Annual Monitoring Report 2017-18
Undergraduate Programmes

Departmental Information	
Department	Physics
Faculty	Natural Sciences
Author of Report *(including job title)*	Dr Robert J Forsyth, Director of Undergraduate Studies
Period covered by the report	2016-17 academic year
Date report produced	11 December 2017
Deadline for submitting report	Monday 13 November 2017

Please check that the list of programmes below is accurate:

Programmes within the scope of this report *(including collaborative provision)*
Physics (BSc 3YFT)
Physics (MSci 4YFT)
Physics and Music Performance (BSc 4YFT)
Physics with Science Education (BSc 3YFT)
Physics with Science Education (MSci 4YFT)
Physics with Theoretical Physics (BSc 3YFT)
Physics with Theoretical Physics (MSci 4YFT)
Physics with a Year in Europe (MSci 4YFT)

Section 1: Departmental Overview and Context

The Department of Physics is one of the largest in the UK and is the second-largest department in the College in terms of its total population of undergraduate students. The Department receives over 1600 applications each year from highly qualified applicants for its target intake of 240 students, attracted in particular by the Department's high quality research reputation. All of the Department's programmes are accredited by the Institute of Physics (IOP), renewed for a further five year period in 2015.

2016-17 was a year where no major changes were made to our Physics programmes following on from the changes arising from our previous rolling curriculum review reaching Year 4 in 2015-16. Minor changes in 2016-17 included the first teaching of revised Year 1 Electronics courses to fill a gap in teaching of the IOP core curriculum identified during preparation for our 2015 accreditation review. All students now attend a short Basic Electronics course and then those on our standard MSci and BSc Physics programmes follow a mainly lab-based Advanced Electronics course. The focus of our Year 4 Research Interfaces professional skills course changed from being focussed on a preparing a business plan to being focussed on preparing a scientific research grant, with the learning outcomes largely unchanged – this resulted in a significant improvement in the SOLE results for the module. Entrepreneurial skills had previously been moved to the Year 3 professional skills module where they can also be of benefit BSc graduates.

Driven by recommendations from our 2015 IOP accreditation review and also NSS feedback we began a major review of our undergraduate laboratory teaching through all years of our degree programme. The review team made a number of visits to selected UK Physics Departments gathering good practice to inform their planning. As a result of this review a completely revised Year 1 Laboratory & Computing course has been put in place for first teaching in 2016-17, with the review team now moving on to consider Years 2 and 3 laboratory provision.

Strengths	Issues
Students are attracted to study Physics at Imperial by the Department's reputation for being at the cutting edge of research in a broad range of areas. This is manifested in our teaching by the wide range of elective modules we are able to offer in Years 3 and 4 and by the wide range of projects we are able to offer in Years 1, 3 and 4. Final year projects in Years 3 and 4 are often based in the research groups and a few each year lead to student participation in scientific publications. Student Achievement: our graduating students performed very strongly in 2016-17 with a significantly higher proportion of First Class degrees – however this appears to be explainable by student demographics as	Student Feedback: Our weak showing in the NSS survey continues to be our most significant issue (Section 5 of this report). Issues raised include consistency of assessment and feedback, lack of community in the Department and an increased number of comments mentioning mental health issues in 2016-17 Pastoral Support: Variability of support provided by personal tutors remains an issue. We have adopted the Starfish student support in the summer of 2017 which should allow better monitoring. Our newly appointed Student Liaison Officer will provide additional support for personal tutors.

described in Section 2 of this report. Student Destinations: The majority of our students continue to be in either employment of further study 6 months after graduation with only small a small proportion still seeking employment. These proportions have not changed significantly over very many years.	Curriculum: We are aware that certain parts of our curriculum have become overcrowded particularly towards the end of Year 2. This will be addressed as part of the upcoming curriculum review.

