MQF Level 4

Advanced Diploma in Welding and Fabrication

AE4-A5-21

Course Description

This course comprises theoretical knowledge and extended practical training carried out in workshops equipped to industry standards. Students will be expected to participate individually and in teams to fabricate welded products. They will learn how to analyse and generate solutions to typical fabrication using thin plates and pipes. Students will also be given the opportunity to follow an apprenticeship to improve their hands-on experience. In order to be able to appreciate the importance of good production management, supervised visits to complex production set-ups are organised during the course.

Programme Learning Outcomes

At the end of the programme the learner will be able to:

1. *Carry out a risk assessment of the surrounding working environment before and after executing an assigned task;*
2. *Use tools and equipment related to steel fabrication;*
3. *Use tools and equipment to prepare and weld steel by a suitable process;*
4. *Identify and select common engineering materials fit for specific applications.*

Entry Requirements

MCAST Diploma in Welding and Fabrication
or
MCAST Diploma in Construction Engineering
or
MCAST Diploma in Automotive Repair (Body and Paint)
or
MCAST Diploma in Light Vehicle Servicing
or
MCAST Diploma in Mechanical Engineering
or
MCAST Diploma in Aircraft Structures and Repairs
or
MCAST Diploma in Engineering (Electronics)
or
MCAST Diploma in Electrical Installations
or

4 SEC/O-Level/SSC&P (Level 3) passes Preferred: English, Mathematics, Engineering Technology, Technical Drawing, Graphical Communication, Design and Technology

Current Approved Programme Structure

Unit Code	Unit Title	ECVET	Year
ETW&F-406-1505	MMA Welding Technology and Practice Plate 4G	6	1
ETW&F-406-1502	Manual Metal Arc Welding Technology and Practice	6	1
ETW&F-406-1503	TIG Welding Technology and Practice Part 1	6	1
ETH&S-406-1502	Safety at Work and Handling Operations	6	1
ETW&F-406-1512	Technical Drawing for Plate and Pipe Fabrication	6	1
ETW&F-406-1508	Plate Fabrication	6	1
ETW&F-406-1509	Pipe Fabrication	6	1
ETW&F-406-1510	Fabrication Drawings	6	1
CDKSK-406-2007	Mathematics	6	1
CDKSK-406-2001	English	6	1
ETPAM-406-1501	Planning and Administration	6	2
ETW&F-406-1511	Power Tools , Marking and Cutting Technologies	6	2
ETW&F-406-1504	TIG Welding Technology and Practice Part 2	6	2
ETW&F-406-1506	MMA Welding Technology and Practice Pipe (1,2,5,6 G)	6	2
ETW&F-406-1507	Material Science and Weldability of Materials	6	2
ETPRJ-412-1505	Welding and Fabrication Synoptic Project	12	2
ETW&F-406-1501	Metal Inter Gas Welding Technology and Practice	6	2
CDKSK-404-1915	Employability and Entrepreneurial Skills	4	2
CDKSK-402-2104	Community Social Responsibility	2	2
ETCMP-406-1602	Vocational Competences : Apprenticeship in W&F	6	1/2
	Total ECVET	**120**	

Unit: ETW&F-406-1505 - Manual Metal Arc Welding Technology and Practice Plate (4G)

Unit level (MQF): 4

Credits: 6

Unit Description

This Unit is designed to allow learners to gain welding skills and knowledge to a level based upon acceptance standards ISO 5817 – Arc welded joints in steel – Guidance on quality levels for imperfections and BS EN 287 welder approval testing, which will enable them to carry out work in complex welding positions. Learners will combine and apply the technological theory experienced within unit number 2. Manual Metal Arc Welding Technology and Practice Part 1. Learners must be able to operate effectively at more than a basic level of competence before commencing this Unit.

On completion of the Unit learners will understand and know how to produce plate welds in 4G positions that may be more technically complex in practice, as well as developing the understanding, knowledge and skills required to produce them. This Unit will provide the Learner with the ability to identify material, cut, prepare, weld and test welded plate specimens inline with the above welding standards.

