

Module Title:	Road Design
Language of Instruction:	English
Credits:	5
NFQ Level:	8
Module Delivered In	1 programme(s)
Teaching & Learning Strategies:	Lectures; Project Work; Private Study
Module Aim:	The aims of this module are to provide the students with a knowledge of (1) the Civil 3D design package for the geometric layout design of roads and junctions; and (2) the bituminous materials used in road construction
Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Prepare a geometric design of a section of road and junction using 3D road design software.
LO2	Select appropriate bituminous pavement structures for vehicle loading and specify appropriate testing for these materials.
LO3	Demonstrate appropriate presenting, written and visual communication skills including writing reports, presentations and preparing drawings using 3D road design software.
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>	
Bachelor of Engineering (Ordinary) in Civil Engineering	

Module Content & Assessment

Indicative Content

Geometric Design for Highways

(a) Geometric details of Roundabouts (b) Sign posting and road marking (c) Geometric parameters on design speed (d) Horizontal alignment (e) Vertical alignment (f) Geometric design project for a highway (g) Relevant excerpts from Transport Infrastructure Ireland DMRB

Civil 3D

(a) Horizontal Alignment (b) Vertical Alignment (c) Assemblies (d) Corridors (e) Sample Lines (f) Cut and Fill Volume Calculations

Soil Engineering for Highway Design

(a) Soil characteristics (b) Basic engineering properties of soil (c) Classification of soils for highway construction (d) Soil compaction (e) Sub- base and road- base materials (f) sustainable re use of materials in road construction

Materials in Pavement Design Part I

(a) Binder Types (b) Manufacture, storage and handling of bitumen (c) Constitution, structure and mechanical testing of bitumen (d) Bitumen emulsions and modified bitumen (e) Aggregate specifications (f) Composition and specification of bituminous paving material (g) Blended aggregates and mix design (h) Transport, laying and compaction (i) Recycled materials in road construction

Design of Flexible Pavements

(a) Structural Components (b) General principles (c) Foundation design (d) Pavement design using LL 1132 (Powell et al, 1984) (e) Pavement design using DMRB HD 25-26 charts (f) Traffic loading

Assessment Breakdown	%
Continuous Assessment	20.00%
Project	80.00%

Continuous Assessment

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Other	End of Term Exam	1,2	20.00	Ongoing

Project

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Project	Project Literature Review, Presentations etc	2,3	30.00	Sem 1 End
Project	Geometric Road Design	1,3	50.00	Every Week

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		
<i>Workload Type</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lab/Lecture	Every Week	3.00
Estimated Learner Hours	Every Week	3.00
Total Hours		6.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_CMHCE_B	Bachelor of Engineering (Honours) in Civil Engineering	5	Mandatory