

Physics

Physics: AS and Advanced Level. OCR 3888,7888.

The course followed is an exciting new AS and A level developed by the Institute of Physics entitled '*Advancing Physics*'. It has had considerable financial input and academic support from industry and higher education. The course provides a distinctive structure within which students learn about fundamental physical concepts and about physics in technological settings. A primary aim of the course is to show how physics is practised and used today. Equally important, however, is to show the usefulness of the subject, and to illustrate the kind of impact which discoveries in physics have had on the way people live.

Key features of the course are

- new material – a simple, direct and rigorous approach to modern ideas;
- new perspectives – different angles on familiar topics;
- encouragement for students to select topics of interest for further individual study;

The course is extensively resourced with up to date materials, including for each year:

- a full colour student's book;
- an integrated CD-ROM for the student, containing: extensive questions and answers for practice; a full A-Z glossary of A level physics; a course guide; physics models, computer tools, images and tables, revision aids and an easy to use search facilities.

These are supported by the *Advancing Physics* web site, where the student can find ideas about the course; access to relevant web sites for activities and links to careers and higher education.

Content of the AS course

The AS course is in two parts, each part being divided into two sections. The internally assessed coursework forms part of this work.

Physics in Action provides a graduated path from GCSE into AS level, showing a wide variety of ways in which physics is currently put to use.

- Communication is about imaging and signalling, and sensing via electrical circuits.
- Designer Materials is about material properties and how they are used to make new materials.

Understanding processes is organised around different ways of understanding processes of change, the focus being on 'curiosity-driven' physics.

- *Waves and quanta* is mainly about how waves behave, and the quantum nature of photons.
- *Space and time* develops classical mechanics and introduces some modern cosmology.

In the AS course students will be asked to carry out three coursework tasks: an instrumentation project, research and presentation and making sense of data.

Content of the A2 course

Rise and fall of the clockwork Universe develops the grand conception of the world as a 'mathematical machine', which has transformed Western culture.

Field and particle pictures introduces the modern picture of fields and particle interactions as fundamental mechanisms of nature.

The final module, *Advances in Physics* consolidates, puts together and uses, physics ideas from the whole course. A number of case studies show how different aspects of the physics in the course are used to tackle problems.

The coursework in the A2 consists of two more substantial components than in the AS, namely a Practical Investigation and a Research Report project.