

## WP 2

# Inventory of Courses for Innovative Maintenance Techniques Gateshead College

## **BFPA Industrial Hydraulics Programme Cetop (Passport) Occupational level 2**

### **Description of Content**

- Interpret hydraulic circuit diagrams, assemble a hydraulic system and pump performance test

Technologies addressed in the course

- Hydraulics and Pumps

### **Target Group**

- Personnel involved in the maintenance and management of industrial hydraulic systems and associated controls Maintenance Operatives

### **Modalities**

- Demonstrations , classroom, practical application

### **Name of Certification**

Industrial Hydraulics Programme CETOP (PASSPORT) OCCUPATIONAL LEVEL 2

### **Type of Certification**

- Competence-based qualifications

### **Level of Certification**

- Level 2

### **Sources**

BRITISH FLUID POWER, ASSOCIATION QUALIFICATIONS  
INDUSTRIAL HYDRAULICS, PROGRAMME (IH2)  
CETOP (PASSPORT) OCCUPATIONAL  
LEVEL 2  
Q10 Issue 1 2004

## Mobile Hydraulics Programme

### Description of Content

- Fundamental principles.
- Hydraulic system components.
- Pumps and associated control systems.
- Hydraulic actuators.
- Circuitry and control features.
- Hydraulic fluids.
- Reservoirs and auxiliary equipment.
- Contamination control.
- Maintenance, monitoring and fault finding.

### Technologies addressed in the course

- Interpret hydraulic circuit diagrams, assemble a hydraulic system pump performance test and system contamination levels assessed

### Target Group

- personnel involved in the maintenance and management of mobile hydraulic systems and associated controls,

### Modalities

- Demonstrations , classroom, practical application

### Name of Certification

CETOP (PASSPORT) OCCUPATIONAL LEVEL 2

### Type of Certification

- Competence-based qualifications

### Level of Certification

- Level 2

### Sources

BRITISH FLUID POWER, ASSOCIATION QUALIFICATIONS  
MOBILE HYDRAULICS PROGRAMME (MH2)  
CETOP (PASSPORT) OCCUPATIONAL  
LEVEL 2  
Issue 1 2004

## Industrial Hydraulics & associated control

### Description of Content

- Fundamental and Scientific Principles
- Application of the Fundamental Principles
- Hydraulic Fluids
- Valve Mounting Styles/Configurations
- Hydraulic System Components
- Slip-in Logic Cartridge Valves
- Fundamental Electrical Principles
- Electrical/Electronic Components
- Proportional Valve Technology
- Pumps and Associated Control Systems
- Hydraulic Actuators (Motors and Cylinders)
- Closed-Loop Hydrostatic Transmissions
- Reservoirs, Conditioning and Auxiliary Components
- Pipes and Hoses - Installation and Commissioning Procedures
- Contamination Control
- Circuitry and Control Features (Recognition and use of symbols hydraulic and electrical)
- Installation and Commissioning Procedures
- Maintenance, Monitoring and Fault Finding Procedures

### Technologies addressed in the course

- Interpret hydraulic and electro-hydraulic circuit diagrams applicable to selected systems (against recommended specification) and prepare a schematic representation of the system. Assemble electro-hydraulic system involving on-off control and proportional control from given information Carry out effective fault diagnosis and rectification. Establish documented procedures and carry out predictive maintenance and monitoring of electro-hydraulic systems

### Target Group

- Personnel involved in the maintenance and management of industrial hydraulic systems and associated

### Modalities

- Demonstrations , classroom, practical application

### Name of Certification

- CETOP (PASSPORT) OCCUPATIONAL LEVEL 3

### Type of Certification

- Competence-based qualifications

### Level of Certification

- Level 2

### Sources

BRITISH FLUID POWER, ASSOCIATION QUALIFICATIONS  
INDUSTRIAL HYDRAULICS & ASSOCIATED CONTROL  
PROGRAMME (IH3)  
CETOP (PASSPORT) OCCUPATIONAL LEVEL 3  
Issue 2 2004

