



# Welcome to the Automotive and Marine Engineering Department



## Activity Starter Pack

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## We are Bournemouth & Poole College

We are the largest provider of Further Education (FE) and Apprenticeships in the area. Our core focus is on developing the work skills of our students, so that when they leave us, they are ready to start or to progress within their chosen career.

### Our mission

Through inspiring teaching and learning, we develop our students' work skills, life skills and knowledge, and so help to build a thriving local economy and community.

### Our values

- A passion for learning and success
- Supportive and caring
- Respectful and considerate
- A champion for equality through learning
- Ambitious and tenacious

### Meet the team

The Automotive and Marine Engineering department covers a wide range of FT, PT and apprentice studies to help you progress and achieve your aspirations. We have a wide variety of personal experience and knowledge. We have excellent facilities to provide both excellent theory and practical sessions.

**Peter Leech - Learning Manager**

**Kevin Chappell - Lead Tutor**

**Michael Marshall - Marine/ Engineering/ Automotive Engineering Lecturer**

**Owen Davies - Marine/ Engineering/ Automotive Engineering Lecturer**

**Dan Lovett - Marine/ Engineering/ Automotive Engineering Lecturer**

**David Wheeler - Automotive Engineering Lecturer**

**Steve Smith - Automotive Engineering Lecturer**

**Lee James - Automotive Engineering Lecturer**

**Richard Broden-Cowell - Marine Lecturer**

**Brian McKeown - Marine Lecturer**

**Steve Lunn - Boatbuilding Lecturer**

## Useful Contacts

**Automotive office:** 01202205668 or [marine@bpc.ac.uk](mailto:marine@bpc.ac.uk)

**Wellbeing:** 01202 205242

**Safeguarding:** 07714851103 (Fulcrum & NR) 07774974781 (Lansdown & APP)

**Student finance:** 01202205660

**WPO:** Edit Laczó - 01202205197 [laczoe2@bpc.ac.uk](mailto:laczoe2@bpc.ac.uk)

**Curriculum Admin:** Stephanie Wilcocks - 01202205622 - [willcockss@bpc.ac.uk](mailto:willcockss@bpc.ac.uk)

**IT:** 01202205566 Option 1

**Careers advise:** 01202205312

## The Course Overview

**Name:** BTEC National Diploma Extended Certificate in Engineering (Marine Technologies)

**Level :** 3

**Awarding Body:** BTEC

**Progression:** Year 2 Level 3 Diploma/Apprenticeship/Higher Education or Employment

**Units:** Units are graded Unclassified, Near Pass, Pass, Merit and Distinction with points awarded dependent on grade. The total number of points give an overall grade for the qualification.

The BTEC Nationals attract UCAS points. Please go to the UCAS website for full details of the points allocated.

Below is the curriculum outline:

Units	Description
Unit 1 Engineering Principles:	Learners apply mathematical and physical science principles to solve electrical-, electronic- and mechanical-based engineering problems. <b>2 hour externally set exam</b>
Unit 2 Delivery of engineering processes safely as a team:	Learners explore how processes are undertaken by teams to create engineered products or to deliver engineering services safely. <b>Course work based</b>
Unit 3 Engineering Product design and manufacture	Learners will explore engineering product design and manufacturing processes and will complete activities that consider function, sustainability, materials, form and other factors. <b>External exam</b>
Unit 9 Work Experience	Learners explore the benefits of work experience. They carry out and reflect on a period of work experience, and plan for their personal and professional development. <b>Course work based</b>
Unit 12 Pneumatic and hydraulic systems	Learners explore the safe operation of pneumatic and hydraulic systems, including simulation of circuits using software and practical system assembly and testing. <b>Course work based</b>

## Engineering Safety Rules

The following are safety rules that must be obeyed when working in the workshops:

