MQF Level 6

Bachelor of Science (Honours) in Quantity Surveying

CE6-04-21

Course Description

This course prepares the learner for a successful career in quantity surveying. The programme structure provides an opportunity to explore a range of construction-related disciplines. During the programme, the learner will develop a comprehensive understanding of the disciplines which underpin construction management and the surveying professions. This knowledge will include subjects such as; economics, law, industry practice and building technology. Throughout the programme there will be a strong focus on project work and interdisciplinary collaboration is highly encouraged. The BSc Quantity Surveying programme leads to a development of specialist knowledge related to construction economics and contract law, with a particular focus on managing costs throughout the project life-cycle from early design through to building completion and beyond. As part of this programme the learners will also complete a dissertation on a research topic of their choice and a quantity surveying project, in which they will prepare a design cost plan for a project.

Programme Learning Outcomes

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

1. *Explain the principles of design, construction of buildings and built facilities abiding by the construction technology that underpin them.*
2. *Apply basic principles building measurement to project and cost management in the light of the law that underpins them.*
3. *Undertake the financial appraisal and feasibility of a development project by calculating final quantities and costings of construction operations and applying value management.*
4. *Explain procurement strategies which will lead to successful commercial management.*
5. *Conduct research in relation to the development and construction industry and in relation to Contract and Finance management.*

Entry Requirements

MCAST Advanced Diploma in Building Services Engineering
or
MCAST Advanced Diploma in Construction Engineering
or
MCAST Advanced Diploma in Civil Engineering
or
Undergraduate Diploma in Foundations of
Engineering
or
2 A-Level passes and 2 I-Level passes
Compulsory A-Level: At least one A-Level pass from Accounts, Engineering Drawing, Mathematics (Pure or Applied), Physics
Preferred I-Level: Engineering Drawing and Graphical Communications

Knowledge in CAD will be considered an asset

Current Approved Programme Structure

Unit Code	Unit Title	ECTS	Year
ETCNS-506-1803	Introduction to the Built Environment	6	1
ETLAW-506-1801	General Introduction to Law	6	1
ETQSS-506-1801	Introduction to Measurement	6	1
ETCNS-506-1804	Understanding Construction Technology and Material Science	6	1
ETQSS-506-1802	Introduction to Quantification and Computerised Taking Off	6	1
ETMTH-506-1514	Applied Mathematics for Construction and the Built Environment	6	1
ETCNS-506-1805	Construction Site Engineering	6	1
ETH&S-506-1512	Health, Safety and Welfare for Construction and the Built Environment	6	1
ETBTC-506-1502	Technology for Complex Buildings	6	1
CDKSK-503-1907	English 1	3	1
CDKSK-503-1908	English 2	3	1
ETCVE-506-1502	Contractual Procedures and Procurement for Construction and the Built Environment	6	2
ETPRJ-506-1804	Development Project	6	2
ETLAW-506-1802	Law and Economics for the Built Environment	6	2
ETMGT-506-1510	Management Principles and Application in Construction and the Built Environment	6	2
ETPRJ-506-1519	Group Project in the Construction Industry	6	2
ETPRJ-506-1521	Research Project	6	2
ETQSS-506-1804	Measurement, Quantification and Costing	6	2
CDKSK-604-1909	Entrepreneurship	4	2
CDKSK-602-2105	Community Social Responsibility	2	2
ETCNS-506-1527	Measuring, Tendering and Estimating for Construction and the Built Environment	6	2
ETPRJ-506-1902	Procurement Strategy	6	2
ETCNS-606-1904	Built Facility and Construction Industry Studies	6	3
ETFIN-606-1907	Value and Finance Management	6	3
ETQSS-606-1803	Advanced Measurement, Quantification and Costing	6	3
ETCNS-606-1905	Construction Economics and Cost Management	6	3
ETCNS-606-1809	Building Construction and Environmental Systems	6	3
ETCNS-606-1810	Construction Procurement-Commercial Management	6	3
ETLAW-606-1804	Advanced Contractual Procedures	6	3

ETPRJ-606-1805	Quantity Surveying Project	6	3
ETRSH-600-1502	Research Methods	0	3
ETDIS-612-1802	Dissertation	12	3
	Total ECTS	**180**	**/**

Unit: ETCNS-506-1803 - Introduction to the Built Environment

Unit level (MQF): 5

Credits: 6

Unit Description

This unit aims to develop an understanding of the context within which buildings are constructed including natural processes that shaped the terrain and human activities that formed the particular urban environment.

Students will gain knowledge on the processes that shape the terrain above which the urban areas are situated. They will also get an understanding of the types of natural environments and get an appreciation on issues of safeguarding and conservation. The students will have the opportunity to gain knowledge on the positive effects that the natural environment may have on the built environment while also gain an appreciation on the importance that the natural environment has for the built environment.

The students will gain an understanding how the built environment evolved over time and will be able to distinguish between the different typologies of the built environment. In addition, awareness on the drivers that led to different city forms prior to the 20th century will be provided.

The unit shall provide the students with an understanding of the human needs and how buildings and other spaces address such needs. Students shall be made aware of the way buildings are connected to one another through different modes of transport.
Students will gain knowledge to determine the particular identity of the built environment and make considerations on the role that old buildings and landmark buildings have within the built environment in order to provide an identity to the area. This is also complemented with an awareness on the ensuing issue between the need to conserve versus the quest for modernisation.

The unit will assist the students in gaining knowledge on the principles for sustainable development being applied and foster awareness on the importance to achieve sustainability. The students will be also made aware on the likely effects of climate change on the built environment. Thus, the students will be able to make considerations that a development will have in the wider context.

Learning Outcomes

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

1. *Appraise the natural features affecting an urban area.*
2. *Examine the historic development of the built environment.*
3. *Discuss what renders the built environment functional.*
4. *Assess emerging considerations for future urban areas.*

Unit: ETLAW-506-1801- General Introduction to Law

Unit level (MQF): 5

Credits: 6

Unit Description

The unit broadly aims to give the students an understanding of the substantive and procedural rules that can be found primarily in two (2) of the most important legislative instruments that form part of the Maltese legal system, namely the Civil Code (Chapter 16 of the Laws of Malta) and the Code of Organization and Civil Procedure (Chapter 12 of the Laws of Malta).

