

# EXCITING NEW COURSE

## Principal Learning in Engineering



### About the course:

Starting in September 2013 and based at The Mosslands School, this qualification, which is equivalent to 1.5 A Level, aims to:

- Develop a broad understanding and knowledge about engineering and related sectors
- Develop the knowledge, skills and attributes required to work in the engineering sectors
- Encourage you to learn through experience of applying knowledge and skills to tasks or contexts including those that have many of the characteristics of real work

Part of the course will be delivered at Liverpool John Moores University and Unilever. You will be expected to do work experience in an engineering company and to take A Level Maths and Physics.

### How will it be assessed?

This 2 year course is assessed across 9 units:

1. **Investigating Engineering Business and the Environment** – This unit covers the knowledge of how an engineering business is structured and operates, the internal and external factors affecting the operation of the business, knowing and applying financial and planning concepts, costing and planning techniques and knowing about the importance of health and safety legislation. The unit is externally assessed.
2. **Applications of Computer Aided Designing** – This unit covers knowledge of the component parts of a computer system and methods of data storage, the capabilities of design, presentation, testing and analysis software packages, the use of CAD to produce 2D drawings, using design software to produce 3D models and using simulation software to test and analyse performance of a product/system as a design support tool. The unit is internally assessed and externally moderated.
3. **Selection and Application of Engineering Materials** – This unit covers knowledge of the structure of engineering materials and their effects on mechanical properties, the forms of supply, applications and selection of engineering materials, the impact of processing on the structure of materials and the effects of loading, modes of failure as well as carrying out testing of engineering materials. The unit is internally assessed and externally moderated.

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4. **Instrumentation and Control Engineering** – This unit covers the difference between analogue and digital signals and the need for various forms of transmission data, the use of sensors, transducers and instrumentation displays in instrumentation and control applications and the understanding of the principals and difference between open and closed loop systems. It also covers the use of programmable logic controllers in instrumentation and control applications and the understanding of control engineering. The unit is internally assessed and externally moderated.
5. **Maintaining Engineering Plant, Equipment and Systems** – This unit covers the cost of maintenance and the consequences of plant, equipment or system failure including the effects on production, the ability to deploy effective maintenance strategies and the knowledge of how data gathered from monitoring the performance and condition of engineering plant, equipment or system can be used. The unit is internally assessed and externally moderated.
6. **Investigating Modern Manufacturing Techniques used in Engineering** – This unit covers the understanding of the differences between traditional and modern manufacturing production systems used within engineering industries, the different types of manufacturing processes and how they utilise computer aided manufacturing systems and the ability to plan for the production of an engineered product for industry. It also assesses the ability to work in a team and apply quality control and quality assurance systems. The unit is internally assessed and externally moderated.
7. **Innovative Design and Enterprise** – This unit covers the knowledge of how a successful product evolves, the knowledge of successful entrepreneurial engineering individuals, investigating how engineering activities impact on society and the environment, the ability to produce or improve designs in an innovative way and knowledge about the opportunities for success when bringing a new product to market. The unit is internally assessed and externally moderated.
8. **Mathematical Techniques and Applications for Engineers** – This unit tests the knowledge of using algebraic methods to solve engineering problems, using trigonometric methods to solve problems, the ability to use statistical methods to display data and the applications of calculus techniques to solve engineering problems. This unit is externally assessed.
9. **Principals and Application of Engineering Science** – This unit covers the application of mechanical principals to determine the effects of force in systems and the effects of motion, work and energy transfer in systems. It covers the application of electrical principals to determine the effects of electric charge and current and determine the voltage, current, resistance and power in electrical circuits. It also covers the application of the principals of heat and thermodynamics to determine the effects of expansion and compression of gases and energy transfer in engineering systems, the principals of chemistry and the effects of chemical processes and reactions and the application of the principals of fluid dynamics. This unit is internally assessed and externally moderated.

**What it prepares you for:** Engineering or related courses at university, apprenticeship in Engineering, employment in engineering.

### Qualification details:

Edexcel Level 3 Principals Learning in Engineering which is equivalent to 1.5 A Levels grades A\*-E and is worth up to 210 UCAS points.

**Entry requirements:** A keen interest in Engineering, grade A or high grade B in Science and Maths and at least 5 GCSEs graded A-B.