practice components, please comment on the learning and assessment of practice components of the curriculum

N/A

6. Please comment on the nature and effectiveness of enhancements to the programme(s) and modules since the previous year

It would be particularly helpful if you could also identify areas of good practice which are worthy of wider dissemination.

No comments – I do not believe that this year any major changes to the programmes and/or modules were implemented relative to last.

7. Please comment on the influence of research on the curriculum and learning and teaching

This may include examples of curriculum design informed by current research in the subject; practice informed by research; students undertaking research.

As has been my experience in the past many of the courses – in particular the masters' level modules – take advantage of the lecturers' research interests and knowledge. This was very evident in the project work, but also in the modules that focused on areas of "contemporary" physics such as Quantum Computation and Nanophysics & Nanotechnology and in the research area I am most familiar with, i.e., Astrophysics.

The departmental support for student research placements in the summer vacations is an excellent initiative and is to be applauded.

8. Where the programme forms part of an Integrated PhD, please comment on the appropriateness of the programme as training for a PhD

N/A

For Examiners involved in mentoring arrangements

9. If you have acted as a mentor to a new External Examiner or have received mentor support please comment here on the arrangements

This year I did act as a mentor for a new External, . Timing constraints meant that we had to interact by email and phone alone, but this was just about satisfactory.

It would have been preferable had we both been able to meet at Leeds, but the need for the Externals' presence at two different times made this difficult.

The Examination/Assessment Process

10. The University and its Schools provide guidance for External Examiners as to their roles, powers and responsibilities. Please indicate whether this material was sufficient for you to act effectively as an External Examiner.

Whether External Examiners have sufficient access to the material needed to make the required judgements and whether they are encouraged to request additional information.

As in the past. I was provided with sufficient material to enable me to act in an effective manner. I was able to request additional material as and when I liked, and any queries were answered expeditiously.

11. Did you receive appropriate documentation relating to the programmes and/or parts of programmes for which you have responsibility, e.g. programme specifications or module handbooks, marking criteria?

The coherence of the policies and procedures relating to External Examiners and whether they match the explicit roles they are asked to perform.

Information on the programmes that I had responsibility for was received in a timely manner. Where I was in need of additional material I was able to request this straightforwardly.

This year, I was able to better schedule and plan my time during my visit so that:

1. I was able to scrutinise the work of candidates who were competing for prizes and offer some external commentary on the proposed awards. However, I was not provided with these candidates' names in advance, but had to infer them from the marks sheets.
2. I was just about able to scrutinise the large volume of scripts;
3. I was able to receive graphical representations of the marks distributions for the papers while I was visiting. This was very helpful.

12. Were you provided with all draft examination papers/assessments? Was the nature and level of the questions appropriate? If not, were suitable arrangements made to consider your comments?

Yes, I was provided with all draft examination papers satisfactorily, and I believe that my comments were passed onto the examiners expeditiously.

It would have been helpful to have received confirmation that my comments and suggested corrections had been taken on board (or rejected) by the examiners, but I appreciate that this might have been unreasonably burdensome for the

examining team. I was able to check the examiners' responses when I visited Leeds – in almost all cases my comments had been taken into consideration and the papers adjusted.

13. Was sufficient assessed / examined work made available to enable you to have confidence in your evaluation of the standard of student work? Were the scripts clearly marked/annotated?

The complete set of examined work was made available for me to inspect when I visited Leeds. I was able to look at a large sample of this and convince myself that the work had been marked correctly and was of a suitable standard. The scripts were marked and annotated clearly.

There were two areas where some adjustment would have assisted me greatly in the assessment of the quality of the marking and the candidates.

1. It would be helpful if a sheet showing the marks distributions **for each question** and **for the overall paper** in the form of **histograms** were available. This would have been useful in assessing whether the marking had been fair, and also in assessing how strong any given candidate was. If these data could be made available in the future that would be great.
2. The volume of scripts that need to be inspected is very large and unfortunately the room in which the scripts were located was very uncomfortable – e.g. it had no fresh air ventilation. It would really help if a more comfortable space were utilised.

14. Was the choice of subjects for dissertations appropriate? Was the method and standard of assessment appropriate?

The choice of subjects for dissertations seemed appropriate and very similar to that at my home institute, i.e. focused on the areas of expertise of the faculty and including topics right at the cutting edge of contemporary research.

I found the procedures for assessment of the project work comprehensive and well planned. In particular the breakdown into different components of the activity, ranging from review, research, writing and verbal presentation seemed very sensible and useful to the candidates.