In particular, students will gain some knowledge on the historical and philosophical context of the Maltese legal system, as a continental system, as opposed to common law systems. In this context, the unit will also give the students an insight into the organization of the various legislative instruments making up the Maltese legal system and the organization of the judicial bodies which give effect to those legislative instruments.

At the core of the unit, the students will gain a thorough understanding of the basic substantive rules of contract law and tort law and the rules that are applied in the interpretation of contracts. The students will also acquire knowledge of the different types of obligations that may be found in contracts and the means with which they are extinguished. The unit will also delve on the principles of damages, both tortuous damages and also contractual damages.

The unit will also aim to impart to the students an understanding of the basic legal principles governing certain particular contracts, with particular reference to contracts of works.

Also at the core of the unit, students will be engaged in understanding, in some detail, the rules of procedure relative to the institute of evidence in general and also those rules relevant to the role of a quantity surveyor, both as an *ex parte* witness and as a court-appointed expert.

In the latter end of the unit, lectures will focus on training students to apply the rules referred to above, to real-life scenarios, with reference to jurisprudence, that are relevant to the professional practice that the students eventually embark upon.

Learning Outcomes

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

1. *Appraise the more important elements that make up the Maltese legal system.*
2. *Understand the basic substantive rules of contract law and tort law.*
3. *Appraise the rules of procedure relevant to the role of a quantity surveyor, both as an ex parte witness and as a court-appointed expert.*
4. *Apply the substantive rules and procedural rules referred to in the foregoing, in real-life scenarios.*

Unit: ETQSS-506-1801- Introduction to Measurement

Unit level (MQF): 5

Credits: 6

Unit Description

This unit will allow learners to demonstrate their knowledge and understanding of the measurement process about works within the construction industry. It has been devised to help learners to demonstrate an ability to apply basic measurement concepts and conventions to the construction industry, including the adherence to a standard method of measurement and to the standard traditional conventions for measuring work and processing the measurement to produce a bill of quantities. It is a unit with some practical content, including mathematical calculation and manual techniques in taking off and bill of quantity production.

The Unit is relevant to learners wishing to develop their knowledge of measurement concepts and principles in the construction industry. On completion of the Unit learners will understand the principles that underpin the measurement of work for construction projects, with knowledge of the standard methods of measurement, which apply, their structure and sections, processes and techniques to undertake measurement tasks, and manual techniques to produce measurements (using traditional dimension paper), abstracts and bills of quantities. This Unit will provide the Learner with an understanding of measurement conventions and documentation, with appropriate mathematical calculation techniques.

The learner will also be able to apply, analyse and evaluate the effects and implications upon the measurement process of the current differing range of standard methods of measurement, with emphasis upon the recently adopted RICS New Rules of Measurement (NRM2), the Maltese traditional method, Civil Engineering Standard Method of Measurement 4 and the transport Malta method of measurement (SL499.57). The learner will be able to carry out basic measurement tasks, with appropriate presentation and calculations, and continue the process, by converting those measurements to an abstract and finally to a bill of quantities, thus developing the understanding, knowledge and skills required to produce them.

Finally, learners should have the underpinning knowledge and understanding of the construction industry and simple construction technology. Some prior experience of measurement /quantification of building and civil engineering works would be advantageous.

Learning Outcomes

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

1. *Understand all types of standard method of measurement used in the construction industry.*
2. *Understand the traditional dimension paper and its use for the calculation of estimates and measured works.*
3. *Recognise why the current conventions are used by explaining the methods and techniques to undertake measurement tasks.*
4. *Understand the purpose for which measurement is carried out at various stages throughout the construction process.*

Unit: ETCNS-506-1804 - Understanding Construction Technology and Material Science

Unit level (MQF): 5

Credits: 6

Unit Description

Construction methods evolve by two methods, either through a scientific discovery or else by try and error over periods of time. Then as resources are depleted, advancements in construction develops in attempt to prolong resource life. However, innovative techniques are only discovered by respecting the balance between material strength and weakness. Therefore, this module would involve hands on laboratory practice to understand what materials are made of at first hand.

The field of construction engineering has various branches requiring different requirements. However, it's unfeasible to replace natural resources and rely on offshore procurement methods. Therefore, students following this unit will obtain a good foundation about the origin of Maltese geologic materials and their application.

Traditionally, Upper Coralline limestone was used in the lower courses and exposed element to act as an impermeable durable layer to deleterious weathering. On the other hand, Lower Globigerina limestone, was considered a soft material to be used for facades and sculptures. With regards to road works, construction methods involve subgrade material reinforcement that requires a well graded mixture of aggregate that maximize density without losing strength.

Therefore, this unit is aimed towards providing the learner the adequate skills necessary for a quantity surveyor to understand the materials involved in construction quality assurance.

Learning Outcomes

After completing this unit the student will be able to:

1. *Explain the geologic process of material formation, the importance of site investigation and describe safe methods of excavation.*
2. *Understand the properties of construction materials used to transfers load to the bedrock.*
3. *Understand the implications of compression and flexural actions acting on the material of main structural elements.*
4. *Understand the principles, types of roads, water services and the required machinery involved in the build-up of road works.*

Unit: ETQSS-506-1802 - Introduction to Quantification and Computerised Taking Off

Unit level (MQF): 5

Credits: 6

Unit Description

This unit will allow learners to demonstrate their knowledge and understanding of the quantification process about works and the computerized take off system within the construction industry. It has been devised to help learners to demonstrate an ability to apply basic take off techniques and conventions to the construction industry, including the adherence to a standard method of measurement and to the standard traditional conventions for measuring work and processing with computer software. It is a unit with some practical content, including mathematical calculation and manual techniques in taking off and bill of quantity production.