Finally, learners should have the underpinning knowledge and understanding to carry out and complete the learning outcomes including an on-line assessment.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Produce a single-vee butt weld from one side of a joint in the PC horizontal position;*
2. *Produce a tee fillet weld on one side of the joint in the PD horizontal/overhead position;*
3. *Produce a corner weld from one side of the joint in the PE overhead position;*
4. *Produce a tee fillet weld on one side of the joint in the PE overhead position;*
5. *Produce a single-vee butt weld from one side of the joint in the PE overhead position;*
6. *Explain the health & safety and welding specific underpinning knowledge requirements for the process (MMA).*

Unit: ETW&F-406-1502 - Manual Metal Arc Welding Technology and Practice

Unit level (MQF): 4

Credits: 6

Unit Description

This unit sets out the requirements for manual metal arc welding in a modern engineering and Fabrication environment, in terms of what needs to be achieved by the learner, i.e., welding a series of challenging joint configurations across in a wide range of positions that are compliant to welding procedure specifications.

The unit is concerned with the technology and practices involved in the application of manual metal arc welding. The unit is demanding in terms of technological content and the complexity of the welding that candidates are expected to achieve. The unit is broadly divided into health and safety, welding equipment, welding consumables (i.e., electrodes) and the practicalities of producing a welded joint in relation to a welding procedure specification (WPS) and a quality specification. (EN and AWS).

The unit sets out to give a strong practical capability in the topic area of Manual Metal Arc Welding which supplements and strengthens the student's knowledge and practical capabilities in other associated units within the course provision.

It is anticipated that all practical work carried out within the workshop, will be do so in accordance with relevant Health and Safety legislation, to not only ensure the safety of the students and staff. But also to impart good working practice to the student at the beginning of their career, which can then be an integral platform from which their practical capabilities and technical understanding in the subject area can develop.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Apply safe working practices to manual metal arc welding;*
2. *Prepare equipment for performing manual metal arc welding;*
3. *Perform manual metal arc welding operations to meet welding procedure specification requirements;*
4. *Evaluate welded joints for welding procedure specification conformance.*

Unit: ETW&F-406-1503 - Tungsten Inert Gas (TIG) Welding Technology and Practice - Part 1

Unit level (MQF): 4

Credits: 6

Unit Description

This unit is concerned with the technology and practices involved in the application of Tungsten Inert Gas (TIG) welding. The unit is demanding in terms of technological content and the complexity of the welding that learners are expected to achieve. The unit is broadly divided into health and safety, welding equipment, welding consumables and the practicalities of producing a welded joint in relation to a welding procedure specification (WPS) and a quality specification. Relevance will be made to the suitability of weld type to materials involved and environmental conditions.

It is anticipated that all practical work carried out within the workshop, this will be undertaken in accordance with relevant Health and Safety legislation, to not only ensure the safety of the learners and staff. But also to impart good working practice to the student at the beginning of their career, which can then be an integral platform from which their practical capabilities and technical understanding in the subject area can develop.

On completion of the unit learners will understand how to produce welded joints that are more complex, as well as developing the understanding, knowledge and skills required to produce them. This unit forms one part of an overall competence in welding technologies and practice required for individuals working within this industry.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Know safe working practices related to TIG welding;*
2. *Apply TIG weld equipment for a range of welded joints;*
3. *Describe the organizational quality systems used and weld standards to be achieved;*
4. *Explain the weld inspection and test procedures used including destructive and non-destructive methods.*

Unit: ETH&S-406-1502 – Safety at Work and Handling Operations

Unit level (MQF): 4

Credits: 6

Unit Description

This unit is concerned with the requirements that are essential to enable engineering activities to be carried out safely and effectively. It includes dealing with statutory and organisational requirements in accordance with approved regulations, codes of practice and procedures. It covers responsibilities relating to accident reporting and the identification of hazards and risks.

Students will be introduced to the skills and knowledge to ensure that their own actions do not create any health and safety risks, they do not ignore hazards with significant risk in the workplace and that they take sensible action to put things right.

There are many potential hazards within the welding and fabrication industry. This unit is designed to ensure that those that work within it are aware of the potential dangers, likely hazards and where to source: safety information, appropriate regulations and apply them to the workplace and the people who operate within it.

This unit is about identifying the hazards and risks that are associated with the job. Typically, these will focus on the working environment, the tools and equipment that are used, materials and substances that are used, working practices that do not follow laid-down procedures, manual lifting and carrying techniques.