I concur with the other External Examiner that the balance between the weighting of the mark awarded by the supervisor and that awarded on the basis of the viva seemed too biased towards the supervisor's opinion. Furthermore, the suggestion that there be external scrutiny should there be too large a variance between the assessor and supervisors marks is an excellent one. This is a process that we introduced in a few years ago and we have found it to be very useful.

15. Were the administrative arrangements satisfactory for the whole process, including the operation of the Board of Examiners? Were you able to attend the meeting? Were you satisfied with the recommendations of the Board?

I was broadly speaking happy with the whole process.

However, the need for the External Examiners to be present in Leeds at two separate times during the summer examination season means that it is almost impossible to them to meet face to face. This is a significant problem and some thought ought to be given as to how to overcome this.

16. Were appropriate procedures in place to give due consideration to mitigating circumstances and medical evidence?

I believe so. I saw no evidence of candidates being unreasonably disadvantaged.

Other comments

Please use this box if you wish to make any further comments not covered elsewhere on the form

As this is my last year as an External Examiner, I hope I can provide a few general comments. Over these past three years my impression of the examination procedure at Leeds has been favourable. The course content seems appropriate, the standard of the best candidates has been high, and the ability of students to be exposed to both core and more topical modern physics is admirable.

My experience this year did, though, again expose a number of important issues that I hope will be examined by the internal team carefully. I have listed these issues individually below so as to provide a record them for the examination team:

1. It was a pity that in one case a lecturer setting questions in two papers (Physics 4 & Nuclear and Particles) used notation that was unfamiliar to the class and this led to the need to revise the marking of these two papers. This does suggest that the internal team had not spotted this issue before the examination. While it was clear that measures were taken to ensure that no candidate was unfairly penalised, the potential of this change to cause a problem ought to have

been trapped earlier.

2. I was not made aware of any formal quantitative comparison of the relative levels of difficulty of the papers taken by the candidates in any given year. At my home institution, in years 3 and 4, candidates can choose from a range of options and care is taken to ensure that these are assessed in a way that mitigates against the possibility that the examiners – for whatever reason – have set peculiarly hard (or easy) examination papers. This assists as a check of fairness of the classification and as a guide to examiners for subsequent years. If evidence exists that, for example, an examiner has set a particularly difficult paper then they are obliged to define a revised marking scheme and remark all the scripts before the classification meeting. This acts as an excellent incentive to think hard when setting exam questions and when preparing a marks scheme.
3. In some papers there was evidence of a large variation in the relative level of difficulty of the questions (as based on the students' marks and, more obviously, the relative numbers of students attempting the different questions).

The presence of large variations in difficulty is unfair to candidates where they have a choice of question, and so I would recommend that the examiners consider reviewing the marks distributions per question within papers **as a matter of course**. This might not only help ensure fairness for the students but could incentivise the proper setting of exam questions and help inform novice examiners as to how to set questions of a uniform level of difficulty. I am sure that introducing this level of scrutiny in the future would be of benefit.

4. In a few papers papers (e.g. Maths 1 and Maths 2) the marks distributions of candidates were very unusual: the distributions were peaked at 1st class and then fell quasi-monotonically towards fails. This suggests that the level of difficulty of the papers had not been well matched to the class ability. This identical issue was mentioned last year, but this year the proportion of candidates scoring a 1st class mark was even higher. This may have reflected an even stronger student cohort this year, but whatever the reason, I would **urge** that a review of the overall student performances (**taking place as part of the marking itself**) is used to inform the examiners and question setters of each module in subsequent years.
5. In some re-papers there appears to have been a tendency for some examiners to wish to re-use questions that had originally appeared only a few years ago. This is probably not a sensible practice and should be discouraged.

I hope that the examining team and those involved in teaching administration might consider these reflections and how these might be incorporated into the examinations practice next year, so as to improve things and bring them to an excellent level.

Finally, may I take this opportunity to thank everyone who I have interacted with as an External Examiner, especially and their administrative teams, who went out of their way to assist me at all stages of the process. I am very grateful to both their advice and hospitality, which made the whole exercise a very pleasant and enlightening one.

Yours truly,

27 October 2014

Dear

Thank you very much for your examiner's report, which was discussed at the School's Taught Student Education Committee meeting on October 15. We are pleased that your overall impressions of our examination procedure are favourable.

However, we do note your comments and suggestions for changes, and your report as well as this response will be made available to all our examiners. The points that you have raised will be fully discussed in the School.

