

PX151-30 Astrophysics Laboratory I

21/22

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 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. A sub-set of these experiments will be in astrophysics. 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 electronic instrumentation and astronomy.

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
- Examine, process and assess astronomical data
- Gain experience in the use of electronic instrumentation
- Write a scientific report

Subject specific skills

Understanding of experimental errors, use of computer-based data analysis, planning the use of the time available for an investigation, scientific report writing. Use of laboratory instrumentation.

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%)
Practical classes	4 sessions of 5 hours (7%)
Total	300 hours

Type	Required
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

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

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

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

Availability

Courses

This module is Core for:

- Year 1 of UPXA-F3F5 Undergraduate Physics with Astrophysics (BSc)
- Year 1 of UPXA-F3FA Undergraduate Physics with Astrophysics (MPhys)