The level at which the unit is aimed is to address vocational application needs and as students gain more workplace experience, their comprehension and implementation of safety matters will improve.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Understand compliance with statutory health and safety regulations and organisational requirements;*
2. *Understand compliance with statutory environmental regulations and organisational requirements;*
3. *Know how to implement accident and emergency procedures;*
4. *Understand safe working practices and procedures;*

5. *Understand the reasons for safe manual handling, how manual handling risk assessments contribute to improving health and safety and the principles, types of equipment and testing requirements associated with manual handling safety.*

Unit: ETW&F-406-1512 – Technical Drawing for Plate and Pipe Fabrication

Unit level (MQF): 4

Credits: 6

Unit Description

This unit allows the student to develop skills required to produce developed patterns to obtain flat layouts of 3 Dimensional form. These flat layouts can then be used in the production of templates to mark off plate and pipe to shape such as Square to Round, Rectangle to Square, Offset Pipe to Pipe and Conical Frustum.

The application of drawing techniques and practices is crucial to the fabrication process, with students learning basic drawing skills to be adapted to produce suitably sized templates. A range of different geometrical shapes will allow the student to be familiar with the main patterns they will be liable to encounter in practice.

The unit is obviously a combination of theoretical and practical, with demonstrations forming a platform from which students can individually practice and ultimately be assessed.

It is anticipated that all practical work carried out within the workshop, this will be undertaken in accordance with relevant Health and Safety legislation, to not only ensure the safety of the students and staff. But also, to impart good working practice to the student at the beginning of their career, which can then be an integral platform from which their practical capabilities and technical understanding in the subject area can develop.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Determine lines of intersection;*
2. *Develop patterns using Parallel Line Techniques;*
3. *Develop patterns using Radial Line Techniques;*
4. *Develop patterns using Triangulation;*
5. *Produce templates of developed patterns.*

Unit: ETW&F-406-1508 - Plate Fabrication

Unit level (MQF): 4

Credits: 6

Unit Description

This unit is designed to allow the student to develop the skills and knowledge to undertake the fabrication of plate in the thickness regions of 6mm to 25mm of various metals such as low carbon steels, medium carbon and austenitic stainless steels and to include the following sections. Bolted fabrications, welded fabrications, developed plates-work in conjunction with the unit "Pattern Development", tubular connections, boxed girder sections and boiler/pressure vessels.

Health and safety applicable to fabrication of plate for example COSHH, Management of Health and Safety, HASAWA, Asbestos Regs. Working at Heights etc. will also be considered as will the planning of the assemblies to include cost of equipment, suitability of equipment, accuracy and quality of cut, use of templates such as wood, paper and sheet metal, marking off using for example chalk lines and plate squares, cutting using thermal (oxy-fuel gas cutting) and non-thermal processes using mechanical/hydraulic guillotines, rotary shears, forming of plate using the following, brake press, pyramid rolls, vertical rolls, section rolls, conical rolls in the production and manufacture of plate work assemblies.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Apply safe working practices to plate-work fabrication;*
2. *Prepare equipment for plate-work cutting;*
3. *Prepare the equipment for plate-work forming;*
4. *Produce fabrications using plate-work techniques.*

Unit: ETW&F-406-1509 - Pipe Fabrication

Unit Level (MQF): 4

Credits: 6

Unit Description

This unit is concerned with the underlying technology related to the fabrication of pipe work assemblies using the following processes: cutting of pipe, forming of pipe and joining of thick plate and rolled sections of pipe. Health and safety will also be covered as will the risks and hazards pertinent to cutting using oxy-fuel gas, forming, assembly and the joining of the pipe work assemblies.

The following jointing methods will also be used to include non-thermal techniques, mechanical techniques - bolting, screwing and thermal such as soldering, MMA, MIG and TIG welding processes.

