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**BTEC Level 3 Engineering Guide**

**How BTEC Engineering will be taught:**

BTEC Engineering is taught via face-to-face teaching, presentations and via practical sessions. There will be a lot of discussion, questioning and practical tasks to ensure you learn new advanced engineering skills to enable you progress to a career in your choice of engineering specialism.

You can expect hands-on practical and theoretical learning using industry-standard technology and equipment. All students are given a course handbook; these are used as the basis of the topics you will learn, qualification structure and more importantly how you will be assessed.

**Working expectations:**

You are expected to put at least as many hours into BTEC Engineering outside of lessons as you would in lessons. BTEC Engineering is a joint collaboration between a reading and writing subject and a vocational practical based subject; in your free periods, aside from homework, you should be going back over your lesson notes, ensuring you go over the subject of each lesson in much more detail, enabling you to complete assessments and coursework effectively.

**What 100% effort in this subject looks like:**

* As much time out of lesson devoted to the BTEC Engineering units
* Always go over the subject of each lesson in much more detail, enabling detailed notes to be used for coursework or external assessments
* Seeking additional content or question papers, doing them as practice and handing them in.
* Making your own revision booklets
* Keeping up to date with all assessment deadlines and realising that developing your practical skills can only be achieved by extra input from you outside of normal timetabled lessons.
* Independent learning: Reading about the wider context, new technology & engineering information not necessarily covered within the specification.

**Coursework Policy:**

*Your folder should have:*

* All notes made in lesson, including learning mats which contain the relevant information on each element of the topic you’ll be studying.
* All notes in unit order.
* All copies of assessment work or mock exams should always be kept in the back of your folder for reference and to show progress.
* Exemplar work and other overall revision materials should also be in the back.

*Your PC based assignment work should have:*

* Title page, contents page and then the body of evidence, including images where appropriate.
* Student declaration stating that the evidence submitted for this assignment is your own and that you have clearly referenced any sources used in your work.

**What Marking looks like:**

* Ordinary class notes are not marked, as there is nothing to assess.
* You will have regular feedback from your tutor regards improvements, suggestions and advice.
* Exam questions will be marked with the relevant mark scheme, comments and discussed individually and as a class to clarify any issues.
* Assignments will be marked with the relevant cover sheet, comments and resubmission given where appropriate.

**What Homework looks like:**

* Research tasks
* Assignments on each unit given at that time
* Examination questions
* Practical tasks
* Analysis of assessment criteria.

**Units at a glance:**

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| **Year 1 – Extended Engineering Diploma** |
| Engineering Principles (c) | Electronic Printed Circuit Boards |
| Delivery of Engineering Processes Safely as a Team (c) | Electronic Devices and Circuits |
| Engineering Product Design and Manufacture (c) | Maintenance of Mechanical Systems |
| Manufacturing Secondary Machining Processes | (c) Indicates a core unit  |

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| **Year 2 – Extended Engineering Diploma** |
| Applied Commercial and Quality Principles in Engineering (c) | Further Engineering Mathematics |
| A Specialist Engineering Project (c) | Computer Aided Design |
| Microcontroller Systems for Engineers (c) | Static Mechanical Principles in Practice |
| Calculus to Solve Engineering Problems (c) | Manufacturing Primary Forming Processes  |

**Summer preparation**

The purpose of giving you a summer bridging task is:

1. To provide a bridge from level 2 to level 3 study, and lead into the early stages of the course.
2. To engage you in independent learning which is required at level 3.
3. To encourage you to develop your work ethic and commitment to study.
4. To measure your suitability for the course and assess your initial levels of achievement.

**Task 1**: There are 5 key Health & Safety terms that crop up throughout the two-year course. It is important that you are aware of their meaning and purpose in engineering.

