MCAST

MCAST PROGRAMMES - PUBLIC INFORMATION TEMPLATE (FULL TIME)

Institute	Institute of Engineering and Transport
Department	Building Services Department

Programme Title	Advanced Diploma in Welding and Fabrication				
Course Code *To be filled in by Admissions Dept.*	BL4-A05-23		**If the programme includes a WBL element, How is it accredited?**	Apprenticeship	
MQF/ EQF Level	Level 4	**Type** *(refer to Appendix 1 for Parameters)*	Qualification	**Awarding Body**	MCAST – Malta College of Arts, Science and Technology
Accreditation Status	Accredited via MCAST's Self Accreditation Process (MCAST holds Self-Accrediting Status as per 1st schedule of Legal Notice 296/2012)				
Mode of Delivery	Face to Face	**Duration** *(Academic Years or Semesters)*	3 Years	**Mode of Attendance**	Full-time
Total Number of Credits	120 credits	**Total Learning Hours** *(25 Total Learning Hours for each ECTS)*	3000 hours		
Target Audience	Ages 16 - 65	**Target Group** *(the type of learners that the educational institution anticipates joining this programme)*	Students exiting compulsory education		
Programme Fees	There are no fees applicable to Maltese and other EU Nationals (as will be evidenced by their Identity Document) Fees apply for other International Applicants… for fee information and any related updates it is best to communicate with MG2i International through applyinternational@mcast.edu.mt One may consider checking about possible eligibility or otherwise for any exemption from fees by contacting the relevant section within MEYR (Floriana) – or visit the servizz.gov.mt website here				
Date of Next Student Intake	For further information regarding upcoming student intake and applications time windows for same kindly click here				
Language of Instruction	The official language of instruction at MCAST is English. All notes and textbooks are in English (except for language courses, which will be in the respective language being instructed). International candidates will be requested to meet English language certification requirements for access to the course.				
Application Method	Applications to full-time courses are received online via the College Management Information System. Applicants can log-in using Maltese Electronic ID (eID) in order to access the MCAST Admissions Portal directly and create one's own student account with the identity being verified electronically via this secure service. Non-EID applicants need to request account creation though an online form after that they confirm that their local Identification Document does not come with an EID entitlement. . Once the identity is verified and the account is created on behalf of the applicant, one may proceed with the online application according to the same instructions applicable to all other applicants.				

	For more information about how to apply online for a course at MCAST, please visit: https://mcast.edu.mt/how-to-apply-online-2/
Information for Non-EU Citizens	Non-EU candidates require a study visa in order to travel to Malta and join the course applied for (on a Full Time delivery mode). For further information re study-visa please access https://www.identitymalta.com/unit/central-visa-unit/. Further information International / TCN applicants should take note of before requesting to being considered for a programme of studies at MCAST, can be obtained through the respective FAQ found on https://mcast.edu.mt/important-information/
IMPORTANT note to Non-EU Nationals / TCNs	In instances where a TCN is applying for an MCAST programme of studies which includes Apprenticeship / Placement / Internship, it is the applicant's responsibility to check with the relevant Maltese Authority whether one would be eligible to have the necessary permits to be able to carry out the accredited Apprenticeship / Placement / Internship, success from which is expected in order to be able to successfully complete the selected programme of studies. Further information can also be obtained through the respective FAQ found on: https://mcast.edu.mt/important-information/
Address where the Programme will be Delivered	*MCAST has four campuses as follows:* **MCAST Main Campus** Triq Kordin, Paola, Malta *All courses except for courses delivered by the Institute for the Creative Arts, the Centre of Agriculture, Aquatics and Animal Sciences and the Gozo Campus are offered at the Main Campus address (above).* *Courses delivered by the Institute for the Creative Arts, the Centre of Agriculture, Aquatics and Animal Sciences, or the Gozo Campus, are offered in one of the following addresses as applicable:* **Institute for the Creative Arts** Mosta Campus Misraħ Għonoq Tarġa Gap, Mosta **Institute of Applied Sciences** Centre of Agriculture, Aquatics and Animal Sciences, Luqa Road, Qormi **Gozo Campus** J.F. De Chambray Street MCAST, Għajnsielem Gozo *In the case of courses delivered via Online Learning, students will be following the programme from their preferred location/address.* *Programmes delivered via Blended Learning, and which therefore contain both an online and a face to face component shall be delivered as follows:* ○ Face to Face components – as per above address instructions ○ Online components – from the student's preferred address.

