

<b>Module Title:</b>	Commercial and Industrial Technology 1, Sustainable Technology 1
<b>Language of Instruction:</b>	English
<b>Credits:</b>	10
<b>NFQ Level:</b>	6
<b>Module Delivered In</b>	<a href="#">3 programme(s)</a>
<b>Teaching &amp; Learning Strategies:</b>	Lectures Projects Practicals Private study
<b>Module Aim:</b>	<p>The aims of the subject are: 1. To provide an awareness and understanding of the functions and requirements for substructure, &amp; foundations systems of commercial and industrial construction. 2. To provide an understanding of materials, properties, junctions and their interaction with modern construction techniques. The aims of the Commercial &amp; Industrial Technology section of this module are: 1. To provide an awareness and understanding of the functions and requirements for substructure, &amp; foundations systems of commercial and industrial construction. 2. To provide an understanding of materials, properties, junctions and their interaction with modern construction techniques. The aims of the Sustainable Technology section of this module are: 1. To develop competence in the evaluation of both traditional and renewable energy use in buildings. 2. To foster an understanding of sustainability issues in the design, construction, operation and usability of buildings.</p>
<b>Learning Outcomes</b>	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	To describe, explain, illustrate and apply an understanding of substructure & foundations systems of commercial and industrial construction and apply an understanding of materials, properties, junctions and their interaction with modern construction techniques.
LO2	To prepare and demonstrate understanding of the role and function of practicals, projects and reports and their interaction with modern construction techniques and the operation of the building site.
LO3	Demonstrate through sketches and written descriptions a knowledge of and reasoning behind sustainable building design in relation to the building's superstructure
LO4	To describe, explain, illustrate and apply an understanding of materials, properties, junctions and their interaction with modern superstructure construction techniques.
LO5	Demonstrate through sketches, written descriptions and applied calculations a knowledge of building energy related legislation, regulations, certification, economics, and usage.
LO6	Demonstrate through sketches, written descriptions and applied calculations a knowledge of energy efficient and sustainable building design, sustainable building practices and the usage of alternative sustainable energy technologies (renewables) for a building.
<b>Pre-requisite learning</b>	
<b>Module Recommendations</b>	
<i>This is prior learning (or a practical skill) that is recommended before enrolment in this module.</i>	
No recommendations listed	
<b>Incompatible Modules</b>	
<i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module.</i>	
No incompatible modules listed	
<b>Co-requisite Modules</b>	
No Co-requisite modules listed	
<b>Requirements</b>	
<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

#### Substructure, Foundations & Building Sites (48h)

a). Isolated bases (b). Piled and raft foundations. (c). High thermal performance foundation systems i.e. passive house. (d). Underpinning, retaining walls. Basements (e). Insulation for foundations (f) Temporary works. (g) Demolition work.

#### The Energy Efficient Building (12h)

(a) Impact of building form, thermal mass & orientation on a building's thermal performance (b) Passive and active solar heating & cooling (c) Thermal insulation and economical thicknesses, (d) thermal bridges and psi values, (e) airtightness and air infiltration (f) Passive House Standard (g) Nearly Zero Energy Buildings (NZEB) (h) Energy Retro Fitting techniques & details

#### Sustainable Buildings (8h)

(a) Sustainable Building Materials, sustainable materials, environmental impact of construction materials, management of the construction process & operation of the building (b) Green buildings, green/blue roofs & walls (c) Recycling water & waste; grey water, rainwater harvesting, SuDS

#### Energy Legislation, Policies, Standards and Certification (4h)

(a) Energy legislation, taxes and trading (b) Standards and codes of practice, e.g. Part L, Building Regulations, ISO 50001 (c) National & international energy policies (d) Energy Certification, e.g. BREEAM, LEED, BERs

#### Energy Management (6h)

(a) Energy management (b) Energy Audits

#### Energy Consumption Analysis (6h)

(a) Degree days (b) fuel types (c) fuel consumption and costs

#### Energy Technology and Renewables (12h)

(a) Renewable energy sources - solar thermal and PV panels, heat pumps, wind turbines, bio fuel, micro CHP, nuclear, etc. (b) Integration of alternative technologies into building design & construction methods

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	Practically based projects applying class based knowledge	1,2	40.00	n/a

No Practical

### End of Module Formal Examination

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	A formal end of year exam covering class based theory, design and calculations	1,2,3,4,5,6	60.00	End-of-Semester

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

### Module Workload

Workload: Full Time		
Workload Type	Frequency	Average Weekly Learner Workload
Lecture	12 Weeks per Stage	7.00
Laboratory	12 Weeks per Stage	1.00
Independent Learning	12 Weeks per Stage	4.00
Project	12 Weeks per Stage	2.00
Total Hours		168.00

**Module Delivered In**

Programme Code	Programme	Semester	Delivery
CW_CMOPB_B	<a href="#">Bachelor of Science (Honours) in Construction Management</a>	3	Mandatory
CW_CMQSU_B	<a href="#">Bachelor of Science (Honours) in Quantity Surveying</a>	3	Mandatory
CW_CMBSE_D	<a href="#">Bachelor of Science in Construction Management</a>	3	Mandatory