

# ENGINEERING FITTER APPRENTICESHIP STANDARD

**Standard Code ST0537**  
**Course Level 3**  
**Day Release**  
**Location: Lincoln**  
**Funding Level £21000**  
**Duration 45mths including EPA**

## *Course Description*

This occupation is found in manufacturing and process sectors. The broad purpose of the occupation is to produce complex high value, low volume components or assemblies in full or part, using machines, equipment or systems, to the required specification. For example, turbines, cranes, gearboxes, production lines, rigs and platforms. Fitters may typically have a mechanical, electrical, electronic, control systems, pipe fitting or instrumentation bias or operate across multiple disciplines depending on the type of assembly. To produce or re-furbish the components fitters will interpret drawings/specifications and plan their work, for example ensuring they have the right tools, equipment and resources to complete the task to the required specification. Fitters are required to check their work against quality standards and adjust as required based on their knowledge. On completion of the task a fitter will hand over the product and prepare the work area for the next task by checking equipment meets the standards required to operate. They may be based in a workshop or client's premises - this may include hazardous environments.

In their daily work, an employee in this occupation typically interacts with line managers/supervisors; depending on the size of the employer and nature of the work they may work as part of a team of fitters or independently. They may interact with personnel in other functions for example installation and maintenance engineers, health & safety and quality assurance personnel, as well as internal or external customers.

An employee in this occupation will be responsible for completion of their work to the required specification and deadlines, in line with quality, health & safety and environmental regulations and requirements, with minimum supervision.

## *Off the Job Training*

A key requirement of an Apprenticeship is Off-the-job training. This must make up an average of 6 hours per week of the apprentice's working hours, over the total duration of the apprentice's planned training period. Off-the-job training must be directly relevant to the apprenticeship standard and must take place within the apprentice's normal working hours. The new learning must be documented and reflected on through the Learner Journal on their e-portfolio.

## *Entry Requirements*

Level 2 English and Maths and either an engineering related qualification, an interest, or aptitude for engineering. The Apprentice will need to be in a relevant role and show a willingness to undertake the knowledge, skills and behaviours required.

Apprentices may be required to attend an interview and undertake relevant skills assessments.

Once they have been accepted on to the programme all apprentices will be required to attend a Lincoln College Induction. Apprentices will require access to a tablet/computer to access their e-portfolio.

## *Knowledge, Skills and Behaviours*

### **KNOWLEDGE**

- K1:** Materials used in components/assemblies, for example; mild steel, aluminium, composites, copper etc. Their use and application considerations, for example machinability, hardness, conductivity, cost, availability, compatibility.
- K2:** Principles of design and operation, for example; design for cost, minimising waste, productivity (speed), health and safety, reverse engineering Back to Duty.
- K3:** Manufacturing and assembly processes for example; filing, sawing, scraping, drilling, soldering, bolting, wire cutting, threading etc.
- K4:** Safe use of tools and equipment (hand and power tools); right tool for the job, requirements for machinery checks, adjustments, operation and shut down.
- K5:** Component/assembly specifications, for example; electrical loading, load charts, torque settings, tolerances. What they are and how to use them.
- K6:** Techniques for measuring, marking, cutting and drilling materials to the required size and shape, accurately, safely and economically and manufacturing processes.
- K7:** Engineering mathematical and scientific principles; methods, techniques, graphical expressions, symbols, formulae and calculations.
- K8:** Engineering data, for example; electrical readings, vibration, speed and calibration. What they are and how to interpret and use.
- K9:** Component/assembly documentation. For example, bill of materials, standard operating procedures, inspection records, assembly instructions, electrical/pneumatic/hydraulic circuit diagrams. What they are and how to interpret and use.

**K10:** Quality standards for components/assembly for example, drawing, calibration of equipment, materials specification. How to ensure they have been met and assured. Application of ISO9001 (Quality Management Standard) in the workplace.

