

Examiner's Details	
Full name and title	Dr Timo Betcke
Home institution or other affiliation	University College London
Degree being examined (e.g. BSc/GEP/MBBS/MEng/MSc/MRes)	Bsc
Subject and part being examined (e.g. Biology)	Mathematics
Year of Tenure	3

*** If this is your final year of office please ensure you complete the final section of this report.**

1. Programme Information/support for External Examiner Role

1(a)	Programme/Module Information Please confirm if the following was provided to you (either sent directly or through a publication site link)	
(i)	Programme handbook(s) / programme specification including programme learning outcomes?	Yes/All
(ii)	Syllabus or module descriptors including learning outcomes?	Yes/All
(iii)	Assessment briefs / marking criteria	Yes/All
(iv)	Sufficient information about the programme(s) / modules in order to fulfil your role?	Yes/All
The department provides very good information on the marking schemes.		
(v)	Is there any additional documentation/ information that you would have benefited from receiving?	No

New External Examiners only

1(b)	College Induction and Appointment Process Please answer the following questions with regards to the College appointment and induction process	
(i)	Did you find the appointment process fit for purpose?	N/A
(ii)	Was the appointment made in a timely manner?	N/A
(iii)	Do you consider that the arrangements for the Induction day were sufficient?	N/A
(iv)	Did you find the follow-up information useful?	N/A
(v)	Was the department process to provide an induction to the programme and specific requirements of your role effective?	N/A
(vi)	Following completion of your first year of tenure, is there any additional	N/A

	information/ support that you feel would be beneficial to provide at induction in future?	

Q1: Department response

No response required.

2. Programme/Curriculum Design

2(a)	Overall programme design and coherence Please comment on the strengths and weaknesses of the programme design in relation to:
(i)	The balance and content of the degree programme(s) in relation to stated learning outcomes; The Mathematics Undergraduate Programme at Imperial has a wide selection of suitable modules, in particular in later years. I am very happy that the department continues to invest in continuous assessment driven modules for higher years.
(ii)	Coherence and currency of the programme(s) and the appropriateness of compulsory modules/units in relation to stated learning outcomes; The compulsory training at Imperial is exemplary. Student get a state-of-the art training at the highest international level.
(iii)	Suitability of the programme design in relation to the relevant subject benchmarks/ Professional Statutory Regulatory Body (PSRB) or Accrediting Body requirements (where applicable); No comment here.
(iv)	Where applicable, the relevance and integration of placements¹ to the overall programme and its contribution to the programme learning outcomes; No comment here.

2(b)	Assessment Strategy Please comment on the strengths and weaknesses of the assessment strategy in relation to:
(i)	The rigour, appropriateness and overall quality of the methods of assessment (unseen written papers, essays/dissertations, orals, clinical examinations) in relation to the level of study and the intended learning outcomes; Most of the assessment is done through written examinations. Apart from minor exceptions the exams were well balanced and reflected the strength of the undergraduate Mathematics students at Imperial. Some exams seemed slightly easier as compared with previous years. One issue certainly was the strike. However, there was no adverse effect from this on the overall mark distributions, and scaling was limited.
(ii)	The balance and comparability of assessment methods across modules of the same level;

¹ Placements are any provision taken away from the direct College environment and may include: Year abroad, year in industry, modules studied at other approved HEIs (collaborative modules), or any other periods away from the College as part of an approved study plan.

Modules are mostly well calibrated. An issue as with previous years are the continuous assessment based modules whose average is consistently significantly better than exam based modules. This matters in borderline cases and can skew the perceived performance of students.

(iii) The suitability of the overall assessment load for the programme(s);

The overall assessment load is appropriate for a top international undergraduate programme.

Q2: Department response

We thank the External for the positive comments in 2(a).

2(b)(i): we note that exam-setters were asked to design assessments so that they would require less scaling than in previous years. In particular, the amount of standard material in papers should have been increased somewhat. We do nevertheless continue to expect that, at the top end, papers should be as challenging as in previous years.

2(b)(ii) The Department agrees that ensuring comparability of assessment of modules with no exams is, in several cases, an issue. Lecturers on these modules will be asked to ensure that their assessments and marking schemes produce mark distributions which are more in line with those on modules with exams. There are some project modules which produce such outcomes and we will use these as exemplars of good practice.

3. Assessment Process, Marking and Moderation

3(a)	Drafting of Assessment	
(i)	Did you receive all of the necessary draft assessments for comment / approval?	Yes/All
(ii)	Were the nature and level of the questions (or tasks) appropriate?	Yes/All
(iii)	Were suitable arrangements in place to consider your comments on the draft assessments?	Yes/All
(iv)	Did you receive feedback on your comments?	Yes/All

3(b)	Marking and Moderation of scripts (Examination, assessed coursework, dissertation/project reports)	
(i)	Did you receive a sufficient number of scripts and other assessed work, including those of first class, distinction, borderline and failed candidates, for scrutiny?	Yes/All
(ii)	Was the general standard and consistency of marking appropriate?	Yes/All
(iii)	Was there evidence that assessed work had been moderated internally, either through check marking or second marking?	Yes/All
(iv)	Were the scripts marked in such a way as to enable you to see the reasons for the award of given marks?	Yes/All

3(c)	In relation to Practical Examinations	
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(i)	Were satisfactory arrangements made for the conduct of practical examinations?	Yes/All
(ii)	Was the general standard and consistency of marking appropriate?	No/None
As already mentioned above, continuous assessment modules were consistently marked higher than exam based assessments.		

3(d)	In relation to Oral Assessments (including Viva Voce Examinations)	
(i)	Were satisfactory arrangements made for the conduct of oral assessments (e.g. presentations, poster presentations etc...)?	N/A
(ii)	Were suitable arrangements made for you to conduct viva voce examinations?	N/A
(iii)	Was the purpose for conducting a viva voce examination and the criteria for selecting candidates for a viva voce clear?	N/A
(iv)	Was the assessment of such work appropriate and consistent?	N/A

3(e)	Please comment on the assessment process, marking and moderation in relation to:
(i)	The suitability of marking schemes / marking criteria and, where appropriate, model answers and the consistency with which these were applied;
Marking schemes and criteria were well laid out and consistent.	
(ii)	The suitability of the procedures for marking and moderation and the consistency with which these were applied;
Imperial Mathematics has an established scaling system that is consistent and well explained.	
(iii)	Whether the grade boundaries for the assessment are set at the appropriate level and applied consistently;
No issues	
(iv)	The extent to which the assessment process measures student achievement rigorously and fairly against the intended outcomes of the programme(s) and is conducted in line with College policies and regulations
The Mathematics Department has taken measures to distinguish better within each question between different achievement levels of students, and in line with the strong international reputation of the department. This is a step in the right direction and will further reduce the need for scaling in the future.	

3(f)	Programme content which has been delivered and assessed by another institution (this would cover 1) placement activity, e.g. some or all of an undergraduate year abroad study plan, and 2) modules undertaken at local partner institutions, i.e. what are termed collaborative modules).	
(i)	Was it clear in advance of the Board that students under consideration had	Yes/All

	undertaken content away from the College?	
(ii)	Were the procedures for incorporating marks obtained by students at another institution clear and consistently applied?	Most/Usually
(iii)	Was any such provision discussed at the Board of Examiners, particularly in relation to progression/award decisions, overall value and consistency with regards to the programme(s) of study?	Yes/All

One student was discussed who spent a year abroad, and in that year scored significantly lower than he did at Imperial in other years. The corresponding year abroad was subsequently zero-weighted in the overall marks of the student. This is an appropriate step. However, it would be good in the Department to have discussions over how to fairly translate marks from an overseas institution that may have a higher level, to Imperial, without penalising the marks of the student and using exceptional rules in the exam board.

Q3: Department response

We thank the External for the positive comments here and the support for the changes we have introduced recently.

3(c): please see the response to 2(b)(ii).

3(f): The Department has a process for converting marks from each of its overseas partners. This is available to students and Examiners. The Department's Teaching Committee is in the process of re-calibrating the conversion and the new method will come into effect in 2018-19.

4. Board of Examiners

4(a)	Board of Examiners' Meeting	
(i)	Were you invited to attend the meeting?	Yes
(ii)	Were you able to attend the meeting?	Yes
(iii)	Was the meeting conducted to your satisfaction?	Yes
(iv)	Were you satisfied with the recommendations of the Board of Examiners?	Yes

The main board of examiners meeting was organised smoothly. There was an issue though with the pre-meeting for progression. Many of the progression recommendations (PP, PT, etc.) were wrong. This should not have happened, and points to internal IT issues, as an automated system would have printed the correct suggestions. The progression decisions were deferred to a corresponding subpanel in order to allow time to correct the progressions.

4(b)	Please comment on the following aspect related to Boards of Examiners' Meetings:	
(i)	Whether the arrangements for degree classification (e.g. the scheme for the award of honours [UG] / scheme for the award of pass, merit or distinction [PG] – whichever is relevant) are set at the appropriate level and applied consistently.	

A recurring problem are borderline cases. The Mathematics Department considers each borderline case individually. I am not convinced by this approach and think that formalisms similar to other universities should be trialled to make the process more transparent.

(ii)	Whether the College procedures governing mitigating circumstances and/or academic misconduct (e.g. plagiarism cases) were considered and applied fairly and equitably to all students.
Mitigating circumstances were well explained and incorporated in the decision making.	
(iii)	Whether the consideration of borderline performances was conducted fairly and equitably, and in line with College Procedures.
See above.	

Q4: Department response

4(a): The Department acknowledges that there were IT issues which resulted in some errors in progression codes at the pre-Board (though not in the marks presented). This is definitely being looked into and the format of the pre-Board is being re-considered.

4(b)(i): The Board usually takes into account a number of factors when deciding whether or not to promote a borderline candidate to a higher class. Particular weight is given to the views of External Examiners, who will have spent time reviewing the candidate's mark profile and scripts. Given the difficulties in ensuring complete comparability of marks across a very large number of modules, such as those mentioned by the External, distributions of marks in the individual modules taken by a borderline student can also be taken into consideration, together with standard indicators such as number of modules in a particular class. There is some degree of collective memory which aims for consistency with decisions in previous years, but we take the point that this could be documented better (for example by recording marks and profiles at class boundaries from previous years). We know that a more algorithmic approach to promoting borderline students is taken in some other institutions, but we have serious concerns about the fairness of such approaches in a programme which allows so much student choice in the final year(s).

5. Academic Standards

5	Please comment on academic standards and student achievement with regard to:
(i)	The appropriateness of the standards set for the awards in relation to the Framework for Higher Education Qualifications, national subject benchmarks and any additional Professional, Statutory and Regulatory Body (PSRB) or accrediting body requirements (where relevant);
The academic standards at Imperial Mathematics are among the best in the world, as remarked in previous years.	
(ii)	The standards of student performance in the programme(s) or parts of programmes and whether these are comparable with standards achieved by students on similar programmes or parts of programmes in other UK higher education institutions of which you have experience;
I am astonished each year by the high standards of the students. Some of the exams are very hard. Yet, the students are trained exceptionally well to cope with demanding questions.	
(iii)	The extent to which the academic standards and standards of student performance across modules within the programme(s) are comparable;
Academic standards and student standards are well calibrated.	
(iv)	For external examiners <u>not</u> in their first year of appointment – are the standards of student performance across modules within the programme(s) comparable to those in previous cohorts;
Yes. I did not notice a drop-off.	

Q5: Department response

We thank the External for these very positive comments on standards.

6. Response to previous year's External Examiner Report

6.	Response to previous year's report	
(i)	Did you receive the formal written response from the department to the previous year's External Examiner report²?	Yes
(ii)	Are you satisfied that the issues raised in the previous report either have been, or are being, addressed?	Yes

Q6: Department response

No response required.

7. Overview Comments, Recommendations and Good Practice

Please provide an overview of your assessment of the programme(s) and modules for which you are responsible as External Examiner. Please identify any specific matters relating to the academic standards of the awards and/or the quality of learning opportunities provided to students that should be addressed. Please also highlight any examples of good and/or innovative practice that you consider to be worthy of wider dissemination within the College.

7a.	Recommendations / Suggestions for Enhancement
Overall, the programme is in good shape. I suggest to make a number of modules based on continuous assessment mandatory. This would solve the problem that students in these modules typically receive better marks than in exams as everybody would have to take such a module. It would also go some way to introducing more project based work into the undergraduate programme.	
7b.	Examples of good and/or innovative practice in learning, teaching and assessment
The introduction of modules based on continuous assessment is a good step forward. One could think about more project oriented modules, such as literature projects, student lead seminars, etc. Some of this (literature projects) is done, but I believe at the moment only as a voluntary component.	
7c.	Overview Comments
See comments in 7a and 7b.	

² i.e. completed copy of the report template sent on by the Quality Assurance Team on behalf of the department.

Q7: Department Response

These are interesting ideas which we will certainly consider as part of our Curriculum Review. There are already a number of seminar-style modules on offer, but currently these have low uptake and introducing them more widely would require discussion with the students. There are some specialisms (such as computing options) where assessment by project work is perhaps more suitable and so one would expect students who want to specialise in such topics to want to take more of these modules than other students. So we would still need to ensure good mark distributions in these types of assessment.

8. For Examiners final year in office only: Final Exit Report

8	Please provide an overview of your term of office. This should ideally include comment on any changes in standards of student performance over time, major developments in the provision during your tenure, the implementation of any recommendations for enhancement (this is not an exhaustive list and examiners are welcome to comment on any matters they consider appropriate)
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Q8: Department Response

n/a

9. Overall Confidence statement

The independent views of our External Examiners form an important part of the annual reporting of the maintenance of standards and judgement of the governing body.

Please complete the following section with regards to the module(s)/programme(s) of study to which this report relates. Where you are unable to say 'Yes', commentary must be provided in the comments box below.

(i)	The degree awarding body is maintaining the threshold academic standards set for its awards in accordance with the FHEQ and relevant Subject Benchmarks Statements.	Yes
(ii)	The assessment process measures student achievement rigorously and fairly against the intended learning outcomes of the programme(s) and is conducted in line with the College's policies and regulations	Yes
(iii)	The academic standards and the achievements of students are comparable with those in other UK degree-awarding bodies of which you have experience	Yes

External Examiner Signature (an electronic or typed signature is acceptable):	T Betcher
Date of submission:	02/07/2018

Internal Use Only

Name and title of Department Respondent	Professor David Evans
Position:	<i>Director of Undergraduate Studies, Mathematics</i>
Date:	24/09/2018

Introduction

Your report is an important and integral part of the quality assurance of the programmes of study at the College and acts as an institutional record of the effective completion of the assessment process and the maintenance of academic standards of its awards. The report template, based on the indicators and guidance in the QAA Quality Code, will ask you to comment on the standards and comparability of the provision, good and/or innovative practice and suggestions for further enhancement where appropriate.

This report form can also be accessed electronically at the [external examining webpage](#). Should you require any further information or you have any queries, please contact the Registry Quality Assurance team: external.examiner@imperial.ac.uk or 0207 594 8993.

