

# Apprenticeships +

Engineering  
Technician  
(Tool Maker)

Apprenticeship  
Level 3



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**The  
Sheffield  
College**

4 Excellent Campuses  
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## Quick Information

### New Apprenticeship Standard designed by employers for employers

#### Sector

Engineering and manufacturing

#### Who is it for?

New or existing staff

#### Start date

September (other dates available depending on availability)

#### Level

Level 3

#### Duration

42 months (this does not include EPA period)

#### How does it work?

Delivered in your workplace with one day a week in College and tutor visits every 6 – 8 weeks

#### Content

Level 2 Diploma in Advanced Manufacturing Engineering (Foundation Competence)

Level 2 Award for Foundation Phase Gateway Assessment

Level 3 Diploma in Advanced Manufacturing Engineering (Development Competence) – Tool-maker, Tool and Die Maintenance

Edexcel Diploma in Advanced Manufacturing Engineering

#### Assessment

Foundation competence and knowledge is assessed in college in the first 2 years of study.

Development knowledge is assessed in college in years 3 and 4.

#### Qualification

Engineering Technician (Tool Maker Pathway)

#### Review

The apprenticeship will be reviewed after a maximum of 3 years

## Engineering Technician (Tool Maker)

Designing, building, servicing and repairing a range of engineering products and services

Engineering Technicians in the Aerospace, Aviation, Automotive, Maritime Defence and wider Advanced Manufacturing and Engineering Sector are predominantly involved in highly skilled, complex work and must, as a minimum be able to:

- Apply safe systems of working
- Make a technical contribution to either the design, development, quality assurance, manufacture, installation, commissioning, decommissioning, operation or maintenance of products, equipment, systems, processes or services
- Apply proven techniques and procedures to solve engineering/manufacturing problems
- Demonstrate effective interpersonal skills in communicating both technical and non-technical information
- Have a commitment to continued professional development

Engineering Technicians take responsibility for the quality and accuracy of the work they undertake within the limits of their personal authority. They also need to be able to demonstrate a core set of behaviours in order to be competent in their job role, complement wider business strategy and development. This will enable them to support their long term career development.

Engineered and manufactured products and systems that Engineering Technicians work on could involve mechanical, electrical, electronic, electromechanical and fluid power components/systems.



### Key Areas of Study

An apprentice will develop skills in working safely, hand fitting, communicating technical information, business improvement, using lathes and milling machines.

They will also develop knowledge around engineering mathematics, mechanical and electrical principles, CAD and engineering project.

### Typical job titles:

Engineering Technician, Machinist, Mechatronics Engineer and Toolmaker

#### Sector Wide

1. Machinist – Advanced Manufacturing Engineering
2. Mechatronics Maintenance Technician
3. Product Design and Development Technician
4. Toolmaker and Tool and Die Maintenance Technician
5. Technical Support Technician

### Core Knowledge & Skills

Engineering Technicians are able to demonstrate:

#### Knowledge:

- understanding the importance of complying with statutory, quality, organisational and health and safety regulations
- understanding of general engineering/manufacturing mathematical and scientific principles, methods, techniques, graphical expressions, symbols formulae and calculations used by engineering technicians
- understanding the structure, properties and characteristics of common materials used in the sector
- understanding the typical problems that may arise within their normal work activities/environment
- understanding approved diagnostic methods and techniques used to help solve engineering/manufacturing problems
- understanding the importance of only using current approved processes, procedures, documentation and the potential implications for the organisation if this is not adhered to
- understanding and interpreting relevant engineering/manufacturing data and documentation in order to complete their job role

- understanding the different roles and functions in the organisation and how they interact.
- understanding why it is important for an organisation to continually review their processes and procedures

#### Skills:

- obtaining, checking and using the appropriate documentation (such as job instructions, drawings, quality control documentation)
- working safely at all times, complying with health, safety and environmental legislation, regulations and organisational requirements
- planning and where applicable obtaining all the resources required to undertake the work activity
- undertaking the work activity using the correct processes, procedures and equipment
- carrying out the required checks (such as quality, compliance or testing) using the correct procedures, processes and/or equipment
- dealing promptly and effectively with engineering/manufacturing problems within the limits of their responsibility using approved diagnostic methods and techniques and report those which cannot be resolved to the appropriate personnel
- completing any required documentation using the defined recording systems at the appropriate stages of the work activity
- restoring the work area on completion of the activity and where applicable return any resources and consumables to the appropriate location

#### Behaviours

The required behaviours are:

1. Personal responsibility, resilience and ethics. Comply with health and safety guidance and procedures, be disciplined and have a responsible approach to risk, work diligently at all times, accept responsibility for managing time and workload and stay motivated and committed when facing challenges. Comply with any organisational policies/codes of conduct in relation to ethical compliance
2. Work effectively in teams. Integrate with the team, support other people, consider implications of their actions on other people and the business
3. Effective communication and interpersonal skills, open and honest communicator, communicating clearly using appropriate methods, listening to others and have a positive and respectful attitude
4. Focus on quality and problem solving. Follow instructions and guidance, demonstrates attention to detail, follow a logical approach to problem solving and seek opportunities to improve quality, speed and efficiency
5. Continuous personal development. Reflect on skills, knowledge and behaviours and seeks opportunities to develop, adapt to different situations, environments or technologies and have a positive attitude to feedback and advice

## Entry Requirements

Individual employers will set the recruitment and selection criteria for their Apprenticeships. In order to optimise success, candidates will typically have 4 GCSEs at Grade C/4 or equivalent, including Mathematics, English and a Science.

## Duration of Apprenticeship

Typically 42-48 months - timescales may vary depending on occupational role and/or prior relevant qualifications / experience and Assessment of Prior Learning and Knowledge (APL/K) opportunities.

## Qualifications and Development

All apprentices will be required to achieve as a minimum:

- An employer approved Level 2 Foundation Competence qualification
- An employer approved Level 3 Development Competence qualification
- 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
- See section Employer Specific Requirements of this Standard for further details on the specific mandatory qualifications required for each job role

All of the qualification requirements in the foundation and development phases are mandatory outcomes for the completion and final certification of the Apprenticeship Standard. Each qualification has a core and options approach and employers will select the most applicable pathway and unit options to meet their organisational requirements.

There will be an end point assessment during the final phase of the Apprenticeship where the apprentice will need to demonstrate to the employer how they have achieved full occupational competence against, skills, knowledge and behaviours, set out in the Standard On successful completion of the End Point assessment and employer endorsement phase (final sign off) apprentices will be then be put forward to be awarded their Apprenticeship completion certificate.

## Professional Recognition

Completion of the Apprenticeship is designed to be recognised by relevant Professional Engineering Institutions at the appropriate level of professional registration (EngTech). In the case of the Military specific pathway in the Aircraft Maintenance Fitter/Technician Standard, professional competence will be recognised by the Military Independent Assessment Authority (MIAA).

## Level and Review

This Apprenticeship Standard is at Level 3 and will be reviewed as a minimum every three years.

Options: Sector/Occupational Specific Role Requirements – Knowledge, Skills and

Behaviours (NB All Mandatory Qualifications listed in sections 1-13 to be made available by September 2017)

## Sector Wide Advanced Manufacturing and Engineering

### Toolmaker and Tool and Die Maintenance Technician

#### Role Profile

Toolmakers and Tool & Die Maintenance Technicians are predominantly involved in the highly skilled, complex and specialist detailed work of manufacturing and maintaining the engineering tooling used to produce components, products and assemblies. These products, assemblies and systems affect all of our daily lives, whether it be for travel such as (cars, planes, boats and rail) energy, defence, food, clothing, packaging and health including medical equipment, devices and implants such as joint replacements. This requires the application of a broad range of activities including the interpretation of Engineering drawings and technical instructions and the use of hand, machine and automated computer controlled machine tools and measuring equipment.

Technicians must comply with applicable legislation and organisational safety requirements and be expected to work both individually and as part of a manufacturing team, working with minimum supervision, taking responsibility for the quality and accuracy of the work they undertake. They will be proactive in finding solutions to problems and identifying ways to improve the business.

They will be expected to test and adjust the systems they have built or maintained ensuring tooling, jigs, fixtures and assemblies meet the required specification. This requires the application of a broad range of skills, knowledge and occupational behaviours across a range of engineering disciplines.

#### Specific Specialist Knowledge and Skills

Specific Specialist Knowledge:

- understand mathematical techniques, formula and calculations in a Toolmaking environment
- understand the structure, properties and characteristics of common materials used for the manufacture and repair of tooling, Moulds, Dies and jigs and fixtures
- understand the safe operation, correct selection and the application of a range of hand tools used for toolmaking and die maintenance, including grinders, drills, stones etc.
- understand the safe operation and operating principles of a range of complex and often state of the art workshop machinery (such as CNC lathes, milling, grinding and erosion machining centres, drilling and welding equipment)
- understand how to set up and operate the machinery/

equipment efficiently and effectively

for all starts from 1st July 2017

- understand the principles of how the relevant tools, dies, jigs and fixtures being manufactured/maintained function, the operating sequences, the purpose of individual components/systems and how they interact
- Understand the application of pneumatics, hydraulics, electrical and electronic systems as applied to various moulding, injection, pressing and similar associated machinery.

