



Physics

Advanced General Certificate of Education

The science courses offered here at Health Futures UTC are designed to offer academic and vocational experiences to prepare students for both higher education and health-centred careers. We also offer unique opportunities to work with local universities and health professionals as part of our contribution to the extra-curricular programme.

Course details:

Awarding body: AQA 2015 specification (7408)

Content:

You will study five topics in the first year and a further five in the second year:

Year 1 topics

1 Measurements and their errors

Content in this section is vital working knowledge of the specified fundamental (base) units of measurement is vital. It also provides an underpinning for practical work in the subject as students must be aware of the nature of measurement errors and of their numerical treatment.

2 Particles and radiation

This section introduces students both to the fundamental properties of matter, and to electromagnetic radiation and quantum phenomena

3 Waves

GCSE studies of wave phenomena are extended through a development of knowledge of the characteristics, properties, and applications of travelling waves and stationary waves. Topics treated include refraction, diffraction, superposition and interference.

4 Mechanics and materials

Vectors and their treatment are introduced followed by development of the student's knowledge and understanding of forces, energy and momentum. The section continues with a study of materials considered in terms of their bulk properties and tensile strength.



5 Electricity

This section builds on and develops earlier study of these phenomena from GCSE. It provides opportunities for the development of practical skills at an early stage in the course and lays the groundwork for later study of the many electrical applications that are important to society.

Year 2 topics:

6 Further mechanics and thermal physics

The earlier study of mechanics is further advanced through a consideration of circular motion and simple harmonic motion (the harmonic oscillator). The thermal properties of materials, the properties and nature of ideal gases, and the molecular kinetic theory are also studied in depth.

7 Fields and their consequences

The concept of field is one of the great unifying ideas in physics. The ideas of gravitation, electrostatics and magnetic field theory are developed within the topic to emphasise this unification. Many ideas from mechanics and electricity from earlier in the course support this and are further developed.

8 Nuclear physics

This section builds on the work of Particles and radiation to link the properties of the nucleus to the production of nuclear power through the characteristics of the nucleus, the properties of unstable nuclei, and the link between energy and mass.

9 Medical physics

This topics allows students to explore the applications of physical principles and techniques in medicine. The physics of the eye and ear as sensory organs is discussed. The important and developing field of medical imaging, with both non-ionising and ionising radiations is considered. Further uses of ionising radiation are developed in a section on radiation therapy.

Assessment overview

External examinations will take place at the end of year 2 and will consist of three written papers:

Paper 1: Topics 1-5 and 6.1 Periodic motion; 2 hrs, 85 marks which contributes 34% of total qualification

Paper 2: Topics 7-8 and 6.2 Thermal physics. Assumed knowledge from topics 1-6; 2 hrs, 85 marks which contributes 34% of total qualification

Paper 3: Practical skills and data analysis and 10 (Medical physics) 2 hrs, 80 marks which contributes 32% of total qualification

Practical endorsement in physics – (not examined) reported separately.

Specific Entry Requirements:

5 GCSEs (Grades 9-4) including grade 6 in physics or combined science, grade 5 in English language and grade 6 in mathematics