- Wait outside the room quietly at the beginning of the lesson
- Only enter a room if a member of staff is present
- Listen carefully to instructions
- Always walk, never run
- Wear appropriate safety clothing:
  - Steel toe capped boots
  - Your Engineering Overalls
- Keep bags and stools out of the way during practical work
- Clean up any spills or pick up any dangerous items from the floor immediately
- Be aware of the fire drill for the area
- Report any accidents to the instructor immediately
- Check tools and equipment are not damaged before use
- Ensure inductions have taken place to ensure safe operation of mechanical and electrical equipment before they are switched on.
- Never handle electrical equipment with wet hands or when standing in water
- Always concentrate when using electrical equipment / sharp instruments / tools
- Operate equipment / machines on your own, avoid crowding around equipment / machines
- Switch off and if necessary, unplug electrical equipment after use.
- Replace tools and clean equipment when you have finished using them
- Always leave the working area clean and tidy

**You are responsible for your Health & Safety and the safety of others**

**I have read and understand the above:**

**Name:**

**Assessor Name:**

Confirming safety procedures have been followed by the student.

**Signatures:**

**Date:**

## Activities

Please follow and complete the below tasks that will enable you to hit the ground running and get some useful skills and knowledge built in preparation for your start date.

### Watch some videos

YouTube is a wonderful resource that we can use for research and learning!! It can be entertaining and resourceful  
Please have a look at some of the following videos/channels to prepare for the start of your qualification:

#### Health & Safety

- Flirting with Disaster - <https://www.youtube.com/watch?v=WavEcAsI2AY>
- Machine Operation and Maintenance - [https://www.youtube.com/watch?v=hiFL-Qr5xl0&list=PLMNR-rOEMXB8n\\_AmBX70MoAqeKkoyHSVU&index=7](https://www.youtube.com/watch?v=hiFL-Qr5xl0&list=PLMNR-rOEMXB8n_AmBX70MoAqeKkoyHSVU&index=7)
- Maintenance of Machine Safety Guard - [https://www.youtube.com/watch?v=n51R8sYiz54&list=PLMNR-rOEMXB8n\\_AmBX70MoAqeKkoyHSVU&index=5](https://www.youtube.com/watch?v=n51R8sYiz54&list=PLMNR-rOEMXB8n_AmBX70MoAqeKkoyHSVU&index=5)

#### Fire Safety

- Fire Safety Video - <https://www.youtube.com/watch?v=ult6Biaf7oM&list=PLMNR-rOEMXB9xY3zO72s72MtcedFjQiUy&index=3&t=7s>
- How not to use a fire extinguisher - [https://www.youtube.com/watch?v=IIwResK9VBc&list=PLMNR-rOEMXB8n\\_AmBX70MoAqeKkoyHSVU&index=18&t=0s](https://www.youtube.com/watch?v=IIwResK9VBc&list=PLMNR-rOEMXB8n_AmBX70MoAqeKkoyHSVU&index=18&t=0s)

#### Tools & Equipment

- Engineers tools list - <https://www.youtube.com/watch?v=htQqkU0oBwA>
- Basic Engineering Tools- <https://www.youtube.com/watch?v=1H63--50hr4>

## Materials

Create a Poster outlining all the different types of materials there are!

Materials are widely used in Engineering and come in different shapes, colours, smells and properties.

Can you find out what the different types of materials are and list examples. Use the following link to support you: <https://www.thewarren.org/ALevelRevision/engineering/Materialclasses.html>

Include description and of course pictures!

## Toolbox

Begin building a list of tools and equipment you think a Marine Engineer will need. This can be in a word document or PowerPoint.

List your tools, explain where you might use them and of course a picture!!

For bonus points include the price of each tool and add the end total up the cost of your toolbox.

## About you

Produce a poster or Power point all about you!

Include images, photos and the following information;

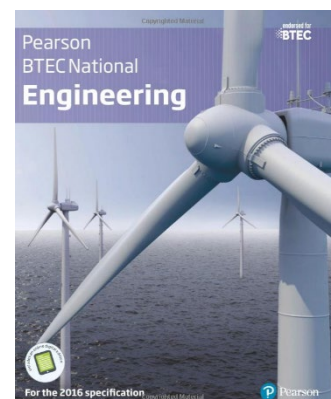
- What is your pet hate?
- What is your hidden talent?
- Random fact about yourself?
- What is your biggest achievement?
- What is your guilty pleasure?
- Include your goals; 2 short term 2 long term
- Include a quote and picture from someone that you look up to. This could be a famous person, a public figure, friend or family

See an example on the next page.

