

Introduction to BTEC Engineering Level 3

Pearson BTEC Level 3 National Extended Certificate in Engineering

Equivalent in size to one A level. 4 units of which 3 are mandatory and 2 are external. Mandatory content (83%)
External Assessment (67%)

This qualification provides a broad basis of study for the engineering sector.

It has been designed to support progression to higher education when taken as part of a programme of study that includes other appropriate BTEC qualifications or A levels.

Unit 1

Engineering Principles.
(External Assessment - Exam)

Unit 2

Delivery of Engineering processes safely as a team.
(Internally Marked Assignments)

Unit 3

Product Design and Manufacture.
(External Assessment - Exam)

Unit 10

Computer Aided Design in Engineering.
(Internally Marked Assignments)

Year 12

Unit 2

Delivery of Engineering processes safely as a team.
(Internally Marked Assignments)

In the first semester you will examine engineering processes and human factors. Investigating how engineering processes are used safely when manufacturing a given product. You will be required to consider how human factors, as an individual or a team affect the performance of engineering process, and examine the health and safety legislation that is required when creating engineered products.

When you have completed some initial training in the computer aided design of products and the documentation required to produce an engineered product, you will be required to work in Teams, taking the lead on various tasks to produce an engineered component through casting and secondary processes.



Year 12

Unit 1

Engineering Principles.
(External Assessment - Exam)

Throughout both years 12 & 13 you will require to apply mathematical and physical science principles to solve electrical, electronic, and mechanical-based engineering problems.

As such you will have weekly lessons delivering the content required for the successful outcome of an external assessment completed under exam conditions halfway through Year 13 with a possible resit at the end of Year 13.

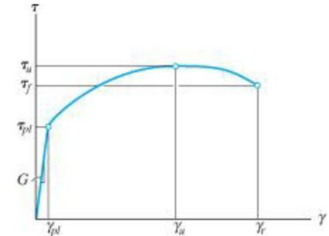
Typically you will be required to recall basic engineering principles and mathematical methods and formulae. Perform mathematical procedures to solve engineering problems. Demonstrate an understanding of electrical, electronic and mechanical principles to solve engineering problems. Analyse information and systems to solve engineering problems, and be able to integrate and apply electrical, electronic and mechanical principles to develop an engineering solution.

3.6 SHEAR STRESS-STRAIN DIAGRAM

- Hooke's law for shear

$$\tau = G\gamma$$

G is shear modulus of elasticity or modulus of rigidity



G can be measured as slope of line on τ - γ diagram, $G =$

$$\tau_{pl} / \gamma_{pl}$$

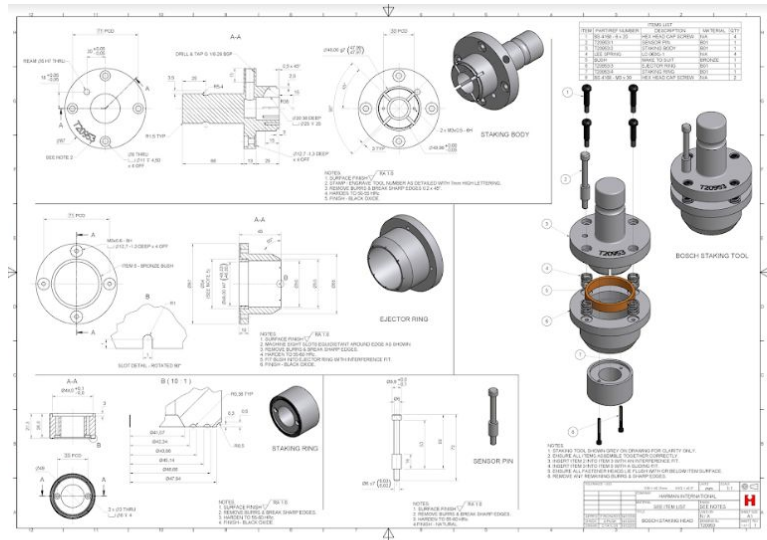
The three material constants E , ν , and G is related by

$$G = \frac{E}{2(1 + \nu)}$$

Year 13

Unit 10

Computer Aided Design in Engineering. (Internally Marked Assignments)



In this unit you will use CAD software to produce 2D and 3D drawings. You will acquire the skills to produce models of products, editing and modifying these, and exploring materials and their properties.

