



Year One Summer project

Faculty: Natural Sciences

Department: Physics

Module name: Statistics of measurement and the summer project

**Module leader:
Prof. Yoshi Uchida**

Format: Laboratory-based group project

Level: Undergraduate Year 1

Approximate number of students: Full cohort (About 250 students)

Duration: Six weeks (Third term)

Weighting and credit: 70% of final credit

Module ECTS: 7.5

Assessment overview

The first-year project is a group-based assessment, applying skills acquired in the core year 1 undergraduate physics laboratories to independently follow open-ended questions. Under the guidance of an academic, postdoc or PhD student, each four-student group develops their own idea into a project. There is considerable flexibility permitted in the scope of the projects, which can be anything from purely experimental to purely computational, or somewhere in between these two. The projects are presented to a wider audience of parents, academics and school leavers at one of the College Open Days where students are required to record a video of up to 10 minutes serving as a fully standalone presentation of their project.

Design decisions

Rationale

In core laboratory studies, students follow scripted worksheet and work in pairs with close supervision. This is important training but it does not properly emulate real research environments. The purpose here is to simulate a less scripted research environment, allowing students to explore their own questions, and to experience the collaborative and creative aspect of real physics-based research. A major objective of the project is to convey the fun involved in research to students without micromanaging them and constraining their approach, hence a trial-and-error approach to the project is emphasised and encouraged.

Practicalities

Timeline of the project

The students are provided with details on the project midway through term 2, and are tasked with forming their own groups and deciding on possible project ideas during that term. Groups were then assigned an academic guide, whose knowledge and expertise is suited to the group's chosen topic, to work with during the duration of the project. The major work of the project then runs over the course of term 3, with the Open Day presentations and video recording in the final week of term. As many projects run in undergraduate laboratories all design and planning for the module has been done in liaison with the undergraduate laboratory technicians. Formative assessment is provided to students at regular intervals by the academic guide during the term, and the full and final summative assessment and feedback for the submitted video is given within the first two weeks of the summer holidays.



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Assessment and feedback

The year 1 summer project has been a core component of the physics degree for over 15 years, and has seen gradual changes on format and assessment style from time-to-time. Emergency changes to ensure the project could run at all were made for the 2020-21 cohort to incorporate for lockdown measures including departmental closure, necessitating several sharp and major changes. Some of these changes served to improve and strengthen the module – the most notable was the video recorded aspect of the project, which has now superseded the older format of a poster and formal report submission. Both students and assessors find the video submission better for several reasons: it aligns more clearly with the course learning outcomes, gives more freedom for creativity, is more comfortable to view and critically analyse for assessors to provide constructive feedback, both staff & students feel the grading process is fairer and less subjective than the previous system, and is generally a more enjoyable feature of the exercise for all involved.

Student's perspective

The general student and staff view of the project and its the method of the assessment is very positive, with students especially citing the freedom provided in the module which permits a depth of learning in an enjoyable way. Students also especially value the experience of going the earlier developmental stages of the project, and having the time & space to follow non-scripted trial-and-error approaches under the supervision of an academic guide. Depending on the nature of the project, students sometimes found project logistics to be difficult (some are entirely computational meaning work can be done remotely at any time, whereas other involves use of laboratory equipment with the presence of a technician providing occasionally awkward restrictions). Video productions is generally thought of as an fun activity, but also produced some frustrations, especially when recording the relatively crowded environment of an open day.