**K11:** Health and safety, including Health & Safety at Work Act, personal protective equipment (PPE), manual handling, Control of Substances Hazardous to Health (COSHH), Provision and Use of Work Equipment Regulations (PUWER), Noise at Work Regulations, Electricity at Work regulations, risk assessments; how they must be applied in the workplace.

**K12:** Environmental considerations; safe disposal of waste, minimizing waste (re-use and re-cycle), energy efficiency.

**K13:** Who they need to communicate with and when, and communication techniques - verbal and written.

**K14:** Planning techniques – resources, tools, equipment, people; time management.

**K15:** Component/assembly quality checks for example; checking tolerances, threads, voltages. Types of faults that occur and problem-solving techniques, for example; cause and effect, 5 Whys, flow process analysis etc.

**K16:** Improvement techniques, for example; 5s techniques, problem solving techniques, value stream mapping, kaizen, contributing to effective team working, Total Productive Maintenance.

**K17:** Fitters' role in wider operation. Limits of autonomy; reporting channels. Other functions that fitters could interact with for example health & safety, quality assurance, business improvement/excellence, their purpose and interdependencies. Internal and external customers.

**K18:** Commercial considerations including contractual arrangements (for example penalty clauses, targets). How the role contributes to commercial operations.

## SKILLS

**S1:** Reading, interpreting and understanding the component/assembly specification, diagrams, drawings and work instructions.

**S2:** Planning component/assembly task – materials, tools and equipment.

**S3:** Preparing work area for component/assembly task; sourcing required resources, tools/equipment.

**S4:** Carryout relevant planning and preparation activities before commencing work activity and know how to source required resources and interpret detailed drawings, specifications and job instructions.

**S5:** Checking tools during and after task completion; identifying and reporting defects.

**S6:** Measuring and testing, checking/inspecting component/assembly for example; use of micrometers, verniers, multimeters, volt meter.

**S7:** Problem solving; analysing the issue and fixing the issue where appropriate.

**S8:** Applying improvement techniques; recommending/implementing solutions where appropriate.

**S9:** Communicating with colleagues and/or customers (internal or external).

**S10:** Completing component/assembly documentation for example job instructions, drawings, quality control documentation.

**S11:** Reporting work outcomes and/or issues.

**S12:** Restoring the work area on completion of the activity; returning any resources and consumables to the appropriate location and house-keeping.

- S13:** Disposing of waste in accordance with waste streams; re-cycling/re-using where appropriate Back to Duty
- S14:** Operating within limits of responsibility.
- S15:** Operating in line with quality, health & safety and environmental policy and procedures; identifying risks and hazards and identifying control measure where applicable.

## BEHAVIOURS

- B1:** Takes personal responsibility and resilient. For example, health and safety-first attitude, disciplined and responsible approach to risk, works diligently regardless of how much they are being supervised, accepts responsibility for managing their own time and workload and stays motivated and committed when facing challenges.
- B2:** Works effectively in teams. For example, integrates with the team, supports other people, considers implications of their own actions on other people and the business whilst working effectively to get the task completed.
- B3:** Effective communicator and personable. For example, open and honest communicator; communicates clearly using appropriate methods, listens well to others and have a positive, respectful attitude, adjusts approach to take account of equality and diversity considerations.
- B4:** Focuses on quality and problem solving. For example, follows instructions and guidance, demonstrates attention to detail, follows a logical approach to problem solving and seeks opportunities to improve quality, speed and efficiency.
- B5:** Committed to continuous personal development. For example, reflects on skills, knowledge and behaviours and seeks opportunities to develop, adapts to different situations, environments or technologies and has a positive attitude to feedback and advice.

