

# PX110-24 Physics Laboratory

**20/21**

**Department**

Physics

**Level**

Undergraduate Level 1

**Module leader**

Thomas Hase

**Credit value**

24

**Module duration**

14 weeks

**Assessment**

100% coursework

**Study location**

University of Warwick main campus, Coventry

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## Description

### Introductory description

The Physics Laboratory introduces experimental science. There are experiments in six areas: i) The measurement of fundamental constants including  $h$ ,  $c$  and  $e/m$  for an electron; ii) Wave phenomena; iii) Electricity and Magnetism, iv) Matter, v) Geometrical Optics and vi) Astronomy. The experiments can help give a different and more 'tangible' perspective on material treated theoretically in lectures. They illustrate the importance of correct handling of data and the estimation of errors, and provide experience in using a range of equipment. The module also teaches the 'art' of writing scientific reports.

[Module web page](#)

### Module aims

The first year Physics Laboratory should provide a grounding in practical laboratory work and preparation for the more sophisticated practical work of the later years of the degree programme

### Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

The laboratory module consists of 9 lectures, one workshop and 14 laboratory sessions with these sessions supported by 3 assessed reports. The module is a Designated Module requiring a pass mark of 40% for students to progress into year 2.

Laboratory sessions are graded at the end of each session out of 10 by the laboratory demonstrators, with all lab sessions contributing towards the final module mark. The total laboratory marks contribute 50% of the module mark - each lab session being worth 0.85 CATS. The marks from the reports, which are marked by members of staff, contribute the remaining 50% of the module mark. The first report is worth 3 CATS, the second report is worth 4 CATS, and the final report is worth 5 CATS.

The module teaches skills required for the successful implementation of laboratory practice including the use of apparatus, keeping a laboratory notebook, error analysis and graph plotting as well as critical thinking and problem solving. It supports core physics in the first year courses as well as exploring new physics concepts through experimental approaches.

## Learning outcomes

By the end of the module, students should be able to:

- Keep a laboratory notebook as an accurate record of an experiment
- Use commonly-encountered laboratory equipment
- Identify the random and systematic errors in an experiment and estimate the uncertainty in individual measurements
- Analyse the results of an experiment and draw relevant graphs with error bars
- Assess critically the effectiveness of an experimental procedure and suggest possible improvements
- Write a scientific report

## Indicative reading list

Measurements and their uncertainties: a practical guide to modern error analysis, Ifan Hughes; Thomas P. A. Hase 2010

[View reading list on Talis Aspire](#)

## Subject specific skills

Understanding of experimental errors, planning the use of the time available for an investigation, scientific report writing

## Transferable skills

Analytical, communication, problem-solving, report-writing, working with equipment safely

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## Study

## Study time

Type	Required
Lectures	8 sessions of 1 hour (3%)
Seminars	1 session of 3 hours (1%)
Supervised practical classes	14 sessions of 6 hours (35%)
Private study	145 hours (60%)
Total	240 hours

## Private study description

Reading scripts, analysing results, completing error exercises, maintaining lab book, writing scientific reports

## Costs

No further costs have been identified for this module.

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## Assessment

You do not need to pass all assessment components to pass the module.

### Assessment group A1

Assessment component	Weighting	Study time	Eligible for self-certification
Laboratory Assessed Work	100%		No
Laboratory Reports. Practical assessments.			

#### Reassessment component

Laboratory reassessment No

This is a designated module. Students who fail this module will be required to withdraw. While it is possible to resubmit laboratory reports it is not possible to redo the experiments.

## Feedback on assessment

## Availability

## Courses

This module is Core for:

- Year 1 of UPXA-F300 Undergraduate Physics (BSc)
- UPXA-F303 Undergraduate Physics (MPhys)
  - Year 1 of F300 Physics
  - Year 1 of F303 Physics (MPhys)
- Year 1 of UPXA-F3N1 Undergraduate Physics and Business Studies
- Year 1 of UPXA-F3N2 Undergraduate Physics with Business Studies