Completing the Report

1. The report template asks you to address specific questions (with a range of stated responses from “Yes/Always” to “No/Never”, with the opportunity to provide any qualifying/explanatory comments) and also asks a series of questions to which the College would like to receive more detailed written feedback/commentary. You are asked to comment fully under each of the headings, particularly where there are negative responses to any of the questions.
2. Your feedback will influence how the Department develops its programmes. To assist the College and the Department, please ensure that your report contains clear feedback. One word or one sentence responses throughout the report will not provide the Department with sufficient information to enable them to further enhance the programme(s).
3. In line with the expectations of the Quality Code, external examiners’ reports will be shared with staff, students and student representatives and may be disclosed in response to requests made under the Freedom of Information Act. Reports will also be shared with professional, statutory and regulatory bodies and the Quality Assurance Agency upon request. **Therefore there should be no identifiable reference to individual members of staff or students (either by use of name or student ID number) in the report to ensure that appropriate confidentiality is maintained.** The College may also, on occasion, use anonymous extracts from your annual report in promotional material.
4. In addition to maintaining confidentiality by refraining from using names or any other identifier, examiners are requested not to provide significant details about specific assessment tasks.
5. Examiners are reminded that where they have a serious concern they should follow the procedure available from the [website](#). They may make a separate confidential serious concerns report directly to the Provost on any matter of serious concern in addition to their annual report. A ‘Serious Concerns Report’ template for this purpose is available to download from the external examiner website at the link shown above. Please be assured that this report is confidential.

Report Submission

6. Completed reports should be returned within one month of the final meeting of the Board of Examiners, at the latest by **21 Aug 18 for undergraduate programmes** or **1 Feb 19 for postgraduate programmes**.
7. The report should be returned electronically, as an e-mail attachment and in MS Word format, to the Registry Quality Assurance team at: external.examiner@imperial.ac.uk
8. Payment of your annual fee for external examining duties will only be processed upon receipt of a satisfactorily completed report.

Report Dissemination

9. The College greatly values the feedback provided by its external examiners in their annual reports. Please note that a sample of reports across the provision are personally read by the Vice Provost (Education).
10. The Registry Quality Assurance team will ensure that the report is considered by the appropriate Departmental staff. Departmental staff will be expected to provide a formal response to the feedback/comments in your report and this will be circulated to you at the earliest opportunity.
11. In addition to the department review of the report, the Quality Assurance team undertake analysis of all reports to identify any themes arising, make recommendations for College-wide improvements to process or procedures, or to disseminate best practice.

Examiner's Details	
Full name and title	Dr Mark Blyth
Home institution or other affiliation	University of East Anglia
Degree being examined (e.g. BSc/GEP/MBBS/MEng/MSc/MRes)	Ancillary Mathematics for Engineering
Subject and part being examined (e.g. Biology)	Mathematics
Year of Tenure	5*

* If this is your final year of office please ensure you complete the final section of this report.

1. Programme Information/support for External Examiner Role

1(a)	Programme/Module Information Please confirm if the following was provided to you (either sent directly or through a publication site link)	
(i)	Programme handbook(s) / programme specification including programme learning outcomes?	Yes/All
(ii)	Syllabus or module descriptors including learning outcomes?	Yes/All
(iii)	Assessment briefs / marking criteria	Yes/All
(iv)	Sufficient information about the programme(s) / modules in order to fulfil your role?	Yes/All
(v)	Is there any additional documentation/ information that you would have benefited from receiving?	No

New External Examiners only

1(b)	College Induction and Appointment Process Please answer the following questions with regards to the College appointment and induction process	
(i)	Did you find the appointment process fit for purpose?	N/A
(ii)	Was the appointment made in a timely manner?	N/A
(iii)	Do you consider that the arrangements for the Induction day were sufficient?	N/A
(iv)	Did you find the follow-up information useful?	N/A
(v)	Was the department process to provide an induction to the programme and specific requirements of your role effective?	N/A
(vi)	Following completion of your first year of tenure, is there any additional	N/A

	information/ support that you feel would be beneficial to provide at induction in future?	

Q1: Department response

(No response required.)

2. Programme/Curriculum Design

2(a)	Overall programme design and coherence Please comment on the strengths and weaknesses of the programme design in relation to:
(i)	The balance and content of the degree programme(s) in relation to stated learning outcomes; N/A
(ii)	Coherence and currency of the programme(s) and the appropriateness of compulsory modules/units in relation to stated learning outcomes; N/A
(iii)	Suitability of the programme design in relation to the relevant subject benchmarks/ Professional Statutory Regulatory Body (PSRB) or Accrediting Body requirements (where applicable); N/A
(iv)	Where applicable, the relevance and integration of placements¹ to the overall programme and its contribution to the programme learning outcomes; N/A
2(b)	Assessment Strategy Please comment on the strengths and weaknesses of the assessment strategy in relation to:
(i)	The rigour, appropriateness and overall quality of the methods of assessment (unseen written papers, essays/dissertations, orals, clinical examinations) in relation to the level of study and the intended learning outcomes; All fine.
(ii)	The balance and comparability of assessment methods across modules of the same level; N/A
(iii)	The suitability of the overall assessment load for the programme(s); N/A

¹ Placements are any provision taken away from the direct College environment and may include: Year abroad, year in industry, modules studied at other approved HEIs (collaborative modules), or any other periods away from the College as part of an approved study plan.

Q2: Department response

(No response required.)

3. Assessment Process, Marking and Moderation

3(a)	Drafting of Assessment	
(i)	Did you receive all of the necessary draft assessments for comment / approval?	Yes/All
(ii)	Were the nature and level of the questions (or tasks) appropriate?	Yes/All
(iii)	Were suitable arrangements in place to consider your comments on the draft assessments?	Yes/All
(iv)	Did you receive feedback on your comments?	Yes/All

3(b)	Marking and Moderation of scripts (Examination, assessed coursework, dissertation/project reports)	
(i)	Did you receive a sufficient number of scripts and other assessed work, including those of first class, distinction, borderline and failed candidates, for scrutiny?	Yes/All
(ii)	Was the general standard and consistency of marking appropriate?	Most/Usually
(iii)	Was there evidence that assessed work had been moderated internally, either through check marking or second marking?	Yes/All
(iv)	Were the scripts marked in such a way as to enable you to see the reasons for the award of given marks?	Yes/All

I picked up an instance in ME3-HMTH where a near-borderline candidate had given a correct response to parts of a question, and had been awarded zero by the marker (the checker did not notice). A correction was agreed by myself and the marker.

For AE34-10 the papers had clearly been checked with exceptional care, and I would like to commend the checker for this.

3(c)	In relation to Practical Examinations	
(i)	Were satisfactory arrangements made for the conduct of practical examinations?	N/A
(ii)	Was the general standard and consistency of marking appropriate?	N/A

3(d)	In relation to Oral Assessments (including Viva Voce Examinations)	
(i)	Were satisfactory arrangements made for the conduct of oral assessments (e.g. presentations, poster presentations etc...)?	N/A

(ii)	Were suitable arrangements made for you to conduct viva voce examinations?	N/A
(iii)	Was the purpose for conducting a viva voce examination and the criteria for selecting candidates for a viva voce clear?	N/A
(iv)	Was the assessment of such work appropriate and consistent?	N/A

3(e)	Please comment on the assessment process, marking and moderation in relation to:	
(i)	The suitability of marking schemes / marking criteria and, where appropriate, model answers and the consistency with which these were applied;	
All fine and appropriate.		
(ii)	The suitability of the procedures for marking and moderation and the consistency with which these were applied;	
Again, all fine and the procedures applied with a high degree of consistency.		
(iii)	Whether the grade boundaries for the assessment are set at the appropriate level and applied consistently;	
These are standard and appropriate.		
(iv)	The extent to which the assessment process measures student achievement rigorously and fairly against the intended outcomes of the programme(s) and is conducted in line with College policies and regulations	
Fine.		

3(f)	Programme content which has been delivered and assessed by another institution (this would cover 1) placement activity, e.g. some or all of an undergraduate year abroad study plan, and 2) modules undertaken at local partner institutions, i.e. what are termed collaborative modules).	
(i)	Was it clear in advance of the Board that students under consideration had undertaken content away from the College?	N/A
(ii)	Were the procedures for incorporating marks obtained by students at another institution clear and consistently applied?	N/A
(iii)	Was any such provision discussed at the Board of Examiners, particularly in relation to progression/award decisions, overall value and consistency with regards to the programme(s) of study?	N/A

Q3: Department response

Dr Blyth's diligence in checking the borderline scripts, and hence identifying one in which marks were missed, is very much appreciated. First-markers (i.e., lecturers) are instructed to look particularly carefully at exams for which the mark is close to the borderline, and the incoming director of ancillary teaching will be made aware of this. That said, the fact that this issue was identified is a strong vindication of the redundant assessment system that is in place (and in which the external examiner plays an important role).

4. Board of Examiners

4(a)	Board of Examiners' Meeting	
(i)	Were you invited to attend the meeting?	Yes
(ii)	Were you able to attend the meeting?	Yes
(iii)	Was the meeting conducted to your satisfaction?	Yes
(iv)	Were you satisfied with the recommendations of the Board of Examiners?	Yes
The meeting itself and the organisation beforehand were very ably handled by Daniel Mortlock, and I would like to thank him for making the processes transparent.		

4(b)	Please comment on the following aspect related to Boards of Examiners' Meetings:
(i)	Whether the arrangements for degree classification (e.g. the scheme for the award of honours [UG] / scheme for the award of pass, merit or distinction [PG] – whichever is relevant) are set at the appropriate level and applied consistently.
N/A	
(ii)	Whether the College procedures governing mitigating circumstances and/or academic misconduct (e.g. plagiarism cases) were considered and applied fairly and equitably to all students.
N/A	
(iii)	Whether the consideration of borderline performances was conducted fairly and equitably, and in line with College Procedures.
Fine.	

Q4: Department response

(No response required.)

5. Academic Standards

c. Academic Standards	
5	Please comment on academic standards and student achievement with regard to:
(i)	The appropriateness of the standards set for the awards in relation to the Framework for Higher Education Qualifications, national subject benchmarks and any additional Professional, Statutory and Regulatory Body (PSRB) or accrediting body requirements (where relevant);
Absolutely fine.	

(ii)	The standards of student performance in the programme(s) or parts of programmes and whether these are comparable with standards achieved by students on similar programmes or parts of programmes in other UK higher education institutions of which you have experience;
Fine.	
(iii)	The extent to which the academic standards and standards of student performance across modules within the programme(s) are comparable;
N/A	
(iv)	For external examiners <u>not</u> in their first year of appointment – are the standards of student performance across modules within the programme(s) comparable to those in previous cohorts;
Yes. This year the average for AE34-10 was a touch on the high side and this is something to keep an eye on.	

Q5: Department response

The high average mark for AE3-410 is something the lecturer is aware of and he will take particular care in setting the 2018-2019 exam to ensure all questions have suitable marks attached to more advanced/unseen material.

6. Response to previous year's External Examiner Report

6.	Response to previous year's report	
(i)	Did you receive the formal written response from the department to the previous year's External Examiner report ² ?	Yes
(ii)	Are you satisfied that the issues raised in the previous report either have been, or are being, addressed?	Yes

Q6: Department response

(No response required.)

7. Overview Comments, Recommendations and Good Practice

Please provide an overview of your assessment of the programme(s) and modules for which you are responsible as External Examiner. Please identify any specific matters relating to the academic standards of the awards and/or the quality of learning opportunities provided to students that should be addressed. Please also highlight any examples of good and/or innovative practice that you consider to be worthy of wider dissemination within the College.

7a.	Recommendations / Suggestions for Enhancement
I looked at two papers: ME3-HMTH and AE34-10. Both contain appropriate material and questions are set on the examination at the appropriate level, and this has been the case throughout my tenure. The students in generally perform well. These look to be well functioning modules.	

² i.e. completed copy of the report template sent on by the Quality Assurance Team on behalf of the department.

7b.	Examples of good and/or innovative practice in learning, teaching and assessment

7c.	Overview Comments

Q7: Department Response

(No response required.)

8. For Examiners final year in office only: Final Exit Report

8	Please provide an overview of your term of office. This should ideally include comment on any changes in standards of student performance over time, major developments in the provision during your tenure, the implementation of any recommendations for enhancement (this is not an exhaustive list and examiners are welcome to comment on any matters they consider appropriate)
The main development during my tenure has been the reduction in the number of papers to look at each year. I understand that the decision has been taken to dissolve this board and subsume it into the main Mathematics examination board and this seems very sensible. Over the five years I have acted as External for this board, I have seen a high level of consistency from year to year in student performance. Where issues have arisen, steps have been taken to address them. I am entirely happy with the assessment methods for the modules I have looked at, and would like to commend all of those involved for their efforts and thank them for their helpfulness and cooperation during my tenure, in particular both of the chairs of the board – first Chris Ford and then Daniel Mortlock.	

Q8: Department Response

The Mathematics for Engineers exam board will not take place in the 2018-2019 academic year, and the ME3-HMTH and A3-410 modules overseen by Dr Blyth will, as he states, be covered by the main Mathematics exam board.

9. Overall Confidence statement

The independent views of our External Examiners form an important part of the annual reporting of the maintenance of standards and judgement of the governing body.

Please complete the following section with regards to the module(s)/programme(s) of study to which this report relates. Where you are unable to say 'Yes', commentary must be provided in the comments box below.

(i)	The degree awarding body is maintaining the threshold academic standards set for its awards in accordance with the FHEQ and relevant Subject Benchmarks Statements.	N/A
(ii)	The assessment process measures student achievement rigorously and fairly against the intended learning outcomes of the programme(s) and is conducted in line with the College's policies and regulations	Yes
(iii)	The academic standards and the achievements of students are comparable with those in other UK degree-awarding bodies of which you have experience	Yes

External Examiner Signature (an electronic or typed signature is acceptable):	M Blyth
Date of submission:	29/06/2018

Internal Use Only

Name and title of Department Respondent	Dr Daniel Mortlock, senior lecturer in Mathematics and Physics
Position:	<i>Mathematics Director of Ancillary Teaching</i>
Date:	05/09/2018

Read by Vice Provost (Education)		Date:	Click here to enter a date.
Comments			
Further action required by Department			

Response to Vice Provost Comments / Further Action:	
Date:	Click here to enter a date.

Examiner's Details	
Full name and title	Professor Anthony Carbery
Home institution or other affiliation	University of Edinburgh
Degree being examined (e.g. BSc/GEP/MBBS/MEng/MSc/MRes)	BSc/MSci Mathematics
Subject and part being examined (e.g. Biology)	Analysis and Geometry
Year of Tenure	3

* If this is your final year of office please ensure you complete the final section of this report.

