

ENGINEERING LEVEL 3 BTEC EXTENDED CERTIFICATE

EXAMINING BOARD: Edexcel (Pearson)

Minimum Entry Requirements: GCSE Grade 5 in Maths (a Pass or higher in BTEC L2 Engineering would be advantageous)

KEY FEATURES OF THE COURSE:

- This course has been developed to provide experience in a broad range of knowledge and skill areas in the engineering industry.
- The work is targeted at a range of learning styles, including computer-based learning and hands-on practical activities. Students will develop skills in engineering drawing, Computer Aided Design as well as practical workshops skills such as using turning lathes and milling machines.
- Some of the work will require the use of higher Maths skills and students choosing this course must be strong mathematicians. We recommend that students have gained at least a progress grade of 6 in Mathematics in Y11 to be able to access the Maths and Science aspects of the Engineering Principles unit.
- This course is suitable for students who wish to progress onto higher education at University or potentially a career / apprenticeship in a range of engineering sectors, ranging from Mechanical and Automotive to Electrical and Electronic Engineering.

CONTENT COVERED IN YEAR 12:

Unit 3: Engineering Product Design and Manufacture

In this unit, you will examine what triggers changes in the design of engineering products and the typical challenges that engineers face, such as designing out safety risks. You will learn how material properties and manufacturing processes impact on the design of an engineering product. Finally, you will use an iterative process to develop a design for an engineering product by interpreting a brief, producing initial ideas and then communicating and justifying your suggested solution. You will draw on and apply knowledge and understanding from Unit 1: Engineering Principles and Unit 2: Delivery of Engineering Processes Safely as a Team, for example by using calculations to demonstrate a reduction in mass, by sketching using orthographic projection drawing methods or by justifying an engineering process as its use reduces the carbon footprint of a product

Unit 2: Delivery of Engineering Processes Safely as a Team

In this unit, you will examine common engineering processes, including health and safety legislation, regulations that apply to these processes and how individual and team performance can be affected by human factors. You will learn the principles of another important process, engineering drawing, and develop two-dimensional (2D) computer-aided drawing skills while producing orthographic projections and circuit diagrams. Finally, you will work as a team member and team leader to apply a range of practical engineering processes to manufacture a batch of an engineered product or to safely deliver a batch of an engineering service. To complete the assessment task within this unit, you will need to draw on your learning from across your programme.

CONTENT COVERED IN YEAR 13

Unit 1: Engineering Principles

This unit will develop your mathematical and physical scientific knowledge and understanding to enable you to solve problems set in an engineering context. You will explore and apply the algebraic and trigonometric mathematical methods required to solve engineering problems. The mechanical problems you will encounter cover static, dynamic and fluid systems. The electrical and electronic problems you will encounter cover static and direct current (DC) electricity, DC circuit theory and networks, magnetism, and single-phase alternating current theory. You may apply these engineering principles to solve problems involving more than one of these topic areas.

Unit 41: Manufacturing Secondary Machining Processes

In this unit, you will cover the technology used in, and characteristics of, a range of traditional machining processes such as turning, and specialist machining processes such as broaching. You will develop knowledge of the health and safety requirements for working on secondary machining processes, and gain practical skills and understanding to be able to set up and operate traditional secondary machining processes to manufacture a component. Finally, you will reflect on the skills and understanding of secondary machining processes that you have acquired and the behaviours applied while manufacturing a component.

TYPE OF ASSESSMENT IN YEAR 12

Unit 3: Engineering Product Design and Manufacture – Externally Assessed Exam - 66%

Unit 2: Delivery of Engineering Processes Safely as a Team - Internally Assessed Coursework - 33%

TYPE OF ASSESSMENT IN YEAR 13

Unit 1: Engineering Product Design and Manufacture – Externally Assessed Exam - 66%

Unit 41: Manufacturing Secondary Machining Processes- Internally Assessed Coursework - 33%