The Unit is relevant to learners wishing to develop their knowledge of quantification and computerised take off concepts and principles in the construction industry. On completion of the Unit learners will understand the principles that underpin the quantification of work for construction projects, with knowledge of the standard methods of measurement, which apply, their structure and sections, processes and techniques to undertake measurement with computer software, and manual techniques to produce take offs (using traditional dimension paper).

This Unit will provide the Learner with an understanding of measurement conventions and documentation, with appropriate mathematical calculation techniques. The learner will also be able to apply, analyse and evaluate the effects and implications upon the quantification process of the current differing range of standard methods of measurement, with emphasis upon the recently adopted RICS New Rules of Measurement (NRM2), the Maltese traditional method, Civil Engineering Standard Method of Measurement 4 and the transport Malta method of measurement (SL499.57). The learner will be able to carry out basic measurement tasks, with appropriate presentation and calculations, and continue the process, by converting those measurements to an abstract and finally to a bill of quantities, thus developing the understanding, knowledge and skills required to produce them.

Finally, learners should have the underpinning knowledge and understanding of the construction industry and simple construction technology. Some prior experience of measurement /quantification of building and civil engineering works would be advantageous.

Learning Outcomes

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

1. *Understand the different roles of the practices of quantification and costing in the development and construction processes.*
2. *Demonstrate how quantification is appropriately used at different stages of the process and in different circumstances.*
3. *Carry out the mensuration and quantification of items of construction work for the purposes of early stage estimates of cost and preparation of contract documentation.*
4. *Undertake simple, practical examples of taking off quantities of construction work items at an appropriate level of detail, by using a computer programme.*

Unit: ETMTH-506-1514 - Applied Mathematics for Construction and the Built Environment

Unit level (MQF): 5

Credits: 6

Unit Description

This unit has been designed to build upon previous mathematical knowledge covered in Mathematics in Construction and the Built Environment, to be used in a more practical construction context. Therefore, it is assumed that the learner has successfully completed this unit prior to commencing Applied Mathematics for Construction and the Built Environment. Furthermore, it acts as an essential basis for the successful completion of many of the other units within the qualification. Delivery of the unit should be set within the context of the award to which it contributes.

The first learning outcome will build upon the learners existing algebra skills and includes manipulating and solving equations that contain exponentials and logarithms, solving direct and inverse proportion problems in a construction context, using graphs to solve problems Displacement, velocity, acceleration, momentum, impulse and projectiles are introduced within this outcome and exploring matrices and using them to solve problems.

Learners will develop their trigonometry skills and ability to calculate areas and volumes of irregular shapes in learning outcome 2.

Learning outcome 3 will return to statistics to further develop techniques used to represent and interpret data and applying this technique in a practical context.

Learning outcome 4 will develop the student's knowledge of using vectors to represent and solve problems involving forces, velocity, time and displacement. Students will also be introduced to calculus and using differentiation and integration to solve problems.

Learning Outcomes

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

1. *Apply algebraic and graphical methods to construction problems.*
2. *Apply trigonometry methods to construction problems.*
3. *Apply statistical methods to construction problems.*
4. *Apply vectors and calculus methods to engineering problems.*

Unit: ETCNS-506-1805 - Construction Site Engineering

Unit level (MQF): 5

Credits: 6

Unit Description

This unit will cover the main concepts involved in the design, construction and refurbishment of buildings and infrastructure. Roles in the construction and built environment industry require the application of knowledge and understanding related to the design of structures and infrastructure and the selection and use of construction materials. This unit will delve into concepts and methodologies, applying the knowledge and skills to ensure that materials are fit for purpose and that specified quantities are ordered and used on a construction project.

This unit will first delve into developing skills needed to solve a variety of practical construction problems by applying scientific knowledge and carrying out mathematical techniques. Learners will be exposed to the manufacture, properties and degradation of construction materials. They will also learn to apply mathematical principles and techniques to carry out calculations that determine how materials behave under the action of forces or loads when used as structural members, and draw conclusions on whether a material is fit for the purpose.

Today's buildings can use combinations of modern and traditional techniques and materials in their construction. This unit will provide learners with an understanding of the technology used in the design and construction of low-rise domestic and commercial/industrial buildings. Learners will examine various forms of construction and consider the most appropriate forms for differing site conditions and client requirements. They will get an understanding of the different types of foundation that could be used on a project and the factors that influence its selection.

The significance of a safe system of work shall be investigated by examining the responsibilities of employees and employers with regards legislation and regulations and the procedures used to control hazards and risks for construction operations across a range of activities.

Lecturers will also delve into exploring a real-life construction project. Learners will be guided into considering the categorisation of the project and the associated design considerations. The methods and techniques of construction, and the materials used in the project will be examined, before developing an understanding of the potential economic and social impacts of the project. Learners will also be guided to consider the positive and negative impacts on the natural environment, locally and globally.

The last part of this unit will focus on an understanding of the substructures and earthworks associated with civil engineering. Lecturers will deliver information on how water is contained and controlled, on how the excavation of earth forms cuttings, trenches and deep excavations. The pouring of concrete and the formation of bridges, walls, foundations and other civil engineering structures is also covered.

Learning Outcomes

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

1. *Describe the use of materials as used in the construction industry.*
2. *Outline the common forms of low-rise construction projects.*
3. *Identify the health and safety procedures associated with civil engineering activities.*
4. *Examine the design of a construction project by investigating methods and techniques used and by exploring the impact of a construction project.*
5. *Identify the methods and techniques used to perform earthwork activities.*

Unit: ETH&S-506-1512 - Health, Safety and Welfare for Construction and the Built Environment

Unit level (MQF): 5

Credits: 6

Unit Description

The aim of this unit is to enable learners to understand the responsibilities of employers and employees to take measures to reduce risk and to meet legal requirements. Learners will gain knowledge of how to undertake risk assessments, record accidents and follow the reporting procedures.

Learners will explore the importance of planning for health and safety for themselves and others. They will investigate dangerous occurrences, common accidents and how to report an accident. Learners will explore risk assessment methods and control measures in construction. They will identify physical, environmental, psychosocial, chemical and biological hazards at work place. They will know the method of designing a risk assessments format that can be understood by everyone. Learners will know the legal requirements and safe systems of work and become familiar with components of health and safety management systems.