1. Programme Information/support for External Examiner Role

1(a)	Programme/Module Information Please confirm if the following was provided to you (either sent directly or through a publication site link)	
(i)	Programme handbook(s) / programme specification including programme learning outcomes?	Yes/All
(ii)	Syllabus or module descriptors including learning outcomes?	Yes/All
(iii)	Assessment briefs / marking criteria	Yes/All
(iv)	Sufficient information about the programme(s) / modules in order to fulfil your role?	Yes/All
(v)	Is there any additional documentation/ information that you would have benefited from receiving?	No

New External Examiners only

1(b)	College Induction and Appointment Process Please answer the following questions with regards to the College appointment and induction process	
(i)	Did you find the appointment process fit for purpose?	N/A
(ii)	Was the appointment made in a timely manner?	N/A
(iii)	Do you consider that the arrangements for the Induction day were sufficient?	N/A
(iv)	Did you find the follow-up information useful?	N/A
(v)	Was the department process to provide an induction to the programme and specific requirements of your role effective?	N/A
(vi)	Following completion of your first year of tenure, is there any additional information/ support that you feel would be beneficial to provide at induction in future?	N/A

Q1: Department response

No response required

2. Programme/Curriculum Design

2(a)	Overall programme design and coherence Please comment on the strengths and weaknesses of the programme design in relation to:
(i)	The balance and content of the degree programme(s) in relation to stated learning outcomes;
This continues to be fine.	
(ii)	Coherence and currency of the programme(s) and the appropriateness of compulsory modules/units in relation to stated learning outcomes;
This also continues to be fine.	
(iii)	Suitability of the programme design in relation to the relevant subject benchmarks/ Professional Statutory Regulatory Body (PSRB) or Accrediting Body requirements (where applicable);
The design of the Imperial programme continues to elicit high expectations and standards in comparison with other institutions.	
(iv)	Where applicable, the relevance and integration of placements¹ to the overall programme and its contribution to the programme learning outcomes;
This topic was not specifically raised this year, but I am confident that placements continue to be handled with the same care and common sense that I have witnessed in the past.	
2(b)	Assessment Strategy Please comment on the strengths and weaknesses of the assessment strategy in relation to:
(i)	The rigour, appropriateness and overall quality of the methods of assessment (unseen written papers, essays/dissertations, orals, clinical examinations) in relation to the level of study and the intended learning outcomes;
With a small number of exceptions of which the department is aware, this is to be commended.	
(ii)	The balance and comparability of assessment methods across modules of the same level;
The PTEM scalings are now much more transparently organised and a good deal of care went into ensuring comparability of assessment across modules at the same level. The Project Moderation Board worked especially hard to ensure that the projects were considered en masse and that the marks awarded to individual projects were consistent across the board.	
(iii)	The suitability of the overall assessment load for the programme(s);
This is fine.	

¹ Placements are any provision taken away from the direct College environment and may include: Year abroad, year in industry, modules studied at other approved HEIs (collaborative modules), or any other periods away from the College as part of an approved study plan.

Q2: Department response

We thank the External for the comments on our standards in 2(a)(iii) and the remarks about PTEM scaling in 2(b)(ii). We are indeed aware of the issues alluded to in 2(b)(i) and will continue to try to do better in this regard (see comments later on).

3. Assessment Process, Marking and Moderation

3(a)	Drafting of Assessment	
	Did you receive all of the necessary draft assessments for comment / approval?	Yes/All
	Were the nature and level of the questions (or tasks) appropriate?	Most/Usually
	Were suitable arrangements in place to consider your comments on the draft assessments?	Yes/All
	Did you receive feedback on your comments?	Most/Usually

Not all staff involved in setting exams engaged in constructive feedback on my comments, but the vast majority did. (Giving this feedback important for closing the "loop of confidence" in the individual exam papers.) There is still some room for improvement in terms of the professionalism with which certain individual papers are prepared before being sent for me to review. Sometimes this could be achieved by slightly closer mentoring for junior members of staff; it is more difficult in the case of senior staff whose preparation leaves something to be desired.

3(b)	Marking and Moderation of scripts (Examination, assessed coursework, dissertation/project reports)	
(i)	Did you receive a sufficient number of scripts and other assessed work, including those of first class, distinction, borderline and failed candidates, for scrutiny?	Yes/All
(ii)	Was the general standard and consistency of marking appropriate?	Yes/All
(iii)	Was there evidence that assessed work had been moderated internally, either through check marking or second marking?	Yes/All
(iv)	Were the scripts marked in such a way as to enable you to see the reasons for the award of given marks?	Yes/All

I was particularly impressed with the fact that, when one course was not marked to the satisfaction of the course lecturer, immediate and effective steps were taken to remedy matters. This is an instance of internal quality control which is to be commended.

3(c)	In relation to Practical Examinations	
(i)	Were satisfactory arrangements made for the conduct of practical examinations?	N/A
(ii)	Was the general standard and consistency of marking appropriate?	N/A

3(d)	In relation to Oral Assessments (including Viva Voce Examinations)	
(i)	Were satisfactory arrangements made for the conduct of oral assessments (e.g. presentations, poster presentations etc...)?	N/A

(ii)	Were suitable arrangements made for you to conduct viva voce examinations?	N/A
(iii)	Was the purpose for conducting a viva voce examination and the criteria for selecting candidates for a viva voce clear?	N/A
(iv)	Was the assessment of such work appropriate and consistent?	N/A

3(e)	Please comment on the assessment process, marking and moderation in relation to:	
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(i)	The suitability of marking schemes / marking criteria and, where appropriate, model answers and the consistency with which these were applied;	
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With a small number of exceptions these were of very good or exemplary standard. See the comments to 3(a) above.

(ii)	The suitability of the procedures for marking and moderation and the consistency with which these were applied;	
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This continues to be fine.

(iii)	Whether the grade boundaries for the assessment are set at the appropriate level and applied consistently;	
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This has improved significantly in comparison with last year. See the comments in 2(b)(ii) above.

(iv)	The extent to which the assessment process measures student achievement rigorously and fairly against the intended outcomes of the programme(s) and is conducted in line with College policies and regulations	
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This continues to be fully achieved.

3(f)	Programme content which has been delivered and assessed by another institution (this would cover 1) placement activity, e.g. some or all of an undergraduate year abroad study plan, and 2) modules undertaken at local partner institutions, i.e. what are termed collaborative modules).	
(i)	Was it clear in advance of the Board that students under consideration had undertaken content away from the College?	N/A
(ii)	Were the procedures for incorporating marks obtained by students at another institution clear and consistently applied?	N/A
(iii)	Was any such provision discussed at the Board of Examiners, particularly in relation to progression/award decisions, overall value and consistency with regards to the programme(s) of study?	N/A

I was unfortunately unable to attend the Examination Board in person, so I visited Imperial in advance to carry out the vast majority of my duties. This aspect was presumably discussed at the Board itself. Nevertheless, based on practice in previous years, I have absolutely no concerns about how remote delivery and assessment is handled. See also my comments in 2(a)(iv) above.

3(a): From 2018-19 the Department has put in place extra mentoring arrangements for junior members of staff, particularly postdocs, who are new to teaching at Imperial. Each will be assigned a 'Teaching Partner' who will have direct involvement in the setting of the exam paper, alongside other mentoring roles.

Issues around senior staff mentioned in 3(a) will be monitored on an individual basis, with extra checking put in place where necessary.

4. Board of Examiners

4(a)	Board of Examiners' Meeting	
(i)	Were you invited to attend the meeting?	Yes
(ii)	Were you able to attend the meeting?	No
(iii)	Was the meeting conducted to your satisfaction?	N/A
(iv)	Were you satisfied with the recommendations of the Board of Examiners?	Yes
As mentioned above I was not able to attend the Board in person. Nevertheless I was able during my advance visit to carry out all the checks required to ensure that everything that was presented at the Board which pertained to my own responsibilities was in good order, and I therefore believe that the recommendations of the Board are sound.		

4(b)	Please comment on the following aspect related to Boards of Examiners' Meetings:
(i)	Whether the arrangements for degree classification (e.g. the scheme for the award of honours [UG] / scheme for the award of pass, merit or distinction [PG] – whichever is relevant) are set at the appropriate level and applied consistently.
According to the advance information I was presented with, very much so, and with more clarity now than previously.	
(ii)	Whether the College procedures governing mitigating circumstances and/or academic misconduct (e.g. plagiarism cases) were considered and applied fairly and equitably to all students.
The documentation for this was not available at the time of my advance visit, so I cannot comment. If the procedures were the same as (or an enhancement of) those of previous years, then I have every confidence that these were handled sensitively and appropriately.	
(iii)	Whether the consideration of borderline performances was conducted fairly and equitably, and in line with College Procedures.
I cannot comment specifically on this as I was not at the Board Meeting.	

Q4: Department response

No response required.

5. Academic Standards

5	Please comment on academic standards and student achievement with regard to:	
(i)	The appropriateness of the standards set for the awards in relation to the Framework for Higher Education Qualifications, national subject benchmarks and any additional Professional, Statutory and Regulatory Body (PSRB) or accrediting body requirements (where relevant);	

The standards are absolutely consistent with the various guidelines and benchmarks.	
(ii)	The standards of student performance in the programme(s) or parts of programmes and whether these are comparable with standards achieved by students on similar programmes or parts of programmes in other UK higher education institutions of which you have experience;
The Imperial student body continues to be exceptionally strong.	
(iii)	The extent to which the academic standards and standards of student performance across modules within the programme(s) are comparable;
All is well-balanced across my remit.	
(iv)	For external examiners <u>not</u> in their first year of appointment – are the standards of student performance across modules within the programme(s) comparable to those in previous cohorts;
There was some truly outstanding project work this year – a definite step up from last year. Otherwise standards of performance are comparable over the years.	

Q5: Department response

We thank the External for these positive comments on our standards.

6. Response to previous year's External Examiner Report

6.	Response to previous year's report	
(i)	Did you receive the formal written response from the department to the previous year's External Examiner report²?	Yes
(ii)	Are you satisfied that the issues raised in the previous report either have been, or are being, addressed?	Yes
It is particularly pleasing to see one's feedback and suggestions considered and acted upon. Imperial is to be commended in this regard. I also thank the College Administration for its response to the feedback I directed towards it over the last two years (even if implementing some of my suggestions has proved impossible).		

Q6: Department response

No response required.

7. Overview Comments, Recommendations and Good Practice

Please provide an overview of your assessment of the programme(s) and modules for which you are responsible as External Examiner. Please identify any specific matters relating to the academic standards of the awards and/or the quality of learning opportunities provided to students that should be addressed. Please also highlight any examples of good and/or innovative practice that you consider to be worthy of wider dissemination within the College.

² i.e. completed copy of the report template sent on by the Quality Assurance Team on behalf of the department.

7a.	Recommendations / Suggestions for Enhancement
Overall I am very happy with the systems and procedures in place. There is still some work to be done to ensure that all exam setters undertake their duties to the same high standards.	

7b.	Examples of good and/or innovative practice in learning, teaching and assessment
Nothing further to add.	

7c.	Overview Comments
Many thanks to the team who organised all the paperwork for my advance visit in a very efficient and easy-to-access way. It is a pleasure to see the continued high standards that Imperial maintains in mathematics.	

Q7: Department Response

We thank the External for these comments: we are aware that the issues in 7(a) are still work-in-progress.

8. For Examiners final year in office only: Final Exit Report

8	Please provide an overview of your term of office. This should ideally include comment on any changes in standards of student performance over time, major developments in the provision during your tenure, the implementation of any recommendations for enhancement (this is not an exhaustive list and examiners are welcome to comment on any matters they consider appropriate)

Q8: Department Response

n/a

9. Overall Confidence statement

The independent views of our External Examiners form an important part of the annual reporting of the maintenance of standards and judgement of the governing body.

Please complete the following section with regards to the module(s)/programme(s) of study to which this report relates. Where you are unable to say 'Yes', commentary must be provided in the comments box below.

(i)	The degree awarding body is maintaining the threshold academic standards set for its awards in accordance with the FHEQ and relevant Subject Benchmarks Statements.	Yes
(ii)	The assessment process measures student achievement rigorously and fairly against the intended learning outcomes of the programme(s) and is conducted in line with the College's policies and regulations	Yes
(iii)	The academic standards and the achievements of students are comparable with those in other UK degree-awarding bodies of which you have experience	Yes
As for (iii), the academic standards and students' achievements comfortably exceed those in most other UK institutions.		

External Examiner Signature (an electronic or typed signature is acceptable):	A.Carbery
Date of submission:	04/07/2018

Internal Use Only

Name and title of Department Respondent	Professor David Evans
Position:	<i>Director of Undergraduate Studies, Mathematics</i>
Date:	24/09/2018

Introduction

Your report is an important and integral part of the quality assurance of the programmes of study at the College and acts as an institutional record of the effective completion of the assessment process and the maintenance of academic standards of its awards. The report template, based on the indicators and guidance in the QAA Quality Code, will ask you to comment on the standards and comparability of the provision, good and/or innovative practice and suggestions for further enhancement where appropriate.

This report form can also be accessed electronically at the [external examining webpage](#). Should you require any further information or you have any queries, please contact the Registry Quality Assurance team: external.examiner@imperial.ac.uk or 0207 594 8993.

Completing the Report

1. The report template asks you to address specific questions (with a range of stated responses from “Yes/Always” to “No/Never”, with the opportunity to provide any qualifying/explanatory comments) and also asks a series of questions to which the College would like to receive more detailed written feedback/commentary. You are asked to comment fully under each of the headings, particularly where there are negative responses to any of the questions.
2. Your feedback will influence how the Department develops its programmes. To assist the College and the Department, please ensure that your report contains clear feedback. One word or one sentence responses throughout the report will not provide the Department with sufficient information to enable them to further enhance the programme(s).
3. In line with the expectations of the Quality Code, external examiners’ reports will be shared with staff, students and student representatives and may be disclosed in response to requests made under the Freedom of Information Act. Reports will also be shared with professional, statutory and regulatory bodies and the Quality Assurance Agency upon request. **Therefore there should be no identifiable reference to individual members of staff or students (either by use of name or student ID number) in the report to ensure that appropriate confidentiality is maintained.** The College may also, on occasion, use anonymous extracts from your annual report in promotional material.
4. In addition to maintaining confidentiality by refraining from using names or any other identifier, examiners are requested not to provide significant details about specific assessment tasks.
5. Examiners are reminded that where they have a serious concern they should follow the procedure available from the [website](#). They may make a separate confidential serious concerns report directly to the Provost on any matter of serious concern in addition to their annual report. A ‘Serious Concerns Report’ template for this purpose is available to download from the external examiner website at the link shown above. Please be assured that this report is confidential.

Report Submission

6. Completed reports should be returned within one month of the final meeting of the Board of Examiners, at the latest by **21 Aug 18 for undergraduate programmes** or **1 Feb 19 for postgraduate programmes**.
7. The report should be returned electronically, as an e-mail attachment and in MS Word format, to the Registry Quality Assurance team at: external.examiner@imperial.ac.uk
8. Payment of your annual fee for external examining duties will only be processed upon receipt of a satisfactorily completed report.