Define the following key terms, giving a detailed description of the regulations and legislation surrounding them:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **HASAWA** | **PPE** | **RIDDOR** | **MHOR** | **COSHH** | **Risk Assessment** |

**Useful websites:**

<https://www.hse.gov.uk/>

**Task 2:** We will be studying a number of mechanical engineering topics that require you to use three manual secondary machining processes. German History. Create a report on all three processes, which includes relevant images or diagrams.

Research the following three manual secondary machining processes:

• Milling Machine

• Lathe

• Pillar Drill

Describe how they operate, the requirements for Health & Safety (PPE, COSHH, RIDDOR, MHOR) and the tools that they use in producing different components. Include in each processes description how they produce different features as well as particular reference to accuracy (e.g. tolerances).

**Potentially useful websites:**

Milling Machine Video: [https://www.youtube.com/playlist?list=PLyv4Q1JxT\_Rh0Fv5loUN9ZTm74VkxYjhJ](https://eur02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.youtube.com%2Fplaylist%3Flist%3DPLyv4Q1JxT_Rh0Fv5loUN9ZTm74VkxYjhJ&data=02%7C01%7CPFowler%40nuast.org%7C8049d94a0d96417ec30e08d7d6234243%7Cf4ebe22eb55344f388563e0d84908eb8%7C0%7C0%7C637213319238933958&sdata=KqmFwK6lXV8HTWfHa%2FaPITRHvjv1gtXFtEGDEQe6eAs%3D&reserved=0)

Lathe video: [https://www.youtube.com/watch?v=Za0t2Rfjewg](https://eur02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.youtube.com%2Fwatch%3Fv%3DZa0t2Rfjewg&data=02%7C01%7CPFowler%40nuast.org%7C8049d94a0d96417ec30e08d7d6234243%7Cf4ebe22eb55344f388563e0d84908eb8%7C0%7C0%7C637213319238943956&sdata=z5MaxZenDduxcfXI2juKPrYa5KPVwP3%2F6HraROEhYa0%3D&reserved=0)

Pillar Drill Video: [https://www.youtube.com/watch?v=qOJKeuzBc78](https://eur02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.youtube.com%2Fwatch%3Fv%3DqOJKeuzBc78&data=02%7C01%7CPFowler%40nuast.org%7C8049d94a0d96417ec30e08d7d6234243%7Cf4ebe22eb55344f388563e0d84908eb8%7C0%7C0%7C637213319238953954&sdata=5pKfgVGfdAUdspCXxaeSnNn72U45IhOxDKp4FL2bM9c%3D&reserved=0)

**Task 3:** We will also be studying a number of electronic engineering topics that require you to simulate electronic circuits, build prototype circuits and design and make Printed Circuit Boards (PCB’s). Using the links below as a guide describe how a multi-layer PCB is designed and manufactured. Watch the first video all the way through and then use the information and headings on the second link to guide the structure of your report.

Video creating the PCB: [https://www.youtube.com/watch?v=sIV0icM\_Ujo](https://eur02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.youtube.com%2Fwatch%3Fv%3DsIV0icM_Ujo&data=02%7C01%7CPFowler%40nuast.org%7C6df9cef5071440c1568d08d7d4ad2081%7Cf4ebe22eb55344f388563e0d84908eb8%7C0%7C0%7C637211712346311446&sdata=yql%2FjN5pePNRNx3G%2BO7d1ZKMOFHTqzqR3AD8Xe0LWVA%3D&reserved=0)

Step by Step instruction video: [https://www.eurocircuits.com/making-a-pcb-pcb-manufacture-step-by-step/](https://eur02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.eurocircuits.com%2Fmaking-a-pcb-pcb-manufacture-step-by-step%2F&data=02%7C01%7CPFowler%40nuast.org%7C6df9cef5071440c1568d08d7d4ad2081%7Cf4ebe22eb55344f388563e0d84908eb8%7C0%7C0%7C637211712346311446&sdata=nprD2NjDcpMzb4AObOux7vTkoojVfZEF27zwWpBSYsE%3D&reserved=0)

**Please bring your work with you to your first lesson.**