

Engineering Science – Course Outline

The course develops skills in three main areas:

Engineering contexts and challenges

Candidates develop a deep understanding of engineering concepts by exploring a range of engineering problems with some complex features, and their solutions. This allows them to explore some existing and emerging technologies and challenges, and to consider implications relating to the environment, sustainable development, and economic and social issues.

Electronics and control

Candidates explore an appropriate range of key concepts and devices used in electronic control systems, including analogue, digital and programmable systems. They develop skills in problem solving and evaluating through simulation, practical projects and investigative tasks across a range of contexts.

Mechanisms and structures

Candidates develop a deep understanding of mechanisms and structures. They develop skills in problem solving and evaluating through simulation, practical projects and investigative tasks across a range of contexts.

Skills, knowledge and understanding for the course

The following provides a broad overview of the subject skills, knowledge and understanding developed in the course:

- ◆ analysing engineering problems with some complex features
- ◆ designing, developing, simulating, building, testing and evaluating solutions to engineering problems in a range of contexts
- ◆ investigating and evaluating existing and emerging technologies
- ◆ communicating engineering concepts clearly and concisely, using appropriate terminology
- ◆ knowledge and understanding of:
 - the many types of engineering
 - the wide role and impact of engineering on society and the environment
 - the workings of a range of engineered objects
 - key concepts related to electronic and microcontroller-based systems, and their application
 - key concepts related to mechanical, structural and pneumatic systems, and their application
 - the relevance of energy, efficiency and sustainability to engineering problems and solutions
- ◆ applying engineering knowledge, understanding and skills in a range of contexts