MCAST

Malta College of Arts, Science & Technology

MQF Level 2

CE2-01-19

Foundation Certificate in Construction Engineering

Course Specification

Course Description

This programme provides the student with an opportunity to get acquainted with the different vocational trades related to construction engineering. The vocational practice component is based on a 'taster' approach whereby the student will learn about the tools, materials, processes and applications relative to:

i) Welding and Fabrication

ii) Plumbing and Electrical Installation

iii) Refrigeration and Air-conditioning

iv) Woodwork

v) Trowel trades, including Restoration, Stone Masonry and Tile Laying.

Additionally, Technical Drawing will complement the five vocational areas listed above.

Scientific underpinning principles, directly related to the vocational units, are also embedded within the programme.

Programme Learning Outcomes

At the end of the programme the students are able to

1. *Understand the basic characteristics of word, plumbing, welding, fabrication, refrigeration and air-conditioning and trowel trades.*
2. *Use basic hand tools effectively and safely to carry out specific practical tasks in a workshop environment.*
3. *Apply the knowledge and skills gained throughout the programme to develop a practical project, under supervision.*
4. *Understand and use essential skills in mathematics, language communication, information technology and basic technical documentation to carry out simple assigned tasks and assessments responsibly.*

Entry Requirements

- Finished Compulsory Education; or
- MCAST Introductory Certificate

Other Entry Requirements

- Initial Assessment Tests
- Applicants with SEC/O-Level passes at Grades 6 or 7 in at least two subjects from Maltese, English Language and Mathematics or "Secondary School Certificate and Profile" (SSC&P) at Level 1 or 2 will be exempted from the Initial Assessment Tests and will start directly at Level 2.

Current Approved Programme Structure

Unit Title	ECVET
Electrical, plumbing refrigeration and air conditioning	6
Stone Heritage, Trowel and Tile Laying	6
Welding and Fabrication	6
Woodwork	6
Mathematics	6
English	6
Malti	6
Information Technology	6
Individual and Social Responsibility	6
Science	6
Total ECVET	60

Electrical, Plumbing, Refrigeration and Air Conditioning

Unit level (MQF): 2
Credits : 6

Unit Description

This unit explores the materials, tools, equipment and working techniques used in electrical, plumbing and refrigeration and air conditioning trades. The main content of the unit includes knowledge of hand and light portable power tools and access equipment (ladders etc.), as well as job risks and how to protect themselves and their co-workers using proper personal protective equipment (PPE), especially when using power tools.
Learners will acquire the ability to identify the correct tools for making/connection/installing pipework, fittings and fixtures. They will demonstrate various skills by carrying out a range of tasks under supervision and with limited responsibility unit content also covers the making simple electrical, plumbing and refrigeration and air conditioning joints, applying compression/capillary fittings and their assembling for domestic use.

Learning Outcomes

On completion of this unit the learner will be able to

1. *Identify and select appropriate tools and materials for electrical installation tasks, and produce a basic electrical installation in a safe manner.*
2. *Identify and select appropriate tools and materials for plumbing installation tasks, and produce plumbing pipe-joining in a safe manner.*
3. *Identify and select appropriate tools and materials, and carry out basic maintenance procedures on a refrigeration and air-conditioning systems in a safe manner.*

Stone Heritage, Trowel and Tile Laying

Unit level (MQF): 2
Credits : 6

Unit Description

Learners will acquire skills needed to make simple structures (single and double walls) made of limestone blocks and bricks tied with mortar, qualifying to be limestone layers and bricklayers. This unit also explores the materials, tools, equipment and working techniques used in the floor tile laying, plastering and rendering.
Learners will also learn the correct terminology, working procedures, and how to identify common materials and tools used in trowel trades. Structures should be made according to given building drawings and by using measuring stone ruler. Learners will be able to learn basic skills in plastering, rendering, tile laying, drawing and building basic elements of constructions. Learners are also introduced with risks at job and how to protect themselves and their co-workers using proper personal protective equipment (PPE).

Learning Outcomes

On completion of this unit the learner will be able to

1. *Identify and explain brick and block work laying methods, and perform a brick or blockwork laying task in a safe way.*
2. *Identify and explain tile laying procedure, and lay tiles in a safe way according to defined task.*
3. *Identify and explain stone restoration procedures, and perform simple stone restoration tasks in a safe way.*

Welding & Fabrication

Unit level (MQF): 2
Credits : 6

Unit Description

Welding and fabricating are basic activities with metals in construction, in the workshop and on site. There are different welding techniques for joining metal parts and they depend on the nature of the material as well as its thickness. Basic welding techniques covered in this unit are electric arc and gas welding.

This unit explores the materials, tools, equipment and working techniques used to perform welding tasks in a safe manner. The unit focuses on hand tools, basic portable power tools, access equipment, personal protective equipment (PPE) and safe work techniques.

The aim of this unit is to provide learners with knowledge of different types of materials commonly used in metal constructions, their properties and with the knowledge on how to select metals for given practical applications throughout the unit delivery.

The unit covers the technology that underpins welding processes, and the basic principles of welding will be covered as well. Learners will have the opportunity to apply their knowledge producing simple joints using welding technology in the workshop.

Learning Outcomes

On completion of this unit the learner will be able to

1. *Identify and select appropriate tools, materials and consumables, and joints preparations to perform MMA and Gas welding tasks in a safe manner.*
2. *Produce MMA and Gas welding tasks in a safe manner.*
3. *Identify and select appropriate tools and materials for sheet metal fabrication tasks, and fabricate simple components from sheet metal in a safe manner.*

Woodwork

Unit level (MQF): 2
Credits : 6

Unit Description

This unit introduces students to basic woodworking practices. The unit will approach the subject from both the practical and the technological aspects, with more emphasis placed on the practical side of the trade. The technological lessons will deal with, different types of materials used currently, the difference between soft and hard woods, the identification and safe use of basic hand tools, Personal protective equipment, power tools and main fasteners. Work drawings will be used to extract information to manufacture basic joints and finally to draw a workshop rod complete with a cutting list.

During the practical lessons the students will be taught how to execute basic joints (housing and halving joints), using hand tools effectively and safely. As a final exercise the students will produce a task, made up of different components, comprising the basic joints, which will finally be sanded down and varnished.

Learning Outcomes

On completion of this unit the learner will be able to

1. *Describe and discuss materials for carpentry and joinery, and the use of hand tools.*
2. *Demonstrate skills of making/reading a drawing and completing a range of well-defined tasks.*
3. *Understand facts and procedures of job risks and eliminate them using PPE.*
4. *Make simple joints for a door/window, etc. according to proposed task in safe working conditions with responsibility for the quality of made items.*