## Course reference material

Course Specification: <https://qualifications.pearson.com/en/qualifications/btec-nationals/engineering-2016.html>

Dedicated course text book. Available in the LRC in ebook and hard copy.





# An insight to me...Dan

## 5 QUESTIONS...

### 1. What is your pet hate?

People not being mindful of others.

### 2. What is your hidden talent?

I can eat peanut butter with/ on everything!

### 3. Random fact about yourself?

I finished 4<sup>th</sup> in my age group at the 'GB SUP National Series 2019'.

### 4. What is your biggest achievement?

Completing my CertEd in Post Compulsory Education

### 5. What is your guilty pleasure?

Watching surf movies and eating a ton of chocolate and nachos



## Short term goals

1. To complete my level 3 'Coaching in the workplace'
2. To shape and glass a surfboard

## Long term goals

1. To swim around St.Marys
2. To paddle around the I.O.W



Make sure your worst enemy doesn't live between your two ears.

— Laird Hamilton —



## Glossary

**Assembling:** A process done by welding, binding with adhesives and bending in the form of a crimped seam

**Base metal:** The metal to be welded or cut

**Bending:** A process done by hammering or via press brakes

**Blanking:** A part is cut out of the sheet metal, and the material around the part is discarded

**Brittle:** Materials that have a tendency to break easily or suddenly without stretching or bending first.

**CAD design:** An acronym for computer-aided design

**Ceramics:** Ceramics are not shiny unless glazed, hard, often brittle, heavy, can be any colour (often white, pale brown to dark brown), cold to the touch.

**CNC cutters:** An acronym for computer numerical computer cutters; the automation of machine tools that are operated by precisely programmed commands encoded on a computer instead of operated manually by hand wheels or levers

**Conductivity:** How well a material conducts heat and electricity.

**Corrosion resistance:** The ability to withstand environmental attack and decay.

**Cutting:** A process done by sawing, shearing, or chiselling with manual and power tools, or torching with hand-held plasma torches using CNC cutters like lasers

**Cutting torches:** A tool that is capable of cutting large sections of sheet metal with little effort

**Density:** Density is mass per unit volume. The unit of density is the Kg per metre cubed.

**Die cutting:** A process that cuts metal pieces without the formation of chips or the use of burning or melting; also known as shearing

**Ductility:** The ability to be pulled into a thin wire or threads. Good examples are gold, copper and brass.

**Elastics:** The ability of a material to return to its original shape after a force has been applied and removed.

**Fab shops:** An abbreviation for fabrication shops

**Flexibility:** The ability to cope with bending forces without breaking.

**Hardness:** A measure of how easily a material can be scratched or dented.

**Malleability:** The ability to shape a material by applying pressure or a force. Good examples are lead, gold and copper.

**Metal punching:** When metal fabrication equipment punches holes, louvers or a predetermined shape out of sheet metal

**Metals:** Metals are shiny, hard, heavy, good conductors, can be polished and are cold to the touch.

**Milling:** The process of using rotary cutters to remove material from a metal piece advancing in a direction at an angle with the axis of a tool

**Oxy-acetylene torch:** A tool used to straighten significantly warped steel in a slow, linear fashion

**Plastics:** Materials that change shape permanently when small forces are applied. Plasticine and clay are good examples.

**Roll forming:** A constant bending process in which sheet metal, coil, bar or strips of metal pass through rolls that form the metal

**Sheet metal fabrication:** The process of cutting, shearing, rolling, bending and punching sheet metal to fabricate parts and pieces

**Stamping:** A high production process in which single or multiple punches, bends and embossing are performed at one time or in a progressive die

**Stiffness:** The ability to resist bending.

**Strength:** The ability of a material to withstand forces.

**Tough:** Materials that absorb forces - the opposite to brittle materials.

**Welding:** The main focus of sheet metal fabrication; a process of using a blow torch or electric arc to join together two or more metal pieces or parts by heating the surfaces of the parts to the point of melting then uniting them by pressing, hammering or other techniques