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| Module Title: | Structures I |
| Language of Instruction: | English |
| Credits: | 10 |
| NFQ Level: | 7 |
| Module Delivered In | 1 programme(s) |
| Teaching & Learning Strategies: | Lectures Project work Private study |
| Module Aim: | The aims of the module are: (1) to develop an understanding of structural theory and analysis; (2) to develop a knowledge of the elastic design of timber and steel beams. (3) to develop a knowledge of the design and detailing of structural elements in reinforced concrete. |

| Learning Outcomes | |
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| <i>On successful completion of this module the learner should be able to:</i> | |
| LO1 | to draw a shear force and bending moment diagram for statically determinate members. |
| LO2 | to calculate the section properties for symmetrical and non-symmetrical sections. |
| LO3 | to calculate the elastic bending stresses and the deflection of simply supported timber and steel members. |
| LO4 | to analyse a simple truss using the method of sections and method of joints. |
| LO5 | to calculate the characteristic dead and imposed loads on structural members. |
| LO6 | to design a simply supported reinforced concrete beam and slab in accordance with Eurocode 2. |

| 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

Theory of Structures

(a) Section properties:- area, second moment of area, elastic modulus and radius of gyration (b) Shear force and bending moment diagrams (c) Theory of simple bending (d) Tension and compression members (e) Effective length and slenderness ratio. (f) Axial capacity of compressive members. (g) Analysis of pinned jointed frames

Design of Structural Elements

a. Load on structural elements b. Design methods: permissible stress and limit state c. Elastic bending stress d. Shear stress e. Deflection f. Analysis of a reinforced concrete section. g. Cover to reinforcement h. Characteristic and ultimate loads i. Design shear force and bending moment j. Tension steel k. Shear steel l. Deflection m. Design of reinforced concrete elements to the relevant National and European Standards.

Detailing of Structural Elements

a. Bond and Anchorage b. Lap lengths c. Curtailment d. Reinforcement scheduling e. Weight of reinforcement

| Assessment Breakdown | % |
|----------------------------------|--------|
| Continuous Assessment | 20.00% |
| Project | 20.00% |
| End of Module Formal Examination | 60.00% |

Continuous Assessment

| Assessment Type | Assessment Description | Outcome addressed | % of total | Assessment Date |
|-----------------|------------------------|-------------------|------------|-----------------|
| Examination | Class Exam | 1,2,3,4,5,6 | 20.00 | n/a |

Project

| Assessment Type | Assessment Description | Outcome addressed | % of total | Assessment Date |
|-----------------|------------------------|-------------------|------------|-----------------|
| Project | Design Projects | 1,2,3,4,5,6 | 20.00 | n/a |

No Practical

End of Module Formal Examination

| Assessment Type | Assessment Description | Outcome addressed | % of total | Assessment Date |
|-----------------|------------------------|-------------------|------------|-----------------|
| Formal Exam | Final Exam | 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 | | |
|----------------------------|--------------------|--|
| <i>Workload Type</i> | <i>Frequency</i> | <i>Average Weekly Learner Workload</i> |
| Lecture | 30 Weeks per Stage | 4.00 |
| Estimated Learner Hours | 30 Weeks per Stage | 4.00 |
| Total Hours | | 240.00 |

Module Delivered In

| Programme Code | Programme | Semester | Delivery |
|----------------|--|----------|-----------|
| CW_CMHCE_B | Bachelor of Engineering (Honours) in Civil Engineering - Ab Initio | 3 | Mandatory |