Please note that reporting within the following sections should be 'by exception'. Where the evidence (both qualitative and quantitative) shows consistently good performance and there are no obvious issues, simply indicate this by marking the relevant box and no further commentary is required. However, where there is significant deviation in data from one year to the next or recommendations within qualitative reports which require a response, these should be commented on in the relevant sections with resulting/proposed actions detailed.

Throughout the report, authors are encouraged to highlight examples of good practice and any commendable achievements. Whilst the report does focus to an extent on issues or areas of concern which may require further action it is of equal importance to highlight areas of good practice, innovation and commendation. One of the key principles of the annual monitoring process is to promote continuous enhancement of academic programmes and the student experience. Identification and sharing of good practice which could, if suitably adapted, be implemented elsewhere in the College provides an opportunity to promote enhancement as well as an opportunity for Departments to celebrate areas of excellence and innovation.

Section 2: Evaluation of Student Achievement and Progression 2016-17

Guidance notes for this section can be found on the website (see tab 'Reviewing Undergraduate Provision').

Please tick as appropriate	
Yes ☐ **No** ☒	There were no significant trends or changes in relation to student achievement
Yes ☒ **No** ☐	There were no significant trends or changes in relation to student progression and retention

There were the following trends or changes in relation to student achievement in 2016-17:

When the degree class statistics are aggregated across programmes a notable increase in First Class degrees emerges for 2016-17, 51% in 2016-17 compared 39% in 2015-16 and typically 40-45% range in previous years. However, detailed analysis prior to the exam board meetings showed that this is explainable by decisions taken at the end of Year 2 for the respective cohorts (2013 and 2014 entry) graduating this year. Note that both these cohorts had approximately the same overall marks profile at the end of Year 2. For the 2013 entry cohort a higher than usual proportion of strong students (based on marks at the end of Year 2) chose to proceed on the MSci programmes and graduate in 2017. For the 2014 entry cohort a higher proportion than usual of strong students opted to proceed on the BSc programmes and hence also graduate in 2017. The combination of these decisions led to the notable increase in First Class degrees in 2017. If this modelling is correct and similarly applied to the 2018 graduating cohorts a return to a more typical proportion of First Class degrees is expected in 2018.

Section 3: External Examiner Reports 2016-17

Guidance notes for this section can be found on the website (see tab 'Reviewing Undergraduate Provision').

Please tick as appropriate	
Yes ☒ **No** ☐	There were no significant issues raised by External Examiners in their reports for 2016-17 that require further action by the Department

The following issues were raised by External Examiners in their reports for 2016-17 that require further consideration and/or action

Issues raised by the external examiners were relatively minor in 2016-17 compared to recent previous years.

One examiner was particularly critical of the need to scale the results of a slightly more than usual number of examinations in 2016-17, regarding this as a failure of the question setters to set a balanced paper in terms of the proportions of easier and harder material. We have updated our examination setting guidance document to emphasise this point.

All three examiners found some examples of scripts where it was not obvious from green pen markings that the second marker had checked every page. We have updated our guidance to both first and second markers to address this and other points raised.

Errors in papers being discovered during the examinations themselves were fewer this year. One examiner has suggested that we include a formal report of such errors in our Board of Examiners meetings and we will implement this for 2018.

Our Comprehensive examination papers continue to be cited as an example of good practice. This year the broad range of MSci final year projects available was cited as a strength of our programmes.

Section 4: Professional, Statutory and Regulatory Body (PSRB) and other external reports
Guidance notes for this section can be found on the website (see tab 'Reviewing Undergraduate Provision').

Please tick as appropriate	
Yes ☒ **No** ☐	Not applicable – No PSRB accreditation visit(s) took place in 2016-17
Yes ☐ **No** ☐	A visit by the [name of PSRB/or other] took place in 2016–17. The outcome of the visit was [explain]
Yes ☐ **No** ☐	There were no significant issues raised by PSRBs during accreditation visits in 2016-17 that require further action by the Department

The following issues were raised by PSRBs during accreditation visits in 2016-17 that require further consideration and/or action:

The following areas of good/innovative practice or commendable achievements were identified by PSRBs in the report(s):

Section 5: Student Feedback
Guidance notes for this section can be found on the website (see tab 'Reviewing Undergraduate Provision').

