

PX152-30 Physics Laboratory

22/23

Department

Physics

Level

Undergraduate Level 1

Module leader

Thomas Hase

Credit value

30

Module duration

23 weeks

Assessment

100% coursework

Study location

University of Warwick main campus, Coventry

Description

Introductory description

The module introduces experimental science and teaches the skills required for successful laboratory work. These include how to work with apparatus, how to keep a laboratory notebook, how to handle data and quantify errors and how to write scientific reports. The module also asks you to think critically and to solve problems. Initial experiments build core skills while later experiments explore important areas of physics.

[Module web page](#)

Module aims

To 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.

Two induction days will be spent looking at: 1) making measurements, assessing their precision, and combining errors. 2) Keeping an adequate laboratory notebook; 3) Planning experimental

work

Further days will be spent in the laboratory, on each of which one experiment allocated from a list will be done and the laboratory notebook record assessed for credit. The laboratory organizer will allocate experiments to be written up as formal reports for credit. Guidance on report writing will be given before the first report has to be written.

In addition, a series of workshops will develop key practical skills in electronics.

Learning outcomes

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

- Plan and execute an experiment. Students should be able take account of the time available and use commonly-encountered equipment
- Keep a laboratory notebook as an accurate record of an experiment
- Analyse the results of an experiment, quantify the uncertainty in the measurements, use graphs with error bars. Students should be able to assess the effectiveness of the procedure and suggest possible improvements
- Write a scientific report
- Build and analyse electronic circuits containing transistors, op-amps and logic elements

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

Study

Study time

Type	Required
Lectures	8 sessions of 1 hour (3%)
Seminars	1 session of 3 hours (1%)
Total	300 hours

Type	Required
Practical classes	4 sessions of 5 hours (7%)
Supervised practical classes	14 sessions of 6 hours (28%)
Private study	185 hours (62%)
Total	300 hours

Private study description

Reading scripts, analysing results, completing error exercises, maintaining lab book, writing scientific reports, preparation for each workshop

Costs

No further costs have been identified for this module.

Assessment

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

Assessment group A

	Weighting	Study time
Laboratory Assessed Work	100%	
Laboratory Reports. Practical assessments.		

Feedback on assessment

Discussions with demonstrators, written comments from report and lab book markers

Availability

Courses

This module is Core for:

- UPXA-F300 Undergraduate Physics (BSc)
 - Year 1 of F300 Physics
 - Year 1 of F300 Physics
 - Year 1 of F300 Physics
- UPXA-F303 Undergraduate Physics (MPhys)
 - Year 1 of F300 Physics

- Year 1 of F303 Physics (MPhys)
- Year 1 of UPXA-F3N2 Undergraduate Physics with Business Studies