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**.