You will produce and develop two-dimensional and three-dimensional computer-aided models of an engineered product. Your portfolio of drawings, will include orthogonal, 3D shaded or solid models, and detail views and drawings, to an international standard. These have historically proved useful and favoured by employers as evidence of your ability when applying for university and further apprenticeships and training.

Year 13

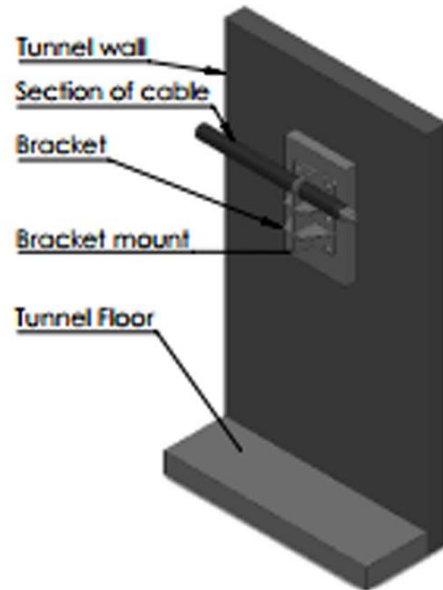
Unit 3

Product Design and Manufacture. (External Assessment - Exam)

This unit results in an external assessment exam at the end of Yr13 in May. You will explore engineering product design and manufacturing processes and will complete activities that consider function, sustainability, materials, form and other factors.

This unit is assessed by a set task of 60 marks provided by Pearson and completed under supervised conditions. You will be given a case study and produce independent research that you will be able to apply to the given case study

You will be shown how to follow a standard development process of interpreting a brief, scoping initial design ideas, preparing a design proposal and evaluating a proposal.



A View of one Cable Bracket in Operation

How you will be assessed.

Unit 1

Engineering Principles. (External Assessment - Exam)

A series of in class assessments and mock exam papers will prepare you for your external exam in January of Yr13 (resit in June).

Unit 2

Delivery of Engineering processes safely as a team. (Internally Marked Assignments)

Three written assignments completed in line with the BTEC assessment plan throughout semester 1 and 2 of Year 12.

Unit 3

Product Design and Manufacture. (External Assessment - Exam)

'Live' case studies delivered throughout Yr13 assessed using examination model. Mock paper prior to final assessment.

Unit 10

Computer Aided Design in Engineering. (Internally Marked Assignments)

A portfolio of drawings derived from three assignments completed in line with the BTEC assessment plan throughout semester 2 of Yr12 and Yr13.

What next?...

Teaching staff

Ms K Barnett - Engineering

Dr P Knight - Engineering Principles

Mrs M Whetman - Design & Engineering Technician

Mr I Glanville - Head of Engineering (glanvillei@plympton.academy)

Summer work

Preparation for commencement of course in September is advantageous and is

Available on Google classroom. **sikipf6**.

Text Books

Pearson BTEC National Engineering

BTEC National Engineering Publisher: Pearson

9781292141008

BTEC National Engineering Revision Guide

Publisher: Pearson

Author: Andrew Buckenham, Kevin Medcalf, David Midgley, Victor Walsh ISBN: 9781292150284

Google classroom

Google classroom is used extensively throughout the dept and is the primary point of communication for the sixth form course. All assignments are posted on the classroom along with any resources that are relevant to each assignment.

Please see the code for access **sikipf6**.

