CONT H2506: Building Information Modelling

Module Title:	Building Information Modelling
Language of Instruction:	English

Credits:	10

NFQ Level:	6

Module Delivered In	1 programme(s)

Teaching & Learning Strategies:	Lectures Practical's Private study

Module Aim:	The aims of the subject are: (1) To increase productivity and master professional level techniques in Building Information Modelling environment. (2) To develop a practical knowledge of structural detailing in reinforced concrete, structural steelwork, (3) To give the student the ability to quantify structural elements in reinforced concrete and structural steelwork. (4) To develop a knowledge of structural timber and masonry. (5) To give students the computer skills required to communicate effectively in a modern technical environment. (6)To teach students how to interpret drawings in relation to Bills of Quantities and other contractual documents. (7) To leverage BIM preconstruction tools for site and constructability evaluation.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Use basic modelling techniques and sustainable design strategies in BIM to construct and evaluate buildings of medium complexity, focusing on the highest professional standards.
LO2	Use BIM tools to import and export a wide range of information with other applications.
LO3	Create Sheets Layouts; Plans, Elevations, Sections, Details, Site Plans, 3D Sections, automated schedules and legends of building components and drafting views of details in substructure and superstructure.
LO4	Prepare good quality working drawings of commercial and residential projects to the highest professional standard.
LO5	(a) Import coordinate list into Civil 3D and terrain a model, generating contours, levels and sections. (b) Create good quality working drawings of a site plan and longitudinal section of commercial and residential projects.
LO6	(a) Prepare good quality reports, letters and graphical presentations for various stages of the construction process. (b) Create, edit and print a variety of word processing, databases and spreadsheets documents.
LO7	Accurately predict material construction costs using BIM material takeoff tools.
LO8	Create and manage drafting views ensuring that they are tied parametrically to sheets and all references are dynamic and coordinated. Create 3D details fully annotated, using parts and assemblies.

Pre-requisite learning		
Module Recommendations *This is prior learning (or a practical skill) that is recommended before enrolment in this module.*		
6627	CONT H2506	Building Information Modelling
Incompatible Modules *These are modules which have learning outcomes that are too similar to the learning outcomes of this module.*		
No incompatible modules listed		
Co-requisite Modules		
No Co-requisite modules listed		
Requirements *This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.*		
No requirements listed		

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Module Content & Assessment

Indicative Content
Building Information Modelling Use BIM and sustainable design strategies to prepare and evaluate buildings of medium complexity, focusing on the highest professional standards. Create conceptual and detailed energy analysis reports from their BIM models.
BIM Customisation of Systems, Families and Project Settings (a) Setting up project environments in (BIM). (b) Get acquainted with the graphical user interface of the latest version of Autodesk Revit Architecture. (c) Create basic modelling elements: Covering the following topics; levels, grids, walls, floor, ceiling, roofs, doors, windows, curtain walls, foundation and piling, columns, beams, bracing and truss systems, stairs, ramps and railings. (d) Modifying and creating family geometry in BIM. (e) Creating views, basic legends and schedules. (f) Geometry formation and in-place families. (g) Create family types in the project environment and family editor.
Create Professional-quality Construction Documentation (a) Control the Revit display and plotting environments. (b) Placing views on sheets, create presentation techniques for plans, elevations, sections, callouts of drafting views, 3D isometric, perspective views, animated sun studies, and simple renderings that let you explore materials and lighting. (c) 2D draughting, annotation and component categories, detail component libraries, repeating details, tags, and keynotes. (e) Create views, manage schedules and legends in (BIM). (f) Publishing, populating sheets, working with schedules and document management.
Wall creation, manipulation and Site Modelling (a) Wall types, working with levels, attaching walls, editing wall shapes. (b) Creating and editing toposurfaces, building pads, regions and sub-regions.
Green Building Studio Create conceptual and detailed energy analysis of your BIM models.
BIM material takeoff tools Accurately predict construction costs using BIM material takeoff tools.
Computer Aided Design (a) Arranging the AutoCAD user interface (b) Use AutoCAD hatch, text, dimensioning and annotation functions to suit different viewport scales. (c) Create and plot multiple viewports and mix 2D plan and 3D models views on the same drawing. (d) Create and edit colour dependent plot styles table using line weights and screening, mixing monochrome and colour. (e) Create and edit dynamic blocks (f) Open multiple AutoCAD drawings using the AutoCAD Design Centre and reuse components and setting using drag and drop techniques. (g) Scan raster images into AutoCAD drawings (h) Create and edit drawings (i) Use AutoCAD function keys (j) Use and save the user co-ordinate system to further increase drawing accuracy. (k) Understand linetype global scale factor / object scale (l) Understand how drawings are structured using layers and the purpose of controlling layer visibility. Create layers with meaningful names and assign linotypes, line weights (m) Create block, blocks with attributes and blocks libraries (n) Extract attribute information from drawing into Excel to create a bill of materials. (o) Control the use of layout and sheets (p) Control the AutoCAD display and plotting environments (q) Share data working with other applications Word and Excel. (r) Extract a coordinate list from a survey. Import the coordinate list into Civil 3D, generate a model and export the information in AutoCAD maintaining a real-world scale. (s) Scan an ordnance survey map and scale reference it to real life size using the OS scale bar as reference. (t) Produce two dimensional drawings using A4, A3, A2 and A1 sheet with multiple viewports.
Microsoft Office (a) Use spreadsheets to perform numerical analyses, such as listing data and performing calculations on data. (b) Use databases to create, maintain and use list of related information. (c) Extract attribute information from drawing into Excel to create a bill of materials. (d) Share data working with other applications Word and Excel. (e) Create, edit and print a variety of word processing, database and spreadsheet documents. (f) Prepare good quality reports.
(1) Reinforced concrete Detailing (a) Properties of Reinforced Concrete (b) General arrangement drawing (c) Reinforced concrete detailing Foundations Columns & walls Beams Slabs Stairs (d) Bending Schedules and weights of reinforcement
(2) Structural Steelwork Detailing (a) Steel sections (b) Bolts, holes, notches and welds (c) Base plate detail (d) Column to beam connections (e) Beam to beam connections (f) Roof trusses (g) Bracing (h) Precast concrete floors, stairs and walls
(3) Structural Timber (a) Timber grading (b) Moisture content (c) Preservative treatment (d) Timber member sizes
(4) Masonry (a) Masonry units and wall types (b) Compressive strength (c) Mortar (d) Wall-ties
(5) Drawing practice - Substructure: (a) Foundations (b) Basements (c) Internal and External tanking (d) Floors
(6) Superstructure: (a) Frame buildings (b) Steel buildings (c) Portal frame (d) Timber portal frame (e) In-situ and pre-cast R.C (f) Insulation and roof covering (g) Cladding: R.C. and GRC

Assessment Breakdown	%
Project	100.00%

No Continuous Assessment

Project

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Project	Detached Two Storey Residential Building	1,2,3,4,5,6,7,8	40.00	Sem 1 End
Project	Small Scaled Commercial Building	1,2,3,4,5,6,7,8	60.00	Sem 2 End

No Practical

No End of Module Formal Examination

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

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Module Workload

Workload: Full Time		
Workload Type	*Frequency*	*Average Weekly Learner Workload*
Contact Hours	30 Weeks per Stage	2.00
Contact Hours	30 Weeks per Stage	2.00
Estimated Learner Hours	30 Weeks per Stage	6.00
	Total Hours	300.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_CMBSE_D	Bachelor of Science in Construction Management with Buildings Services	3	Mandatory