Our Apprenticeship Programme

Engineering – Mechanical Manufacturing

Associated qualifications	City & Guilds Level 3 Diploma in Engineering – Mechanical Manufacturing
Duration	3 years

Off-the-job training, assessment and apprentice reviews:

This details what training the apprentice will receive, principally through qualification unit delivery with the learner outcomes attached.
It also includes estimated assessment dates.

On-the-job support for learning, competency and behaviour:

This summarises the broad timetable of tasks that can take place in the workplace, where possible, to support the off-the-job training.
It should focus on duties that include:
- Competencies - activities and practical tasks gained through on-the-job exercises with opportunities to practise
- Behaviours - actions, attitudes and beliefs embedded through the employer's organisational code of conduct

Key:

Training to be delivered	
Assessments	

Estimated Start date Month	Off-the-job training, assessment and apprentice reviews	On-the-job support for learning, competency and behaviour
Year 1 2021/22	Level 3 Diploma in Engineering – Mechanical Manufacturing	
	Principles of mechanical manufacturing engineering (Unit 307) *Outcomes:* 1. Understand how to determine the alignment of machine tools 2. Know how to differentiate between methods of power transmission in machine tools 3. Understand how to evaluate the application of CNC to machine tools 4. Understand the maintenance requirements for machine tool systems	**This is a theory only based unit**. Where possible, support should be given to the apprentice to understand the following principles of mechanical manufacturing engineering within the workplace: - Machine tools (Machines) - Structural requirements - Mounting - Alignment - Range - Rotational movement, Linear movement, speeds - Hydraulic / Pneumatic - components / systems - CNC - Operating principles, part-programming - Cutting tool materials - Maintenance - types, programmes - Lubrication - Coolants - Commissioning
	Principles of mechanical manufacturing engineering (Unit 307) Written assessment	
	Detailed fitting of materials (Unit 327) *Outcomes:* 1. Be able to determine tooling and equipment requirements 2. Be able to prepare to perform detailed fitting operations 3. Be able to perform detailed fitting operations 4. Be able to reinstate the work area	Where possible, support should be given to the apprentice to understand the detailed fitting of materials, including: - Safe working practices - Hazards - Reading Engineering drawings - Identifying tools and equipment - Functions of equipment and systems - Factors affecting accuracy - Forces exerted on pins and keys - Purpose of workholding - Describe different machines - Meaning and application of threads

Estimated Start date Month	Off-the-job training, assessment and apprentice reviews	On-the-job support for learning, competency and behaviour
		- Reaming holes - Scraping - Shafts and bearings - Types of seal - Flanges - Gear assemblies - Transmission systems - Cylinders / actuators - Types of Pump / Valve - Auxiliary components - Produce assemblies - Using drilling and grinding machines - Produce internal and external threads - Sharpening tools - Produce reamed holes
	Detailed fitting of materials (Unit 327) Written assessment	
	Detailed fitting of materials (Unit 327) Practical assessment	
Ongoing	**Machining materials by turning (Unit 323)** *Outcomes:* 1. Be able to carry out alignment tests and machine to required dimensions 2. Be able to produce self-holding and quick release tapers 3. Be able to produce single and two start threads 4. Be able to differentiate between cutting methods	Where possible, support should be given to the apprentice to understand machining materials by turning within the workplace, including: - Work holding - 3 Jaw chuck, 4 jaw chuck, Collet Chuck, Face plate - Techniques - facing off, turning down, taper turning, boring (internal/external), thread cutting (internal/external) - Transmission - positive / frictional
Year 2 2022/23	Level 3 Diploma in Engineering – Mechanical Manufacturing	
Ongoing	**Machining materials by turning (Unit 323)** *Outcomes:* 1. Be able to carry out alignment tests and machine to required dimensions 2. Be able to produce self-holding and quick release tapers	Where possible, support should be given to the apprentice to understand machining materials by turning within the workplace, including: - Work holding - 3 Jaw chuck, 4 jaw chuck, Collet Chuck, Face plate

Estimated Start date Month	Off-the-job training, assessment and apprentice reviews	On-the-job support for learning, competency and behaviour
	3. Be able to produce single and two start threads 4. Be able to differentiate between cutting methods	- Techniques - facing off, turning down, taper turning, boring (internal/external), thread cutting (internal/external) - Transmission - positive / frictional
	Machining materials by milling (Unit 324) *Outcomes:* 1. Be able to prepare for milling operation 2. Be able to machine components using a universal dividing head 3. Be able to machine components by reaming and boring 4. Be able to reinstate the work area	Where possible, support should be given to the apprentice to understand machining materials by milling within the workplace, including: - Machines - alignment - Speeds / Feeds - Cutting fluid - Machine safety - Controls - Workholding - Cutters - geometry, effective production, problems - Universal dividing head - Calculations - Gears - Inspection - Reaming and Boring - Reinstatement of work area - legislation, safe working practices, inspection of equipment and tooling
	Machining materials by milling (Unit 324) Written assessment	
	Machining materials by milling (Unit 324) Practical assessment	
Year 3 2023/24	Level 3 Diploma in Engineering – Mechanical Manufacturing	
	Engineering health and safety (Unit 301) *Outcomes:* 1. Understand compliance with statutory health and safety regulations and organisational requirements 2. Understand compliance with statutory environmental regulations and organisational requirements	**This is a theory only based unit**. Where possible, support should be given to the apprentice to understand the following health and safety requirements within the workplace: - Health and Safety legislation - The employers responsibilities - The employee responsibilities

Estimated Start date Month	Off-the-job training, assessment and apprentice reviews	On-the-job support for learning, competency and behaviour
	3. Know how to implement accident and emergency procedures 4. Understand safe working practices and procedures	- Reporting of accidents - Risk assessments - Safe practices - personal - Causes of accidents - Human, environmental - Control measures - Environmental legislation - Signage - First Aid - procedures, actions - Fire prevention - Safe working practices and procedures - permit to work
	Engineering health and safety (Unit 301) Online multiple choice test	
	Engineering principles (Unit 302) *Outcomes:* 1. Know how to interpret engineering information 2. Know how to differentiate between common engineering materials 3. Know how to perform engineering calculations 4. Understand quality control in engineering	**This is a theory only based unit**. Where possible, support should be given to the apprentice to understand the following engineering principles within the workplace: - Interpreting engineering information - BS EN ISO Standards - Abbreviations and notations - Charts, tables and graphs - Drawings - dimensioning, labelling - Materials - Supply, Characteristics - Heat treatment - Corrosion - Defects - major, minor - Calculations - Degree of accuracy - Transpositions, Algebraic expressions, straight line graphs, Sine, cosine, tangent - Moments of force - Work, power, energy - Friction - Temperature, Heat
	Engineering principles (Unit 302) Online multiple choice test	

Estimated Start date Month	Off-the-job training, assessment and apprentice reviews	On-the-job support for learning, competency and behaviour
Ongoing	**Machining materials by turning (Unit 323)** *Outcomes:* 1. Be able to carry out alignment tests and machine to required dimensions 2. Be able to produce self-holding and quick release tapers 3. Be able to produce single and two start threads 4. Be able to differentiate between cutting methods	Where possible, support should be given to the apprentice to understand machining materials by turning within the workplace, including: - Work holding - 3 Jaw chuck, 4 jaw chuck, Collet Chuck, Face plate - Techniques - facing off, turning down, taper turning, boring (internal/external), thread cutting (internal/external) - Transmission - positive / frictional
	Machining materials by turning (Unit 323) Written assessment	
	Machining materials by turning (Unit 323) Practical assessment	
End	Successful completion of the attached qualification	