In particular, your comment (point 14) about the relatively large contribution of the supervisor's assessment to the project or dissertation mark has already been raised, and we will revisit this point in the next few meetings to explore the possibility of changing this by increasing the assessor's contribution at the expense of the supervisor's. As you are aware, this point was also raised by the second examiner,

The other important point (Other Comments, 3 and 4) that was brought up at the meeting of October 15 was the need to ensure that more challenging questions were set to prevent a mark distribution that is skewed towards the upper end of the scale. We will make efforts to correct this.

I apologise for the lack of adequate ventilation in the room in which the scripts and other material were laid out. We are taking steps to have this room and a few others like it fitted with windows that open.

In response to your initial, overall assessment of the entire three-year period as external examiner we acknowledge that there has been an unacceptably large number of typographical errors and other mistakes in our examination procedure during the past few years. We have been working on establishing more robust checking procedures to ameliorate the situation, and appreciate your patience during this time.

On behalf of everyone in the School I would like to thank you for your efforts over the past three years. We all feel that you have made an invaluable contribution towards improving our examinations procedures and standards.

I look forward to welcoming you to the School again on some future occasion

Best wishes

Head of School

The University of Leeds

EXTERNAL EXAMINER'S REPORT

ACADEMIC YEAR: 2013– 2014

Part A: General Information**Subject area and awards being examined**

Faculty / School of:	Physics and Astronomy
Subject(s):	<i>Physics</i>
Programme(s) / Module(s):	Physics, Physics with Astrophysics, Physics with Nanotechnology, Theoretical Physics. Medical Physics
Awards (e.g. BA/BSc/MSc etc):	BSc, MPhys

Name and home Institution / affiliation of Examiner**Completed report**

The completed report should be attached to an e-mail and sent as soon as possible, and no later than six weeks after the relevant meeting of the Board of Examiners, to exexadmin@leeds.ac.uk.

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Room 12:81, EC Stoner Building
The University of Leeds, Leeds LS2 9JT

Part B: Comments for the Institution on the Examination Process and Standards**Matters for Urgent Attention**

If there are any areas which you think require urgent attention before the programme is offered again please note them in this box

None.

Only applicable in first year of appointment

Were you provided with copies of previous relevant External Examiners' reports and the response of the School to these?

Yes.

For Examiners completing their term of appointment

Please comment on your experience of the programme(s) over the period of your appointment, remarking in particular on changes from year to year and the progressive development and enhancement of the learning and teaching provision, on standards achieved, on marking and assessment and the procedures of the School

N/A

Standards

1. Please indicate the extent to which the programme Aims and Intended Learning Outcomes (ILOs) were commensurate with the level of the award

- *The appropriateness of the Intended Learning Outcomes for the programme(s)/modules and of the structure and content of the programme(s);*
- *The extent to which standards are appropriate for the award or award element under consideration.*

The various degree schemes cover a broad range of undergraduate physics. The Aims and ILOs are appropriate and commensurate with the awarded BSc and MPhys degrees.

2. Did the Aims and ILOs meet the expectations of the national subject benchmark (where relevant)?

- *The comparability of the programme(s) with similar programme(s) at other institutions and against national benchmarks and the Framework for Higher Education Qualifications.*

The Aims and ILOs are comparable with those at <> where I have been teaching for 25 years. The difficulty of examination papers and student performance are broadly similar to those at <>. The courses are accredited by the Institute of Physics.

3. Please comment on the assessment methods and the appropriateness of these to the ILOs

- *The design and structure of the assessment methods, and the arrangements for the marking of modules and the classification of awards;*
- *The quality of teaching, learning and assessment methods that may be indicated by student performance.*

The assessment methods are appropriate in terms of balance between course work and examination and in terms of examination paper structure with sections A and B to probe breadth and depth. Marking procedures were appropriate and the classification of awards was fine. Student performance was in line with my expectations based on experience at my home university.

4. Were students given adequate opportunity to demonstrate their achievement of the Aims and ILOs?

- *The academic standards demonstrated by the students and, where possible, their performance in relation to students on comparable courses;*
- *The strengths and weaknesses of the students as a cohort.*

The examination papers were appropriate and fairly effective at probing the students' understanding and ILOs. The section A and B structure is a helpful one in this regard. Final year projects in both BSc and MPhys covered a wide range of topics: some of the reports were of an extremely high standard.