Report Dissemination

9. The College greatly values the feedback provided by its external examiners in their annual reports. Please note that a sample of reports across the provision are personally read by the Vice Provost (Education).
10. The Registry Quality Assurance team will ensure that the report is considered by the appropriate Departmental staff. Departmental staff will be expected to provide a formal response to the feedback/comments in your report and this will be circulated to you at the earliest opportunity.
11. In addition to the department review of the report, the Quality Assurance team undertake analysis of all reports to identify any themes arising, make recommendations for College-wide improvements to process or procedures, or to disseminate best practice.

Examiner's Details										
Full name and title	Professor Mark Dennis									
Home institution or other affiliation	University of Bristol/Birmingham									
Degree being examined (e.g. BSc/GEP/MBBS/MEng/MSc/MRes)	BSc/MSci									
Subject and part being examined (e.g. Biology)	Applied Mathematics and Mathematical Physics									
Year of Tenure	1		2		3		4*		5*	X

* If this is your final year of office please ensure you complete the final section of this report.

1. Programme Information/support for External Examiner Role

1(a)	Programme/Module Information Please confirm if the following was provided to you (either sent directly or through a publication site link)	
(i)	Programme handbook(s) / programme specification including programme learning outcomes?	Most/Usually
(ii)	Syllabus or module descriptors including learning outcomes?	Most/Usually
(iii)	Assessment briefs / marking criteria	Yes/Always
(iv)	Sufficient information about the programme(s) / modules in order to fulfil your role?	Yes/Always
(v)	Is there any additional documentation/ information that you would have benefited from receiving?	
It would have been good to receive a summary of how modules had changed from previous year (usually with new lecturers)		

New External Examiners only

1(b)	College Induction and Appointment Process Please answer the following questions with regards to the College appointment and induction process	
(i)	Did you find the appointment process fit for purpose?	Yes/Always
(ii)	Was the appointment made in a timely manner?	Yes/Always
(iii)	Do you consider that the arrangements for the Induction day were sufficient?	No/Never
(iv)	Did you find the follow-up information useful?	N/A
(v)	Was the department process to provide an induction to the programme and specific requirements of your role effective?	Yes/Always
I could not attend the original induction day due to travelling, and was not given a chance later. The information provided to me by the department appeared sufficient.		
(vi)	Following completion of your first year of tenure, is there any additional information/ support that you feel would be beneficial to provide at induction in future?	

Q1: Department response

We note the point in 1(a)(v). Exam Editors could be asked to note changes to module lecturers when sending papers.

2. Programme/Curriculum Design

2(a)	Overall programme design and coherence Please comment on the strengths and weaknesses of the programme design in relation to:
(i)	The balance and content of the degree programme(s) in relation to stated learning outcomes; The papers and assessments I have been sent are highly appropriate within mathematics. As I have commented in previous years, the optional courses which I have been sent in applied maths and mathematical physics seem to be less popular, on average, than other modules offered by the department.
(ii)	Coherence and currency of the programme(s) and the appropriateness of compulsory modules/units in relation to stated learning outcomes; Largely this is good within Applied Mathematics and Mathematical Physics. More could be done to develop ideas across related modules (at least for those students opting for both), such as between Special Relativity and Fields, and General Relativity, both of which develop an approach to mathematical physics in a tensorial framework. Most modules I saw were not compulsory, but those I did were of a high standard and very appropriate to the level at which they were assessed.
(iii)	Suitability of the programme design in relation to the relevant subject benchmarks/ Professional Statutory Regulatory Body (PSRB) or Accrediting Body requirements (where applicable);
N/A	

(iv)	Where applicable, the relevance and integration of placements¹ to the overall programme and its contribution to the programme learning outcomes;
N/A	
2(b)	Assessment Strategy Please comment on the strengths and weaknesses of the assessment strategy in relation to:
(i)	The rigour, appropriateness and overall quality of the methods of assessment (unseen written papers, essays/dissertations, orals, clinical examinations) in relation to the level of study and the intended learning outcomes;
The assessments for modules I am responsible are mainly examination based. The questions are challenging, and seem to differentiate well between different levels of students. I feel that some questions focus more on raw calculation than giving students the opportunity to demonstrate a synoptic understanding of the material (which could be in the form of more text-based answers). The internal checking procedure continues to work well in a collegial way. The process of monitoring assessment of projects continues to improve, and the administrative procedures around projects continue to improve. As I have said in previous years, more could be done within individual exams to differentiate the marking. Too many exam questions seem to be at a uniformly, homogeneously challenging level, rather than being tapered, with different parts testing knowledge and understanding of the course material rather than ability to work with new, previously unseen concepts).	
(ii)	The balance and comparability of assessment methods across modules of the same level;
The papers and assessments I have been sent are highly appropriate within mathematics. As I have commented in previous years, the optional courses which I have been sent in applied maths and mathematical physics seem to be somewhat less popular, on average, than other units offered by the department. The standard between optional units which are 100% exam based and 100% coursework based needs to be monitored continually to ensure consistent standards are maintained.	
(iii)	The suitability of the overall assessment load for the programme(s);
This is suitable and appropriate for a leading University.	

Q2: Department response

We thank the External for these comments.

2(a)(ii) These comments will be passed on to the Mathematical Physics section and will be considered as part of Curriculum Review.

2(b)(i) The question-setting instructions have recently been amended to emphasise that some tapering of questions is appropriate, as the External suggests. Setters are asked to make this explicit in their mark schemes and setters and checkers will be reminded that this needs to be done.

2(b)(iii) We are continuing to monitor comparability of standards of modules, and will ask lecturers to take action where marks appear to be out-of-line.

¹ Placements are any provision taken away from the direct College environment and may include: Year abroad, year in industry, modules studied at other approved HEIs (collaborative modules), or any other periods away from the College as part of an approved study plan.

3. Assessment Process, Marking and Moderation

3(a)	Drafting of Assessment	
(i)	Did you receive all of the necessary draft assessments for comment / approval?	Yes/Always
(ii)	Were the nature and level of the questions (or tasks) appropriate?	Yes/Always
(iii)	Were suitable arrangements in place to consider your comments on the draft assessments?	Yes/Always
(iv)	Did you receive feedback on your comments?	Yes/Always
Feedback was given during my visit. I did not receive any before the exams were set, but also there were no issues that required extra attention.		

3(b)	Marking and Moderation of scripts (Examination, assessed coursework, dissertation/project reports)	
(ii)	Was the general standard and consistency of marking appropriate?	Yes/Always
(iii)	Was there evidence that assessed work had been moderated internally, either through check marking or second marking?	Yes/Always
(iv)	Were the scripts marked in such a way as to enable you to see the reasons for the award of given marks?	Yes/Always
The consistency of the internal moderation within the department is much improved and transparent.		

3(c)	In relation to Practical Examinations	
(i)	Were satisfactory arrangements made for the conduct of practical examinations?	N/A
(ii)	Was the general standard and consistency of marking appropriate?	N/A

3(d)	In relation to Oral Assessments (including Viva Voce Examinations)	
(i)	Were satisfactory arrangements made for the conduct of oral assessments (e.g. presentations, poster presentations etc...)?	N/A
(ii)	Were suitable arrangements made for you to conduct viva voce examinations?	N/A
(iii)	Was the purpose for conducting a viva voce examination and the criteria for selecting candidates for a viva voce clear?	N/A
(iv)	Was the assessment of such work appropriate and consistent?	N/A

3(e)	Please comment on the assessment process, marking and moderation in relation to:	
(i)	The suitability of marking schemes / marking criteria and, where appropriate, model answers and	

	the consistency with which these were applied;
I was pleased with the scripts I was shown, and, as noted above, was particularly impressed by the obvious effort in the past year in leading to a robust process for project assessment, which incorporates input from two markers in a sensible and justified way.	
(ii)	The suitability of the procedures for marking and moderation and the consistency with which these were applied;
The moderation procedures are much improved from previous years, and marking is of a high quality.	
(iii)	Whether the grade boundaries for the assessment are set at the appropriate level and applied consistently;
Yes	
(iv)	The extent to which the assessment process measures student achievement rigorously and fairly against the intended outcomes of the programme(s) and is conducted in line with College policies and regulations
As far as I can tell, assessments are very fair and effective measures of the achieves in mathematics of students at Imperial College.	

3(f)	Programme content which has been delivered and assessed by another institution (this would cover 1) placement activity, e.g. some or all of an undergraduate year abroad study plan, and 2) modules undertaken at local partner institutions, i.e. what are termed collaborative modules).	
(i)	Was it clear in advance of the Board that students under consideration had undertaken content away from the College?	Yes/Always
(ii)	Were the procedures for incorporating marks obtained by students at another institution clear and consistently applied?	Most/Usually
(iii)	Was any such provision discussed at the Board of Examiners, particularly in relation to progression/award decisions, overall value and consistency with regards to the programme(s) of study?	Yes/Always
This was discussed in detail for the cases of students who had studied for a year abroad. Due to differing teaching/assessment styles in other countries, evaluating the marks required careful judgement. I was impressed by the care with which this was done.		

Q3: Department response

We thank the External for these positive comments.

4. Board of Examiners

4(a)	Board of Examiners' Meeting	
(i)	Were you invited to attend the meeting?	Yes/Always
(ii)	Were you able to attend the meeting?	Yes/Always
(iii)	Was the meeting conducted to your satisfaction?	Yes/Always
(iv)	Were you satisfied with the recommendations of the Board of Examiners?	Yes/Always

The meeting was effective.

4(b) Please comment on the following aspect related to Boards of Examiners' Meetings:

(i) Whether the arrangements for degree classification (e.g. the scheme for the award of honours [UG] / scheme for the award of pass, merit or distinction [PG] – whichever is relevant) are set at the appropriate level and applied consistently.

This was consistent and fair.

(ii) Whether the College procedures governing mitigating circumstances and/or academic misconduct (e.g. plagiarism cases) were considered and applied fairly and equitably to all students.

This appeared to be carefully considered and fair.

(iii) Whether the consideration of borderline performances was conducted fairly and equitably, and in line with College Procedures.

Yes, as far as I can tell. I would prefer the department adopt an official "secondary rule" to guide borderline cases, but the current procedures were implemented fairly and effectively in the examiners' meeting

Q4: Department response

4(b)(iii) The Board usually takes into account a number of factors when deciding whether or not to promote a borderline candidate to a higher class. Particular weight is given to the views of External Examiners, who will have spent time reviewing the candidate's mark profile and scripts. Distributions of marks in the individual modules taken by a borderline student can also be taken into consideration, together with standard indicators such as number of modules in a particular class. We appreciate that the External's point here is that a fully systematic approach to this, in the form of a secondary rule based on these types of indicators, could be helpful, though we are also firmly of the view that some degree of discretion and final judgement must be retained by the Board.

We know that a more algorithmic approach to promoting borderline students is taken in some other institutions, but we have serious concerns about the fairness of such approaches in a programme which allows so much student choice in the final year(s).

5. Academic Standards

5 Please comment on academic standards and student achievement with regard to:

(i) The appropriateness of the standards set for the awards in relation to the Framework for Higher Education Qualifications, national subject benchmarks and any additional Professional, Statutory and Regulatory Body (PSRB) or accrediting body requirements (where relevant);

The standards set seem to be in keeping with the appropriate frameworks, and the high reputation of the College for education in Mathematics.

(ii) The standards of student performance in the programme(s) or parts of programmes and whether these are comparable with standards achieved by students on similar programmes or parts of programmes in other UK higher education institutions of which you have experience;

The standards of student performance seem comparable with students on similar programmes in the UK.

(iii) The extent to which the academic standards and standards of student performance across modules within the programme(s) are comparable;

The standards between different modules that I saw seem comparable.

(iv) **For external examiners not in their first year of appointment – are the standards of student performance across modules within the programme(s) comparable to those in previous cohorts;**

Standards seem consistent with what I saw in my previous years of appointment.

Q5: Department response

No response required

5. Response to previous year's External Examiner Report

6.	Response to previous year's report	
(i)	Did you receive the formal written response from the department to the previous year's External Examiner report ² ?	Yes/Always
(ii)	Are you satisfied that the issues raised in the previous report either have been, or are being, addressed?	Yes/Always

Q6: Department response

No response required.

7. Overview Comments, Recommendations and Good Practice

Please provide an overview of your assessment of the programme(s) and modules for which you are responsible as External Examiner. Please identify any specific matters relating to the academic standards of the awards and/or the quality of learning opportunities provided to students that should be addressed. Please also highlight any examples of good and/or innovative practice that you consider to be worthy of wider dissemination within the College.

7a.	Recommendations / Suggestions for Enhancement
The assessment process continues to be based on handwritten paper documents. Moving to a computer-based system would surely save a lot of time and space, and would also enable a better overview of the process, with anomalies and problems being able to be picked up earlier in the process. Again, I recommend introduction of a consistent 'secondary rule' to deal with borderline cases, rather than extended discussion on a case-by-case basis in the examiners meeting. As I have commented previously, I feel that there is too much focus on a 'bottom up' approach where most teaching staff are focused only on the handful of modules they teach, rather than the department taking a wider view of the teaching received by students on the overall programme. This could be done with a greater degree of communication and discussion between lecturers teaching similar material, both within the same year group and across different years of study. This was reflected in the comments of the small number of undergraduates with whom we had the	

² i.e. completed copy of the report template sent on by the Quality Assurance Team on behalf of the department.

opportunity to speak. They were very happy with the level and quality of teaching they received at all levels, but felt that more guidance could have been given on the choice of different modules for options, especially outside the specialist area of the academic adviser.

7b. Examples of good and/or innovative practice in learning, teaching and assessment

The quality of the exams was high, and the collegiality of the exam checking, high quality of marking with annotations on the scripts were all very impressive.

The integration of 'Mastery' level questions into MSci assessments is a particularly strong feature, and these questions continue to do a good job in bridging the gap between undergraduate and graduate level assessment.

I was impressed with the clear way in which the Ancillary Mathematics modules were managed by the department, and am confident that Mathematics is providing an excellent service to the Physics and Chemistry departments in providing these units.

The quality of the exams was high, and the collegiality of the exam checker, high quality of marking with annotations on the scripts were all very impressive.

The incorporation of the Masters level 'Mastery' questions into the relevant exams, rather than as a separate paper, seems to have worked well, and these questions continue to do a good job in bridging the gap between undergraduate and graduate level assessment.

I appreciated the clear way in which the Ancillary Mathematics modules were managed by the department, and am confident that Mathematics is providing an excellent service to the Physics and Chemistry departments in providing these units

7c. Overview Comments

I am pleased that the academic standards of the degrees in Mathematics are maintained at the highest level, and in such a way that all teaching members of the school feel invested in the assessment process.

As previously, I found the material prepared for externals before arrival for the scrutiny day extremely helpful both in preparing me for the tasks required and giving a feeling for the assessment culture in the department.

Q7: Department Response

7(a) Greater use of secure on-line systems for recording and checking of marks and student absences is planned for 2018-19. A College-wide student information system may eventually produce further streamlining of processes and paperwork.

