

BTEC Level 3 National Foundation Diploma in Engineering

**(Please make sure you read the second section
regarding your task for the holiday)**

Equivalent in size to 1.5 A Levels. 7 units of which 4 are mandatory and 2 are external.

Mandatory content (67%). External assessment (44%)

This qualification has been designed as a one-year, full-time course that supports progression to an apprenticeship in engineering or to a further year of study at Level 3. If taken as part of a programme of study that includes other BTEC Nationals or A Levels, it supports progression to higher education.

The subjects will be delivered by a number of different tutors throughout the week.

Mandatory subjects being:

Engineering Principles

Delivery of Engineering Principles Safely as a Team

Engineering Product Design and Manufacture

Applied Commercial and Quality Principles in Engineering

Optional units possibly being:

Electronic Circuit Design and Construction

Testing of Electronic Circuits

Manufacturing Secondary Machining Processes

Each unit will be timetabled at least 1.25 hours per week and will result in a possible grade of PASS, MERIT OR DISTINCTION.

Externally set assessments have a possible grade of NEAR PASS, PASS, MERIT or DISTINCTION

Each unit that is not externally assessed will usually have 3 or more assignments each. These will be issued throughout the year when the tutor is confident that the students are ready.

Many of the units involve a 'hands on' approach to learning requiring the learners to engage in a practical task from which their assignments can be based on.

Progression from this qualification is either to a larger size qualification at Level 3 (e.g. BTEC National Extended Diploma in Engineering or other related subject (e.g. Computing).

In the BTEC National units there are opportunities during the teaching and learning phase to give learners practice in developing employability skills. Where employability skills are referred to in this specification, we are generally referring to skills in the following three main categories:

- cognitive and problem-solving skills: use critical thinking, approach non-routine problems applying expert and creative solutions, use systems and technology
- intrapersonal skills: communicating, working collaboratively, negotiating and influencing, self-presentation
- interpersonal skills: self-management, adaptability and resilience, self-monitoring and development.

Mandatory units

There are four mandatory units, two internal and two external. Learners must complete and achieve at Near Pass grade or above in all mandatory external units and achieve a Pass or above in all mandatory internal units.

Optional units

Learners must complete at least three optional units.

Synoptic assessment

The mandatory synoptic assessment requires learners to apply learning from across the qualification to the completion of a defined vocational task. Within the assessment for Unit 3: Engineering Product Design and Manufacture, learner's complete product design and manufacturing tasks which draw together underpinning engineering science principles and skills such as engineering drawing and health and safety. Learners complete the task using knowledge and understanding from their studies of the sector and apply both transferable and specialist knowledge and skills.

Preparation for the course

All students will require the following in order to make the most of their learning experience:

Note pad, Pen, Pencil, ruler, rubber, scientific calculator.

When in the workshop doing practical activities it is a mandatory requirement for everyone to be equipped with PPE. The minimum for the learner to bring to each session are safety boots and a lab coat (best to be a dark colour). Other kit (safety glasses, ear plugs) will be provided.

Lockers will be provided for learners to store their kit.

Other sessions for tutorials will be timetabled into the week and these must be attended.

During the first week of the first term all new groups will be inducted into the things necessary to make their time at the college safe and equipped to do well.

We hope this brief booklet has given you a little more insight into the course and we hope to see you at Worthing College in September if not before at the course confirmation day some time in August.

Student name:

While you are having a well-earned summer break we have set you some homework to work through. Please complete as much as you can and return it during induction week in September for marking.

An important part of engineering is understanding about materials, their properties and where they can be best employed.

TASK 1: Research into the following materials and find out about what their strengths and weaknesses are, where they are used in products and why. Try and list at least three properties for each if you can and examples of products they would be made out of.

1. Titanium 6AL-4V alloy



2. High Modulus Carbon Fibre Reinforced Polymer



3. Invar



The first and third materials listed are classified as alloys. What does this term mean and why are pure metals rarely used in engineering.

TASK 2: Engineering like any other industry has its own technical language. Below are some of the terms that you will need to be fluent with especially when using them in your assignments. Find out about and record a definition for each of the following:

Tensile Strength

Compressive Strength

Toughness

Hardness

Thermally conductive

Ductility

Malleability

Sonorous

Density

TASK 3: The legs of the Worthing pier are made of iron it was built in 1862. In view of the fact that it sitting permanently in salt water all year round why haven't the legs rusted away?



What are the key properties of iron that made it ideal for the pier construction.

Task 4: Previously you have been asked to research about different materials. Now you are being asked to invent a new unheard-of material. Think about what properties it would possess, maybe ones that currently do not exist!