NSS Results

Note: A number of the questions were been changed for the 2017 survey which will impact historic comparison

Table 1: Percentage satisfaction (%) in 2017 for the Department of Physics and the College by NSS Category, along with the percentage change from 2016 and 2015.

NSS Question Category	College (%)	Sector Average (%)	Difference	Rank /42
Teaching	78	87	-9	38
Learning opportunities	66	83	-17	42
Assessment and feedback	48	74	-26	42
Academic support	67	84	-17	41
Organisation and management	66	82	-16	39
Learning resources	82	88	-6	35
Learning Community	61	80	-19	40
Student Voice	57	69	-12	37
Overall Satisfaction	67	88	-21	41

Rank is coloured as follows: Top quartile; second quartile; third quartile; bottom quartile.

Table 2: The percentage satisfaction for the NSS subject Physics, by NSS Question Category, for the College and the Sector Average. It also shows the College's NSS Subject rank within the institutions teaching Physics.

NSS Question Category	Subject			College Total		
	2017 (%)	Δ since 2016	Δ since 2015	2017 (%)	Δ since 2016	Δ since 2015
Teaching	78	-3	-11	84	-1	-5
Learning opportunities	66	-	-	82	-	-
Assessment and feedback	48	+6	-13	65	+3	-3
Academic support	67	+4	-9	77	0	-6
Organisation and management	66	+8	-10	78	0	-6
Learning resources	82	-2	-8	88	-4	-7
Learning Community	61	-	-	79	-	-
Student Voice	57	-2	-19	76	+5	-2
Overall Satisfaction	67	0	-19	84	+1	-4

Reflections on NSS 2017 results

The Physics 2017 NSS results were again very disappointing; although there were small improvements in three categories since 2016 the majority remain well below 2015 levels of satisfaction. Although we are making progress on a number of fronts in response to the 2016 survey, these were mostly too late to affect the views of 2017 respondents reflecting back on their whole time at Imperial. Actions taken over the past year include the appointment of a Student Liaison Officer who took up post in August 2017, roll out of Physics specific assessment and feedback training for postdocs and GTAs who teach, a longer term full-review of our laboratory teaching which has already led to major changes to our Year 1 Laboratory & Computing teaching, including a significant new equipment spend, while our Heads of Year 2 and 3 Laboratories have updated their assessment procedures to include scheduled opportunities for students to discuss their report feedback with their markers.

Once again there were many positive written comments of the quality of lecturing and teaching – the negative comments are summarised in the section below.

Please tick as appropriate	
Yes ☐ **No** ☒	There were no significant issues arising from NSS in 2017 that require further action by the Department

The following issues were identified from NSS 2017 that require further consideration and/or action:

Areas of concern highlighted by scrutiny of the NSS comments were in many cases similar to 2016, with consistency of assessment and feedback, high workload, a perception that the Department was uncaring about its students and a lack of community being prevalent comments. A new issue in 2017 was the number of comments that mentioned mental health concerns.

For assessment and feedback, continuation and reinforcement of actions already taken we hope will gradually address this problem, namely the improved demonstrator training, opportunities to discuss feedback with the marker, and the longer term review of our laboratory teaching. With the implementation of a completely revised Year 1 Laboratory & Computing programme in October 2017, the review team is now moving on to consider Years 2 and 3 in greater detail. Issues related to high workload and possible over-assessment will be targeted as part of our curriculum review. The Department has adopted the Starfish personal tutoring system over the summer of 2017, which is allowing us to keep closer tabs on the frequency of personal tutors meeting with their tutees. Our new Student Liaison Officer has already reviewed community building activities within our Department and has introduced a number of new activities to try to address this issue.