We are aware of the issues (overlap, lack of clarity about content etc.) about the way modules fit together and this will be looked at as part of Curriculum Review. We will eventually use curriculum mapping to provide more detailed information to students about suitable pathways through programmes.

7(b), (c) – we thank the External for these comments.

8. For Examiners final year in office only: Final Exit Report

8 Please provide an overview of your term of office.

This should ideally include comment on any changes in standards of student performance over time, major developments in the provision during your tenure, the implementation of any recommendations for enhancement (this is not an exhaustive list and examiners are welcome to comment on any matters they consider appropriate)

In general, I have been impressed with the changes and improvements made to the degree programme structure over the five years of my appointment. Rules are more transparent and less arcane, procedures are firmly established and followed through, and there appears to be a greater consistency in the assessment.

Particular highlights of improvements are projects, which caused some serious concerns in previous years, and now are managed very effectively.

The moderation of exam marks is also much better and transparent.

The management of the ancillary units has also developed in an effective and consistent way.

On the other hand, I have made several comments in most years of my appointment, which do not seem to have changed. Although none of these are crucial, I encourage members of the department to consider them in the future:

- examinations be structured more, in particular including difficult material to differentiate the very best students;
- provide more advice to students on effective combinations of optional modules in higher years;
- address the relative unpopularity of Applied Mathematics and Mathematical Physics modules;
- develop an algorithm to handle borderline cases, and be less reliant on external examiners to lead this procedure.

However, these comments are minor and I feel privileged to have been able to contribute to the delivery of Mathematics teaching at Imperial College over the past five years. I have enjoyed the challenge of attempting the examinations myself, and have myself learned a lot about mathematics learning and teaching in delivering my role.

Over the years of my appointment, various different members of the department have taken key roles in the management of teaching and the examinations process. I have found all of these to be welcoming, engaged and engaging in providing the best education possible. In particular, the two Directors of Undergraduate Study, Profs David Evans and Jonathan Mestel, have managed the extremely complicated and challenging role very effectively.

Q8: Department Response

We thank the External for his thoughtful comments and for his work over the last 5 years. We believe that the individual points which he raises have been commented upon in earlier responses. The issues which he highlights are 'work in progress' or will be addressed through curriculum review.

9. Overall Confidence statement

The independent views of our External Examiners form an important part of the annual reporting of the maintenance of standards and judgement of the governing body.

Please complete the following section with regards to the module(s)/programme(s) of study to which this report relates. Where you are unable to say 'Yes', commentary must be provided in the comments box below.

(i)	The degree awarding body is maintaining the threshold academic standards set for its awards in accordance with the FHEQ and relevant Subject Benchmarks Statements.	Yes
(ii)	The assessment process measures student achievement rigorously and fairly against the intended learning outcomes of the programme(s) and is conducted in line with the College's policies and regulations	Yes
(iii)	The academic standards and the achievements of students are comparable with those in other UK degree-awarding bodies of which you have experience	Yes

External Examiner Signature (an electronic or typed signature is acceptable):	Mark R Dennis
Date of submission:	26 Sept 2018

Please email your completed form (as an MS Word file) to: external.examiner@imperial.ac.uk

Internal Use Only

Name and title of Department Respondent	Professor David Evans
Position:	<i>Director of Undergraduate Studies, Mathematics</i>
Date:	8 October 2018.

Read by Vice Provost (Education)		Date:	
Comments			
Further action required by Department			

Response to Vice Provost Comments / Further Action:	
Date:	

Introduction

Your report is an important and integral part of the quality assurance of the programmes of study at the College and acts as an institutional record of the effective completion of the assessment process and the maintenance of academic standards of its awards. The report template, based on the indicators and guidance in the QAA Quality Code, will ask you to comment on the standards and comparability of the provision, good and/or innovative practice and suggestions for further enhancement where appropriate.

This report form can also be accessed electronically at the [external examining webpage](#). Should you require any further information or you have any queries, please contact the Registry Quality Assurance team: external.examiner@imperial.ac.uk or 0207 594 8993.

Completing the Report

1. The report template asks you to address specific questions (with a range of stated responses from “Yes/Always” to “No/Never”, with the opportunity to provide any qualifying/explanatory comments) and also asks a series of questions to which the College would like to receive more detailed written feedback/commentary. You are asked to comment fully under each of the headings, particularly where there are negative responses to any of the questions.
2. Your feedback will influence how the Department develops its programmes. To assist the College and the Department, please ensure that your report contains clear feedback. One word or one sentence responses throughout the report will not provide the Department with sufficient information to enable them to further enhance the programme(s).
3. In line with the expectations of the Quality Code, external examiners’ reports will be shared with staff, students and student representatives and may be disclosed in response to requests made under the Freedom of Information Act. Reports will also be shared with professional, statutory and regulatory bodies and the Quality Assurance Agency upon request. **Therefore there should be no identifiable reference to individual members of staff or students (either by use of name or student ID number) in the report to ensure that appropriate confidentiality is maintained.** The College may also, on occasion, use anonymous extracts from your annual report in promotional material.
4. In addition to maintaining confidentiality by refraining from using names or any other identifier, examiners are requested not to provide significant details about specific assessment tasks.
5. Examiners are reminded that where they have a serious concern they should follow the procedure available from the [website](#). They may make a separate confidential serious concerns report directly to the Provost on any matter of serious concern in addition to their annual report. A ‘Serious Concerns Report’ template for this purpose is available to download from the external examiner website at the link shown above. Please be assured that this report is confidential.

Report Submission

6. Completed reports should be returned within one month of the final meeting of the Board of Examiners, at the latest by **21 Aug 18 for undergraduate programmes** or **1 Feb 19 for postgraduate programmes**.
7. The report should be returned electronically, as an e-mail attachment and in MS Word format, to the Registry Quality Assurance team at: external.examiner@imperial.ac.uk
8. Payment of your annual fee for external examining duties will only be processed upon receipt of a satisfactorily completed report.

Report Dissemination

9. The College greatly values the feedback provided by its external examiners in their annual reports. Please note that a sample of reports across the provision are personally read by the Vice Provost (Education).
10. The Registry Quality Assurance team will ensure that the report is considered by the appropriate Departmental staff. Departmental staff will be expected to provide a formal response to the feedback/comments in your report and this will be circulated to you at the earliest opportunity.
11. In addition to the department review of the report, the Quality Assurance team undertake analysis of all reports to identify any themes arising, make recommendations for College-wide improvements to process or procedures, or to disseminate best practice.

Examiner's Details	
Full name and title	Professor Tom Fearn
Home institution or other affiliation	UCL
Degree being examined (e.g. BSc/GEP/MBBS/MEng/MSc/MRes)	BSc
Subject and part being examined (e.g. Biology)	Mathematics for engineers (Statistics)
Year of Tenure	3

* If this is your final year of office please ensure you complete the final section of this report.

1. Programme Information/support for External Examiner Role

1(a)	Programme/Module Information Please confirm if the following was provided to you (either sent directly or through a publication site link)	
(i)	Programme handbook(s) / programme specification including programme learning outcomes?	N/A
(ii)	Syllabus or module descriptors including learning outcomes?	Yes/All
(iii)	Assessment briefs / marking criteria	Yes/All
(iv)	Sufficient information about the programme(s) / modules in order to fulfil your role?	Yes/All
I had all the information I needed.		
(v)	Is there any additional documentation/ information that you would have benefited from receiving?	No

New External Examiners only

1(b)	College Induction and Appointment Process Please answer the following questions with regards to the College appointment and induction process	
(i)	Did you find the appointment process fit for purpose?	N/A
(ii)	Was the appointment made in a timely manner?	N/A
(iii)	Do you consider that the arrangements for the Induction day were sufficient?	N/A
(iv)	Did you find the follow-up information useful?	N/A
(v)	Was the department process to provide an induction to the programme and specific requirements of your role effective?	N/A
(vi)	Following completion of your first year of tenure, is there any additional information/ support that you feel would be beneficial to provide at induction in future?	N/A

Q1: Department response

(No response required.)

2. Programme/Curriculum Design

2(a)	Overall programme design and coherence Please comment on the strengths and weaknesses of the programme design in relation to:
(i)	The balance and content of the degree programme(s) in relation to stated learning outcomes; I was external this year for a single Statistics module offered to students on a Mechanical Engineering programme. I cannot comment on this programme as a whole, but the content of this module seems appropriate for such a context.
(ii)	Coherence and currency of the programme(s) and the appropriateness of compulsory modules/units in relation to stated learning outcomes; N/A
(iii)	Suitability of the programme design in relation to the relevant subject benchmarks/ Professional Statutory Regulatory Body (PSRB) or Accrediting Body requirements (where applicable); N/A
(iv)	Where applicable, the relevance and integration of placements¹ to the overall programme and its contribution to the programme learning outcomes; N/A

2(b)	Assessment Strategy Please comment on the strengths and weaknesses of the assessment strategy in relation to:
(i)	The rigour, appropriateness and overall quality of the methods of assessment (unseen written papers, essays/dissertations, orals, clinical examinations) in relation to the level of study and the intended learning outcomes; The assessment methods for this particular module are both appropriate and rigorous.
(ii)	The balance and comparability of assessment methods across modules of the same level; N/A

¹ Placements are any provision taken away from the direct College environment and may include: Year abroad, year in industry, modules studied at other approved HEIs (collaborative modules), or any other periods away from the College as part of an approved study plan.

(iii)	The suitability of the overall assessment load for the programme(s);
N/A	

Q2: Department response

3. Assessment Process, Marking and Moderation

3(a)	Drafting of Assessment	
(i)	Did you receive all of the necessary draft assessments for comment / approval?	Yes/All
(ii)	Were the nature and level of the questions (or tasks) appropriate?	Yes/All
(iii)	Were suitable arrangements in place to consider your comments on the draft assessments?	Yes/All
(iv)	Did you receive feedback on your comments?	Yes/All
The system is well-designed and carefully implemented		

3(b)	Marking and Moderation of scripts (Examination, assessed coursework, dissertation/project reports)	
(i)	Did you receive a sufficient number of scripts and other assessed work, including those of first class, distinction, borderline and failed candidates, for scrutiny?	Yes/All
(ii)	Was the general standard and consistency of marking appropriate?	Yes/All
(iii)	Was there evidence that assessed work had been moderated internally, either through check marking or second marking?	Yes/All
(iv)	Were the scripts marked in such a way as to enable you to see the reasons for the award of given marks?	Yes/All
I looked at borderline scripts and at a haphazard selection of other scripts. All of the ones I looked at had been carefully and appropriately marked and check marked.		

3(c)	In relation to Practical Examinations	
(i)	Were satisfactory arrangements made for the conduct of practical examinations?	N/A
(ii)	Was the general standard and consistency of marking appropriate?	N/A

3(d)	In relation to Oral Assessments (including Viva Voce Examinations)	
(i)	Were satisfactory arrangements made for the conduct of oral assessments (e.g. presentations, poster presentations etc...)?	N/A
(ii)	Were suitable arrangements made for you to conduct viva voce examinations?	N/A
(iii)	Was the purpose for conducting a viva voce examination and the criteria for selecting candidates for a viva voce clear?	N/A
(iv)	Was the assessment of such work appropriate and consistent?	N/A

3(e)	Please comment on the assessment process, marking and moderation in relation to:
(i)	The suitability of marking schemes / marking criteria and, where appropriate, model answers and the consistency with which these were applied;
I was sent the model answers and marking schemes in advance. They were consistently applied in the actual marking.	
(ii)	The suitability of the procedures for marking and moderation and the consistency with which these were applied;
No problems.	
(iii)	Whether the grade boundaries for the assessment are set at the appropriate level and applied consistently;
Yes, the scripts I looked at around boundaries between grades all seemed to reflect the levels of achievement I would have expected.	
(iv)	The extent to which the assessment process measures student achievement rigorously and fairly against the intended outcomes of the programme(s) and is conducted in line with College policies and regulations
Completely.	

3(f)	Programme content which has been delivered and assessed by another institution (this would cover 1) placement activity, e.g. some or all of an undergraduate year abroad study plan, and 2) modules undertaken at local partner institutions, i.e. what are termed collaborative modules).	
(i)	Was it clear in advance of the Board that students under consideration had undertaken content away from the College?	N/A
(ii)	Were the procedures for incorporating marks obtained by students at another institution clear and consistently applied?	N/A

(iii)	Was any such provision discussed at the Board of Examiners, particularly in relation to progression/award decisions, overall value and consistency with regards to the programme(s) of study?	N/A
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Q3: Department response

(No response required.)

4. Board of Examiners

4(a)	Board of Examiners' Meeting	
(i)	Were you invited to attend the meeting?	Yes
(ii)	Were you able to attend the meeting?	Yes
(iii)	Was the meeting conducted to your satisfaction?	Yes
(iv)	Were you satisfied with the recommendations of the Board of Examiners?	Yes
All competently and efficiently carried out, with good documentation provided.		

4(b)	Please comment on the following aspect related to Boards of Examiners' Meetings:
(i)	Whether the arrangements for degree classification (e.g. the scheme for the award of honours [UG] / scheme for the award of pass, merit or distinction [PG] – whichever is relevant) are set at the appropriate level and applied consistently.
N/A	
(ii)	Whether the College procedures governing mitigating circumstances and/or academic misconduct (e.g. plagiarism cases) were considered and applied fairly and equitably to all students.
I was not aware of any such cases for this exam.	
(iii)	Whether the consideration of borderline performances was conducted fairly and equitably, and in line with College Procedures.
So far as the single exam for which I was responsible was concerned, yes.	

Q4: Department response

(No response required.)

5. Academic Standards

5		Please comment on academic standards and student achievement with regard to:
(i)	The appropriateness of the standards set for the awards in relation to the Framework for Higher Education Qualifications, national subject benchmarks and any additional Professional, Statutory and Regulatory Body (PSRB) or accrediting body requirements (where relevant);	
Once again, I can only comment on one module. The standards for this were exactly what one would expect in the context.		
(ii)	The standards of student performance in the programme(s) or parts of programmes and whether these are comparable with standards achieved by students on similar programmes or parts of programmes in other UK higher education institutions of which you have experience;	
Similar to those in my own institution (UCL).		
(iii)	The extent to which the academic standards and standards of student performance across modules within the programme(s) are comparable;	
N/A		
(iv)	For external examiners <u>not</u> in their first year of appointment – are the standards of student performance across modules within the programme(s) comparable to those in previous cohorts;	
Yes (for this module).		

Q5: Department response

(No response required.)

6. Response to previous year's External Examiner Report

6.	Response to previous year's report	
(i)	Did you receive the formal written response from the department to the previous year's External Examiner report²?	Yes
(ii)	Are you satisfied that the issues raised in the previous report either have been, or are being, addressed?	Yes

² i.e. completed copy of the report template sent on by the Quality Assurance Team on behalf of the department.

Q6: Department response

(No response required.)

