This guide is for students, parents and carers. It outlines: Information about the GCSE course; the topics on each examination paper and where students can find revision resources; and ends with examination tips specific to this subject.

**Course Title and Exam Board**

|  |  |
| --- | --- |
| Exam board | BTEC |
| Course title | BTEC Engineering NQF Level 1/2 |
| Course structure and assessment | 4 Units each consisting of 25% of final grade.Unit 1 Online exam (Compulsory / Externally assessed)Unit 2 Writing an Engineering Specification (Coursework / Compulsory / internally assessed)Unit 3 Health and Safety in Engineering (Chosen / internally assessed)Unit 6 Computer Aided Engineering (Chosen / internally assessed) |
| Key dates | 30 January 2019 | 9.40am Unit 1 Online Exam  |

**BTEC Examinations**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Paper | Marks | Duration | Weighting | Topics on this paper |
| Unit 1 the Engineered World | 50 | 1Hr | 25% | * Engineering Sectors
* Engineering Processes
* Scales of Production
* Modern and Smart Materials
* New Technologies in Engineering
* Life Cycle Assessment
* Reducing Waste
* Lean Manufacturing
* Renewable Energy
 |

**Course Components (a more detailed explanation of skills and topics)**

* Engineering Sectors – Understanding of a products main sector and why.
	+ Aerospace
	+ Automotive
	+ Biomedical
	+ Chemical
	+ Communications
	+ Electrical / Electronic
	+ Mechanical

Understanding that products may have secondary sectors. Why they are secondary.

* Engineering Processes / Uses / Applications / Safety
	+ Manual Machining processes
	+ CNC Machining Processes
	+ Casting Processes Sand / /Die / /Investment / Permanent mould)
	+ Forging Processes (Drop / Press/ Die / Upset )
	+ PCB Manufacture / Soldering / Surface Mount technologies)
	+ Joining Methods - Welding/ Brazing / Soldering / Mechanical / Rivets / Adhesives
* Scales of Production
	+ Describe types / Reasons – One Off / Batch / Mass / Continuous
	+ Typical Products / Tool & Equipment / Labour type / Production Efficiency / Unit Costs / Labour Costs
* Modern and Smart Materials
	+ Modern Materials - Properties / Uses / Reasons for use / Improvements over traditional materials
		- Carbon Fibre
		- Kevlar
		- GRP
	+ High Performing Materials - Properties / Uses / Reasons for use / Improvements over traditional materials
		- Tungsten
		- Titanium
		- Nickel Based Super Alloys
		- Cobalt Based Super Alloys
		- Ceramics – Boron Carbide
		- Ceramics – Cubic Boron Carbide
		- Ceramics - Zirconia
	+ Smart Materials - Properties / Uses / Reasons for use / Improvements over traditional materials
		- Shape Memory Alloys
		- Shape Memory Polymers
		- Electrochromic Materials
		- Piezoelectric Actuators
		- Piezoelectric Transducers
* New Technologies in Engineering – Technology replaced / How works / Advantages / Disadvantages (OFTEN USED FOR THE EVALUATE QUESTIONS)
	+ Optical Fibres
	+ Hydrogen Fuel Cells
	+ Surface Nanotechnology
	+ Metallic Foams
	+ Powder Metallurgy
	+ Bionics
	+ Blended Wing Bodies
	+ Telematics
* Life Cycle Assessment (Environmental impact of a product) Understanding the following in terms of their environmental impact. (Impact / how achieved / Advantages / Disadvantages)
* (OFTEN USED FOR THE EVALUATE QUESTIONS)
	+ Extracting Materials
	+ Processing
	+ Transporting
	+ Using
	+ Disposing of the product.
* Reducing Waste (impact / how achieved / Advantages / Disadvantages) (OFTEN USED FOR THE EVALUATE QUESTIONS)
	+ 4 R’s
		- Reducing
		- Reusing
		- Recovering
		- Recycle
* Lean Manufacturing (impact / how achieved / Advantages / Disadvantages) (OFTEN USED FOR THE EVALUATE QUESTIONS)
	+ Just in Time
	+ Poka Yoke
	+ Kaizen
* Renewable Energy (impact / how achieved / Advantages / Disadvantages) (OFTEN USED FOR THE EVALUATE QUESTIONS)
	+ Wind Energy
	+ Solar Energy
	+ Hydro Energy
	+ Geothermal Energy

**Where are the revision resources?**

|  |  |
| --- | --- |
| Revision topics | What resources to use (website links, student: drive titles of folders/ documents; books recommended etc.) |
| **Paper 1** | [www.longhillengineering.co.uk](http://www.longhillengineering.co.uk)<https://sites.google.com/a/longhill.org.uk/engineering/home/unit-1-the-engineered-world>Past Papers and Mark Schemes - <https://sites.google.com/a/longhill.org.uk/engineering/home/unit-1-the-engineered-world/past-papers-and-mark-schemes>Staff set Questions - <https://sites.google.com/a/longhill.org.uk/engineering/home/unit-1-the-engineered-world/revision-homeworks>  Link to different processes - <https://sites.google.com/a/longhill.org.uk/engineering/home/investigating-an-engineered-product/unit-2---c-understand-the-selection-and-use-of-manufacturing-processes-in-an-engineered-product/resources-for-unit-2-task-c/processes-for-unit-2-task-c>Link to Materials – <https://sites.google.com/a/longhill.org.uk/engineering/home/investigating-an-engineered-product/unit-2-re/material-website-links>P Drive – Students – Engineering Also holds above plus additional revision / content materials.  |
| Unit 1 The Engineered World |

**Three Examination Tips Specific to this Subject**

* Examination Paper 1 – Unit 1 The Engineered World

Students **state / Identify / Give** short answers to test knowledge

* Students apply knowledge and understanding to explain a concept/ process. Answer must **contain the answer** with **BECAUSE** followed by an e**xplanation**.
* Students need to evaluate a Scenario against a suggested strategy/process. Answer must contain the **positives** of the strategy / process, the **negatives** of the strategy / process. This must lead to a **conclusion** where the scenario is considered in light of the positives and negatives. The **conclusion must have a final decision related to the scenario with justification**.