

## **Experimental Physics**

### **Quality Improvement Plan Updates**

#### **Institutional/Strategic Recommendations**

Number	Recommendation	Additional PRG Comments
1	Support the Department's strategy of targeted advance replacement of academic staff.	

Action by the University: As stated in the recommendation.

Requests for staff replacement have been made at every opportunity. A lecturer (with expertise in devices for astronomical instrumentation) was recruited to replace the retiring Head of Department. Last year, on the advice of the Dean given the COVID-19 situation and the consequent budget and recruiting difficulties, we applied for a temporary replacement of another retiring staff member (early) to cover teaching. This year we have requested a permanent replacement and noted the possible retirement of two further academic staff members.

Number	Recommendation	Additional PRG Comments
2	Provide additional support for academic staff who wish to take sabbatical leave.	

Action by the University: As stated in the recommendation.

We continue to support any University policy that would improve the financial assistance available. Additional supports have been provided this year with the potential for supplementing the assistance for sabbatical leave with additional research funds that the person taking leave may have. The COVID-19 situation has since made taking sabbatical leave difficult, but it will be encouraged again in the future.

Number	Recommendation	Additional PRG Comments
3	Provide funding for the renewal of lab equipment.	

Action by the University: As stated in the recommendation.

A modest renewal plan over an extended period will be budgeted for and implemented for critically ageing equipment. Small items are being replaced as the budget allows. The Dean will work with the Department to identify the equipment that needs upgrading and explore mechanisms to secure additional funding to renew laboratory equipment.

Number	Recommendation	Additional PRG Comments
4	Improve the funding levels for postgraduate teaching scholars to at least bring them in line with the norms across the University sector.	<i>In addition, ensure that scholars have sufficient time to devote to their research.</i>

Action by the University: As stated in the recommendation

The University has regularised all postgraduate teaching scholarships and identified maximum hours that graduate students may contribute towards teaching. The University endeavours to keep our full scholarships aligned with national standards, such as that of the Irish Research Council.

## Recommendations to the Department

Number	Recommendation	Additional PRG Comments
1	Maintain Institute of Physics (IOP) accreditation and recognition of undergraduate degree courses.	

Action by the Department:

- Submit the re-accreditation application to the Institute of Physics
- Prepare for the site visit by Accreditation Panel.
- Act on any recommendations in the resulting IOP Accreditation Report.

The accreditation application was submitted and the site visit by the IOP Accreditation Panel has taken place. Accreditation was renewed. The Panel expressed concern at the University's policy of allowing uncapped repeat exams which it believes is not best practice and out-of-line with similar institutions. A meeting was held with the Registrar to discuss the issue. As there are no plans to change the University policy the Department has decided to introduce a separate regulation for Experimental Physics students which will cap repeat marks at 40% for all years other than first year. This proposal will be submitted to the Academic Programmes Committee. Given the added flexibility afforded to students during the COVID-19 pandemic, it was felt that it is not appropriate to introduce the new policy until all pandemic measures have been removed.

Number	Recommendation	Additional PRG Comments
2	Maintain the strong laboratory component of the undergraduate programmes.	

Action by the Department:

- We will maintain the strong emphasis on laboratory training and skills as a core element of our undergraduate courses.

The Department strongly supports this recommendation and we continue to maintain this emphasis in all years of our undergraduate programmes. For example, a significant effort by technical and academic staff meant that we could run laboratories on campus, when public health measures allowed, in 2020-21.

Number	Recommendation	Additional PRG Comments
3	Put formal structures in place to ensure that students in 3 <sup>rd</sup> and 4 <sup>th</sup> year have sufficient mathematical skills.	

Action by the Department:

- Lecturers to prepare a list of mathematical methods required for courses
- Consider introduction of a short mathematical methods for experimental physics courses in the Second Year.

A list of mathematical topics required for each Experimental Physics module was prepared. A meeting was held with a member of the Mathematics Department to discuss our specific requirements.

A new course (12 lectures) on Mathematical Methods for Experimental Physics has been introduced into 2nd year and this must now be taken by all Experimental Physics students. This course specifically targets mathematical concepts that are important for Physics and that might not be dealt with in the 1st year Mathematics syllabus. We re-organised our Physics with Astrophysics structure to allow for this.

The textbook “Mathematics for Physicists” by Woolfson & Woolfson was adopted as a standard mathematics reference from 2nd year onwards and staff will provide clear reference to the appropriate chapters for any mathematical content in their course.

Number	Recommendation	Additional PRG Comments
4	Provide some tutorial support after the 1 <sup>st</sup> year.	

