SUBJECT: BTEC ENGINEERING

EXAM BOARD: Pearson Edexcel

Course Overview

<u>By the end of this course you will have:</u>

- Learned a combination of engineering principles and mathematics
- Developed an understanding of health and safety, team work and interpreting and creating computer-aided engineering drawings
- Be able to design and manufacture of products.

This qualification provides a broad basis of study for the Engineering sector. This course contains 4 units of which 3 are mandatory and 2 are assessed externally.

The 3 mandatory units that will be covered are:
Unit 1 Engineering principals- Learners will apply mathematical and physical science principles to solve electrical and mechanical based engineering problems.
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.
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.

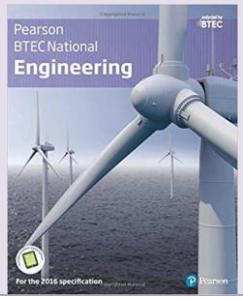
The optional unit that will be covered is:
Unit 10 Computer Aided Design in Engineering- Learners develop two-dimensional (2D) detailed drawings and three-dimensional (3D) models using a computer-aided design (CAD) system.

This qualification is the equivalent of 1 A level during the course you will be both internally and externally assessed. The external assessments take two different forms as seen below.

Unit 1 Engineering principals- External assessment in the form of a written exam paper. The paper is 2 hours long and worth 80 marks, this exam can either be set in January of June. The assessment will focus on learner's ability to solve problems that require individual and combined application of mathematical techniques, and electrical, electronic and mechanical principles to solve engineering problems.

Unit 3 Engineering Product Design and Manufacture- A task will be set by Pearson and completed under supervised conditions. Prior to the assessment learners will be given a case study in order to carry out research in no more than three hours in a one week period to help prepare for the assessment. The supervised assessment period is 8 hours and is completed within 5 days.

The internally assessed units are written by BTEC and set by your teacher, the evidence for these units will be in a variety of styles such as; essays, writing up the findings of your own research, case studies, projects, demonstrating practical and technical skills. Units are assessed using a grading scale of Distinction (D), Merit (M), Pass (P), Near Pass (N) and Unclassified (U).

Useful websites	https://qualifications.pearson.com/content/dam/pdf/BTEC-Nationals/Engineering/2016/specification-and-sample-assessments/SPEC-BTEC-NAT-ENG-ExtCert.pdf https://www.solidworks.com/sw/resources/solidworks-tutorials.htm
Essential books	 Title: BTEC National Engineering Student Book: For the 2016 specifications (BTEC Nationals Engineering 2016) Paperback Price: £28.56 (Amazon)
Summer task	Read through the scenario below and then complete all for tasks for your return in September. **Scenario** You are working in a small engineering company, and your manager has asked you to take a look at a prototype of a screw driver and determine the best way to manufacture five more as samples for potential clients. Your recommendation should be fully justified and include a comparison with alternative processes.  If the screw driver eventually goes into production, it will be required in large numbers. Your manager has explained that when demand reaches a certain level, a fully automated manufacturing system will be introduced that will eliminate human involvement in the process almost entirely. This would require a significant investment, and your company is keen to establish how a range of human factors could actually benefit the performance of engineering processes involved in manufacturing. Your manager has asked you to write a technical report that will address the issues that she will present to the operations director of the company. Care must be taken to ensure that a high standard of written language is used throughout. **Task 1**- Read through the information sheets and make notes. **Task 2**- Explain how three engineering processes could be used safely to manufacture the screw drivers initially as a batch of 5 but then eventually in larger numbers. Analyse why you've chosen these manufacturing processes. **Task3**- Explain how human factors, as an individual or as a team, could affect the performance of engineering processes. **Task 4**- Evaluate, using high quality written language, the potential effectiveness of using your three chosen engineering processes to manufacture the screw driver and how human factors, as an individual and as a team, could affect the performance of engineering processes.