Module 1 Development of Practical Skills in Physics

Examined as part of written exams and 12 practical assignments.

Module 1

Module 1: Development of practical skills in physics

Physics is a practical subject. The development and acquisition of practical skills is fundamental. The Physics A course provides learners with the opportunity to develop experimental methods and techniques for analysing empirical data. Skills in planning, implementing, analysing and evaluating, as outlined in **1.1**, will be assessed in the written papers.

1.1 Practical skills assessed in a written examination

Practical skills are embedded throughout all the content of this specification.

Learners will be required to develop a range of practical skills throughout their course in preparation for the written examinations.

Content (What you need to know)

1.1.1 Planning

Learning outcomes

Learners should be able to demonstrate and apply their knowledge and understanding of:

(a) experimental design, including to solve problems set in a practical context

(b) identification of variables that must be controlled, where appropriate

(c) evaluation that an experimental method is appropriate to meet the expected outcomes.

1.1.2 Implementing

Learning outcomes

Learners should be able to demonstrate and apply their knowledge and understanding of:

(a) how to use a wide range of practical apparatus and techniques correctly

(b) appropriate units for measurements

(c) presenting observations and data in an appropriate format.

Content (What you need to know)

1.1.3 Analysis

Learning outcomes

Learners should be able to demonstrate and apply their knowledge and understanding of:

(a) processing, analysing and interpreting qualitative and quantitative experimental results

(b) use of appropriate mathematical skills for analysis of quantitative data

(c) appropriate use of significant figures

(d) plotting and interpreting suitable graphs from experimental results, including

- (i) selection and labelling of axes with appropriate scales, quantities and units
- (ii) measurement of gradients and intercepts.

1.1.4 Evaluation

Learning outcomes

Learners should be able to demonstrate and apply their knowledge and understanding of:

(a) how to evaluate results and draw conclusions

(b) the identification of anomalies in experimental measurements

(c) the limitations in experimental procedures

(d) precision and accuracy of measurements and data, including margins of error, percentage errors and uncertainties in apparatus

(e) the refining of experimental design by suggestion of improvements to the procedures and apparatus.