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| Module Title: | Structures I |
| Credits: | 5 |
| NFQ Level: | 7 |
| Module Delivered In | 1 programme(s) |
| Teaching & Learning Strategies: | Lectures Projects Private study |
| Module Aim: | The aim of the module is to develop a knowledge and understanding of the design and or detailing of: - (1) Statically determinate beams (2) section properties (3) analyses of pinned 2d trusses/frames (4) Timber floor design (EC5) (5) Simply supported Beam/Slab design (EC2) (6) Load paths in single/multi-storey structures (7) To have an understanding of the the long and short term implications of material section and construction type and method |

| Learning Outcomes | |
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| <i>On successful completion of this module the learner should be able to:</i> | |
| LO1 | 1. To understand the concept of Global stability, shear force and bending moments acting on statically determinate beams |
| LO2 | 2. To understand section properties of symmetrical and asymmetrical structural section , and how this impacts on the internal moment resisting capacity of such section |
| LO3 | 3 . To carry out analyses of pinned 2-d trusses and frames and to identify the nature of the axial forces in each member (Tension/compression) |
| LO4 | 4. Carry out full (bending, shear and deflection) RC simply supported design of Beams/slabs to EC2 |
| LO5 | 5. Understand how load paths travel through structures |
| LO6 | 6. Understand how and carry out full timber joist floor design to EC5 (bending, shear and deflection) |
| LO7 | To understand the implications of long and short term sustainability (construction and long term carbon footprint) when selecting a particular material and construction type and method, and the long term implications of construction maintenance |

| Pre-requisite learning |
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| 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 |
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| (1) Foundations (20 hours) (a) Pad Foundations (b) Combined foundations (c) Types of piled foundations (d) Pile and pile cap design |
| (2) Earth Retaining Structures (20 hours) (a) Reinforced concrete retaining walls; (b) Design of R.C. retaining walls; (c) Detailing of R.C. retaining walls; (d) Design of Mass Concrete/Gravity Retaining Walls; (e) Sheet pile retaining walls; (f) Detailing cantilever sheet pile walls. |
| (3) Highway Structures (10 hours) (a) Types of highway structures (b) Bridge abutments and piers (c) Bridge decks |
| (4) Underground Structures (10 hours) (a) Underground water tanks. (b) Detailing of underground water tanks. |
| (5) Continuous Reinforced Concrete Members (30 hours lectures) (a) Analysis of continuous reinforced concrete members. (b) Analysis and design of R.C. using computer packages. |
| (6) Structural Steel (20 hours) (a) Design of Steel Beams. (b) Design of Steel Column with combined axial load & bending. (c) Connections in structural steelwork |
| (7) Prestressed Concrete (10 hours) (a) Introduction to prestressed concrete |

| Assessment Breakdown | % |
|-----------------------|---------|
| Continuous Assessment | 100.00% |

| Continuous Assessment | | | | |
|-----------------------|------------------------|-------------------|------------|-----------------|
| Assessment Type | Assessment Description | Outcome addressed | % of total | Assessment Date |
| Other | n/a | 1,2,3,4,5,6,7 | 100.00 | n/a |

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| No Project |
| No Practical |
| No End of Module Formal Examination |

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

Module Workload

| Workload: Full Time | | |
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| <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_CMCIV_D | Bachelor of Engineering in Civil Engineering | 5 | Mandatory |