



# MCAST

Malta College of Arts, Science & Technology

**MQF Level 3**

**Diploma in Construction Engineering**

**CE3-02-19**

**CE3-02-19G**

## **Course Description**

The course consists of college-based training on the various subjects related to the building and construction sector. This qualification gives the student the knowledge, understanding and skills needed in this specialist area of employment and/or enables him/her to continue his/her studies in the same, or in related vocational areas such as Construction, Civil Engineering or Building Services.

During the course the student will be introduced to the different types of technical drawings used in the construction industry. Additionally, the student will be able to apply construction drawing standards and conventions to produce sketches and professional working drawings.

## **Programme Learning Outcomes**

At the end of the programme the students are able to

- 1. Understand the importance of health, safety and welfare in the construction industry;*
- 2. Understand the diversity of the construction industry and the contribution to society by those who work within it;*
- 3. Apply construction drawing standards and conventions;*
- 4. Describe the methods and techniques associated with pre-construction, ground works, substructure, superstructure and building services systems of low-rise domestic buildings.*

## **Entry Requirements**

- MCAST Foundation Certificate; or
- 2 SEC/O-Level/SSC&P (Level 3) passes  
Compulsory: Mathematics
- A full “Secondary School Certificate and Profile” (SSC&P) at Level 2 will be accepted in lieu of one (1) O-Level pass.

## **Other Entry Requirements**

N/A

**Current Approved Programme Structure**

<b>Unit Code</b>	<b>Unit Title</b>	<b>ECVET</b>
ETBTC-306-1401	Building Technology and Setting Out Techniques	6
ETBTC-306-1402	Building Structures	6
ETBTC-306-1403	Building Services in Construction	6
ETBSV-306-1405	Introduction to Building Quantities	6
ETDFC-306-1402	Building Drawing Techniques	6
ETH&S-306-1404	Occupational Safety in the Construction Industry	6
CDKSK-304-1921	Mathematics	4
CDKSK-304-1922	English	4
CDKSK-304-1923	Malti	4
CDKSK-304-1924	Information Technology	4
CDKSK-304-1913	Individual and Social Responsibility	4
CDKSK-304-1925	Science	4
<b>Total ECVET/ECTS</b>		<b>60</b>

## Unit: ETBTC-306-1401 - Building Technology and Setting Out Techniques

Unit level (MQF): 3

Credits: 6

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### Unit Description

This unit develops learners' practical and calculating skills applying them to the typical setting out processes required in the construction work. The use of standard modern equipment and techniques will be emphasised. Learners will be able to apply practical experience working with contemporary instruments and software used in the setting out processes.

This unit will provide learners with knowledge and skills which will enable them to understand building drawings in different projections (orthographic, isometric, oblique, etc.). Learners will demonstrate an understanding of space, positioning in the area and comparing the built environment with representation of drawn elements of the structure.

Learners will use their own initiative to solve various tasks in different situations connected to the setting out process. According to the data used in the drawings, learners will develop necessary skills necessary to understand the process of planning, organize setting out and take care of the safety measures.

Learners are given a chance to demonstrate practical and mathematical skills, information technology knowledge, as well as problem solving and teamwork.

### Learning Outcomes

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

1. *Read and interpret building drawings in specific situations;*
2. *Calculate the data needed for the setting out process;*
3. *Produce in a safe manner a required setting out of a building for a specified task;*
4. *Carry out fieldwork exercises to establish the contours of an area, and make adequate measurements in a safe way;*
5. *Complete team tasks in specific situations (coordinate with others; demonstrate the setting out of buildings, drainage installations and road formations).*

## Unit: ETBTC-306-1402 - Building Structures

Unit level (MQF): 3

Credits: 6

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### Unit Description

Learners will be provided with knowledge about structural elements that are used in building construction. They will gain knowledge and ability to discuss various structural elements used in traditional systems of massive construction, as well as in contemporary skeletal systems, applied in residential houses. Legal principles and processes of making architectural projects will be emphasised to enable learners' understanding of the function and final look of residence building (and its environment). In addition, they will learn how the application of different structural elements connected to the system affects the functional layout and the final look of the building.

Learners will be able to apply theoretical knowledge in discussions about pre-construction activities in situations created by their tutors. They will be able to propose appropriate building systems with the necessary elements in all phases of construction (underground, above ground) - foundations, walls, slab structures, stairs, columns and beams. Along with the understanding of architectural planning process, they will develop their practical skills regarding the final look of the building in correct relation with the basic principles of creating houses.

