

## PHYS285: Technical and Professional Skills for Physicists

### Course Description

PHYS285 is a laboratory based course in experimental techniques, data acquisition and analysis for second-year physical science students.

### Teaching staff

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### Pre-requisites

(1) PHYS101; (2) MATH102 or EMTH118

(3) MATH170 or EMTH171 or COSC121 or MATH280 or MATH282 or another approved course involving programming. These prerequisites may be replaced by a high level of achievement in level 3 NCEA Physics and Mathematics with Calculus or other background approved by the Head of Department.

Recommended Preparation: COSC121.

### Timetable

This year there are two lab streams.

In most weeks we will be operating from our lab, Ernest Rutherford 313, with one stream on Monday and Wednesday morning (9-12), and the other stream on Thursday afternoon (2-5) and Friday morning (9-12).

In Weeks 1 and 3 we have computer lab sessions held jointly for both streams in Jack Erskine 248 (Thu afternoon) and Jack Erskine 001 (Friday morning).

In Week 4, there are no regular labs, but we will have other activities (TBA).

## Assessment

### 20% Preparation and attendance.

Each week you are expected to attend all timetabled activities. For the regular 3-hour labs, you must:

- (a) arrive at the lab at the start time and actively participate; and
- (b) show your lab book where you have done the preparation for your experiment.

If you fulfil these criteria you will receive 2 marks. One mark will be deducted if you are late, don't have your lab book, or haven't done the preparation.

**A minimum mark of 15% out of 20% for this part of the assessment is required in order to pass the course. The expectation is that most students will obtain 2 marks each week.**

### 40% Jupyter notebooks showing experimental analysis and results.

For each experiment, your group will need to submit a jupyter notebook file and supporting data files. The notebook file must be well documented, and contain all the analysis code needed to reproduce your experimental results. Submissions are due at the start time of the following week's first lab session. They will be marked out of 5, and all group members will receive the same mark.

### 40% 4 formal reports, worth 5%, 10%, 10%, 15%

You will be required to write formal lab reports for 4 of your experiments. These will be due on particular dates to be advised. Each report will receive a mark out of 10, and worth progressively higher weights as the course progresses.

## Lab book

During the first week of term you will need to acquire a hardcover laboratory notebook, which are sold from the Copy Centre (in the Central Library) at a cost of about \$15. Your lab book will need to be with you at all times in the lab.

You will use your lab book to document all your experimental work. This will be your main source of information when you come to write your formal reports.

## Absences

You should assume that you are required to attend all sessions necessary to obtain your experimental data. (This will generally not take 6 hours.) In cases of illness or other good reasons that you might have to miss a lab, you will need to send Michael an email detailing the circumstances and requesting an exemption. I will expect you to make best efforts to catch up on missed material when it is feasible to do so.