

Module Title:	Building Technology, Materials and Structures 2
Language of Instruction:	English
Credits:	5
NFQ Level:	6
Module Delivered In	2 programme(s)
Teaching & Learning Strategies:	Lectures Case studies Visiting lecturers Site visits Lab Work Tutorials
Module Aim:	The aims of the subject are: (1) to familiarise students with building materials, both traditional and new, in order to make the correct choices when detailing buildings and to develop an understanding of the functions of the various elements within a structure; (2) to familiarise students with quality buildings and provide them with the ability to use and manipulate materials giving innovative and effective solutions to building problems and an awareness of the impact of current legislation and building regulations; (3) to develop an understanding of the applications for different structural materials and forms and the need for structure in building;

Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	to research and evaluate options in resolving constructional details and to describe and illustrate basic domestic buildings, their foundations, external envelopes, internal components, floor structures, roof structures and coverings;
LO2	to assess, through research, the properties and qualities of materials used in construction and to explain the importance of good building principles in the care of the environment and the durability of the building (i.e. sustainable development);
LO3	to choose appropriate structural materials and to discuss structural form and the impact of structure on space; to describe the basic concepts for structural behaviour of materials including stress and strain, elasticity, strength and factors of safety.
LO4	to explain the concepts of loads, load types and load paths and to describe the behaviour of simple structural elements such as beams, slabs columns and triangulated structures; and to describe the role of the primary structural elements for domestic house construction using standard tables

Pre-requisite learning
Module Recommendations <i>This is prior learning (or a practical skill) that is recommended before enrolment in this module.</i>
No recommendations listed
Incompatible Modules <i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module.</i>
No incompatible modules listed
Co-requisite Modules
No Co-requisite modules listed
Requirements <i>This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.</i>
No requirements listed

Module Content & Assessment

Indicative Content

Overview

Examination of traditional and new methods of construction relative to domestic scale buildings.

Architectural Working Details:

• The use of research and drawing in combining the functional requirements of various building types and components with detailed study of simple structures and materials. • The compilation of good specification and use of international drawing conventions in production information for the construction of buildings. • Working drawings detailing a simple building from foundation to roof with full annotation.

Materials:

• Timber; Growth and structure of trees; Grading of wood; Moisture content and seasoning; Natural and handling defects; Preservation; Timber products. • Glass o Manufacture; Properties; Treatments • Metal Products o Steel – manufacture and corrosion o Galvanising o Properties of sheet lead and its use in weathering details.

Structural Materials:

• Material Structural Behaviour o Elasticity o Stress o Strain o Hooke's Law o Ductility and Brittleness o Strength, Factor of Safety and Allowable stress • Timber

Structural Form:

• Bending moments and shear forces • Bending moment diagrams and shear force diagrams o 2nd moment of area • distributions due to bending moment • Stress distributions due to shear force • Rule of thumb for sizing timber floor joists • Truss Timber roof simple overview • Simple design of water cistern timber bearers

Loading

• Types of loads • Load paths o Action and Reaction o Linear forces and moments o Equilibrium o Reactions to Beams o Load paths for vertical loads through a multilevel structure. o Load path for wind loads on a motorway sign structure.

Laboratory and Model Making:

• Laboratory Experiments o Stress and Strain tensile test o Crushing a concrete cube o Moment equilibrium using a simple see-saw mechanism • Model Making o Building a tower using newspapers o Building a roof truss using cardboard o Building beams using balsa wood.

Assessment Breakdown	%
Project	40.00%
End of Module Formal Examination	60.00%

No Continuous Assessment

Project

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Project	Project	1,2,3,4	40.00	n/a

No Practical

End of Module Formal Examination

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	End of semester exam	1,2,3,4	60.00	End-of-Semester

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

Module Workload

Workload: Full Time		
<i>Workload Type</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	12 Weeks per Stage	3.75
Laboratory	12 Weeks per Stage	0.25
Estimated Learner Hours	12 Weeks per Stage	6.50
Total Hours		126.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_CMARC_B	Bachelor of Science (Honours) in Architectural Technology	2	Mandatory
CW_CMART_D	Bachelor of Science in Architectural Technology	2	Mandatory