

## HIGHER EDUCATION COURSES BTEC HNC - HIGHER NATIONAL CERTIFICATE

# OPERATIONS ENGINEERING

Entry Qualifications: Level 3 diploma in Engineering/Operations Maintenance or equivalent

Our flexible Higher Education delivery model includes:

- Face-to-face tutorials
- Flexible day delivery to minimise effect on employer
- Opportunities to develop workplace projects within employers
- Study at Blackburn

Our enhanced HNC in Operations Engineering is obtained by studying up to five units per year – enhancing your career opportunities.

If a learner completes the HNC with us, they can top up to a HND in one year.



## YEAR ONE:

### ENGINEERING MATHS

The aim of this unit is to develop students' skills in the mathematical principles and theories that underpin the engineering curriculum. Students will be introduced to mathematical methods and statistical techniques in order to analyse and solve problems within an engineering context.

### ENGINEERING SCIENCE

This unit introduces students to the fundamental laws and applications of the physical sciences within engineering and how to apply this knowledge to find solutions to a variety of engineering problems. Among the topics included in this unit are: international system of units, interpreting data, static and dynamic forces, fluid mechanics and thermodynamics, material properties and failure, and A.C./D.C. circuit theories.

### ENGINEERING DESIGN

The aim of this unit is to introduce students to the methodical steps that engineers use in creating functional products and processes; from a design brief to the work, and the stages involved in identifying and justifying a solution to a given engineering need.

### MANAGING A PROFESSIONAL ENGINEERING PROJECT

This unit introduces students to the techniques and best practices required to successfully create and manage an engineering project designed to identify a solution to an engineering need. While carrying out this project students will consider the role and function of engineering in our society, the professional duties and responsibilities expected of engineers together with the behaviours that accompany their actions.

### MECHANICAL PRINCIPLES

The aim of this unit is to introduce students to the essential mechanical principles associated with engineering applications. Topics included in this unit are: behavioural characteristics of static, dynamic and oscillating engineering systems including shear forces, bending moments, torsion, linear and angular acceleration, conservation of energy and vibrating systems; and the movement and transfer of energy by considering parameters of mechanical power transmission systems.

## YEAR TWO:

### AUTOMATION, ROBOTICS AND PROGRAMMABLE LOGIC CONTROLLERS (PLCS)

The aim of this unit is for students to investigate how Programmable Logic Controllers (PLCs) and industrial robots can be programmed to successfully implement automated engineering solutions. Among the topics included in this unit are: PLC system operational characteristics, different types of programming languages, types of robots and cell safety features. On successful completion of this unit students will be able to program PLCs and robotic manipulators to achieve a set task, describe the types and uses of PLCs and robots available, write simple PLC programs, and program industrial robots with straightforward commands and safety factors.

### OPERATIONS AND PLANT MANAGEMENT

The underlying aims of this unit are to develop the students' knowledge of the engineering fundamentals that augment the design and operation of plant engineering systems, and to furnish them with the tools and techniques to maintain the ever more technological equipment.

### ELECTRO, PNEUMATIC AND HYDRAULIC SYSTEMS

The aim of this module is to develop students' knowledge and appreciation of the applications of fluid power systems in modern industry. Students will investigate and design pneumatic, hydraulic, electro-pneumatic and electro-hydraulic systems. This unit offers the opportunity for students to examine the characteristics of fluid power components and evaluate work-related practices and applications of these systems.

### ELECTRICAL SYSTEMS AND FAULT FINDING

This unit introduces students to the characteristics and operational parameters of a range of electrical system components that are used in a variety of applications; and how to fault find when they go wrong. On successful completion of this unit students will be able to follow electrical system circuit diagrams, understand the operation of the various components that make up the system and select the most suitable fault finding technique. Therefore, students will develop skills such as critical thinking, analysis, reasoning, interpretation, decision-making, information literacy, information and communication technology literacy, innovation, creativity, collaboration, and adaptability, which are crucial skills for gaining employment and developing academic competence for higher education progression.

### LEAN MANUFACTURING

The aim of this unit is to introduce students to the principles and processes of lean manufacturing, so that they can become an effective and committed practitioner of lean in whatever industry sector they are employed in. To do this, the unit will explore the tools and techniques that are applied by organisations practicing lean. The students will consider both the benefits and challenges of using lean manufacturing, and become sufficiently knowledgeable about the most important process tools and techniques to be able to operate and use them within an engineering context.

**COURSE COSTS  
FOR 2020/21  
ACADEMIC YEAR:**

**£2000  
+ VAT**

**For more information or to enquire  
about booking a place:  
[www.training2000.co.uk](http://www.training2000.co.uk),  
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