

Module Title:	Building Technology, Materials and Structures 4
Language of Instruction:	English
Credits:	5
NFQ Level:	6
Module Delivered In	2 programme(s)
Teaching & Learning Strategies:	<ul style="list-style-type: none"> • Lecture delivery – 4 hours per week total, varying between Technology, Structures & Materials. Some delivery may be in Studio 3 • Projects – typically one each for technology, structures & materials, feeding into Studio 2 • Lab Experiments • Model Making • Tutorials • The key teaching & learning strategy is integration/‘feeding-in’, through content & timing, of Technology, Structures & Materials instruction with Studio 3 projects, including projects, to allow application of Technology, Structures & Materials theory with formative feedback
Module Aim:	<ul style="list-style-type: none"> • To provide the theoretical and technical background in construction, materials and structures for learners to detail and apply in Studio 3 projects, through introducing them to the characteristics of the main internal & external building materials/finishes used in small to medium scale non-domestic construction • To familiarize learners with the construction principles of sustainable site development & ground-works and concrete structures both pre-cast & cast in-situ and including primary, secondary and tertiary structures, as they affect architectural technology • To familiarize learners with the technologies, principles, materials, span characteristics, support requirements and typical details required for the non-structural completion of small to medium scale non-domestic buildings, including glazing, curtain walling, cladding, roofing and partitioning • To develop learners’ understanding of specification • To develop learners’ understanding of the application of Building Regulations requirements to the design and detailing of small to medium scale non-domestic buildings
Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Research and apply the structural, constructional and material principles of cross-wall, precast & insitu concrete to small to medium scale construction projects
LO2	Research and apply the technological & material principles of non-structural completions, including glazing, curtain walling, cladding, roofing and partitioning to small to medium scale concrete construction projects, including specification
LO3	Demonstrate an understanding of different types of structures and structural frames and have how the loads and load paths are transmitted from building/structural imposed and permanent loading to the foundation (Steel and concrete rigid and braced frames)
LO4	Apply Building Regulations requirements to a small to medium scale concrete building
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

Technology

Detailing for Part L compliance including insulation, airtightness, thermal bridging, moisture management (vapour barrier, breather membrane, DPM, DPC), Concrete construction: insitu & precast: Advantages & disadvantages of insitu & precast concrete, insitu structures, types and factors affecting formwork, insitu concrete finishes internal & external, reinforcement, insitu concrete remedial work, insitu stairs, junctions with other materials, precast concrete structures, components, tolerances, precast concrete details, precast concrete cladding. Apartment building & cross-wall construction: building envelope & structure, walls, green roofs, thermally broken balcony details, construction for lifts, doors (internal & external), high performance windows & curtainwalling, partitions. Roofing types: membranes, metal, asphalt. Sustainable site planning & construction: construction of paving & other hard landscaping surfaces, sustainable drainage, soft landscaping and street furniture

Materials

Non-domestic building materials both internal and external: Glass: Manufacture, properties, treatment, types and uses Concrete: In-situ, precast, reinforced, pre-stressed. Precast flooring systems, Concrete finishes (floor slab, formed finishes, exposed aggregate) Concrete Block Paving: Blocks and flags, sizes, bond patterns, surface finishes, PPV values, pavement make up, edge restraint details, vehicular usage. Bitumen and Asphalt Roofing Materials: Mastic Asphalt – manufacture, properties, roof construction, finishes. Bituminous Sheets – manufacture, sheet classification, performance, construction, finishes. Masonry products: Bricks and Blocks, clay, concrete, calcium silicate, mortars, properties, durability, dimensional changes, bed joint reinforcement, lintels, wind posts. Plastics and products: polymers, sheeting, fittings and paint systems Metal and products; ferrous and non ferrous, use in building

Structures

Masonry • Vertical Load Bearing • Lateral Load Bearing • Bed Joint Reinforcement • Lintels Concrete • RC slab – span arrangements, typical span/depth ratios • Precast Slabs – types, span ranges, typical span/depth ratios • RC Beams – framing arrangements, typical span/depth ratios • RC Columns – sizing guidelines. • Precast Frames – beam column frames • Steel Single Storey Frames • Framing Arrangements • Lateral Stability • Framing around opening • Column base details Cladding • Structural Support Details for cladding systems to meet requirements of projects. Overall Structural Behaviour Building Load Paths Lateral Stability of Buildings, Shear Walls, Bracing • Concrete – slump test, concrete cube tests, density, • Steel – tensile test

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	• Construction specifications linked to Studio 2 project • Materials project Structures project • Or as appropriate	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	3 hour formal 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	4.00
Estimated Learner Hours	12 Weeks per Stage	6.42
Total Hours		125.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_CMARC_B	Bachelor of Science (Honours) in Architectural Technology	4	Mandatory
CW_CMART_D	Bachelor of Science in Architectural Technology	4	Mandatory