Course Description *(Refer to Programme Specification)*	This course combines theoretical knowledge and practical training carried out in College-based industrial workshops. Learners will be expected to participate individually and in teams to fabricate welded products. They will learn how to analyse and generate solutions related to typical fabrication using thin plates and pipes. Learners 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. Applicants need to be able to work within the industries concerned.
Deskrizzjoni tal-Kors *(Refer to Programme Specification)*	Dan il-kors jikkombina l-għarfien teoretiku u t-taħriġ prattiku li jsir f'workshops industrijali bbażati fil-Kulleġġ. L-istudenti jkunu mistennija jipparteċipaw b'mod individwali u f'timijiet biex jiffabbrikaw prodotti wweldjati. Huma jitgħallmu kif janalizzaw u jiġġeneraw soluzzjonijiet relatati mal-fabbrikazzjoni tipika permezz ta' pjanċi u pajpijiet irqaq. Huma jingħataw ukoll l-opportunità li jsegwu Apprendistat biex itejbu l-esperjenza prattika tagħhom. Sabiex l-istudenti jkunu jistgħu japprezzaw l-importanza ta' ġestjoni tajba tal-produzzjoni, matul il-kors jiġu organizzati żjarat sorveljati f'postijiet tax-xogħol fejn il-produzzjoni hija kumplessa. L-applikanti għandhom ikunu kapaċi jaħdmu fl-industriji kkonċernati.
Career Opportunities:	Welding and Fbrication Technician (Welder and Fabricator), Welding and Fabrication Supervisor, Welding and Fabrication Designer, Pipe Welding Specialist (Pipe Welder and Fabricator)
Entry Requirements *(Refer to Prospectus / Course Page on MCAST website)*	Internal Progression Route… Any MCAST MQF Level 3 Diploma OR 4 SEC / SSC&P or equivalent with a Pass Grade / Level 3
Other Notes related to this Programme, and which are to be taken note of	-
Programme Learning Outcomes *(Refer to Programme Specification)*	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.
Teaching, Learning and Assessment Procedures	The programmes offered are vocational in nature and entail both theoretical lectures delivered in classes as well as practical elements that are delivered in laboratories, workshops, salons, simulators as the module requirements dictate. Each module or unit entails a number of in person and/or online contact learning hours that are delivered by the lecturer or tutor directly (See also section 'Total Learning Hours). Access to all resources is provided to all registered students. These include study resources in paper or electronic format through the Library and Resource Centre as well as tools, software, equipment and machinery that are provided by the respective institutes depending on the requirements of the course or module. Students may however be required to provide consumable material for use during practical sessions and projects unless these are explicitly provided by the College. All Units of study are assessed throughout the academic year through continuous

	assessment using a variety of assessment tools. Coursework tasks are exclusively based on the Learning Outcomes and Grading Criteria as prescribed in the course specification. The Learning Outcomes and Grading Criteria are communicated to the Student via the coursework documentation. The method of assessment shall reflect the Level, credit points (ECTS) and the schedule of time-tabled/non-timetabled hours of learning of each study unit. A variety of assessment instruments, not solely Time Constrained Assignments/Exams, are used to gather and interpret evidence of Student competence toward pre-established grading criteria that are aligned to the learning outcomes of each unit of the programme of study. Grading criteria are assessed through a number of tasks, each task being assigned a number of marks. The number of grading criteria is included in the respective Programme Specification. The distribution of marks and assessment mode depends on the nature and objectives of the unit in question. Coursework shall normally be completed during the semester in which the Unit is delivered. Time-constrained assignments may be held between 8 am and 8 pm during the delivery period of a Unit, or at the end of the semester in which the Unit is completed. The dates are notified and published on the Institute notice boards or through other means of communication. Certain circumstances (such as but not limited to the COVID-19 pandemic) may lead Institutes and Centres to hold teaching and assessment remotely (online) as per MCAST QA Policy and Standard for Online Teaching, Learning and Assessment (Doc 020) available via link https://www.mcast.edu.mt/college-documents/ The Programme Regulations pertaining to this Programme's MQF/EQF level available at: link https://www.mcast.edu.mt/college-documents/, apply.
Grading System	All MCAST programmes adopt a Learner-centred approach through the focus on Learning Outcomes. The assessment of MCAST programmes is criterion-referenced and thus assessors are required to assess learners' evidence against a pre-determined set of Learning Outcomes and Assessment Criteria. For a student to be deemed to have successfully passed a unit, a minimum of 50% (grade D) must be achieved. All full time units are individually graded as follows: A* (90-100) A (80-89) B (70-79) C (60-69) D (50-59) Unsatisfactory work is graded as 'U'. Work-based learning units (where applicable) are graded on a Pass/Fail basis only. Some units which follow industry standards and regulations may also be graded on a Pass/Fail basis as per programme regulations referred below. Detailed information regarding the grading system may be found in the Programme Regulations pertaining to this programme's MQF/EQF Level available at:

	https://www.mcast.edu.mt/college-documents/ (Refer to DOC 003, 004 and 005)
Exit Point (where and as applicable)	Where a student will not make it to the Final Certification achievable from this Programme of Studies (as per Programme Regulations), one might wish to look into Exit Point possibilities as may be applicable to this programme for studies. Further information, is available at https://www.mcast.edu.mt/college-documents/, kindly refer to *DOC 077 Procedure for the processing of Claims for Certificates at Interim Exit Points.*
Contact details for Further Learning Opportunities	The MCAST Career Guidance Team, offers the service of qualified and experienced Career Advisers who will be very willing to discuss with potential applicants the course which best achieves one's career ambitions, as well as exploring one's education route, or similar. **MCAST Career Guidance** Tel: 2398 7135/6 Email: career.guidance@mcast.edu.mt
Regulatory Body/ Competent Authority Contact Details *(where applicable - in the case of a programme leading to Regulated Profession)*	Not Applicable

Programme Structure	Unit Code	Unit Title	ECTS	Year	Semester
	ETW&F-406-1502	Manual Metal Arc Welding Technology and Practice	6	1	Year
	ETW&F-405-2307	TIG Welding Technology and Practice Part 1	5	1	Year
	ETW&F-405-2308	Safety at Work and Handling Operations	5	1	Year
	ETW&F-406-1512	Technical Drawing for Plate and Pipe Fabrication	6	1	Year
	ETW&F-405-2309	Plate Fabrication	5	1	Year
	CDKSK-406-2320	Mathematics	6	1	Year
	CDKSK-406-2319	English	6	1	Year
	ETW&F-406-1505	MMA Welding Technology and Practice Plate 4G	6	2	Year
	ETW&F-405-2310	Pipe Fabrication	5	2	Year
	ETW&F-406-1510	Fabrication Drawings	6	2	Year
	ETW&F-405-2311	Planning and Administration	5	2	Year
	ETW&F-406-1511	Power Tools , Marking and Cutting Technologies	6	2	Year
	ETW&F-405-2312	Metal Inter Gas Welding Technology and Practice	5	2	Year
	CDKSK-404-	Entrepreneurship Essentials	4	2	Year

	2325				
	CDKSK-402-2324	Community Social Responsibility	2	2	Year
	ETW&F-406-1504	TIG Welding Technology and Practice Part 2	6	3	Year
	ETW&F-406-1506	MMA Welding Technology and Practice Pipe (1,2,5,6 G)	6	3	Year
	ETW&F-406-1507	Material Science and Weldability of Materials	6	3	Year
	ETPRJ-412-1505	Welding and Fabrication Synoptic Project	12	3	Year
	ETAPP-412-2311	Vocational Competences : Apprenticeship in W&F	12	1/2/3	Year

Allocation of Total Learning Hours (per Unit)

The total learning hours required for each unit or module are determined as follows:

Credits (ECTS)	**Indicative contact hours[1]**	**Self-Learning and Assessment Hours[3]**	**Total Student workload (hrs)[2]**
1	5 – 10 hrs	20 - 15 hrs*	25 hrs
2	10 – 20 hrs	40 - 30 hrs*	50 hrs
3	15 – 30 hrs	60 - 45 hrs*	75 hrs
4	20 – 40 hrs	80 - 60 hrs*	100 hrs
6	30 – 60 hrs	120 - 90 hrs*	150 Hrs
9	45 – 90 hrs	180 - 135 hrs*	225 hrs
12	60 – 120 hrs	240 - 180 hrs*	300 hrs

Note: The 'Self-Learning and Assessment Hours[3]' amount to the difference between the 'Indicative Contact Hours'[1] and the 'Total Student Workload'[2]

APPENDIX 1

MINIMUM CREDITS FOR QUALIFICATIONS AT DIFFERENT LEVELS

MQF Level	Minimum ECTS Required for a Qualification*
8	
7	30
6	180
5	30
4	30
3	60
2	60
1	40

* Programmes assigned fewer ECTS than indicated will be classified as Awards.

Reference: Fig.1: p48, Malta Further and Higher Education Authority (MFHEA) (October 2024). Referencing Report, 5th Revised Edition.