In completing this unit, the student would be able to apply themselves to some or all of the following areas of associated work:

- Able to read and interpret isometric and piping drawings, plot plans and P & ID's;
- Fabricates from spool or isometric drawings pipe spool pieces and associated supports and fitments to meet pre and final assembly, in a variety of material and alloys;
- Selects, measures, cuts and installs underground and above ground piping systems, joints and connections, including concrete pipe, carbon steel pipe, fiberglass and thermoplastic pipe, using hand and power tools and aided by slings and aligning dogs;
- Prepares pipe lengths and fittings for fit-up and sets up all types of weld joints prior to completion by welding;
- Selects, inspects and uses rigging aids such as block and tackle, chain hoist, come-along, jack and tagger. Aligns piping against thrust blocks;
- Completes final installation of piping system with required fabricated spools, pipe, fittings, valves, gaskets, bolts, supports and hangers;
- Prepare completed pipe system for testing in accordance with approved test packages.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Prepare equipment, tools and materials for cutting pipe work;*
2. *Use equipment and tools to fabricate pipe work;*
3. *Produce pipe work assemblies using joining techniques;*
4. *Test fabricated pipe work assemblies.*

Unit: ETW&F-406-1510 - Fabrication Drawings

Unit level (MQF): 4

Credits: 6

Unit Description

This unit is fundamental to the fabrication student. It allows the student to be able to produce engineering drawings as a form of communication and be familiar with the terminology in the fabrication industry.

This unit should also be delivered in conjunction with "Technical drawing for Plate and Pipe Fabrication" unit. The unit will also enhance the marking out skills of the student by ensuring accuracy in the construction of the drawings.

Drawing skills will take in – scales, drawing set-up, plans, elevations, cross-sections, details, projections, annotation and symbols. By giving this grounding much of what the student requires throughout the course will be addressed.

It is anticipated that much of the time allocation of the unit will be directed towards the student developing their skills, after initial instruction and demonstration in particular areas. And once manual drawings skills have been mastered, the student will then be introduced to suitable CAD software to develop their graphical skills on a medium and in a way familiar to industry. The unit should therefore be relatively methodical and structured in its approach to ensure that concepts and skills are being suitably demonstrated before transitions between manual and computer based drawing.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Describe and use a range of equipment, media and techniques used in fabrication drawing;*
2. *Identify standards of fabrication engineering drawings and pictorial views;*
3. *Interpret dimensional graphical information from fabrication drawings;*
4. Produce graphical details using *traditional manual and CAD techniques.*

Unit: ETPAM-406-1501- Planning and Administration

Unit level (MQF): 4

Credits: 6

Unit Description

This unit identifies the knowledge and competences needed to contribute to the development and maintenance of positive working relationships with other people, in accordance with organisational and workplace requirements.

This unit covers the different roles and responsibilities within organisations and the workplace. The learner will be able to identify the current and mandatory legislation, regulations and policies which are required to be complied with in an organisation.

The learner will be able to apply and use the correct planning and administration methods to organise and understand work programmes and the requirements of different trades. The learner will be able to demonstrate the use of formal and informal communication with other persons within a workplace and be able to apply a methodical approach to labour and material estimates.

The learner will understand the use of different communication methods throughout regarding the different personnel and their individual requirements within a workplace. The unit will demonstrate the different types of methods used to ensure all persons within a working environment are informed about work plans and activities that affect them.

The unit will demonstrate how persons within a workplace should know how they can develop and maintain positive working relationships with relevant people. The learner should understand the importance of appearance and behaviour, the feelings and expectations of others, and effective communications.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Identify and understand the members of the construction team and their role within the Building / Engineering / Fabrication Industries;*
2. *Identify and understand how to apply information sources in the Building / Engineering/ Fabrication Industries;*
3. *Communicate with other persons within the Building / Engineering / Fabrication Industries;*

4. *Apply the correct Planning and Administration methods within a working environment.*

Unit: ETW&F-406-1511 - Power Tools, Marking and Cutting Technologies

Unit level (MQF): 4

Credits: 6

Unit Description

This unit enables the candidate to develop the skills and the underlying process technologies required for the marking, cutting and fabrication of platework, including bolted and welded fabrications, developed platework and tubular construction. It covers health and safety aspects of fabrication, necessary planning and template development lay outs, marking out, cutting and forming and joining for the production of platework and tubular fabrications.

The Unit is relevant to learners wishing to further develop their skills and the underlying process technology and the power tools required for the marking, cutting and fabrication of platework, bolted and welded fabrication, pipework fabrication and tubular construction.

On completion of the Unit learners will understand relevant health and safety regulations, how to select the appropriate power tools required for marking, cutting and fabrication of platework and tubular construction taking into consideration the materials being used as well as developing the understanding, knowledge and skills required to produce them.