## Hydraulics System Design Programme

### Description of Content

- Application and System Specification
- Circuit Design
- Component Selection
- Control System Design
- System Performance Evaluation
- Systems Management/Configuration

### Technologies addressed in the course

- The aim of the programme is to provide candidates with a thorough understanding of the Principles of Hydraulic System Design and the “step by step” procedures to follow when planning any design or redesign project
- Interpret hydraulic and electro-hydraulic circuit diagrams applicable to selected systems (against recommended specification) and prepare a schematic representation of the system. Assemble electro-hydraulic system involving on-off control and proportional control from given information Carry out effective fault diagnosis and rectification. Establish documented procedures and carry out predictive maintenance and monitoring of electro-hydraulic systems

### Target Group

- People whose occupational role involves or is likely to involve in the future, hydraulic system design, alterations and improvements to existing systems

### Modalities

- Demonstrations , classroom, practical application Practical laboratory sessions

### Name of Certification

- CETOP (PASSPORT) OCCUPATIONAL LEVEL 4

### Type of Certification

- Competence-based qualifications

### Level of Certification

- Level 4

### Sources

BRITISH FLUID POWER, ASSOCIATION QUALIFICATIONS  
HYDRAULIC SYSTEM DESIGN  
PROGRAMME  
CETOP (PASSPORT) OCCUPATIONAL LEVEL 3  
Issue 2 2004

## Pneumatics and control Programme

### Description of Content

- Interpret pneumatic, electro-pneumatic, electrical/electronic control circuit diagrams relating to selected systems and prepare schematic representation of the system. Assemble pneumatic/electro-pneumatic system from given information. Construct and commission 'PLC' controlled electro-pneumatic system from given information. Identify and rectify faults in pneumatic/electro-pneumatic systems. Establish documented procedures and carry out preventative maintenance and monitoring of pneumatic/electro-pneumatic systems. Identify and apply relevant regulations for the safe installation and operation of pneumatic/electro-pneumatic circuits.

### Technologies addressed in the course

- Fundamental and Scientific Principles  
Application of Fundamental Principles  
Fundamental Electrical Principles  
Electrical/ Electronic Components  
Solenoid Valves  
Electro-Pneumatic Systems  
Proportional Valve Technology  
Electrical noise/ suppression  
Pneumatic Control Systems  
Digital Control Circuits  
Relay Ladder Circuit Diagram  
Programmable Logic Controller (PLC)  
Field Bus Systems  
Vacuum Technology  
Systems and Control Features (Recognition and use of pneumatic, electro-pneumatic, electrical and electronic symbols)  
Installation and Commissioning Procedures  
Maintenance, monitoring and Fault Finding Procedures  
Safety of Machinery, Pneumatic/Electro-pneumatic equipment used on machines conforming to European Directives & Standards

### Target Group

- People whose occupational role involves or is likely to involve in the future, hydraulic system design, alterations and improvements to existing systems

### Modalities

- Demonstrations , classroom, practical application Practical laboratory sessions

### Name of Certification

- CETOP (PASSPORT) OCCUPATIONAL LEVEL 3

### Type of Certification

- Competence-based qualifications

### Level of Certification

- Level 3

### Sources

BRITISH FLUID POWER, ASSOCIATION QUALIFICATIONS  
PNEUMATICS & CONTROL PROGRAMME  
CETOP (PASSPORT) OCCUPATIONAL LEVEL 3  
Issue 2 2004



## Pneumatics

### Description of Content

- Interpret pneumatic circuit diagrams, Construct pneumatic systems from given information, Carry out routine maintenance on pneumatic systems.