Our incoming Head of Department has asked Prof Richard Thompson to lead for the Department on preparations for TEF and as part of this has also asked him to also lead a broader review of issues arising from NSS to inform our further NSS strategy going forward. He has formed two working groups, one looking at NSS issues across the board, and the other looking specifically at mental health issues. These are expected to report back to the Head of Department and to the Teaching Committee next term.

Please tick as appropriate	
Yes ☒ **No** ☐	There were no significant issues arising from student feedback (e.g. SOLE, SSCs, etc) in 2016-17 that require further action by the Department

The following issues were identified from student feedback received in 2016-17 that require further consideration and/or action

Most feedback through SOLE is very specific to a particular module and/or lecturer and staff are asked to respond by providing a written reply on their Blackboard page. A more general issue possibly emerging is the timing and workload associated with some of the later modules in Year 2 which will be addressed as part of curriculum review.

The following areas of strength, good/innovative practice or commendable achievements were identified via student feedback during 2016-17 in the report(s):

Arising from discussions at the Physics SSC, and an unofficial action plan from the 2015 NSS, we ran a trial in January 2017 of having Year 4 Physics undergraduates acting as Undergraduate Teaching Assistants (UTAs) on our Year 1 Laboratory and Computing course. This was very successful and as a result the use of UTAs has been built in to the revised Year 1 Laboratory & Computing course introduced in October 2017. First indications are that this has been well received and is acting as a first step to building a community connection between our Year 4 and Year 1 students.

Section 6: Employability	
Please tick as appropriate	
Yes ☒ **No** ☐	There were no significant issues or changes in relation to employment trends or other employability initiatives offered by the Department

The following issues or changes were identified in relation to employment trends or other employability initiatives offered by the Department that require further consideration and/or action

The following areas of strength, good/innovative practice or commendable achievements were identified via destination data:

Section 7: Collaborative Provision (including collaborative modules)
Please tick as appropriate

Yes ☐ **No** ☒	Not applicable – the Department is not responsible for any programmes or modules delivered in collaboration with other institutions
Yes ☒ **No** ☐	The Department has the following collaborations: Collaboration with the Royal College of Music on BSc Physics and Music Performance programme. Collaboration with Canterbury Christchurch University on MSci and BSc Physics with Science Education programmes.
Yes ☒ **No** ☐	There were no significant issues in relation to collaborative programmes/modules that require further action by the Department
The following issues were identified in relation to collaborative programmes/modules that require further consideration and/or action	
The following areas of strength, good/innovative practice or commendable achievements have been identified:	

Section 8: Good Practice / Commendable Achievements	
Example of good practice or commendable achievement	**Report Section Number**
Successful trial in 2016-17 of having Year 4 UTAs teaching in Year 1 Lab course, leading to full introduction of UTAs in 2017-18	5

Section 9: Recommendations for action at a Faculty or College level		
Matter for further consideration at Faculty or College level ***(please indicate if the issue is for Faculty or College consideration [or both]).***	**Department or Service (if applicable)**	**Report Section Number**

The following sources of evidence and information should be appended to the report:

- External Examiner Reports (including Departmental responses)
- NSS Action Plan 2016 with updates listed against each of the identified actions
- PSRB accreditation report and latest Action Plan (if applicable)
- Updated annual monitoring Action Plan from 2016-17
- Any additional information/evidence that has been referred to in the body of the report (e.g. local student surveys, Staff-Student Committee minutes)

Section 10: Updated Action Plan from the previous academic year (2016-17 covering the 2015-16 cohort)

