PHYSICS

Examination Board Specification: AQA Physics A-Level 7407 / 7408

Why Study Physics? : The AQA Physics A Level syllabus is highly regarded by UK Universities as providing a basis for further studies in physical sciences and in engineering. It stimulates rigorous, logical thought leading to the development of analytical and practical skills and to an appreciation of the physical world. Students explore the link between theory and experiment and they learn how new ideas in Physics have impacted upon society.

Content and Assessment of the Course:

Year 12		
Section 1, Measurements and their errors: A working knowledge of the specified fundamental (base) units of measurement is vital. Likewise, practical work in the subject needs to be underpinned by an awareness of the nature of measurement errors and of their numerical treatment. The ability to carry through reasonable estimations is a skill that is required throughout the course and beyond. **Section 2, Particles and radiation:** This section introduces students both to the fundamental properties of matter, and to electromagnetic radiation and quantum phenomena. Through a study of these topics, students become aware of the way ideas develop and evolve in physics. They will appreciate the importance of international collaboration in the development of new experiments and theories in this area of fundamental research. **Section 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. **Section 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. **Section 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 13		**3 x 2 hour examinations**
Section 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). A further section allows the thermal properties of materials, the properties and nature of ideal gases, and the molecular kinetic theory to be studied in depth. **Section 7, Fields and their consequences:** 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. Practical applications considered include: planetary and satellite orbits, capacitance and capacitors, their charge and discharge through resistors, and electromagnetic induction. These topics have considerable impact on modern society. **Section 8, Nuclear physics:** This section builds on the work of Section 2 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. Students should become aware of the physics that underpins nuclear energy production and also of the impact that it can have on society. **Section 12, Turning points in physics:** This section is intended to enable key concepts and developments in physics to be studied in greater depth than in the core content. Students will be able to appreciate, from historical and conceptual viewpoints, the significance of major paradigm shifts for the subject in the perspectives of experimentation and understanding. Many present-day technological industries are the consequence of these key developments and the topics illustrate how unforeseen technologies can develop from new discoveries.		

Entrance Requirements: A minimum grade 7 in Physics or Additional Science (or in the Physics component of Additional Science) at GCSE is essential. Also a minimum grade 7 in Mathematics at GCSE. Students should enjoy problem solving and practical work, be mathematically competent and, above all, have an enquiring mind.

Desirable Requirements: It is advantageous that students studying A-level Physics continue with Mathematics to at least AS level. Whilst this is not compulsory, this subject combination will benefit the student in the long term.