## Assessment

On program learning will be supported by an engineering work-based assessor and our experienced college lecturing team. They will be assessed in the workplace across a broad range of duties closely mapped to the KSB's above. In addition to this they must also complete their mandatory qualifications which are found below:

- An employer approved Level 3 Development Technical Knowledge qualification
- Apprentices without Level 2 English and Maths will need to achieve this level prior to taking end point assessment

## End Point Assessment

Apprentices must complete:

- Assessment method 1 – project: report including evidence, and questioning
- Assessment method 2 – multiple choice test
- Assessment method 3 – professional discussion supported by portfolio of evidence

### Assessment method 1 – project: report including evidence, and questioning

The purpose of the project is to assess the apprentice's knowledge, skills and behaviours in a way that closely relates to their day-to-day responsibilities. Apprentices must conduct a

project based on an engineering fitter activity undertaken during their EPA period, relevant to their workplace and under the supervision of a technical expert from their employer. Following the activity, the apprentice must compile a report. The report must contain evidence from the completed activity as annexes. The Independent Assessor will question the apprentices about the content of the report and evidence.

### **Assessment method 2 - multiple choice test**

The purpose of the multiple-choice test is to assess the apprentice's depth of understanding in the knowledge elements that may not naturally occur during the observation. The multiple-choice test will usually be computer based and taken on-line; a paper-based version will be available if required. It will consist of 30 multiple choice questions. The questions must relate to the underpinning knowledge and must be varied.

### **Assessment Method 3 – Professional Discussion**

The purpose of the professional discussion is to determine the extent to which the apprentice understands the requirements of his/her role as defined by the standard and to explore them through discussion. The professional discussion (supported by a portfolio of evidence) shall be a face-to-face session involving the apprentice and the end-point assessor. The portfolio will be used as a source of evidence by which apprentices can exemplify their responses to questions asked by the assessor. Modern communication software applications may be used but it is the responsibility of the EPAO to ensure the application and the infrastructures are fit for purpose so as not to disadvantage the apprentice whilst assuring quality and standardisation are not compromised.

## **Qualifications**

Level 3 Development Technical Knowledge qualification

Apprentices without Level 2 English and Maths will need to achieve this level prior to taking end point assessment.

## **Progression**

Apprentices who complete this apprenticeship will be classed as "Time Served Engineers" and as such opportunities within engineering are wide and varied. They may take on a promotion at their employers or look to develop their career in other areas of the UK or overseas. They may also choose to continue with their education and study engineering on an HNC/HND program or a degree.

## **Personal Protective Equipment (PPE) for mechanical pathways**

- Safety footwear (Protective toe cap)
- Navy blue overall (boiler suit) – Flame retardant for Welding Apprentices
- Clear eye protection (CE or BS marked)

## **Course Text Book**

- L3: Mechanical Engineering Fourth Edition (Darbyshire ISBN-10: 1032188537)

## **General Equipment**

- Pen
- Pencil
- Scientific Calculator
- Note book or paper with lever arch file.

## **Fees**

As an Apprentice, you will pay no course fees. However, your employer may have to pay towards your training as well as providing you with a wage. All Apprentices are entitled to the national minimum apprentice wage within their first year of training from their employer, although they can, and often do, pay more. In the second and subsequent years of an Apprenticeship programme, if you are aged 19 or over, the national minimum wage for your age would apply [<https://www.gov.uk/national-minimum-wage-rates>]

If you are an employer and want to find out more information regarding employer contributions and any further costs related to the Apprenticeship programme, please contact our dedicated Apprenticeship team at [employers@lincolncollege.ac.uk](mailto:employers@lincolncollege.ac.uk)

## **Business Benefits**

Employers have designed the Apprenticeship Standards to meet the needs of the sector and industry. Ensuring they include:

- Relevant Knowledge, skills and behaviours ensure that the Standard is relevant to the occupation.
- Widening participation Apprenticeship standards provide opportunities to employees that may not previously have been available.
- Development tools A cost effective way to train your employees to undertake specific roles in your business.
- Return on Investment On average, an apprentice who has completed their course will increase business productivity by £214 per week (CEBR, 2015).