Learners will know the control measures for lifting and manual handling, working at height and working in excavations to avoid risks of accidents and injuries. They will know how to control site traffic and plant and apply general policies on non smoking, drugs and alcohol at workplace for health and safety of all the construction team at site. They will know the procedures for accident investigation, recording accidents and responsibilities during evidence gathering, interviewing and questioning to prepare report of Injuries, root causes and explanation of contributory factors.

Learning Outcomes

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

1. *Explain the responsibilities of employers and employees under current health, safety and welfare legislation applicable to the construction and built environment sector.*
2. *Design risk assessment methods and techniques using appropriate principles and formats.*
3. *Implement the control measures used to reduce risk and meet legal requirements.*
4. *Explain employee role in recording accidents and reporting procedures.*

Unit: ETBTC-506-1502 - Technology for Complex Buildings

Unit level (MQF): 5

Credits: 6

Unit Description

The unit basically covers the aspects required for the construction and design of complex buildings. The unit will go hand in hand with other unit such as Civil Engineering Technology and Structural behaviour and detailing. The unit will delve into the traditional types of construction such as traditional housing and apartment blocks and will be compared to large span structures such as high rise buildings and large span buildings (such as stadia and warehouses).

Popular building material such as concrete and steel will be explained in detail and lectures will focus on the history of use of these materials, their components and their mechanical properties. The typical building typologies used in large span structures as well as the importance of flexibility in the design and construction will be emphasised.

As most complex buildings in Malta are built using pre-stressed concrete a substantial part of this unit will focus on this topic. The reinforced concrete section will be described and its fundamentals explained. Students will be taught on the important of tension zones and the rebar requirements. The unit will then compare the use and design of pre-stressed structures. Precast concrete will also be described and its uses and production explained.

The last part of the unit will delve onto the subject of domes and trusses (as well as tensile structures). This topic will be described briefly and the overall concepts and construction methodologies will be introduced to the students in order to allow further research on the subject.

Learning Outcomes

On completion of this unit the student will able to:

1. *Explain the main types of complex buildings.*
2. *Define and briefly evaluate the use of the various materials and construction layouts used in multi-storey buildings.*
3. *Identify and explain the flooring systems used in complex buildings.*
4. *Define the main types of large span structural systems.*

Unit: ETCVE-506-1502 - Contractual Procedures and Procurement for Construction and the Built Environment

Unit level (MQF): 5

Credits: 6

Unit Description

This unit is aimed at re-enforcing and gaining further knowledge of contractual procedures and procurement in the construction industry. Within this unit the learner will encompass extended knowledge of procurement and contract forms that can be utilized within the industry. The methods of teaching will be at the discretion of the delivering centre, but must not be detrimental to the contents of the unit.

The learners will be assessed on their accurate knowledge of currently practised strategies of procurement and contract arrangements and administration for a range of construction projects and associated standard types and forms of contract. Explanation of the roles of contracting parties as well as their rights and obligations, compliance and dispute resolution is also required.

The learning is a blend of practical and theoretical work, which will allow the teaching centre a range of teaching and learning styles to be encompassed, as appropriate to the given situation. The student should have already developed an awareness of personnel involved within the construction industry and typical types of construction project. Previous successful study of lower level units in this area of study is required. All practices should be relevant to current best practice and recognized issues within the construction industry, as appropriate to local practice. All work should be completed to current legislation, with reference to the latest standard forms of contract, and good practice should always be adhered to.

Any health and safety issues should be shown on the risk assessment, which should be made available to the student.

Learning Outcomes

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

1. *Know the factors which affect the choice of construction procurement methods and contractual arrangements.*
2. *Know current issues and best practice, associated with the procurement of construction projects.*
3. *Know the roles and activities of the parties and organisations involved in the procurement of construction projects.*
4. *Be familiar with construction contracts in terms of time, cost and quality.*
5. *Be familiar with construction contracts in terms of supply chain management.*

Unit: ETPRJ-506-1804 - Development Project

Unit level (MQF): 5

Credits: 6

Unit Description

This unit will allow learners to demonstrate their knowledge and understanding of the measurement, estimation and the quantification process about works within the construction industry. It has been devised to help learners to demonstrate an ability to apply advanced measurement concepts and conventions to the construction industry, including the adherence to a standard method of measurement and to the standard traditional conventions for measuring work and processing the measurement to produce an abstract sheet and bill of quantities. It is a unit with some practical content, including mathematical calculation and manual techniques in taking off and bill of quantity production.

The unit is relevant to learners wishing to develop their knowledge and by providing instruction in developing skills and logical approach in measuring simple building works and provide a platform for further studies in the measurement and pricing of building works measurement concepts and principles in the construction industry. On completion of the unit learners will understand the principles that underpin the measurement of work for construction projects, with knowledge of the standard methods of measurement, which apply, their structure and sections, processes and techniques to undertake measurement tasks, and manual techniques to produce measurements (using traditional dimension paper), abstracts and bills of quantities. This Unit will provide the Learner with an understanding of measurement conventions and documentation, with appropriate mathematical calculation techniques.

The learner will also be able to apply, analyse and evaluate the effects and implications upon the measurement process of the different current range of standard methods of measurement, with emphasis upon the recently adopted RICS New Rules of Measurement (NRM2), Civil Engineering Standard Method of Measurement 4 and Maltese Method of Measurements. The learner will be able to carry out basic measurement tasks, with appropriate presentation and calculations by using BIM or any related software and continue the process, by converting those measurements to an abstract and finally to a bill of quantities, thus developing the understanding, knowledge and skills required to produce them.

Finally, learners should have the underpinning knowledge and understanding of the construction industry and simple construction technology. Some prior experience of measurement /quantification of building and civil engineering works would be advantageous.