Action by the Department:

- Lecturers will make clear during lectures that some slots are allocated as tutorials.

Tutorial support has always been provided after 1st year, but tutorials are not timetabled separately to the lectures after 1st year (this likely led to confusion in the student response when it was discussed with the visiting panel). This is being made clearer to students when course structures are explained.

Number	Recommendation	Additional PRG Comments
5	Provide a dedicated physics problem solving class.	

Action by the Department:

- Introduce an element of physics problem solving as part of the project work in Fourth year.
- Perhaps consider developing problem solving classes in Second Year as part of any possible mathematical methods course to reinforce learning in this area.

Physics problem solving is included in every module that is taught by the Department, and this continues. We ensure some “problem solving” component in 4th year projects and it is included in the new mathematical methods course we have introduced (see above in recommendation number 3). Problem solving tutorial videos have been made available online.

Number	Recommendation	Additional PRG Comments
6	Review the current staff-student committee meeting format and provide clarity on when issues have been resolved.	

Action by the Department:

- Consider the introduction of meetings of year representatives with the corresponding course coordinators.
- Report back more thoroughly on any changes made because of student feedback to the staff-student committee.

Year coordinators meet separately with the representatives from their year group to discuss issues specific to that year. This is separate from the Staff-Student Committee.

Any changes made to e.g. modules or laboratories as a result of student feedback are now reported (and minuted) at the subsequent Staff-Student Committee to ensure new class representatives are aware of the issues that have been resolved or are ongoing.

Number	Recommendation	Additional PRG Comments
7	Provide students with some physics-oriented careers guidance.	

Action by the Department:

- Provide more comprehensive guidance to students on careers in physics, particularly in the earlier years.

Careers seminars, tailored to Experimental Physics, are delivered during the first semester of 4th year. We have developed strong links with graduates in local industries and other universities and regularly pass on information about career opportunities, internships, scholarships etc.

Preparations were in hand for a careers event targeted at earlier years (2nd year in particular) and we had contacted graduates now working in a range of industries who were willing to speak to the undergraduates. This was postponed due to COVID-19 but will be organised again in the future.

Number	Recommendation	Additional PRG Comments
8	Associated with the Juno practitioner application process, provide a safe forum for staff and students to raise gender and inclusion related issues.	

#### Action by the Department:

- The Department to provide a safe forum for staff and students to raise gender and inclusion related issues.
- The Juno committee to promote its action plan for the Department in relation to an application for "Practitioner" status.

Work on our Juno application is progressing (deadlines have been extended due to COVID-19) and updates are reported at departmental meetings. As part of our Juno work, we held networking events and a discussion forum for female staff and students and this forum will be provided on an on-going basis. Another forum which will address inclusion and diversity in general will also be established. As part of these will discuss other mechanisms for safely raising issues, e.g. anonymous feedback boxes etc.

Our student guidelines for each year now contain a clear statement supporting the aims of the Juno Project and who in the Department to contact should a student have a concern related to any aspect of diversity and equality.

Number	Recommendation	Additional PRG Comments
9	In advance of the upcoming retirement of a senior academic staff member, recruit a new staff member in the terahertz optics/communications area.	

#### Action by the Department:

- Continue with the procedure for filling the post.

This post has now been filled.

Number	Recommendation	Additional PRG Comments
10	Recruit a new academic staff member in the atmospheric physics/climate change area	

Action by the Department:

- The Department will seek approval to recruit a new staff member in this area at the appropriate time.

Another member of staff has since retired (early retirement) and we have put in a request to the Dean of Science and Engineering for a permanent replacement. If approved, we would encourage applicants from the general area of Atmospheric Physics and Climate Change in addition to the other specialisms within the Department.

Number	Recommendation	Additional PRG Comments
11	Explore a closer structured alliance with the Department of Theoretical Physics.	<i>One possibility would be retaining the individual discipline identities as two units within a combined School of Physics.</i>

Action by the Department:

- Working committee of the two departments to explore possibilities for deeper working alliance of the two departments

This is ongoing. We now jointly teach a module where there was overlap previously and we have reviewed our module choices to ensure that students taking a double-honours in the two subjects do not have any significant overlap. Both departments recommend suitable final year modules that can be taken in the other department to widen the choice available to students. We are working together on possibilities for close co-operation in the context of a reorganisation of the onmbus degree (e.g. a stream in Geophysics/Atmospheric Physics/Climate Change involving Experimental & Theoretical Physics and Geography). We are also investigating cooperation in term of research between the Astrophysics/Cosmology groups.