7. Overview Comments, Recommendations and Good Practice

Please provide an overview of your assessment of the programme(s) and modules for which you are responsible as External Examiner. Please identify any specific matters relating to the academic standards of the awards and/or the quality of learning opportunities provided to students that should be addressed. Please also highlight any examples of good and/or innovative practice that you consider to be worthy of wider dissemination within the College.

7a. Recommendations / Suggestions for Enhancement

This module seems to be working well.

7b. Examples of good and/or innovative practice in learning, teaching and assessment

I'm not aware of anything innovative.

7c. Overview Comments

Q7: Department Response

(No response required.)

8. For Examiners final year in office only: Final Exit Report

8 Please provide an overview of your term of office.

This should ideally include comment on any changes in standards of student performance over time, major developments in the provision during your tenure, the implementation of any recommendations for enhancement (this is not an exhaustive list and examiners are welcome to comment on any matters they consider appropriate)

The number of modules now handled by this examination board has now dwindled to 3, and I understand it is proposed to deal with these as part of the business of the main board in future. This seems entirely sensible to me. In the three years I have been external for these Statistics service courses, the standards have been consistently high, and the organisation consistently good.

Q8: Department Response

The Mathematics for Engineers exam board will not take place in the 2018-2019 academic year, and the ME3-HSTAT module overseen by Prof Fearn will, as he states, be covered by the main Mathematics exam board.

9. Overall Confidence statement

The independent views of our External Examiners form an important part of the annual reporting of the maintenance of standards and judgement of the governing body.

Please complete the following section with regards to the module(s)/programme(s) of study to which this report relates. Where you are unable to say 'Yes', commentary must be provided in the comments box below.

(i)	The degree awarding body is maintaining the threshold academic standards set for its awards in accordance with the FHEQ and relevant Subject Benchmarks Statements.	Yes
(ii)	The assessment process measures student achievement rigorously and fairly against the intended learning outcomes of the programme(s) and is conducted in line with the College's policies and regulations	Yes
(iii)	The academic standards and the achievements of students are comparable with those in other UK degree-awarding bodies of which you have experience	Yes

External Examiner Signature (an electronic or typed signature is acceptable):	T Fearn
Date of submission:	11/07/2018

Please email your completed form (as an MS Word file) to: external.examiner@imperial.ac.uk

Internal Use Only

Name and title of Department Respondent	Dr Daniel Mortlock, senior lecturer in Mathematics and Physics		
Position:	<i>Mathematics Director of Ancillary Teaching</i>		
Date:	05/09/2018		
Read by Vice Provost (Education)		Date:	Click here to enter a date.
Comments			

Further action required by Department	
Response to Vice Provost Comments / Further Action:	
Date:	Click here to enter a date.

Examiner's Details	
Full name and title	Professor Christopher Jennison
Home institution or other affiliation	University of Bath
Degree being examined (e.g. BSc/GEP/MBBS/MEng/MSc/MRes)	BSc / MSci Mathematics Programmes
Subject and part being examined (e.g. Biology)	Statistics
Year of Tenure	2

* If this is your final year of office please ensure you complete the final section of this report.

1. Programme Information/support for External Examiner Role

1(a)	Programme/Module Information Please confirm if the following was provided to you (either sent directly or through a publication site link)	
(i)	Programme handbook(s) / programme specification including programme learning outcomes?	Yes/All
(ii)	Syllabus or module descriptors including learning outcomes?	No/None
(iii)	Assessment briefs / marking criteria	Yes/All
(iv)	Sufficient information about the programme(s) / modules in order to fulfil your role?	Yes/All
I was provided with documentation on the Department's procedures. Since there were significant changes from the previous year, the Director of Undergraduate Studies also sent me the instructions given to examiners when they set their papers. Information about content of modules is available online in the "Year Level Guides". I repeat the comment about Learning outcomes from my report last year: Programme level objectives are set out in the various Programme Specifications but learning outcomes for individual modules are not provided in many of the module descriptions in the Year Level Guides.		
(v)	Is there any additional documentation/ information that you would have benefited from receiving?	No
No		

New External Examiners only

1(b)	College Induction and Appointment Process Please answer the following questions with regards to the College appointment and induction process	
(i)	Did you find the appointment process fit for purpose?	N/A
(ii)	Was the appointment made in a timely manner?	N/A
(iii)	Do you consider that the arrangements for the Induction day were sufficient?	N/A
(iv)	Did you find the follow-up information useful?	N/A
(v)	Was the department process to provide an induction to the programme and specific requirements of your role effective?	N/A

(vi)	Following completion of your first year of tenure, is there any additional information/ support that you feel would be beneficial to provide at induction in future?	N/A
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Q1: Department response

1(a): Module-level learning outcomes, complementing the detailed description of the module content, will be developed as part of the current Curriculum Review.

2. Programme/Curriculum Design

2(a)	Overall programme design and coherence Please comment on the strengths and weaknesses of the programme design in relation to:
(i)	The balance and content of the degree programme(s) in relation to stated learning outcomes; Students who choose to specialise in Statistics are able to study a reasonable quantity of material at intermediate and advanced levels.
(ii)	Coherence and currency of the programme(s) and the appropriateness of compulsory modules/units in relation to stated learning outcomes; The programme is coherent. Access to more Probability and Statistics modules in Years 1 and 2 would allow students choosing this area of specialisation to progress further in later years.
(iii)	Suitability of the programme design in relation to the relevant subject benchmarks/ Professional Statutory Regulatory Body (PSRB) or Accrediting Body requirements (where applicable); The course material fits well with subject benchmarks and relevant accrediting bodies.
(iv)	Where applicable, the relevance and integration of placements¹ to the overall programme and its contribution to the programme learning outcomes; I did not see evidence of formal placements of a Statistical nature.

2(b)	Assessment Strategy Please comment on the strengths and weaknesses of the assessment strategy in relation to:
(i)	The rigour, appropriateness and overall quality of the methods of assessment (unseen written papers, essays/dissertations, orals, clinical examinations) in relation to the level of study and the intended learning outcomes; Exam papers were rigorous and, for the most part, appropriate to the level of study. A new process was introduced this year to ensure papers contained specified amounts of material at given gradations of difficulty. Overall, the new system worked well and most papers required little or no modifications to the raw marks, which showed that the setter had judged the levels of difficulty correctly. In those cases where modifications were needed, setters should reflect on these outcomes and aim to calibrate papers more accurately in future years.
(ii)	The balance and comparability of assessment methods across modules of the same level; Balance was OK.

¹ Placements are any provision taken away from the direct College environment and may include: Year abroad, year in industry, modules studied at other approved HEIs (collaborative modules), or any other periods away from the College as part of an approved study plan.

(iii)	The suitability of the overall assessment load for the programme(s);
The overall assessment load appeared to be satisfactory.	

Q2: Department response

We thank the External for the comments here and the support in 2(b)(i) for the changes which were introduced this year.

2(a)(ii): From 2019-20, greater choice of Statistics modules will be introduced into years 1 and 2 as part of the revised curriculum.

3. Assessment Process, Marking and Moderation

3(a)	Drafting of Assessment	
(i)	Did you receive all of the necessary draft assessments for comment / approval?	Yes/All
(ii)	Were the nature and level of the questions (or tasks) appropriate?	Yes/All
(iii)	Were suitable arrangements in place to consider your comments on the draft assessments?	Most/Usually
(iv)	Did you receive feedback on your comments?	Most/Usually
For most examinations, I was provided with responses to my comments. In these cases, the comments had been acted upon or an explanation was given for not doing so. In a few cases, I did not see such a response and in at least one case, it appeared that my comments had been ignored. A consequence of this was that one exam question asked students to prove that certain pairs of Cauchy random variables were negatively correlated, even though correlation is undefined for such variables. (It would have reflected well on students if they had pointed out the flaw in this question but, as far as I am aware, this did not happen.)		

3(b)	Marking and Moderation of scripts (Examination, assessed coursework, dissertation/project reports)	
(i)	Did you receive a sufficient number of scripts and other assessed work, including those of first class, distinction, borderline and failed candidates, for scrutiny?	Yes/All
(ii)	Was the general standard and consistency of marking appropriate?	Yes/All
(iii)	Was there evidence that assessed work had been moderated internally, either through check marking or second marking?	Yes/All
(iv)	Were the scripts marked in such a way as to enable you to see the reasons for the award of given marks?	Yes/All
Since I had given my input on the standard of each exam paper and markers followed the specified marking scheme, there was no great need to study a large number of individual scripts to assess the standards achieved. It was, however, interesting to see how well students had performed on the most challenging material in each paper: in some cases students gathered all their marks for the easiest parts of questions, in others students failed to get some of the easy marks but showed their depth of understanding by answering parts that were deemed to be more difficult.		

3(c)	In relation to Practical Examinations	
(i)	Were satisfactory arrangements made for the conduct of practical	N/A

	examinations?	
(ii)	Was the general standard and consistency of marking appropriate?	N/A
Not applicable.		

3(d)	In relation to Oral Assessments (including Viva Voce Examinations)	
(i)	Were satisfactory arrangements made for the conduct of oral assessments (e.g. presentations, poster presentations etc...)?	N/A
(ii)	Were suitable arrangements made for you to conduct viva voce examinations?	N/A
(iii)	Was the purpose for conducting a viva voce examination and the criteria for selecting candidates for a viva voce clear?	N/A
(iv)	Was the assessment of such work appropriate and consistent?	N/A
Not applicable.		

3(e)	Please comment on the assessment process, marking and moderation in relation to:
(i)	The suitability of marking schemes / marking criteria and, where appropriate, model answers and the consistency with which these were applied;
Marking schemes and criteria were appropriate. Model answers were of a high quality. I believe the changes introduced to the overall process this year have improved matters substantially, with both internal and external examiners having a clearer understanding of the process.	
(ii)	The suitability of the procedures for marking and moderation and the consistency with which these were applied;
Procedures were suitable and applied consistently.	
(iii)	Whether the grade boundaries for the assessment are set at the appropriate level and applied consistently;
I believe grade boundaries were set appropriately and consistently.	
(iv)	The extent to which the assessment process measures student achievement rigorously and fairly against the intended outcomes of the programme(s) and is conducted in line with College policies and regulations
I am happy that the assessment has achieved the above aims.	

3(f)	Programme content which has been delivered and assessed by another institution (this would cover 1) placement activity, e.g. some or all of an undergraduate year abroad study plan, and 2) modules undertaken at local partner institutions, i.e. what are termed collaborative modules).	
(i)	Was it clear in advance of the Board that students under consideration had undertaken content away from the College?	Yes/All
(ii)	Were the procedures for incorporating marks obtained by students at another institution clear and consistently applied?	Yes/All

(iii)	Was any such provision discussed at the Board of Examiners, particularly in relation to progression/award decisions, overall value and consistency with regards to the programme(s) of study?	Yes/All
Some students undertake a study year abroad. Incorporating the marks obtained in that year is not always straightforward but procedures were flexible enough to do this in a reasonable manner.		

Q3: Department response

3(a)(iv): Setters and Exam Editors will be reminded of the need to fully document and explain their responses to Externals' comments.

3(b): this is an interesting observation which highlights one of the difficulties in calibrating exam questions: not all students will find the same parts easy/ difficult!

4. Board of Examiners

4(a)	Board of Examiners' Meeting	
(i)	Were you invited to attend the meeting?	Yes
(ii)	Were you able to attend the meeting?	Yes
(iii)	Was the meeting conducted to your satisfaction?	Yes
(iv)	Were you satisfied with the recommendations of the Board of Examiners?	Yes
The meeting was largely straightforward with an appropriate level of discussion of certain cases. One thing that surprised me was the discretion available to the Board in deciding whether a student who had failed a module in year 3 of the MSci degree could take a re-sit in the summer – or would have to wait a year and take the re-sit next May/June. In the end, the Board acted charitably and did not condemn students to a year's break in their studies. I would recommend that the Department adopts the principle that students should have the right to re-assessment in a timely manner.		

4(b)	Please comment on the following aspect related to Boards of Examiners' Meetings:	
(i)	Whether the arrangements for degree classification (e.g. the scheme for the award of honours [UG] / scheme for the award of pass, merit or distinction [PG] – whichever is relevant) are set at the appropriate level and applied consistently.	
Procedures were applied fairly.		
(ii)	Whether the College procedures governing mitigating circumstances and/or academic misconduct (e.g. plagiarism cases) were considered and applied fairly and equitably to all students.	
I find information about the procedures of mitigating circumstances to be rather vague. It is not clear whether mitigation is allowable only for circumstances that affect particular assessments, or for prolonged circumstances that affect the period of study prior to an assessment. In my institution, mitigation is associated with specific assessments and marks for those modules are identified as being mitigated. In the case of longer term problems, we are expected to "make reasonable adjustments" to provide assistance to students in their studies but the marks obtained are not then subject to mitigation. Some of the information presented to external examiners was rather confusing. In cases where re-assessment has taken place because of mitigation, and this re-assessment is unmitigated, I see no reason to describe the outcome as "mitigated". Also, if a student has not submitted a claim for mitigating circumstances, then it is not appropriate to discuss the possibility that mitigating circumstances might exist.		

(iii)	Whether the consideration of borderline performances was conducted fairly and equitably, and in line with College Procedures.
Borderline cases were considered fairly and equitably.	

Q4: Department response

4(a): The Department takes the view that it would be inefficient to routinely produce September reassessment papers for our large number of year 3 and 4 modules and instead requires reassessment in the next session. This is in line with College regulations. In cases where an MSci student has narrowly failed a module, the Board has on occasions exercised its authority to offer an earlier alternative assessment in September.

4(b): We understand that different institutions treat mitigating circumstances in different ways. We believe that the Department's processes are fully in line with College policy. We would be very happy to clarify any aspects of the procedures (including during the External's visit), but the following remarks may be of assistance. The Department can award pro-rata marks for small items of coursework where there are mitigating circumstances, but otherwise, we do not adjust marks. For finalists, the level of severity of any mitigating circumstances is reported to the Board and the Board is informed by the Senior Tutor what, if any, 'mitigation' has already occurred (such as an uncapped resit opportunity). The Board can then take this information into account at final classification.

5. Academic Standards

5	Please comment on academic standards and student achievement with regard to:
(i)	The appropriateness of the standards set for the awards in relation to the Framework for Higher Education Qualifications, national subject benchmarks and any additional Professional, Statutory and Regulatory Body (PSRB) or accrediting body requirements (where relevant);
The standards applied fit well with subject benchmarks and relevant accrediting bodies.	
(ii)	The standards of student performance in the programme(s) or parts of programmes and whether these are comparable with standards achieved by students on similar programmes or parts of programmes in other UK higher education institutions of which you have experience;
Students performed well and I would rate their overall performances in assessment as broadly comparable to the performances of students at other UK institutions.	
(iii)	The extent to which the academic standards and standards of student performance across modules within the programme(s) are comparable;
Performance was comparable across modules.	
(iv)	For external examiners <u>not</u> in their first year of appointment – are the standards of student performance across modules within the programme(s) comparable to those in previous cohorts;
Yes	

Q5: Department response

No response required.