Learning Outcomes

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

1. *Carry out the mensuration and quantification for the over-site area of the given project and the centreline of the foundation, by using BIM or any related software.*
2. *Carry out the mensuration and quantification of all walls and concrete for the given project and the centreline of all partitions, by using BIM or any related software.*
3. *Carry out the mensuration and quantification of finishes for the given project, by using BIM or any related software.*
4. *Create the abstract sheet and bill of quantities for the given project above, by using BIM or any related software.*

Unit: ETLAW-506-1802 - Law and Economics for the Built Environment

Unit level (MQF): 5

Credits: 6

Unit Description

In general, the aim of this module is to provide the Learner with a good grounding in legal analysis in preparation for employment in a wide range of built environment professional contexts. Key economic principles are introduced and their relevance to the built environment is explored. This module's introduction to both law and economics underpins the Learner's subsequent studies across the course.

In particular, the Learner will familiarize himself/herself with the substantive rules governing the building industry, especially those rules having an 'economic' dimension, with reference to pertinent legislation, including the more recent legislation that has attracted general interest.

At the core of the unit, the Learner will gain a thorough understanding of the role of technical professionals involved in the building industry, with particular emphasis on rules of conduct, ethics, and professionalism, relative to the statutory duties that the law places on the said professionals.

Also at the core of the unit, certain aspects of conflict avoidance and management, not otherwise covered under other units and with the 'economic' dimension in mind, will be delved in during the course of this unit.

In the latter part of the unit, lectures will focus on training the Learner to apply the rules referred to above, to real-life scenarios, with reference to relevant legislation (and jurisprudence), that are pertinent to the professional practice that the students eventually embark upon.

Learning Outcomes

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

1. *Understand the role of economics in a legal system.*
2. *Appraise the substantive rules governing the building industry, especially those rules having an 'economic' dimension.*
3. *Appraise the role of technical professionals involved in the building industry, with particular emphasis on rules of conduct, ethics, and professionalism.*
4. *Apply the rules governing the built environment.*

Unit: ETMGT-506-1510 - Management Principles and Application in Construction and the Built Environment

Unit level (MQF): 5

Credits: 6

Unit Description

The unit aims to develop an understanding of the principles of management in construction and the built environment sector.

Students will understand how management theories have evolved over time and how these have been applied in the construction sector. Students will also learn about the management functions and techniques required to manage construction organisations.

Organisation within the construction sector have variety of sizes and types. Students will learn about their structures as well as what happens when teams are formed to work on a specific project.

Managers have to produce various types of documentation which students will appreciate and will produce some of these for a given project. Construction sector is subject to change: legislation; standards; working practices; and technology. Project managers have to manage such changes and hence part of the unit deals with this aspect.

Students will learn about various forms of contract and procurement routes. They will be able to understand the contractual relationships among the parties to a contract in terms of obligations and responsibilities. Students will develop skills to make an informed decision on selecting suitable form of contract and procurement route for a given project.

Learning Outcomes

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

1. *Examine principles of management.*
2. *Analyse construction organisations.*
3. *Apply management principles.*
4. *Review contracting and procurement methods.*

Unit: ETPRJ-506-1519 - Group Project in the Construction Industry

Unit level (MQF): 5

Credits: 6

Unit Description

This is a practice based unit which will develop learners' skills in terms of the units covered so far. This unit will enable the application of knowledge, understanding and skills developed in other units and where possible also uses experiences that are developed through work in a design office.

This unit is designed to bring together small groups of learners into teams so that they can coordinate their individual skills and abilities. The importance of working as team and of keeping adequate records will be an important skill which will be well practiced throughout. The scheme of work should give individual learners an opportunity to take responsibility for their contribution to the outcome and demonstrate their ability to work as a team.

The project brief will include an agreed timescale with defined working constraints and parameters, with the goals leading towards an acceptable and viable solution to the agreed brief. The importance of the project's evaluation and the skills required to do so will be formulated in this Unit.

The basic skills required to produce a complete project will be tackled in this Unit such as the importance of design briefs, client ideas, surveys, preliminary investigations, sketches and so on. The architectural and structural aspect of the project will be tackled in detail and related to the theoretical units covered in other subjects.

Learning Outcomes

On completion of this unit the student will able to:

1. *Devise a project scope and a scheme of works for the project.*
2. *Begin the implementation of the scheme of work for the project.*
3. *Prepare the group project.*
4. *Present the group project drawings and documentation.*

Unit: ETPRJ-506-1521 - Research Project

Unit level (MQF): 5

Credits: 6

Unit Description

The aim of this unit is to enable students to identify and explore areas of personal interest through a sustained research effort which would develop skills to enquire independently using a structured approach. The unit will develop skills which are transferable as well as essential to be successful in any job roles within industry or academia.

The students will develop skills in developing research proposals by applying recognized research techniques. Students will develop themselves in the use of appropriate methodologies and application of statistical techniques and various software available. Students will develop a sound understanding in writing research proposals which are topical and are of relevance to the needs of the stakeholders.

Students will address any health and safety issues as well as ethical considerations arising out of the proposed research activities

Though it is expected that the student will choose a research area which is in line with their programme of study, the research topic should be the one which draws upon learning across the programme and which is substantial enough to be considered adequate at this level.

Students will develop their projects by starting with a proposal identifying aims, objectives, possible hypothesis or research questions and methodology which will be subject to approval by the supervisor. Students will collect and analyse data and present their findings in an appropriate manner.

Learning Outcomes

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

1. *Develop a research proposal.*
2. *Carry out the research project.*
3. *Present the research findings.*

Unit: ETQSS-506-1804 - Measurement, Quantification and Costing

Unit level (MQF): 5

Credits: 6

Unit Description

This unit will allow learners to demonstrate their knowledge and understanding of the measurement, quantification and costings of civil engineering process about works within the construction industry. It has been devised to help learners to demonstrate an ability to apply advanced engineering measurement concepts and conventions to the construction industry, including the adherence to a standard method of measurement and to the standard traditional conventions for measuring engineering works and processing the measurement to produce a bill of quantities. It is a unit with some practical content, including mathematical calculation and manual techniques in taking offs and bill of quantity production.