### Learning Outcomes

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

1. *Apply proper structural elements of construction related to the function of a building and requirements of the project;*
2. *Prepare building activities;*
3. *Be familiar and apply the methods and techniques used in building construction for residential houses.*

## **Unit: ETBTC-306-1403 - Building Services in Construction**

**Unit level (MQF): 3**

**Credits: 6**

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### **Unit Description**

Learners will acquire the knowledge of the basic design and construction principles for standard services installations in houses. Learners will be provided with practical skills for installation and maintenance of building service installations: plumbing and drainage, electrical installations on high and low voltage, CCTV, fire alarm systems, heating, ventilation and air conditioning systems.

The main topics covered will include cold and hot water supply and distribution systems, house sanitarian systems, below ground drainage systems, electrical installations of a single phase and gas supply installations.

This unit will also provide opportunities for learners to practice their understanding of design principles and services used for the development of water supply, drainage, electrical and gas installations through technical drawings.

Learners will also be familiarised with the regulations associated with building services.

### **Learning Outcomes**

**Upon completion of this unit the student will be able to:**

- 1. Understand and develop water supply and distribution house systems in accordance with the associated regulations;*
- 2. Understand and develop drainage house systems in accordance with the associated regulations;*
- 3. Outline electrical house systems and associated regulations;*
- 4. Explain gas supply house installations and associated regulations.*

## Unit: ETBSV-306-1405 - Introduction to Building Quantities

Unit level (MQF): 3

Credits: 6

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### Unit Description

This unit provides learners with the knowledge of measuring instruments, standard methods of measuring, common techniques used to price construction works, estimating and tendering processes.

This unit aims to help learners develop measurement skills, as well as to estimate the amount of work and the preparation of the project documentation related to the part "Estimate of Quantities and Cost of Work", which is used in the contracting phase (tendering), construction phase and supervision.

In this unit, learners will explore the techniques using manual measurements with train gauges and contemporary instruments (modern ultrasound devices). In addition, learners will acquire theoretical knowledge and develop skills of price analysis and cost formation. Learners will use IT technology to develop the necessary calculations in relation to the estimate of quantities and costs of work.

### Learning Outcomes

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

1. *Apply the measuring techniques and calculate the accurate quantities of defined operations;*
2. *Apply the common techniques used for the price analysis and the costs of construction works;*
3. *Understand the purpose of tendering and its aims, common methods of tendering and required tendering documentation.*

## Unit: ETDFC-306-1402 - Building Drawing Techniques

Unit level (MQF): 3

Credits: 6

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### Unit Description

This unit provides learners with knowledge of technical and architectural drawings, the equipment used for drawings, symbols and conventions for presenting materials, objects and dimension lines. Learners will be able to develop the required skills and techniques for producing technical drawings (hand and CAD drawings).

Learners will gain knowledge of the types of drawings used in the design process and construction, depending on the scale of the drawing and the purpose for which these drawings are used. The role of graphical solutions of architectural problems will be emphasised, in various practical situations and tasks supervised by experts.

Skills development for architectural drawings will be acquired through the production and presentation of drawings in accordance with the standards set for their production (using hand tools and various software, related to appropriate scale, symbols, descriptions, line thickness, fill patterns, dimension lines, etc.).

Learners will carry out the required tasks and demonstrate an understanding of the marketing mix (price, product, promotion, and place). They will be prepared for further studying and technical work in the building industry.

### Learning Outcomes

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

1. *Recognise and comment on the various types of technical (or architectural) drawings which are used in the construction and architecture process;*
2. *Be familiar and select appropriate drawing accessories, equipment and material which will be used for various drawings for a specific situation;*
3. *Be familiar with and apply drawing standards, symbols and conventions to produce technical drawings.*



## **Unit: ETH&S-306-1404 - Occupational Safety in the Construction Industry**

**Unit level (MQF): 3**

**Credits: 6**

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### **Unit Description**

This unit provides learners with the knowledge of risks that can arise in the construction process, how to evaluate and predict the necessary safety precautions to enable them to work safely, efficiently and effectively on the building site.

Learners should understand the importance of safety procedures at work to keep their health and safety and that of their colleagues, as well as third parties in the region in check.

They will demonstrate foresight and protection methods against harmful consequences in various situations, by making the right choice of appropriate personal protective equipment and the appropriate safety procedures.

Learners will gain the necessary skills for their appropriate behaviour related to the existence of danger at workplace in order to reduce health risks prior to going to work, during work and after work.

### **Learning Outcomes**

**Upon completion of this unit the student will be able to:**

- 1. Apply principles of occupational safety and health on the construction site and in the surrounding environment;*
- 2. Identify hazards and risks and assess their impact on the workplace;*
- 3. Apply occupational safety procedures in a caused situation.*