

Syllabus 9702 Physics

Recommended Prior Knowledge This Scheme of Work represents the second half of the A-level course (the A2 Year). Although some topics are self-contained, the majority do rely on knowledge and understanding gained in the first year (the AS Year).

General Resources The ordinary apparatus of a physics laboratory is required. Note that the list of apparatus given under the section in the Syllabus on Practical Assessment is not intended as a guide as to the contents of a Physics laboratory.

A selection of textbooks from the Resource List in the Syllabus document. Library copies of alternative texts should be available. Some Internet sites are suggested throughout this Scheme. These suggestions are intended for guidance only. In addition, a Booklet is available from CIE to support the teaching and study of the Applications of Physics Unit.

The use of I.T. is recommended wherever the teacher feels that it is appropriate. A list of suggestions is printed in the Syllabus document. Note that questions will not be set where the answer relies upon knowledge of a particular I.T. application.

UNITS

1	Non-uniform Acceleration Motion in a circle and oscillations are studied. Syllabus Topics 7 and 14. Approximately 11% of the time for the A2 course should be devoted to this Unit, including practical work where appropriate.
2	Thermal Physics The ideal gas equation and the kinetic theory of gases are studied together with aspects of temperature. The Unit concludes with work on the thermal properties of materials. Syllabus Topics 11, 12 and 13. Approximately 14% of the time for the A2 course should be devoted to this Unit, including practical work where appropriate.
3	Force Fields Aspects of gravitational fields, electric fields and magnetic fields are included. Syllabus Topics 8, 17, 18, 21 and 22. Approximately 19% of the time for the A2 course should be devoted to this Unit, including practical work where appropriate.
4	Electromagnetic Induction and a.c. The Unit includes basic electromagnetic induction and some aspects of alternating current and its rectification. Syllabus Topics 23 and 24. Approximately 16% of the time for the A2 course should be devoted to this Unit, including practical work where appropriate.
5	Modern Physics The determination of q , q/m and v for charged particles is studied. Wave-particle duality is approached via the photoelectric effect. Finally, nuclear binding energy and radioactive decay are examined. Approximately 17% of the time for the A2 course should be devoted to this Unit, including practical work where appropriate.

6	<p>Applications of Physics</p> <p>Direct sensing, remote sensing and the communication of information are studied, in the context of modern technological applications of Physics. Syllabus Topics 28, 29 and 30.</p> <p>Approximately 23% of the time for the A2 course should be devoted to this Unit, including practical work where appropriate.</p>
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TEACHING ORDER

It should be noted that it is not intended that the Units are of equal size. Rather, the Units have been designed to provide coherent topics that will guide students through the A2 course in a logical manner.

Where the Units are to be taught consecutively, then the order of teaching can follow the number order of the Units. It is important that the work on Fields (Unit 3) is completed before Units 4 and 5 are studied. Applications of Physics (Unit 6) should be studied towards the end of the course.

If the work is to be shared between two teachers, then the suggested order for one teacher is Unit 1, Unit 2, and Unit 6. The second teacher would, concurrently, teach Unit 3, Unit 4 and Unit 5.

ROLE OF PRACTICAL WORK

Throughout the teaching of each Unit, the role of practical work is of paramount importance. Not only does it enable students to develop experimental skills, but it also assists with the understanding of theoretical concepts. In addition, demonstrations of experimental procedures and the use of models are an integral part of the teaching process.

Practical work is assessed under the headings of 'Planning', 'Manipulation, measurement and observation', 'Presentation of data and observations' and 'Analysis, conclusions and evaluation'. The descriptions and assessment criteria for each of these skills are included in the Syllabus document. The skills of 'Manipulation, measurement and observation', 'Presentation of data and observations' and 'Analysis, conclusions and evaluation' are introduced in the AS year, and assessed in Paper 31/32. These skills should be further developed in the A2 year.

The skill of 'Planning' is considered to require a more mature approach. Therefore, although it should be introduced in the AS year, it is not to be examined until the end of the A2 year, where the skills of 'Planning' and 'Analysis, conclusions and evaluation' will be assessed in Paper 5. Although this examination paper will not require laboratory facilities, it must be stressed that candidates cannot be adequately prepared for this paper without extensive laboratory work throughout both the AS and A2 years. In particular, candidates cannot be taught to plan experiments effectively unless, on a number of occasions, they are required to plan an experiment, to perform the experiment according to their plan, and to evaluate what they have done.