The unit is relevant to learners wishing to develop their knowledge and by providing instruction in developing skills and logical approach in measuring simple engineering works and provide a platform for further studies in the measurement and pricing of engineering works measurement concepts and principles in the construction engineering industry. On completion of the Unit learners will understand the principles that underpin the measurement of work for civil engineering projects, with knowledge of the standard methods of measurement, which apply, their structure and sections, processes and techniques to undertake measurement tasks, and manual techniques to produce measurements (using traditional dimension paper), and bills of quantities. This unit will provide the learner with an understanding of measurement conventions and documentation, with appropriate mathematical calculation techniques.

The learner will also be able to apply, analyse and evaluate the effects and implications upon the measurement process of the different current range of standard methods of measurement, with emphasis upon the recently adopted RICS Civil Engineering Standard Method of Measurement 4. The learner will be able to carry out basic measurement tasks, with appropriate presentation and calculations, and continue the process, by converting those measurements to a bill of quantities, thus developing the understanding, knowledge and skills required to produce them.

Finally, learners should have the underpinning knowledge and understanding of the construction industry and simple construction technology. Some prior experience of measurement /quantification of civil engineering works would be advantageous.

Learning Outcomes

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

1. *Describe alternative method of measurement for civil engineering works.*
2. *Identify civil engineering standard forms of contract and value management.*
3. *Describe how data management is collected and used with computerized software.*
4. *Carry out the mensuration and quantification of a Piling, piling ancillaries and diaphragm wall for a construction project by using BIM or any related software.*

Unit: ETCNS-506-1527 - Measuring, Tendering and Estimating for Construction and the Built Environment

Unit level (MQF): 5

Credits: 6

Unit Description

This unit will allow learners to demonstrate their knowledge and understanding of estimating and tendering within the construction industry. It has been devised to help learners to demonstrate an ability to apply established measuring, estimating and tendering concepts to the construction industry, including the format and interpretation of final quantities from dimensions and descriptions in bills of quantities, the basic information required to produce a tender, calculation of unit rates and all-in rates, through to producing a tender and the influence of contractual arrangements for a construction project.

The Unit is relevant to learners wishing to develop their previous knowledge of measurement, estimating and tendering concepts and principles: especially units in Level 4. On completion of the Unit learners will understand the principles that underpin construction and civil engineering projects, with knowledge of the personnel, procedures and documentation involved in the measurement, tendering and estimating processes. This Unit will provide the Learner with an understanding of selection of contractors, tender documentation and the scrutiny required, the gaining of further information (including site visits), the measurement process, bills of quantities, building up unit rates (including the importance of software) and the conversion of an estimate to a tender. The learner will also be able to apply, analyse and evaluate the effects and implications upon the tendering process of the differing range of project types and tender documentation. The learner will be able to outline the methods and techniques to derive costs, making use of available cost data and possibly software packages, developing the understanding, knowledge and skills required to produce them.The delivery of this unit should make regular and appropriate reference to the public sector procurement regulations – LN296 – 2010.

Finally learners should have the underpinning knowledge and some understanding of the construction industry, construction technology and of measurement/quantification of building and civil engineering works. In addition, an appreciation of currently-used contract conditions would be beneficial.

Learning Outcomes

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

1. *Explain the information required to produce a tender.*
2. *Apply the principles and techniques of estimating.*
3. *Formulate an estimate for construction operation.*
4. *Explain the tendering procedures and contractual arrangements.*

Unit: ETPRJ-506-1902 - Procurement Strategy

Unit level (MQF): 5

Credits: 6

Unit Description

This unit will allow learners to demonstrate their knowledge and understanding of the procurement strategies within the construction industry. It has been devised to help learners to demonstrate and to provide guidance and recommendations on the development within a public or private sector organisation of policies, strategies and procedures for the procurement of construction in the built environment, locally and internationally.

The Unit is relevant to learners wishing to develop their knowledge and by providing instruction in developing skills and logical approach in procurement approach and provides a platform for further studies in the tender understanding documentation for the construction industry. On completion of the unit, learners will understand the principles that underpin the procurement strategy of construction projects, with knowledge of procurement processes and the way procurement information will flow from the quotation development through delivery to work-site.

The learner will have the understanding, scope and purpose of describing the procurement process operations and its responsibilities to guarantee that all the specifications and standards of the contract are met. Thus, Cost Planning and Cost Control activities are determined and carried out during the project life cycle. The overall objective is to assure that the materials and equipment purchased, meet the required standard during manufacturing and fabrication until delivery to site.

Finally, learners should have the underpinning knowledge and understanding of the construction industry and simple construction technology. Some prior experience of procurement of building and civil engineering works would be advantageous.

Learning Outcomes

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

1. *Understand the administration of a contract and its variations.*
2. *Analyse the various standard forms of construction contracts in use.*
3. *Explain the process for appointing subcontractors and the contractual problems that could arise.*
4. *Discuss the relationship of the design process and cost planning and control of cost limits.*

Unit: ETCNS-606-1904 – Built Facility and Construction Industry Studies

Unit level (MQF): 5

Credits: 6

Unit Description

This unit will cover the requirement to achieve best practice in built facility management. The need for direct focus and adequately addresses the operational, spatial, and logistic requirements of the developer, is fundamental in order to achieve successful development delivery.

Strategic management decisions kick-off the built facility process, whereby the higher management executive of a company identifies the need for suitable built facilities to address the company's vision, goals, and aspirations. The existing building stock is review and critically reviewed, in context of the ability to address current and future needs.

Following the initial crucial goal setting strategic management stage, the requirement for adequate planning and projections is developed. These include a number of key decisions that must be in place, prior to the actual procurement process. Key decisions that must be developed and approved include design, legal, operational and commercial aspects. The need to consider windows of opportunity in maximizing revenue and other potential returns, such as capital allowances shall also be considered.

Following completion and mapping out of the planning process, actual procurement of the built facility shall start. Key activities include selection of potential tenderers /contractors, legal and commercial conditions of contract, period of performance and other critical issues or concerns expressed by the Client.

Finally, the studies will develop the understanding for the need of evaluating initial capital investment cost against cost-in-use and maintenance cost. Adequate consideration of the post-procurement challenges needs to be understood and evaluated in terms of any additional expenditure in the actual procurement stage.