No.	Action	Evidence of issue (e.g. external examiner report [Examiner name], NSS data etc.)	Action required by whom (name and role)	Target date for achievement	Date action completed / update
1	Update examination preparation instructions to extend requirement for course associates to make their first attempt draft examination questions without access to model answers for all courses.	External examiner reports	DUGS and Examinations Coordinator	November 2016	Completed November 2016
2	Adapt the more detailed assessment guidance introduced for MSci final year projects for use also for MSci Year in Europe and BSc projects and make marking and moderation guidance consistent for all types of project.	External examiner reports and IOP accreditation report	DUGS and project coordinators	January 2017	Largely completed in January 2017 but some aspects of BSc project guidelines which had already been circulated to students had to wait until October 2017. Now fully completed.
3	Review the transition in learning support available to students moving from Year 2 to Year 3.	Student feedback via external examiner reports and NSS	DUGS and Teaching Committee	October 2017	Now under review in collaboration with SLO, extend deadline to October 2018
4	Review laboratory and computing teaching across all years of our degree programmes with a view to making substantial improvements to the experimental programme and its associated assessment and feedback processes.	IOP accreditation report and NSS	Dr Simon Bland, DUGS, Heads of Labs	June 2017	Completed for Year 1 with a new programme implemented in October 2017 including a substantial spend on new equipment. Ongoing for Years 2 and 3.
5	Teaching Committee to review completion on minor recommendations from IOP accreditation report not addressed elsewhere	IOP accreditation report	DUGS and Teaching Committee	October 2017	Still open, set new deadline of March 2018
6	To establish a monthly newsletter to students (and staff) with teaching related news	NSS 2015 action plan	DUGS and SLO	October 2017	Completed, first newsletter circulated by SLO in October 2017
7	Recruit a Student Liaison Officer	NSS survey	DOM and DUGS	March 2017	Recruitment completed March 2017. SLO took up post in August 2017
8	Update Roles and Responsibility guidelines for Year 3 Lab Heads of Experiment and Demonstrators, emphasising their roles in the assessment process and in providing consistent and effective feedback	NSS survey, Staff Student Committee	Head of Year 3 Lab	November 2016	Completed November 2016

Section 11: Future Action Plan – 2017-18

DEPARTMENT TITLE:	Physics

The future action plan should only highlight key issues or areas to be addressed across the Departments' programmes over the academic year. The Action Plan is intended to be a live document which should be updated as appropriate through the academic year. It should therefore include any actions that are outstanding from previous monitoring cycles. Updated Action Plans may be requested by the Faculty Education Committee for review prior to the next Annual Monitoring cycle.

The person responsible for completing the action should be included in each case, along with a target date for completion. Clear prioritisation of actions would be helpful. There may also be actions that have already been completed during the course of the academic year. In such cases the action should nevertheless be included along with a brief update to show that it has been completed.

*Actions should be **SMART:***
Specific (i.e. what specifically is the Department trying to achieve)
Measurable (i.e. the Department must be able to measure achievement of the target/goal)
Agreed
Relevant and Realistic
Time bound

No.	Action	Evidence of issue (e.g. external examiner report [Examiner name], NSS data etc.)	Action required by whom (name and role)	Target date for achievement	Date action completed / update
1	Review the transition in learning support available to students moving from Year 2 to Year 3 (carried forward from 2016-17).	Student feedback via external examiner reports and NSS	DUGS, SLO and Teaching Committee	October 2018	
2	Review laboratory and computing teaching for Years 2 and 3 of our degree programmes with a view to making substantial improvements to the experimental programme and its associated assessment and feedback processes.	2015 IOP accreditation report and NSS	Dr Simon Bland, DUGS, Heads of Labs	June 2018	

No.	Action	Evidence of issue (e.g. external examiner report [Examiner name], NSS data etc.)	Action required by whom (name and role)	Target date for achievement	Date action completed / update
3	Teaching Committee to review completion on minor recommendations from 2015 IOP accreditation report not addressed elsewhere (carried forward from 2016-17)	2015 IOP accreditation report	DUGS and Teaching Committee	March 2018	
4	Form two working groups to consider longer term actions in response to NSS and separately on the mental health issues raised, to report back to HoD and Teaching Committee early in 2018	NSS data and free comments	Prof Richard Thompson on behalf of HoD	March 2018	Groups recently formed and have begun to meet
5					

Please add further rows to this table, if required.

On completion, please return the completed form to the Quality Assurance & Enhancement Team at external.examiner@imperial.ac.uk