APPENDIX 2

EXAMPLES OF QUALIFICATION TYPES AT A SPECIFIC MQF LEVEL

MQF Level	Examples of qualification types at a specific MQF level (The list in this column is not exhaustive)	Number of ECTS *
8	Doctoral Programmes:	
	PhD	N/A
	Professional Doctorate	180
7	Master's Degree	90
	Postgraduate Diploma	60
	Postgraduate Certificate	30
6	Bachelor's Degree	180
	Bachelor's Honours	240
5	Undergraduate Higher Diploma	90
	Undergraduate Diploma	60
	Undergraduate Certificate	30
	VET Level 5	60
4	Advanced Diploma	120
	Pre-Tertiary Certificate	30 - 60
	MATSEC Matriculation Certificate (Advanced and Intermediate)	N/A
	VET Level 4	120
3	Certificate	60
	MATSEC Secondary Education Certificate	N/A
	VET Level 3	60
2	Foundation Certificate	60
	MATSEC Secondary Education Certificate	N/A
	VET Level 2	60
1	Introductory Certificate	40
	VET Level 1	40

* Programmes assigned fewer ECTS than indicated will be classified as Awards.

Reference: Fig.2: p48, Malta Further and Higher Education Authority (MFHEA) (October 2024). Referencing Report, 5th Revised Edition.

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

Unit Level (MQF/EQF): 4
Credits: 6
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 150

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, ie: 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).*

ETW&F-405-2307: Tungsten Inert Gas (TIG) Welding Technology and Practice - Part 1

Unit Level (MQF/EQF): 4
Credits: 5
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 125

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 undertaken 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.*

ETW&F-405-2308: Safety at Work and Handling Operations

Unit Level (MQF/EQF): 4
Credits: 5
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 150

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.*

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

Unit Level (MQF/EQF): 4
Credits: 6
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 150

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.*

ETW&F-405-2309: Plate Fabrication

Unit Level (MQF/EQF): 4
Credits: 5
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 125

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.*

CDKSK-406-2320: Mathematics

Unit Level (MQF/EQF): 4
Credits: 6
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 150

Unit Description

This unit provides a framework for students to develop mathematical thinking skills further to the level 3 unit specification to solve problems related to real-life situations. Students also develop skills, attributes and knowledge that contribute to their personal growth and effectiveness within their training and work environment and within the community.

The unit is designed to adapt for the needs of a particular field of study (business & finance or engineering & transport and others). To reach this goal the unit was divided into eight learning outcomes from which four learning outcomes are chosen and taught, which are related to statistics, algebra and graphical representation, geometry, areas and volumes, game theory and finance. Through these different areas students will be able to develop the effective skills for information processing, reasoning, evaluation creative thinking and enquiry, all fundamental skills for the problem-solving process. This will prepare students in applying and evaluating a range of strategies to solve real-life problems. Through this unit the learner will also learn to present and communicate results and conclusions effectively.

On successful completion of the unit the learner will be equipped with mathematical thinking skills which make them aware of and understand their thought process, to reassess and identify areas for development. Students learn to evaluate, reflect on their strategies, understand, and verify results to solve problems. These skills will equip students with managerial skills, to further their studies and for work employability.

Learning Outcomes

Learning Outcomes are electives out of which 4 are to be chosen

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

1. *Use algebraic techniques to simplify expressions and solve equations.*
2. *Identify how to simplify more complex expressions and solve harder equations.*
3. *Demonstrate visual and logical techniques in evaluating graphical representations and communication skills in presenting the results effectively.*
4. *Demonstrate skill in calculating angles, sides, areas, and volumes for any given situation.*
5. *Apply information processing skills to solve problems in a relevant statistical context.*
6. *Apply thinking skills and demonstrate evaluation skills to solve problems in a relevant game theory context.*
7. *Demonstrate evaluation and communication skills in solving and presenting problems applied to costing methods and techniques.*

CDKSK-406-2319: English

Unit Level (MQF/EQF): 4
Credits: 6
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 150

Unit Description

This unit typically refers to English language skills needed for specific careers or vocational training programmes. The main objective of this unit is to prepare learners to understand and respond to spoken English on a variety of topics, including abstract or unfamiliar topics, to read and comprehend a variety of texts, including more extended and more complex texts, and to write in a more precise and structured way. Particular focus is given to summarising and paraphrasing.

At this level, learners should have a good understanding of English grammar, vocabulary and usage. They should be able to communicate effectively in written and spoken English, express opinions, and understand complex texts and conversations as required by various but often specific technical contexts within their selected field of study. Learners should also start acquainting themselves with researching reliable and authoritative sources of information. Moreover, they should also be able to cite this information and follow the conventions of the referencing style stipulated by their respective institute.