6. Response to previous year's External Examiner Report

6.	Response to previous year's report	
(i)	Did you receive the formal written response from the department to the previous year's External Examiner report²?	Yes
(ii)	Are you satisfied that the issues raised in the previous report either have been, or are being, addressed?	Yes

Q6: Department response

No response required.

7. Overview Comments, Recommendations and Good Practice

Please provide an overview of your assessment of the programme(s) and modules for which you are responsible as External Examiner. Please identify any specific matters relating to the academic standards of the awards and/or the quality of learning opportunities provided to students that should be addressed. Please also highlight any examples of good and/or innovative practice that you consider to be worthy of wider dissemination within the College.

7a.	Recommendations / Suggestions for Enhancement
The modules I have seen have good content which is well taught. The students displayed some good understanding.	
7b.	Examples of good and/or innovative practice in learning, teaching and assessment
Teaching and assessment followed standard patterns.	
7c.	Overview Comments
Curriculum review: After seeing exam papers for two years, I have developed a clear impression of the material in Statistics taught to undergraduates. While there is plenty of sound material, I do find the course as a whole rather dated. There is a very modest use of computing, despite this being at the core of modern day statistical work. Use of simulation can enliven introductory material in probability. A greater emphasis on applications and the analysis of large, interesting data sets would help prepare students for careers in Statistics. There is much attention to mathematical details in early modules where I would have expected the main task should be to familiarise students with broader concepts. My example in 3(a) of the flawed exam question that asked about the correlation between Cauchy random variables suggests that such technical details are liable to be forgotten in later courses – by both lecturers and students.	

Q7: Department Response

We thank the External for these comments. The points in 7(c) are consistent with some of the Department's own thinking and will be fed into the plans being developed as part of Curriculum Review.

8. For Examiners final year in office only: Final Exit Report

² i.e. completed copy of the report template sent on by the Quality Assurance Team on behalf of the department.

8	Please provide an overview of your term of office. This should ideally include comment on any changes in standards of student performance over time, major developments in the provision during your tenure, the implementation of any recommendations for enhancement (this is not an exhaustive list and examiners are welcome to comment on any matters they consider appropriate)

Q8: Department Response

n/a

9. Overall Confidence statement

The independent views of our External Examiners form an important part of the annual reporting of the maintenance of standards and judgement of the governing body.

Please complete the following section with regards to the module(s)/programme(s) of study to which this report relates. Where you are unable to say 'Yes', commentary must be provided in the comments box below.

(i)	The degree awarding body is maintaining the threshold academic standards set for its awards in accordance with the FHEQ and relevant Subject Benchmarks Statements.	Yes
(ii)	The assessment process measures student achievement rigorously and fairly against the intended learning outcomes of the programme(s) and is conducted in line with the College's policies and regulations	Yes
(iii)	The academic standards and the achievements of students are comparable with those in other UK degree-awarding bodies of which you have experience	Yes

External Examiner Signature (an electronic or typed signature is acceptable):	C Jennison
Date of submission:	17/07/2018

Internal Use Only

Name and title of Department Respondent	Professor David Evans
Position:	<i>Director of Undergraduate Studies, Mathematics.</i>
Date:	25/09/18

Examiner's Details	
Full name and title	Professor Mark Kambites
Home institution or other affiliation	University of Manchester
Degree being examined (e.g. BSc/GEP/MBBS/MEng/MSc/MRes)	BSc and MSci
Subject and part being examined (e.g. Biology)	Mathematics
Year of Tenure	1

* If this is your final year of office please ensure you complete the final section of this report.

1. Programme Information/support for External Examiner Role

1(a)	Programme/Module Information Please confirm if the following was provided to you (either sent directly or through a publication site link)	
(i)	Programme handbook(s) / programme specification including programme learning outcomes?	Yes
(ii)	Syllabus or module descriptors including learning outcomes?	Yes
(iii)	Assessment briefs / marking criteria	Yes
(iv)	Sufficient information about the programme(s) / modules in order to fulfil your role?	Yes
(v)	Is there any additional documentation/ information that you would have benefited from receiving?	No

New External Examiners only

1(b)	College Induction and Appointment Process Please answer the following questions with regards to the College appointment and induction process	
(i)	Did you find the appointment process fit for purpose?	Yes
(ii)	Was the appointment made in a timely manner?	Yes
(iii)	Do you consider that the arrangements for the Induction day were sufficient?	n/a
(iv)	Did you find the follow-up information useful?	Yes
(v)	Was the department process to provide an induction to the programme and specific requirements of your role effective?	Yes
I was unable to attend the College induction day due to a prior commitment, but the written materials provided and induction by the Department were excellent and seem quite adequate preparation.		
(vi)	Following completion of your first year of tenure, is there any additional information/ support that you feel would be beneficial to provide at induction in future?	No

Q1: Department response

No response required.

2. Programme/Curriculum Design

2(a)	Overall programme design and coherence Please comment on the strengths and weaknesses of the programme design in relation to:
(i)	The balance and content of the degree programme(s) in relation to stated learning outcomes; The degree programmes contain a good balance of material appropriate for their learning outcomes.
(ii)	Coherence and currency of the programme(s) and the appropriateness of compulsory modules/units in relation to stated learning outcomes; The programmes are entirely appropriate in this respect.
(iii)	Suitability of the programme design in relation to the relevant subject benchmarks/ Professional Statutory Regulatory Body (PSRB) or Accrediting Body requirements (where applicable); The programmes seem suitable in relation to the QAA MSOR subject benchmarks. I am not aware of any other requirements which apply.
(iv)	Where applicable, the relevance and integration of placements¹ to the overall programme and its contribution to the programme learning outcomes; n/a

2(b)	Assessment Strategy Please comment on the strengths and weaknesses of the assessment strategy in relation to:
(i)	The rigour, appropriateness and overall quality of the methods of assessment (unseen written papers, essays/dissertations, orals, clinical examinations) in relation to the level of study and the intended learning outcomes; The methods of assessment used (for most modules unseen written papers supplemented with a small amount of coursework; for a few modules more extensive projects) are standard for a rigorous academic mathematics degree programme, and as such are entirely appropriate.
(ii)	The balance and comparability of assessment methods across modules of the same level; The balance and comparability of methods is generally good, but see 5(iii) below for comments on comparability of standards.
(iii)	The suitability of the overall assessment load for the programme(s); This seems entirely appropriate.

Q2: Department response

No response required.

¹ Placements are any provision taken away from the direct College environment and may include: Year abroad, year in industry, modules studied at other approved HEIs (collaborative modules), or any other periods away from the College as part of an approved study plan.

3. Assessment Process, Marking and Moderation

3(a)	Drafting of Assessment	
(i)	Did you receive all of the necessary draft assessments for comment / approval?	Yes
(ii)	Were the nature and level of the questions (or tasks) appropriate?	Yes
(iii)	Were suitable arrangements in place to consider your comments on the draft assessments?	Yes
(iv)	Did you receive feedback on your comments?	See below
My comments were of a minor nature and I specifically indicated that I did not require feedback at the time; I did see responses later, when I visited for the examination board, and these were generally satisfactory.		

3(b)	Marking and Moderation of scripts (Examination, assessed coursework, dissertation/project reports)	
(i)	Did you receive a sufficient number of scripts and other assessed work, including those of first class, distinction, borderline and failed candidates, for scrutiny?	Yes
(ii)	Was the general standard and consistency of marking appropriate?	Yes
(iii)	Was there evidence that assessed work had been moderated internally, either through check marking or second marking?	Yes
(iv)	Were the scripts marked in such a way as to enable you to see the reasons for the award of given marks?	Yes

3(c)	In relation to Practical Examinations	
(i)	Were satisfactory arrangements made for the conduct of practical examinations?	n/a
(ii)	Was the general standard and consistency of marking appropriate?	n/a
There are no practical examinations, at least in the part of the programme for which I am responsible.		

3(d)	In relation to Oral Assessments (including Viva Voce Examinations)	
(i)	Were satisfactory arrangements made for the conduct of oral assessments (e.g. presentations, poster presentations etc...)?	n/a
(ii)	Were suitable arrangements made for you to conduct viva voce examinations?	n/a
(iii)	Was the purpose for conducting a viva voce examination and the criteria for selecting candidates for a viva voce clear?	n/a
(iv)	Was the assessment of such work appropriate and consistent?	n/a
I was not involved in any oral examinations.		

3(e)	Please comment on the assessment process, marking and moderation in relation to:	
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(i)	The suitability of marking schemes / marking criteria and, where appropriate, model answers and the consistency with which these were applied;
Marking schemes were generally good, and were consistently applied.	
(ii)	The suitability of the procedures for marking and moderation and the consistency with which these were applied;
Marking and moderation procedures seem very good.	
(iii)	Whether the grade boundaries for the assessment are set at the appropriate level and applied consistently;
Generally speaking the PTEM boundaries were used to set grade boundaries appropriately, but see also comments in 5(iii) below.	
(iv)	The extent to which the assessment process measures student achievement rigorously and fairly against the intended outcomes of the programme(s) and is conducted in line with College policies and regulations
To the best of my knowledge, all assessment was fair, rigorous and in line with appropriate policies and regulations.	

3(f)	Programme content which has been delivered and assessed by another institution (this would cover 1) placement activity, e.g. some or all of an undergraduate year abroad study plan, and 2) modules undertaken at local partner institutions, i.e. what are termed collaborative modules).	
(i)	Was it clear in advance of the Board that students under consideration had undertaken content away from the College?	Yes
(ii)	Were the procedures for incorporating marks obtained by students at another institution clear and consistently applied?	No
(iii)	Was any such provision discussed at the Board of Examiners, particularly in relation to progression/award decisions, overall value and consistency with regards to the programme(s) of study?	Yes
The basis used for converting marks obtained at an overseas institution, during a year abroad, is not clear to me and seems deeply problematic. I understand that procedures were correctly followed, but I am not satisfied that these procedures always produce marks remotely comparable with those obtained in the College. The small number of students affected means I cannot go into more detail without identifying individuals, but I would suggest there needs to be a serious rethink of the way in which marks are converted and incorporated.		

Q3: Department response

3(f): The Department has a process for converting marks from each of its overseas partners. This is available to students and examiners. The Department's Teaching Committee is in the process of reviewing the conversion used and the new method will come into effect in 2018-19.

4. Board of Examiners

4(a)	Board of Examiners' Meeting	
(i)	Were you invited to attend the meeting?	Yes
(ii)	Were you able to attend the meeting?	Yes
(iii)	Was the meeting conducted to your satisfaction?	Yes

(iv)	Were you satisfied with the recommendations of the Board of Examiners?	Yes

4(b)	Please comment on the following aspect related to Boards of Examiners' Meetings:
(i)	Whether the arrangements for degree classification (e.g. the scheme for the award of honours [UG] / scheme for the award of pass, merit or distinction [PG] – whichever is relevant) are set at the appropriate level and applied consistently.
The arrangements are at the appropriate level and generally applied consistently (although see remarks under 4(b)(iii) below about borderline candidates).	
(ii)	Whether the College procedures governing mitigating circumstances and/or academic misconduct (e.g. plagiarism cases) were considered and applied fairly and equitably to all students.
From what I saw, application of these procedures was exemplary.	
(iii)	Whether the consideration of borderline performances was conducted fairly and equitably, and in line with College Procedures.
The consideration was fair and in line with appropriate procedures. However, there is perhaps a lack of clarity in the procedures about the criteria on which borderline candidates are to be assessed. The examiners applied sensible criteria and reached justifiable decisions which were entirely consistent with each other across this year's cohort. However, the choice of criteria and how to weight them seems to have an arbitrary aspect: different criteria or weightings could equally well have been chosen, and different decisions reached, so it is not clear to me how consistent the decisions will be with those made last year or next year.	

Q4: Department response

The Board usually takes into account a number of factors when deciding whether or not to promote a borderline candidate to a higher class. Particular weight is given to the views of External Examiners, who will have spent time reviewing the candidate's mark profile and scripts. Given the difficulties in ensuring complete comparability of marks across a very large number of modules, such as those mentioned by the External in 5, distributions of marks in the individual modules taken by a borderline student can also be taken into consideration, together with standard indicators such as number of modules in a particular class. There is some degree of collective memory which aims for consistency with decisions in previous years, but we take the point that this could be documented better (for example by recording marks and profiles at class boundaries from previous years).

5. Academic Standards

c. Academic Standards	
5	Please comment on academic standards and student achievement with regard to:
(i)	The appropriateness of the standards set for the awards in relation to the Framework for Higher Education Qualifications, national subject benchmarks and any additional Professional, Statutory and Regulatory Body (PSRB) or accrediting body requirements (where relevant);
The standards are entirely appropriate.	
(ii)	The standards of student performance in the programme(s) or parts of programmes and whether these are comparable with standards achieved by students on similar programmes or parts of programmes in other UK higher education institutions of which you have experience;
The standards achieved by the students are very high compared with most UK HEIs. Particularly impressive are the standards achieved in project work by students at the top end of the ability spectrum, which are among the best I have seen anywhere.	

(iii)	The extent to which the academic standards and standards of student performance across modules within the programme(s) are comparable;
Broadly speaking, comparability is good. However, it does seem from raw student marks that pure mathematics assessments are, on average, somewhat harder than assessments in some other areas of mathematics. Although PTEM scaling was used to correct this, a reluctance to scale more than strictly necessary means the effect was not always completely nullified. A student who took a large number of affected modules could in principle have been slightly disadvantaged (although this fact was taken into consideration by the examination board in borderline cases, so I do not believe any student was actually disadvantaged).	
(iv)	For external examiners <u>not</u> in their first year of appointment – are the standards of student performance across modules within the programme(s) comparable to those in previous cohorts;
n/a	

Q5: Department response

We thank the External for the above comments about our standards. The comments in (iii) will be passed on to the Department's Liaison Panel (which makes scaling decisions on behalf of the Board). This is also an issue which needs to be considered when setting papers, and setters and checkers will be reminded to take into account performance in previous years when gauging the level of their papers. It is reassuring to note that the External believes that no borderline students were disadvantaged.

6. Response to previous year's External Examiner Report

6.	Response to previous year's report	
(i)	Did you receive the formal written response from the department to the previous year's External Examiner report²?	n/a
(ii)	Are you satisfied that the issues raised in the previous report either have been, or are being, addressed?	n/a

Q6: Department response

n/a

7. Overview Comments, Recommendations and Good Practice

Please provide an overview of your assessment of the programme(s) and modules for which you are responsible as External Examiner. Please identify any specific matters relating to the academic standards of the awards and/or the quality of learning opportunities provided to students that should be addressed. Please also highlight any examples of good and/or innovative practice that you consider to be worthy of wider dissemination within the College.

² i.e. completed copy of the report template sent on by the Quality Assurance Team on behalf of the department.