This Unit will provide the learner with the ability to develop the skills and the underlying process technology required for the fabrication of platework, including bolted and welded fabrications, developed platework and tubular construction. It covers health and safety aspects of fabrication, necessary planning and template development lay outs, marking out, cutting and forming and joining for the production of platework fabrications.

Learners will identify, select and safely use the appropriate power tool for carrying out a task involving marking, cutting and fabrication of platework, including bolted and welded fabrications, developed platework and tubular construction.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Prepare equipment, tools and materials for cutting of thick plate, bar and rolled sections;*
2. *Be able to use equipment and tools for thick plate, bar and rolled sections;*
3. *Produce fabrications using thick plate and rolled bar sections joining techniques;*
4. *Apply safe working practices to plate-work fabrication.*

Unit: ETW&F-406-1504 - Tungsten Inert Gas (TIG) Welding Technology and Practice - Part 2

Unit level (MQF): 4

Credits: 6

Unit Description

This unit sets out the requirements for tungsten inert gas (TIG) welding in a modern engineering environment, in terms of what needs to be achieved by the student, i.e. welding a series of challenging joint configurations across in a wide range of positions that are compliant to welding procedure specifications. The unit is concerned with the technology and practices involved in the application of TIG welding. The unit is demanding in terms of technological content and the complexity of the welding that students are expected achieve. The unit is broadly divided into health and safety, welding equipment, welding consumables and the practicalities of producing a welded joint in relation to a welding procedure specification (WPS) and a quality specification.

It is anticipated that all practical work carried out within the workshop, this will be undertaken in accordance with relevant Health and Safety legislation, to not only ensure the safety of the students and staff. But also, to impart good working practice to the student at the beginning of their career, which can then be an integral platform from which their practical capabilities and technical understanding in the subject area can develop.

On completion of the unit learners will understand how to produce welded joints that are more complex, as well as developing the understanding, knowledge and skills required to produce them. This unit forms one part of an overall competence in welding technologies and practice required for individuals working within this industry.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Apply safe working practices to TIG welding;*
2. *Prepare equipment for performing TIG welding;*
3. *Perform TIG welding operations to meet welding procedure specification requirements;*
4. *Evaluate welded joints for welding procedure specification conformance.*

Unit: ETW&F-406-1506 - Manual Metal Arc Welding Technology and Practice Pipe (1,2,5,6G)

Unit level (MQF): 4

Credits: 6

Unit Description

This Unit is designed to allow learners to gain welding skills and knowledge to a level based upon acceptance standards ISO 5817 – Arc welded joints in steel – Guidance on quality levels for imperfections and BS EN 287 welder approval testing, which will enable them to carry out work in complex welding positions. Learners will combine and apply the technological theory experienced within unit number 2. Manual Metal Arc Welding Technology and Practice Part 1. Learners must be able to operate effectively at more than a basic level of competence before commencing this Unit.

On completion of the Unit learners will understand and know how to produce pipe welds in 1,2,5,6G positions that may be more technically complex in practice, as well as developing the understanding, knowledge and skills required to produce them. This Unit will provide the Learner with the ability to identify material, cut, prepare, weld and test welded pipe specimens in line with the above welding standards.

All practical work will be undertaken in accordance with relevant Health and Safety legislation to ensure the safety of students and staff members, during practical demonstrations and practical exercises.

Finally, learners should have the underpinning knowledge and understanding to carry out and complete the learning outcomes including an on-line assessment.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Produce a single-vee pipe butt weld in the PA flat-rotated (ASME 1G) position;*
2. *Produce a single-vee pipe butt weld in the PC horizontal (ASME 2G) position;*
3. *Produce a single-vee pipe butt weld in the PF vertical-upwards (ASME 5G) position;*
4. *Produce a single-vee pipe butt weld in the H-LO45 inclined (ASME 6G) position;*
5. *Explain the health & safety and welding specific underpinning knowledge requirements for the process (MMA).*

Unit: ETW&F-406-1507 - Material Science and Weldability of Materials

Unit level (MQF): 4

Credits: 6

Unit Description

The properties of common materials used in fabrication engineering are analysed and evaluated. The student will investigate typical mechanical properties of different types of materials e.g. metallic, polymers and composites. The grain structure of different materials will be examined in relation to the resulting properties that arise.