Learning Outcomes

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

1. *Discuss the building facility procurement routes and processes, including activities and key decisions prior to actual implementation.*
2. *Discuss principal building facility procurement process and post-procurement activities.*
3. *Identify processes to be followed in aligning business and facilities strategies and plans, together with managing service delivery and performance.*
4. *Analyse the management of the supply of facilities services including operational facilities organisation, procurement, delivery, performance management and customer care.*
5. *Examine possible tax reliefs in the form of capital allowances, including application to development.*

Unit: ETFIN-606-1907 – Value and Finance Management

Unit level (MQF): 6

Credits: 6

Unit Description

This unit will cover the requirement to achieve best practice in the management of cost of any development. The need for financial discipline, value for money and meeting budget targets are major requirement for proposed development initiatives. The use of tools and techniques such as value management and value engineering, including cost monitoring are fundamental for fiscal good governance.

Cost monitoring and management in the various stages of a development are fundamental, hence the various techniques are identified and developed. The initial process of data collection and information gathering are an essential requirement for good financial governance. The use of a Work Breakdown Structure (WBS) enables the collation of information in a well-organized uniform elemental structure. Elemental structure, or framework, enables compilation of the ultimate elemental cost analysis whereby indicative budgets or costs are collated and evaluated in the order of pre-set requisites. Complementary classification on the same information by function, or use, enables a complete development to be analysed by function and corresponding elemental cost.

Techniques for establishing the most appropriate order of costs estimates throughout the proposed lifecycle of a development are identified and put into practice. The need to balance accuracy of indicative budget costs, available information and allocated resource course for collating such estimates dictates the requirement for a number of evaluation techniques.

Finally, the studies will develop the understanding for the need of full cost representation of a complete life-cycle costing (including design, construction, operation and end of life cost), rather than the initial build cost only.

Learning Outcomes

Upon completing the unit, learners should be able to:

1. *Identify the value management process, including particular relationship to other project management activities.*

2. *Identify and differentiate between value engineering and value management techniques.*
3. *Collate, analyse and chart potential saving opportunities through value management workshops.*
4. *Identify and discuss cost techniques including correlation to project financing and value management.*
5. *Analyse best practice in financial management of construction initiatives.*

Unit: ETCNS-606-1905 – Construction Economics and Cost Management

Unit level (MQF): 6

Credits: 6

Unit Description

This unit shall apply knowledge gained throughout the various units to practical use in construction economics and relevant cost management. Effective, relevant, and timely decisions related to cost are crucial for salient key decisions by Clients or Developers.

The initial introduction gives a good overview of the role of a Cost Manager and the importance of commercial management. Review of the principal role played by the cost manager within the Client's project team is followed by deeper understanding of principal commercial management activities. Commercial management in a proposed development is key to economic success and feasibility, hence closely monitored and managed in both the pre and post award phases.

Processes, activities and actions of cost planning and cost management are further reviewed in the various project development phases. The importance and effectiveness of indicative cost budgets to commensurate the design development process is further detailed. A good understanding of concept budget documents, including elemental cost plans is further developed and put to practice.

The importance of elemental cost planning in the development of commercial management tools throughout the lifetime of a proposal is further explained. The application of a standard classification system such as the New Rules of Measurement (NRM) by RICS is explained and applied into practical use.

Simultaneously the need for economic management in construction is further explained and developed with reference to processes and reporting tools such as crucial cost plans, cashflows and risk /opportunity registers.

Finally, unwarranted but realistic options of contract termination are investigated. Issues such as insolvency and potential corporate recovery are discussed and developed with particular emphasis on the circumstances in which these shall be applied.

Learning Outcomes

Upon completing the unit, learners should be able to:

1. *Describe the main roles of the Cost Manager and Commercial Management.*
2. *Justify cost planning to achieve best value in construction.*
3. *Apply cost management of a development from feasibility to design completion.*
4. *Explain construction economics and the application of cost management in practical terms.*
5. *Identify circumstances that can lead to the termination of the contract, corporate recovery and insolvency*

Unit: ETCNS-606-1809 – Building Construction and Environmental Systems

Unit level (MQF): 6

Credits: 6

Unit Description

The unit shall further complement the knowledge gained in building construction, through investigation and classification of the various building uses. Furthermore, alternative construction and finishes building materials shall be investigated, with emphasis on the most appropriate selection to address the final development use and most importantly the safety and comfort of the end-users.

Further analysis of the main elements that constitute any development shall be undertaken, with significant emphasis on the need to match the site, end-use or particular conditions. Analytic selection of building methodology and materials shall be undertaken, with particular direction in addressing the function, performance and quality aspect of the completed facility.

The need to efficiently address increased consumer demand, complemented with serious consideration of sustainability shall be developed. Development and the waste it generates shall be addressed through the full life-cycle including manufacture and assembly, through the final decommissioning / demolition stage. Targets and new ways of addressing current practices shall be discussed, complemented with a discussion of projected future possibilities through the application of information technology.

Finally, the effect of information technology including data storage, processing and exporting, shall be further developed. Practical use of data in smart cities and intelligent buildings shall also be evaluated, with particular reference to its application in the local industry.

Learning Outcomes

Upon completing the unit, learners should be able to:

1. *Discuss alternative building uses, available technology and construction materials, including particular relationship to building methodology and waste reduction.*

2. *Recognise the relationship between building elements and successful development.*
3. *Appraise the need for sustainability and identify current / future practices and initiatives in achieving established targets.*
4. *Assess major environmental and sustainability concerns, with particular reference to intelligent applications assisting surveying in the current digital world.*

Unit: ETCNS-606-1810 - Construction Procurement – Commercial Management

Unit level (MQF): 6

Credits: 6

Unit Description

This unit will cover the commercial management of construction works, including understanding of the need for commercial competitiveness. Studies enhance the appreciation for the need for continuous, intensified attention and sensitivity for the regular monitoring of anticipated income and expenses. Effective and intensified recording of costs and income followed by reporting are essential for the monitoring of profitability and the development's success. Effective and timely commercial management is key for Senior Management to keep abreast of established targets and take any required corrective key decisions when and as required.

