THE ENGINEERING DIPLOMA

HIGHER LEVEL UNITS

A GUIDE FOR LEARNERS

RKL 16.4.08

What is the Engineering Diploma?

The Engineering Diploma will develop your knowledge of the exciting and diversified Engineering Industry giving you a unique insight which will allow you to make an informed choice about your future career. As well as understanding the theory behind engineering concepts, learners will learn practical skills and develop an ability to solve problems both individually and as par t of a team. The course is designed to be interesting, relevant to modern engineering methods and to open up a wide range of educational, training and career opportunities.

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 higher 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. The project needs to be agreed with your tutors'.

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 - HIGHER LEVEL

Unit 1: Exploring the Engineering World **Internally assessed**	In this unit, you will discover the world of engineering. You will develop an understanding of the diverse sectors within engineering and how these interlink to offer a range of services and products. You will investigate the achievements and developments of the engineering world from a local and national perspective and investigate the effect engineering has on the modern world.	**Learning outcomes** On completion of this unit, a learner should: LO.1. Know about engineering sectors and their products or services LO.2. Know about job opportunities available within the engineering industry and the role of professional engineering institutions LO.3. Know about the achievements in engineering that relate to social and economic
Unit 2: Investigating Engineering Design **Internally assessed**	In this unit you will find out how products function by dismantling and reassembling them. You will also be looking at the overall design process and how it begins with a design brief from a customer. You will investigate the issues and constraints that influence product design and whether a proposal should be developed into a final solution suitable for manufacture. You will then examine the ways in which a final design solution is prepared and presented.	LO.1. Know about the construction and function of an engineered product or system LO.2. Be able to prepare a product design specification LO.3. Be able to prepare initial design proposals LO.4 Be able to prepare and submit a final design solution.
Unit 3: Engineering Applications of Computers **Internally assessed**	In this unit you will discover how computer systems are applied to every aspect of engineering manufacturing, from product design and development to automated packaging, to maintenance operations. You will also learn how many everyday products use microprocessor technology for the benefit of consumers. This unit will provide you with the opportunity to conduct your research and investigation in appropriate work placements and through visits to companies, using computer technology in their business.	LO.1. Know about computer applications in process control and manufacturing LO.2. Be able to use computer-based systems to solve an engineering problem LO.3. Understand microprocessor control applications in everyday consumer products LO.4. Know about computer aided technology in maintenance operations.
Unit 4: Producing Engineering Solutions **Internally assessed**	This unit will give you the opportunity to undertake your own project, producing an engineered product or carrying out an engineering service such as maintenance, installation or commissioning. As part of your duties, you will have to identify what you need to do, plan the process, taking into account the machinery or tools needed, select the materials required, then, when you have finished, carry out an inspection to help you identify what is right and which areas can be improved.	LO.1. Understand health and safety procedures, standards and risk assessment in engineering activities LO.2. Be able to plan for an engineering product or service LO.3. Be able to select suitable materials, parts or components for an engineered product or service LO.4. Be able to use processes, tools and equipment to make an engineered product or carry out

		Learning outcomes On completion of this unit, a learner should:
Unit 5: Electrical and Electronic Circuits and Systems **Internally assessed**	This unit will provide you with an opportunity to understand how a prototype electronic circuit is constructed and tested. The unit will focus on practical skills and will allow you to undertake the identification and selection of a variety of basic electronic components as well as the assembly and testing of a working electronic circuit. You will also use a variety of different electrical and electronic test instruments to check components and circuits and also how to locate faults on simple electronic circuits.	LO.1. Understand safe working practices in the workshop/ laboratory and understand relevant electrical and electronic principles LO.2. Be able to recognise and select components used in electrical and electronic circuits LO.3. Be able to construct an electronic circuit and understand its basic operating principles LO.4. Be able to test and find faults on electronic circuits.
Unit 6: Application of Manufacturing Techniques in Engineering **Internally assessed**	In this unit you are going to get involved in engineering manufacturing activities, producing, as part of a team, a quantity of the same product. You will learn about production planning and scheduling and be responsible for setting up tools and equipment including computer numerical control (CNC) and preparing materials ready for production. In line with modern industrial practice you will learn how to apply quality control during production and be able to record and interpret the resulting data.	LO.1. Be able to work effectively in a production team and reflect on their performance LO.2. Know about production information and how this is used to plan and schedule for manufacturing LO.3. Be able to set up and use tools and CNC equipment safely to process materials LO.4. Be able to apply appropriate quality control techniques and interpret quality data.
Unit 7: Applications of Maintenance Techniques in Engineering **Internally assessed**	In this unit you will be able to get involved with both maintenance procedures and carrying out of maintenance activities. 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 activities within a real engineering environment.	LO.1. Understand different types of maintenance for engineered products, plant or equipment including the use of statistical trends LO.2. Be able to carry out routine maintenance tasks and devise a maintenance procedure LO.3. Understand the effects of poor maintenance and the range of spares and replacement parts LO.4 Be able to carry out a risk assessment in a maintenance environment.
Unit 8: Exploring Engineering Innovation, Enterprise and Technological Advancements **Externally assessed**	In this unit, you will discover how to take a good idea and transform it to into a feasible product. You will discover how to legally protect an idea and will gain an understanding of the process of research and development. You will learn how to identify appropriate materials, the impact of a product on everyday life, and the environmental considerations of a new product or engineering process.	LO.1. Know about the intellectual property within engineering LO.2. Understand the role of research, development and raising finance when designing engineering products LO.3. Know about developments in materials and processes on products LO.4. Know about the effects of engineering technologies in the home, workplace or built environment LO.5 Know about the environmental and social impact of engineering and sustainability of resources.