Learning Outcomes

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

1. *Read and understand written English effectively to improve knowledge of the subject area.*
2. *Understand extended speech and follow an argument provided the topic is related to one's own subject area.*
3. *Speak with a degree of fluency and spontaneity on topics related to one's own subject area.*
4. *Produce a research-based report or essay with appropriate choice of linguistic style and structure.*

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

Unit Level (MQF/EQF): 4
Credits: 6
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 150

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).*

ETW&F-405-2310: Pipe Fabrication

Unit Level (MQF/EQF): 4
Credits: 5
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 125

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.*

ETW&F-406-1510: Fabrication Drawings

Unit Level (MQF/EQF): 4
Credits: 6
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 150

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.*

ETW&F-405-2311: Planning and Administration

Unit Level (MQF/EQF): 4
Credits: 5
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 125

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.*

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

Unit Level (MQF/EQF): 4
Credits: 6
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 150

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.*

ETW&F-405-2312: Metal Inert Gas Welding Technology and Practice

Unit Level (MQF/EQF): 4
Credits: 5
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 125

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.*

CDKSK-404-2325: Entrepreneurship Essentials

Unit Level (MQF/EQF): 4
Credits: 4
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 100

Unit Description

One of the main policy goals for the EU and Member States over the past years has been the development of the entrepreneurial capacity of European individuals and organizations, since there is a growing understanding that entrepreneurial abilities and information, can be learned, which in turn spurs the development of an entrepreneurial mindset and culture that is advantageous to both people and society at large.

Entrepreneurship is a transversal skill that may be used to launch businesses as well as foster personal growth, actively participate in society, and (re)enter the job market as an employee or self-employed individual (cultural, social, or commercial). Hence, it encompasses a variety of entrepreneurial endeavours, such as intrapreneurship, social entrepreneurship, green entrepreneurship, and digital entrepreneurship. It relates to value creation, and it is applicable to both individuals and groups (teams or organizations), as outlined in the definition below:

'Entrepreneurship is when you act upon opportunities and ideas and transform them into value for others. The value that is created can be financial, cultural, or social' (FFE-YE, 2012)

Therefore, the main objective of this unit is to familiarize the learners with the above-mentioned concept of entrepreneurship, with a view on enhancing entrepreneurial skills by building a strong foundation in this area of studies. Through this unit, learners will be guided on various ideation and creativity techniques, which will enable them to recognize opportunities and/ or generate ideas that address needs which are not currently being met, whilst being driven by sustainability when making these decisions. For example, through the use of the global sustainable developmental goals (SDGs) the learners are encouraged to understand the importance of sustainable development and inspire them to create businesses that contribute to this cause.

Throughout the unit, learners will be encouraged to think critically, creatively, and ethically about entrepreneurship, and to consider the impact of their ventures on society and the environment, by utilising a variety of tools such as the Business Model Canvas(BMC) as a framework, and they will also have the opportunity to develop various other transversal skills such as communication and teamwork skills.

Upon completion of this unit, learners will have developed an appreciation for the role of entrepreneurship in society and acquired an entrepreneurial mindset that will enable them to identify and pursue opportunities for innovation and growth in their personal and professional lives.

Learning Outcomes

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

1. *Identify an entrepreneurial opportunity.*
2. *Apply creative thinking tool(s) and technique(s) to generate idea(s).*
3. *Develop an entrepreneurial idea through a strategic plan.*
4. *Use effective communication skills to persuade various stakeholders.*

CDKSK-402-2324: Community Social Responsibility

Unit Level (MQF/EQF): 4
Credits: 2
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 50

Unit Description

This unit focuses on Community Social Responsibility and provides an opportunity for learners to better understand themselves and others to establish life goals. Community social responsibility enables learners to understand their strengths, areas for improvement, opportunities offered to them during their lifespan and threats which can hinder their achievements. This unit will prepare students for life, employment and how to become active citizens in society.

Lectures will differ from traditional delivery of other units where learners will be empowered to take ownership of their learning process. This means that this unit will be delivered through a combination of discussions, presentations, debates and application of theory through voluntary work. The sessions will focus on students becoming more self-aware of their strengths and limitations and what can be done to improve themselves. Skills needed on working and interacting with other people in the community and the right work ethics when doing the voluntary work. These sessions will help them prepare themselves for life after college and also instil civic duty to become active citizens.

Learning Outcomes

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

1. *Discover oneself through personal reflection and planning personal goals.*
2. *Interact and cooperate with other people effectively.*
3. *Develop active participation and promote community work.*

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

Unit Level (MQF/EQF): 4
Credits: 6
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 150

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.*

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

Unit Level (MQF/EQF): 4
Credits: 6
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 150

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).*

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

Unit Level (MQF/EQF): 4
Credits: 6
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 150

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.*

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

Unit Level (MQF/EQF): 4
Credits: 12
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 300

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.*