## Specific Specialist Skills:

- read and interpret relevant data and documentation used to produce and/or maintain tool and die components, assemblies and systems
- apply methods and techniques to produce, assemble, disassemble repair and/or maintain tools, dies, jigs and fixtures as applicable to the employer requirements
- manufacture components (such as tooling, dies, jigs and fixtures)
- undertake testing to confirm correct operation, and of the effectiveness of repairs and maintenance activities carried out.
- undertake equipment/asset care and/or Preventative Planned Maintenance processes and procedures
- Carry out complex fault diagnosis and repair activities covering the following technologies as applicable to the tool, die, jig and fixture environment:
  - Maintaining mechanical equipment
  - Maintaining fluid & pneumatic power equipment
  - Maintaining electrical & electronic equipment
  - Maintaining process control equipment
- contribute to the business by identifying possible opportunities for improving working practices, processes and/or procedures

## Mandatory Qualifications

After a period of foundation skills and technical knowledge development all apprentices will be required to achieve the following qualifications:

- Level 2 Diploma in Advanced Manufacturing Engineering (Foundation Competence)

After a further period of skills and technical knowledge development all apprentices will be required to achieve the following qualifications:

- Level 3 Diploma in Advanced Manufacturing Engineering (Development Competence) – Toolmaker, Tool and Die Maintenance

Plus **one** of the following

- Level 3 Diploma in Engineering Technology (QCF) – for starts up to June 2017 only
- Level 3 Extended Diploma in Engineering Technologies (QCF) – for starts up to June 2017 only
- Level 3 Diploma or Extended Diploma in Advanced Manufacturing Engineering (Development Knowledge) –

## Training, Tutoring and Assessment

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Apprentices will complete practical and theory assessments in college on day release for their first two years on programme. In year 3 the apprentice will start on their development knowledge on day release for a further two years whilst also completing their development competency qualification within the workplace with their work based assessor. All four mandatory qualifications must be achieved in order to progress to end point assessment.

## End Point Assessment

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The employer undertakes a Portfolio based Occupational Competence Validation Interview (Viva).

A nominated Professional Engineering Institution (PEI) or Military Independent Assessment Authority (MIAA) undertakes the independent assessment to determine if the apprentice has met the Engineering Technician requirements as defined by the UK-SPEC or relevant Military Professional Competenc (MPC) requirements.

The PEI/MIAA will also undertake an independent quality assurance of the Employer Viva Interview documentation and checks that the employer approved mandatory qualifications achieved during the on programme phase and checked at Gateway 2 have been achieved and certificated

*For more information on the assessment for the Engineering Technician (Tool Maker) Apprenticeship please see the full assessment plan in the Apprenticeship Standard documentation. We will arrange the End Point Assessment.*



## Apprentice Entry Requirements

Desirable for an apprentice to already have Maths and English at Grade 4 or above or an equivalent.

## Progression Opportunities

Following the completion of this Apprenticeship Standard the Apprentice may look to progress onto a Level 4 Apprenticeship

## More Information

To find out more about the opportunities and financing of apprenticeships and to discuss your particular requirements, please email [apprenticeshipsandtraining@sheffcol.ac.uk](mailto:apprenticeshipsandtraining@sheffcol.ac.uk) or call **0114 260 2600** to speak to one of our friendly employer advisors.

## Get In Touch

### Email

[apprenticeshipsandtraining@sheffcol.ac.uk](mailto:apprenticeshipsandtraining@sheffcol.ac.uk)

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## Why choose The Sheffield College?

As one of the region's largest providers of apprenticeships, The Sheffield College is more than just your local provider; we deliver the dedicated support you need to source, train and get the best out of your apprentice.

*We appreciate how difficult and time consuming it can be to recruit suitable staff. That's why we will source, shortlist and prepare candidates before you meet them.*

*We help you get the best deal by finding the right funding and we handle the paperwork to make the process of arranging an apprenticeship training programme as smooth as possible. Our employer partnership team, apprenticeship tutors and assessment staff are experts, and we invest time and money in training and upskilling them regularly so their knowledge is up-to-date and industry standard.*

*At The Sheffield College we go above and beyond; we know that every business is different and we help to develop apprentices who will meet the needs of your business.*