5. For Examiners responsible for programmes that include clinical practice components, please comment on the learning and assessment of practice components of the curriculum

N/A

6. Please comment on the nature and effectiveness of enhancements to the programme(s) and modules since the previous year

It would be particularly helpful if you could also identify areas of good practice which are worthy of wider dissemination.

I am not aware of the exact changes made – unable to comment in an informed manner during my first year as external examiner.

7. Please comment on the influence of research on the curriculum and learning and teaching

This may include examples of curriculum design informed by current research in the subject; practice informed by research; students undertaking research.

I observe connections between research strengths and some of the taught modules. In my area of expertise relating to nanotechnology and biophysics, there is a strong synergy between teaching and research, which is to be applauded.

8. Where the programme forms part of an Integrated PhD, please comment on the appropriateness of the programme as training for a PhD

N/A

For Examiners involved in mentoring arrangements

9. If you have acted as a mentor to a new External Examiner or have received mentor support please comment here on the arrangements

<> has been helpful in making <> available for consultation throughout the year. Due to practical constraints, we were both at Leeds at different times which was unfortunate, but unavoidable, in us not meeting.

The Examination/Assessment Process

10. The University and its Schools provide guidance for External Examiners as to their roles, powers and responsibilities. Please indicate whether this material was sufficient for you to act effectively as an External Examiner.

Whether External Examiners have sufficient access to the material needed to make the required judgements and whether they are encouraged to request additional information.

Yes, the guidance was fine.

11. Did you receive appropriate documentation relating to the programmes and/or parts of programmes for which you have responsibility, e.g. programme specifications or module handbooks, marking criteria?

The coherence of the policies and procedures relating to External Examiners and whether they match the explicit roles they are asked to perform.

Yes. <> and colleagues were very helpful in providing information efficiently on request. Graphical representation of the distribution of marks for each module would be helpful.

12. Were you provided with all draft examination papers/assessments? Was the nature and level of the questions appropriate? If not, were suitable arrangements made to consider your comments?

Yes, I was provided with draft examination papers. The level of questions was appropriate in nearly all papers, very few requiring any adjustment.

A small minority of papers displayed a slightly higher level of typographical errors and minor issues of formatting than I am familiar with at <>.

It would be helpful to be able to see clearly during visits whether suggested changes had been implemented. There is no need for these to be supplied during term-time as exam are being prepared. However, these comments and responses should be available for each module with the papers and student scripts during visits related to exam boards in June.

13. Was sufficient assessed / examined work made available to enable you to have confidence in your evaluation of the standard of student work? Were the scripts clearly marked/annotated?

Yes, all papers were made available. I had the time to check a fair number of papers during my visit. Everything seemed to be done well and in an orderly manner.

14. Was the choice of subjects for dissertations appropriate? Was the method and standard of assessment appropriate?

There was an impressively wide range of final year projects/dissertations. Assessment was generally appropriate.

One question I have raised with the School is the supervisor's contribution to the final project mark for years 3 and 4: a relative weighting of 45%, for a module that contributes a large proportion of a student's mark for the year, seems to me to be rather high. The school might consider allocating 20% of the project mark for the viva and 20-25% for the supervisor's assessment rather than the current 10%-45% split.

[I noted three examples for year 4 projects where the assessor's mark for the report varied from that of the supervisor by 10% or more – in each case, the supervisor's mark was the higher. In such cases, might it be appropriate to ask a third person's view and take an average of the three marks?]

15. Were the administrative arrangements satisfactory for the whole process, including the operation of the Board of Examiners? Were you able to attend the meeting? Were you satisfied with the recommendations of the Board?

Overall administrative arrangements were very good, overseen by well-motivated and dedicated staff. I was not able to attend the exam board due to my own time constraints.

16. Were appropriate procedures in place to give due consideration to mitigating circumstances and medical evidence?

Yes.

Other comments

Please use this box if you wish to make any further comments not covered elsewhere on the form

None.

27 October 2014

Dear

Thank you very much for your examiner's report, which was discussed at the School's Taught Student Education Committee meeting on October 15. We are very pleased that you consider that our assessment methods and standards are appropriate.

Regarding your specific comments, the question of the relative weighting of the supervisor's and assessor's contributions to the project mark (point 14) was raised at the above meeting, and we will discuss the possibility of shifting the balance towards the assessor in the next few meetings.

We also acknowledge that there were a regrettably many typographical errors in some of the exam papers this year. We are taking steps to rectify this by a more rigorous checking procedure.

We would like to thank you for your efforts to maintain and improve the standards of our assessment process, and look forward to working with you to this end over the next few years.

Best wishes,

Head of School