

THE ENGINEERING DIPLOMA

FOUNDATION LEVEL UNITS

A GUIDE FOR LEARNERS

RKL 16.4.08

What is the Engineering Diploma?

The Engineering Diploma will open your mind to the extraordinary ways in which engineering affects every aspect of our lives today. You will explore and examine the contribution made by engineers and engineering technology which will allow you to make an informed choice about your future career.

What does the course involve?

Compulsory Units...

Engineering Diploma learners will complete a series of compulsory and optional units, designed to give them the knowledge, skills and experience. The foundation level units have been summarised on the following pages of this booklet.

Work experience...

Diploma learners will do a minimum of 10 days work experience. They will also get the chance to learn from and be mentored by professionals working in their chosen field

The learner project...

All Diploma learners will complete a project to demonstrate the skills and knowledge they have acquired. Learners can choose their own project. For example learners might design a water pump for use in a developing world country.

English, maths and ICT...

All Diploma learners need to achieve a minimum standard in English, Math's and ICT. These subjects are studied as part of the Diploma and will be taken as a GCSE alongside it

Personal Learning and Thinking Skills...

Mastering essential life and work skills is crucial in today's competitive market.

All Diploma learners are encouraged to develop skills like teamwork and self management as part of their course. They will learn to express themselves confidently and how to apply their knowledge and skills creatively in a business environment

What could the Diploma lead to?

The Diploma is designed to broaden a young person's horizons and give them a wide range of next-step options. The Progression and Advanced Diploma could both lead onto college or university or to further training and employment. Learners who have completed a foundation or Higher Diploma in Engineering might choose to go on to do a Progression or Advanced Diploma or perhaps to do 'A' levels. They could also decide to start an Apprenticeship or take a job with further training

A Diploma in Engineering does not mean learners have to pursue a career in the Engineering Industry. A Diploma gives a learner relevant and transferable skills that will be welcomed by colleges, universities and employers

THE ENGINEERING DIPLOMA - FOUNDATION LEVEL

Unit 1: Introducing the Engineering World

Externally assessed

In this unit you will gain an understanding of how engineering has contributed to the social and economic development of our world. You will find out about the many different careers available by looking at some of the exciting sectors within engineering and the role and responsibilities of some engineering jobs. You will also investigate green issues from an engineering perspective, discovering how engineers can help control and reduce environmental damage.

Learning outcomes

On completion of this unit, a learner should:

- LO.1. Know about different engineering sectors and employment opportunities
- LO.2. Know about presentation methods, the benefits of working in a team, and the contribution engineering makes to the world we live in
- LO.3. Know how environmental factors influence the engineering world.

Unit 2: Practical Engineering and Communication Skills

Internally assessed

In this unit you will gain practical experience of some of the engineering skills required at this level. You will develop an understanding of some of the theory behind the selection of materials and the choice of tools and equipment used for manufacture. You will also become familiar with the communication methods used to convey instructions and, just as importantly, the health and safety implications of working on industrial standard machines.

- LO.1. Understand own responsibilities and those of their colleagues under health and safety legislation
- LO.2. Know about the cutting, forming and joining processes used when producing engineered products
- LO.3. Be able to disassemble and assemble engineered products
- LO.4. Be able to produce sketches of an engineered product or assembly
- LO.5. Be able to plan and produce an engineering product.

Unit 3: Introduction to Computer Aided Engineering

Internally assessed

In this unit you will be given opportunities to learn about computer aided engineering through designing and producing a simple component using computer-aided design and manufacturing software linked to computer controlled machine tools. You will use CAD (computer aided design) software to design and create a working drawing of a simple 2D (two dimensional) component. You will then convert the drawing data into a CNC (computer numerical control) machine tool operating program using compatible CAM (computer aided manufacture) software.

- LO.1 Be able to use a CAD system to produce a working drawing of a 2D component and an electrical circuit
- LO.2 Be able to use a CAM system to convert the drawing data into a computer numerically controlled (CNC) operating program
- LO.3 Be able to set and safely operate a CNC machine tool to produce an accurately machined component and check their own production.

Unit 4: Developing Routine Maintenance Skills

Internally assessed

In this unit you will be able to get involved with the carrying out of a maintenance task. This is a practical unit that will involve hands-on activities, putting knowledge and understanding into practice. The unit lends itself to support from local workplace providers so you may well receive an insight into maintenance procedures within a real engineering environment. You will find out about different types of maintenance, carry out a maintenance task and see if a product, equipment or system is likely to fail.

- LO.1. Know about different types of maintenance procedures and supporting documentation used in industry
- LO.2. Be able to use tools safely and effectively to carry out a routine maintenance task
- LO.3. Be able to assess a product, piece of equipment or system against causes of failure.

Unit 5: Introduction to Engineering Materials

Internally assessed

In this unit you will find out about the properties of engineering materials and the range of simple workshop tests that can be used to identify and evaluate their properties. You will also find out about the processes best suited for forming the different materials. There will be opportunities to put this knowledge into practice and collect naturally occurring evidence during practical workshop activities and from an appropriate work experience placement.

Learning outcomes

On completion of this unit, a learner should:

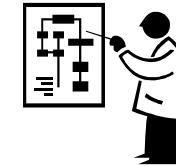
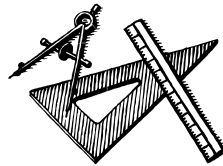
- LO.1. Know about the properties that are used to describe the performance of engineering materials
- LO.2. Know about the materials that engineers use and their forming processes
- LO.3. Be able to identify engineering materials and carry out tests to evaluate their properties.

Unit 6: Electronic Circuit Construction and Testing

Internally assessed

In this unit you will identify the common components used in electronics, learn how to put them together to produce an electronic circuit diagram and how to turn that diagram into a prototype and a practical circuit board. You will have an opportunity to work in a team to plan how best to construct an electronic circuit. Having produced the prototype, you will use test equipment to ensure the correct working of the circuit. The unit will be practically based throughout.

- LO.1. Know how electronic components are identified
- LO.2. Be able to use symbols to produce an electronic circuit diagram
- LO.3. Be able to work in a team to plan the construction of an electronic circuit from a circuit diagram and then individually build the circuit
- LO.4. Be able to test an electronic circuit.



Unit 7: Engineering the Future

Internally assessed

In this unit you will find out about some of the new developments in materials and engineering technology that either have an impact on life today or will do so in the very near future. You must be aware of safe recycling methods of materials or products so that in the future, the work that you do will not add to the environmental problems we have today. As an engineer, you will also be expected to be aware of the available energy sources, how energy can be stored and its impact on the environment.

- LO.1. Know about the new developments in materials and engineering technology that impact on everyday life
- LO.2. Know how products are recycled or safely disposed of at the end of their useful life
- LO.3. Be able to identify renewable energy sources and the environmental issues of each one.