Following the initial identification and classification of the various cost centres in construction projects, responsible stakeholders shall be identified. These individual cost elements shall be further analysed and split into the individual components. Knowledge of construction methodologies, market conditions and proposed materials shall be applied to determine effect on the time, cost and quality aspects of construction projects.

Techniques for establishing initial cost indications, monitoring and regular reporting shall be practised. Tools such as estimates of the order of costs, cashflow forecasting, projected forecasting and reporting shall be developed and practiced.

Finally, the studies shall explain and stress the need for precise and regular real-time reporting to Senior Management to take the required decisions including corrective actions required. Effective, clear and accurate reporting techniques shall be developed.

Learning Outcomes

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

1. *Identify and describe the main components that make up the cost of a project to the Client and the Contractor/s.*
2. *Apply the knowledge to the effective management of construction projects, including inception, monitoring and reporting.*
3. *Monitor, report and advise on sufficiency of projected costs, including cashflows and profitability to enable timely and effective management actions.*
4. *Apply the principles of Key Performance Indicators (KPIs) and benchmarking to draw parallels with similar development.*
5. *Identify and describe the correlation of cost certainty with design development and availability of required detailing.*

Unit: ETLAW-606-1804 – Advanced Contractual Procedures

Unit level (MQF): 6

Credits: 6

Unit Description

This unit will allow learners to demonstrate their knowledge and understanding of the contractual procuders within the construction industry. It has been devised to help learners to demonstrate and to provide guidance and recommendations on the development within a public or private sector organisation of policies, strategies and procedures for the contractual documentation of construction in the built environment, locally and internationally.

The unit is relevant to learners wishing to develop their knowledge and by providing instruction in developing skills and logical approach in contractual procedure approach and provides a platform for further studies in the tender documentation for the construction industry. On completion of the unit, learners will understand the principles that underpin the problems that may arise during construction of a projects, with knowledge of contractual procedures.

The learner will have the understanding, scope and purpose of describing the contractual process operations and its responsibilities to guarantee that all the standards listed in the contract are met. Thus, the client and the contractor are bind and the works could be carried out without problems during the construction phase. The overall objective is to assure that the client and contractor contractual agreement are met

Finally, learners should have the underpinning knowledge and understanding of the construction industry and simple construction technology. Some prior experience of contracts of building and civil engineering works would be advantageous.

Learning Outcomes

Upon completing the unit, learners should be able to:

1. *Deal with construction contracts where one of the parties suffers insolvency.*
2. *Explain how and why payment is made on construction contracts.*
3. *Explore issues relating to the payment of damages in construction contracts.*
4. *Explain how the relevant clauses of a traditional construction contract deal with the issue of time.*

Unit: ETPRJ-606-1805 – Quantity Surveying Project

Unit level (MQF): 6

Credits: 6

Unit Description

This unit will cover some of the contractual consideration issues to do with the purpose, scope, and construction of the contractual documentation. The form and purpose of each of the components that might typically comprise the total contract documents are then examined, together with an analysis of the documentary requirements of the commonly used standard forms of construction contract.

Modern construction specifications arose from the development of competitive tendering systems and the consequent need for precise and contractually binding documents that set out in detail all the contractor's work. In one form or another, therefore, specifications form part of the contract documentation for most projects. Together with the project drawings, various descriptive schedules and sometimes bills of quantities, they provide tendering contractors with a complete and accurate picture of the work required.

Learners will also learn how to compile a tender documentation for different types of project including, creating their respective specifications, select the appropriate standard forms of contract for different types of project and which clauses should be duly addendum. By working in group, the learners will learn how to distribute the work between themselves

Finally, learners should have the underpinning knowledge and understanding of the construction industry and construction technology. Some prior experience of procurement and measurement techniques of building and civil engineering works would be advantageous.

Learning Outcomes

Upon completing the unit, learners should be able to:

1. *Identify the scope of the specification and Bill-of-Quantities for different types of construction.*
2. *Compose a specification for a construction project.*

3. *Compile all the documentation required for a construction project.*
4. *Draw up a design cost plan for a construction project.*

Unit: ETQSS-606-1803 Advanced Measurement, Quantification and Costing

Unit level (MQF): 6

Credits: 6

Unit Description

This unit has been devised to help learners to demonstrate an ability to apply advanced engineering measurement concepts and conventions to the construction industry, including the adherence to a standard method of measurement and to the standard traditional conventions for measuring engineering works and processing the measurement to produce a bill of quantities. It is a unit with some practical content, including mathematical calculation and manual techniques in taking offs and bill of quantity production.

The unit is relevant to learners wishing to develop their knowledge and by providing instruction in developing skills and logical approach in measuring simple engineering works and provide a platform for further studies in the measurement and pricing of engineering works measurement concepts and principles in the construction engineering industry. On completion of the Unit learners will understand the principles that underpin the measurement of work for civil engineering projects, with knowledge of the standard methods of measurement, which apply, their structure and sections, processes and techniques to undertake measurement tasks, and manual techniques to produce measurements (using traditional dimension paper), and bills of quantities. This unit will provide the learner with an understanding of measurement conventions and documentation, with appropriate mathematical calculation techniques.

The learner will also be able to apply, analyse and evaluate the effects and implications upon the measurement process of the different current range of standard methods of measurement, with emphasis upon the recently adopted RICS Civil Engineering Standard Method of Measurement 4. The learner will be able to carry out basic measurement tasks, with appropriate presentation and calculations, and continue the process, by converting those measurements to a bill of quantities, thus developing the understanding, knowledge and skills required to produce them.

Finally, learners should have the underpinning knowledge and understanding of the construction industry and simple construction technology. Some prior experience of measurement /quantification of civil engineering works would be advantageous.

Learning Outcomes

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

1. *Evaluate the financial performance and position of an organisations using financial measures.*
2. *Carry out the mensuration and quantification of a structural construction project.*
3. *Carry out the mensuration and quantification of a road.*
4. *Carry out the mensuration and quantification for timber.*