### Technologies addressed in the course

- Fundamental and Scientific Principles.  
Application of Fundamental Principles.  
Compressed Air Installations.  
Legal Regulations (The Pressure Systems Safety Regulations 2000).  
Airline Components.  
Pneumatic Circuit Components.  
Circuit and Control Features (Recognition and use of pneumatic component symbols).  
Basic Maintenance procedures.

### Target Group

- Personnel involved in the maintenance and management of pneumatic systems and associated controls

### Modalities

- Demonstrations , classroom, practical application Practical laboratory sessions

### Name of Certification

- CETOP (PASSPORT) OCCUPATIONAL LEVEL 1

### Type of Certification

- Competence-based qualifications

### Level of Certification

- National Qualifications Framework level 1

### Sources

BRITISH FLUID POWER, ASSOCIATION QUALIFICATIONS  
PNEUMATICS  
CETOP (PASSPORT) OCCUPATIONAL LEVEL 1  
Issue 2 2004

## Advanced Apprenticeship Framework In Motor Vehicle Maintenance and Repair

### Description of Content

- Practical on the job training to further a career in Motor Vehicle Maintenance and Repair.

### Technologies addressed in the course

- Maintenance and repair of engines, gearboxes, steering systems, etc

### Target Group

- People employed for more than 16 hours per week in Garages.

### Modalities

- Day-release work-based learning

### Name of Certification

- National Vocational Qualification Level 3 in Vehicle Maintenance & Repair
- Technical Certificate - C&G 4101-51 Level 3 Certificate in Vehicle Maintenance and Repair

### Type of Certification

- NVQ level 3

### Level of Certification

- NQF Level 3

### Sources

[www.gateshead.ac.uk](http://www.gateshead.ac.uk)

## Certificate in Engineering - Level 2 (2800)

### Description of Content

- Manufacturing Technology
- Maintenance Technology
- Fabrication and Welding Technology
- Materials Processing Technology
- Electrical Technology
- Electronics Technology
- Gas Operations
- Electricity Operations

### Technologies addressed in the course

- Manufacturing Technology
- Maintenance Technology
- Fabrication and Welding Technology
- Materials Processing Technology
- Electrical Technology
- Electronics Technology
- Gas Operations
- Electricity Operations

### Target Group

- Those employed for over 16 hrs a week

### Modalities

- Competence-based qualifications

### Name of Certification

- Level 2 Certificate in Engineering

### Type of Certification

- NVQ
- City & Guilds

### Level of Certification

- National - NQF Level 2

### Sources

Level 2 Certificate in Engineering(2800)  
Qualification handbook  
[www.cityandguilds.com](http://www.cityandguilds.com)  
October 2008Version 5.1

## Electro, Pneumatic and Hydraulic Systems and Devices

### Description of Content

- An understanding of how fluid power systems are used to control the operation of machinery and equipment is important for anyone thinking of taking up a career in engineering. This unit will give learners a broad understanding of the design and safe operation of pressurised fluid systems that use electrical control devices to make them work. This will include being able to read and produce simple fluid power circuit diagrams, understanding the principles of maintenance, and the use of test routines to identify faults in these systems.

### Technologies addressed in the course

- Know about the legislation, regulations and safety precautions that apply when working with fluid power systems  
Understand the operation of fluid power devices and how they are represented as symbols in circuit diagrams  
Know how fluid power principles are used in the design of circuits  
Carry out simple maintenance, inspection, testing and faultfinding on fluid power systems.

### Target Group

- For anyone interested in taking up a career in the manufacturing industry, particularly where automated machinery is involved.
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### Modalities

- Class work
- Practical group and individual sessions
- Workshops
- Assignments

### Name of Certification

- Electro, Pneumatic and Hydraulic Systems and Devices Unit

### Type of Certification

- BTEC National Unit

### Level of Certification

- NQF Level 3

### Sources

Electro, Pneumatic and Hydraulic Systems and Devices Unit  
Edexcel Level 3 BTEC Nationals in Engineering – Issue 1 – May 2007  
Edexcel Limited 2007