The student will investigate the processes that may be carried out on materials to improve certain desirable properties for specific applications e.g. annealing, tempering of steels etc.

Weld symbols and dimensioning along with weld terminology will be applied to a selection of fabrication designs so that the student will become familiar will the standards used.

Weld defects will be investigated along with methods and procedures to minimise these defects e.g., distortion, residual stress etc. The distribution of heat and the resulting possible effects will be investigated. Weld cracking and also dilution on fully fused joints in dissimilar metals will be examined to prevent or minimise either of these two possible problems in welded structures.

The iron-carbon thermal equilibrium diagram for plain carbon steels and welded joints will be analysed both in the classroom and in the workshop/metallurgical laboratory environment. This will allow the student to fully understand the grain structures possible and the resulting material properties achieved e.g. ferrite, pearlite etc.

Weld NDT (Non-Destructive Testing) investigation methods will be examined and compared and analysed. Student participation in the workshop/metallurgical laboratory or material testing laboratory would be desirable during this part of the unit. Mechanical material testing equipment and methods used augmented by suitable demonstration would also be advantageous for the student.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Describe, compare and contrast the properties of a range of common materials used in fabrication engineering;*
2. *Apply and describe welding symbols for a range of applications;*
3. *Analyse and asses the metallurgical effects of welding in terms of possible defects that occur e.g., distortion and residual stresses;*
4. *Apply and describe techniques for testing welded joints e.g., ultrasonic testing.*

Unit: ETPRJ-412-1505 - Welding and Fabrication - Synoptic Project

Unit Level (MQF): 4

Credits: 12

Unit Description

This unit aims to enable learners to develop the skills needed to specify, plan and implement a project relating to welding and fabrication sector, and then present the project outcomes to an audience.

This unit will enable learners to complete a realistic project relating to welding and fabrication using low carbon steel and other common steels to meet apprenticeship work placement particular requests.

Learners will have the opportunity to develop skills relating to the process and procedures that are required to take a project from inspection to completion, using appropriate technology. Learners will be encouraged to bring together their knowledge, learning and understanding from other units of study in order to develop solutions for a project that has been negotiated and agreed with the tutor.

Projects may take into consideration recent ideas, developments and reports affecting the welding and construction sector. Learners who are following the apprenticeship scheme may carry out a project that is directly related to their workplace, in which case the project outcomes may be designed to be direct use to the employer.

A presentation of the project to a selected audience will be prepared and delivered by learners.

The scale of agreed project should be achievable and yet challenging, and in keeping with the learner ability level. After completing this unit, learners should feel confident in carrying out a project within the level of this programme.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Create a specification for a 'welding and fabrication' project;*
2. *Plan and monitor a 'welding and fabrication' project;*
3. *Implement a 'welding and fabrication' project;*
4. *Present the outcome of the 'welding and fabrication' project.*

Unit: ETW&F-406-1501 - Metal Inert Gas Welding Technology and Practice - Part 1

Unit level (MQF): 4

Credits: 6

Unit Description

This unit sets out the requirements for metal inert gas (MIG) welding in a modern engineering environment, in terms of what needs to be achieved by the learner. This Unit is designed to allow learner to develop a deeper understanding of what's involved in welding a series of challenging joint configurations across in a wide range of positions that are compliant to welding procedure specifications. The unit is concerned with the technology and practices involved in the application of MIG welding. The unit is demanding in terms of technological content and the complexity of the welding that learners are expected achieve. The unit is broadly divided into health and safety, welding equipment, welding consumables (i.e., electrodes) and the practicalities of producing a welded joint in relation to a welding procedure specification (WPS) and a quality specification.

It is anticipated that all practical work carried out within the workshop, will be do so in accordance with relevant Health and Safety legislation, to not only ensure the safety of the students and staff. But also, to impart good working practice to the student at the beginning of their career, which can then be an integral platform from which their practical capabilities and technical understanding in the subject area can develop.

On completion of the Unit learners will understand how to produce welded joints that are more complex, as well as developing the understanding, knowledge and skills required to produce them.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Apply safe working practices to MIG welding;*
2. *Prepare equipment for performing MIG welding;*
3. *Perform MIG welding operations to meet welding procedure specification requirements;*
4. *Evaluate welded joints for welding procedure specification conformance.*