7a.	Recommendations / Suggestions for Enhancement
I recommend that the College should - urgently address the apparent lack of comparability between marks obtained by converting overseas marks during a year abroad and marks obtained in College; - consider providing clearer guidance on the criteria to be applied by the examination board when considering borderline candidates; - ensure that understandable reluctance to scale more than necessary does not result in insufficient scaling being applied to modules where the assessment was more difficult than intended.	

7b.	Examples of good and/or innovative practice in learning, teaching and assessment
I was generally impressed by the care taken with the assessment process, and with the standard of projects. I have not really seen enough yet to form a view on learning and teaching more widely.	

7c.	Overview Comments
All issues are covered above.	

Q7: Department Response

Please see the responses to the points made in sections 3, 4, 5.

8. For Examiners final year in office only: Final Exit Report

8	Please provide an overview of your term of office. This should ideally include comment on any changes in standards of student performance over time, major developments in the provision during your tenure, the implementation of any recommendations for enhancement (this is not an exhaustive list and examiners are welcome to comment on any matters they consider appropriate)
n/a	

Q8: Department Response

n/a

9. Overall Confidence statement

The independent views of our External Examiners form an important part of the annual reporting of the maintenance of standards and judgement of the governing body.

Please complete the following section with regards to the module(s)/programme(s) of study to which this report relates. Where you are unable to say 'Yes', commentary must be provided in the comments box below.

(i)	The degree awarding body is maintaining the threshold academic standards set for its awards in accordance with the FHEQ and relevant Subject Benchmarks Statements.	Yes
(ii)	The assessment process measures student achievement rigorously and fairly against the intended learning outcomes of the programme(s) and is conducted in line with the College's policies and regulations	Yes
(iii)	The academic standards and the achievements of students are comparable with those in other UK degree-awarding bodies of which you have experience	Yes

Everything I have seen suggests academic standards are very high, and I currently have no concerns on this front.

External Examiner Signature (an electronic or typed signature is acceptable):	Mark Kambites
Date of submission:	05/07/2018

Internal Use Only

Name and title of Department Respondent	Professor David Evans
Position:	<i>Director of Undergraduate Studies, Mathematics</i>
Date:	24/09/2018

Examiner's Details	
Full name and title	Dr. Ionica Emilian Parau
Home institution or other affiliation	University of East Anglia
Degree being examined (e.g. BSc/GEP/MBBS/MEng/MSc/MRes)	BSc and MSci
Subject and part being examined (e.g. Biology)	Mathematics
Year of Tenure	2

* If this is your final year of office please ensure you complete the final section of this report.

1. Programme Information/support for External Examiner Role

1(a)	Programme/Module Information Please confirm if the following was provided to you (either sent directly or through a publication site link)	
(i)	Programme handbook(s) / programme specification including programme learning outcomes?	Yes/All
(ii)	Syllabus or module descriptors including learning outcomes?	Yes/All
(iii)	Assessment briefs / marking criteria	Yes/All
(iv)	Sufficient information about the programme(s) / modules in order to fulfil your role?	Yes/All
I received clear information about all the programmes and modules examined.		
(v)	Is there any additional documentation/ information that you would have benefited from receiving?	No

New External Examiners only

1(b)	College Induction and Appointment Process Please answer the following questions with regards to the College appointment and induction process	
(i)	Did you find the appointment process fit for purpose?	N/A
(ii)	Was the appointment made in a timely manner?	N/A
(iii)	Do you consider that the arrangements for the Induction day were sufficient?	N/A
(iv)	Did you find the follow-up information useful?	N/A
(v)	Was the department process to provide an induction to the programme and specific requirements of your role effective?	N/A
(vi)	Following completion of your first year of tenure, is there any additional information/ support that you feel would be beneficial to provide at induction in future?	N/A

Q1: Department response

No response required

2. Programme/Curriculum Design

2(a)	Overall programme design and coherence Please comment on the strengths and weaknesses of the programme design in relation to:
(i)	The balance and content of the degree programme(s) in relation to stated learning outcomes; The BSc/Msci Mathematics programmes have a good mix of Pure, Applied, Statistics and Computational projects, ensuring the achievement of learning outcomes
(ii)	Coherence and currency of the programme(s) and the appropriateness of compulsory modules/units in relation to stated learning outcomes; The structure of core modules in the first two years, followed by optional modules in the last year(s) is adequate and similar to other BSc/MSci programmes in the country. The large number of optional modules in Years 3 and 4 in different areas of Mathematics is very valuable.
(iii)	Suitability of the programme design in relation to the relevant subject benchmarks/ Professional Statutory Regulatory Body (PSRB) or Accrediting Body requirements (where applicable); The methods of teaching seem to be adequate and suitable, as proved by the standards achieved by candidates.
(iv)	Where applicable, the relevance and integration of placements¹ to the overall programme and its contribution to the programme learning outcomes; The Year Abroad offered at ENS Lyon to some students after Year 2 is valuable and has a positive contribution to the learning outcomes.
2(b)	Assessment Strategy Please comment on the strengths and weaknesses of the assessment strategy in relation to:
(i)	The rigour, appropriateness and overall quality of the methods of assessment (unseen written papers, essays/dissertations, orals, clinical examinations) in relation to the level of study and the intended learning outcomes; The methods of assessment (written examination, coursework, projects) are appropriate and rigorous.
(ii)	The balance and comparability of assessment methods across modules of the same level; The assessment methods were of similar standard on the Applied modules of the same level I supervised.
(iii)	The suitability of the overall assessment load for the programme(s); The overall assessment load for the programme is fine.

Q2: Department response

No response required

¹ Placements are any provision taken away from the direct College environment and may include: Year abroad, year in industry, modules studied at other approved HEIs (collaborative modules), or any other periods away from the College as part of an approved study plan.

3. Assessment Process, Marking and Moderation

3(a)	Drafting of Assessment	
(i)	Did you receive all of the necessary draft assessments for comment / approval?	Yes/All
(ii)	Were the nature and level of the questions (or tasks) appropriate?	Yes/All
(iii)	Were suitable arrangements in place to consider your comments on the draft assessments?	Yes/All
(iv)	Did you receive feedback on your comments?	Yes/All
I have received all the draft assessments and I was given enough time to read and make comments. The whole email conversation between setters/checkers of exams until the final version was available to me, which is very valuable.		

3(b)	Marking and Moderation of scripts (Examination, assessed coursework, dissertation/project reports)	
(i)	Did you receive a sufficient number of scripts and other assessed work, including those of first class, distinction, borderline and failed candidates, for scrutiny?	Yes/All
(ii)	Was the general standard and consistency of marking appropriate?	Yes/All
(iii)	Was there evidence that assessed work had been moderated internally, either through check marking or second marking?	Yes/All
(iv)	Were the scripts marked in such a way as to enable you to see the reasons for the award of given marks?	Yes/All
The dissertation/projects have been second-marked. The marks on the exam scripts have been checked by a second person.		

3(c)	In relation to Practical Examinations	
(i)	Were satisfactory arrangements made for the conduct of practical examinations?	N/A
(ii)	Was the general standard and consistency of marking appropriate?	N/A

3(d)	In relation to Oral Assessments (including Viva Voce Examinations)	
(i)	Were satisfactory arrangements made for the conduct of oral assessments (e.g. presentations, poster presentations etc...)?	Yes/All
(ii)	Were suitable arrangements made for you to conduct viva voce examinations?	N/A
(iii)	Was the purpose for conducting a viva voce examination and the criteria for selecting candidates for a viva voce clear?	N/A
(iv)	Was the assessment of such work appropriate and consistent?	Yes/All

3(e)	Please comment on the assessment process, marking and moderation in relation to:
(i)	The suitability of marking schemes / marking criteria and, where appropriate, model answers and the consistency with which these were applied;
The marking schemes and the model answers were suitable and they were applied consistently.	
(ii)	The suitability of the procedures for marking and moderation and the consistency with which these were applied;
The marking and moderation was done in a consistent way across the modules.	
(iii)	Whether the grade boundaries for the assessment are set at the appropriate level and applied consistently;
The grade boundaries were at the appropriate level in most cases. Where needed, the PTEM system was used moderately to correct some small issues.	
(iv)	The extent to which the assessment process measures student achievement rigorously and fairly against the intended outcomes of the programme(s) and is conducted in line with College policies and regulations
The assessment process is well designed and they fulfil very well the job of measuring the student achievement.	

3(f)	Programme content which has been delivered and assessed by another institution (this would cover 1) placement activity, e.g. some or all of an undergraduate year abroad study plan, and 2) modules undertaken at local partner institutions, i.e. what are termed collaborative modules).	
(i)	Was it clear in advance of the Board that students under consideration had undertaken content away from the College?	Yes/All
(ii)	Were the procedures for incorporating marks obtained by students at another institution clear and consistently applied?	Yes/All
(iii)	Was any such provision discussed at the Board of Examiners, particularly in relation to progression/award decisions, overall value and consistency with regards to the programme(s) of study?	Yes/All
There was a discussion about marks of a student in a Year Abroad and their effect on their final classification. The Exam Board should continue to have discretion on dealing with these marks, if they are out of line with the marks obtained at Imperial.		

Q3: Department response

We thank the External for the comments regarding the suitability and appropriateness of these aspects of our processes. The Department is reviewing the calibration year abroad marks, but we note the External's support for the current system which gives the Examination Board the discretion to de-weight the year abroad mark for the purposes of degree classification, if this is out of line with a student's marks at Imperial.

4. Board of Examiners

4(a)	Board of Examiners' Meeting	
(i)	Were you invited to attend the meeting?	Yes
(ii)	Were you able to attend the meeting?	Yes

(iii)	Was the meeting conducted to your satisfaction?	Yes
(iv)	Were you satisfied with the recommendations of the Board of Examiners?	Yes
The Board of Examiners' Meeting was conducted very efficiently. We did have access to all the material requested and the scripts of borderline candidates were in particular scrutinized.		

4(b)	Please comment on the following aspect related to Boards of Examiners' Meetings:
(i)	Whether the arrangements for degree classification (e.g. the scheme for the award of honours [UG] / scheme for the award of pass, merit or distinction [PG] – whichever is relevant) are set at the appropriate level and applied consistently.
Yes, the degree classification was applied consistently.	
(ii)	Whether the College procedures governing mitigating circumstances and/or academic misconduct (e.g. plagiarism cases) were considered and applied fairly and equitably to all students.
The College procedures for mitigating circumstances on borderline cases were applied fairly and equitably. Decisions of the Board were taken based on them.	
(iii)	Whether the consideration of borderline performances was conducted fairly and equitably, and in line with College Procedures.
The borderline candidates were considered on great detail, with External looking in great detail at their exam scripts and projects. They were treated fairly and equitably.	

Q4: Department response

No response required.

5. Academic Standards

5		Please comment on academic standards and student achievement with regard to:
(i)	The appropriateness of the standards set for the awards in relation to the Framework for Higher Education Qualifications, national subject benchmarks and any additional Professional, Statutory and Regulatory Body (PSRB) or accrediting body requirements (where relevant);	
The standards are appropriate for BSc/MSc in Mathematics, as defined on the QAA Benchmarks for Mathematics.		
(ii)	The standards of student performance in the programme(s) or parts of programmes and whether these are comparable with standards achieved by students on similar programmes or parts of programmes in other UK higher education institutions of which you have experience;	
The standards of student performance at Imperial are very high and they compare favourably with standards at different Universities in UK.		
(iii)	The extent to which the academic standards and standards of student performance across modules within the programme(s) are comparable;	
In most cases, the student performances across modules on Maths programmes are comparable. The few exceptions, where a higher or lower average was obtained in some modules, the PTEM scaling was used to adjust the differences.		

(iv)	For external examiners <u>not</u> in their first year of appointment – are the standards of student performance across modules within the programme(s) comparable to those in previous cohorts;
The standards of student performance are similar with those from last year.	

Q5: Department response

No response required

6. Response to previous year's External Examiner Report

6.	Response to previous year's report	
(i)	Did you receive the formal written response from the department to the previous year's External Examiner report ² ?	Yes
(ii)	Are you satisfied that the issues raised in the previous report either have been, or are being, addressed?	Yes
I had just minor comments last year, and they were answered and I received the response.		

Q6: Department response

No response required

7. Overview Comments, Recommendations and Good Practice

Please provide an overview of your assessment of the programme(s) and modules for which you are responsible as External Examiner. Please identify any specific matters relating to the academic standards of the awards and/or the quality of learning opportunities provided to students that should be addressed. Please also highlight any examples of good and/or innovative practice that you consider to be worthy of wider dissemination within the College.

7a.	Recommendations / Suggestions for Enhancement
As mentioned above, the Examiners Board should continue to have the power to discard the marks for the Year Abroad for the final classification, if these are out of line with the marks obtained at Imperial. Also, a clear scheme of scaling of the marks from the institution abroad (e.g. ENS Lyon, MIT) may help. This issue came at the meeting with the students.	
7b.	Examples of good and/or innovative practice in learning, teaching and assessment
The weekly tests in Year 1 seem to be appreciated by the students. Also, the posters produced by students for their computational module are a good practice.	
7c.	Overview Comments
The whole communication with Imperial College in relation to the Exams papers was excellent. The Board of Examiners was very well organised. The PTEM scaling is very useful. Overall, the standard of student performances in written exams and in projects is of very high quality.	

² i.e. completed copy of the report template sent on by the Quality Assurance Team on behalf of the department.

Q7: Department Response

We thank the External for these comments. We ask that College particularly notes:

- (i) the support for the use of the PTEM scaling system;
- (ii) the comments in 7(a) regarding the powers available to the Exam Board when handling year-abroad marks.

The Department uses a scheme for converting year-abroad marks to Imperial marks. This is currently being reviewed by the Department's Teaching Committee, but some extra facility to discard marks should be retained when the new regulations are introduced.

8. For Examiners final year in office only: Final Exit Report

8	Please provide an overview of your term of office. This should ideally include comment on any changes in standards of student performance over time, major developments in the provision during your tenure, the implementation of any recommendations for enhancement (this is not an exhaustive list and examiners are welcome to comment on any matters they consider appropriate)
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Q8: Department Response

n/a

9. Overall Confidence statement

The independent views of our External Examiners form an important part of the annual reporting of the maintenance of standards and judgement of the governing body.

Please complete the following section with regards to the module(s)/programme(s) of study to which this report relates. Where you are unable to say 'Yes', commentary must be provided in the comments box below.

(i)	The degree awarding body is maintaining the threshold academic standards set for its awards in accordance with the FHEQ and relevant Subject Benchmarks Statements.	Yes
(ii)	The assessment process measures student achievement rigorously and fairly against the intended learning outcomes of the programme(s) and is conducted in line with the College's policies and regulations	Yes
(iii)	The academic standards and the achievements of students are comparable with those in other UK degree-awarding bodies of which you have experience	Yes

External Examiner Signature	E Parau
Date of submission:	01/08/2018

Internal Use Only

Name and title of Department Respondent	Professor David Evans
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Position:	<i>Director of Undergraduate Studies, Mathematics</i>
Date:	24/09/2018