Module Title:	Graphics, CAD & BIM II
Language of Instruction:	English

Credits:	10

NFQ Level:	7

Module Delivered In	No Programmes

Teaching & Learning Strategies:	• Studio-based projects & problem-based learning to develop the learners' problem- solving methodology to an advanced level, in an architectural technology context, with one-to-one reviews/tutorials and group/class 'crits' to provide student feedback • Group/team work utilised as appropriate • Lecture format utilised to provide theoretical instruction in CAD/BIM/3DS/Photoshop software tools • Formative assessment given through one-to-one reviews/tutorials and group/class 'crits' & reviews • Structured marking of projects as continuous assessment, involving allocation of marks for: - Final drawings, details, specifications & visualization

Module Aim:	The aims of this module are: • To assist learners in understanding the relative & complimentary uses of the major tools at their disposal, including manual and CAD drawing, 3D/BIM modelling, advanced presentation and written specification • To integrate building information modelling (BIM) into Studio Projects. • To enhance elevations and plans using Photoshop's layer style effects. • To use 3DS Max Design to create hyper-realistic 3D visualizations of your designs

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	• Use more advanced modelling techniques and sustainable design strategies to construct and evaluate different building of medium complexity, focusing on the highest professional standards. Evaluate onsite energy systems and create detailed energy analysis of BIM models.
LO2	• Introduce mechanical, electrical and plumbing (MEP) systems into BIM models and evaluate the sequence in which MEP services are used.
LO3	• Use Revit tools to import and export a wide range of information with other applications.
LO4	• Create plans, elevations, sections, details, 3D details, 3D views, schedules, legends of building components and callouts of BIM models.
LO5	• Setup and manage a BIM collaborative environment and run clash detection to immediately see conflicts among architectural, structural, and mechanical components.
LO6	• Create 3D design visualisation of buildings and its spaces and to show a variety of design options.
LO7	• Extract entourage objects from photographs and use them in architectural illustrations, renderings, plans and elevations.
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.*		
5295	GRAP H2504	Graphics, CAD & BIM I
5296	GRAP H3512	Graphics, CAD & BIM II
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		

Module Content & Assessment

Indicative Content

Building Information Modelling
Use BIM and sustainable design strategies to produce and prepare buildings of medium complexity, focusing on the highest professional standards.

BIM Customisation of Systems, Families and Project Settings
• (a) Create advanced modelling elements: Covering the following topics; walls, windows, doors, foundatiions and piling, beams and truss systems, stairs, ramps and railings; advanced modelling features. Curtain walls. (b) Advance design techniques. Roofs and slabs: advance shape editing. (c) Project phases and design optons.(d) Create, modify and save view templates and load them into projects. (f) Massing families, in-place massing, form manipulation, terrain modelling, analysing the building concept. (g) Export Revit models in forms that others can read and how to import information that is relevant to their projects from other sources. Covering the following topics; exporting, importing and linking, working with imported files, working with civil engineering DWG files, and starting a drawing from a scanned image file. (h) Room definition and boundary elements, room schedules, room area and volume, colour schemes and legends.

Detailing Techniques and Sustainable Design
(a) 2D drafting views use annotation tools and component categories, detail component libraries, repeating details, lines and arc, text, tags and keynotes. (b) Create perspective 3D sectional views that slice through the model, providing stunning graphics that can help better explain plans, sections, details and 3D in one view. (c) Incorporating a sustainable design approach from the beginning, leverage schedules to track sustainable design strategies. (d) Generate an animated solar study that can show the effect of shadows over time, throughout the year. (f) Use Green Building Studio to create conceptual and detailed energy analysis of your models.

Create Professional-quality Construction Documentation
(a) Create sheets, views, annotation, tags, schedules, legends, sections, 3D sections, elevations, details and keynotes. (b) Creating and populating sheets, working with schedules and legends, publishing and document management. (c) Create material finishes from digital images using real world scale. (d) Render real-surfaces with architectural materials.

Mechanical, Electrical and Plumbing (MEP)
(a) Link model into MEP templates, setup project standards. (b) HVAC heating and cooling, ductwork, piping, lighting, power and communications, mechanical systems, electrical systems and circuits, plumbing systems and fire protection.

Photoshop Essentials
(a) Extract entourage (people, cars, plants) from photographs and create libraries of entourage. (b) Create photomontage views and use entourage to enhance your presentations. (d) Enhance plans, elevations, and sections in Photoshop using texture, shadows, reflection and adding entourage.

3ds Max Design
(a) Export Revit models, and link the file into 3DS Max Design so that you can create more advanced rendering, and setup animated walk-through. (b) Simulate lighting effects accurately with global illumination. (c) Use scanline, radiosity and metal ray rendering

Navisworks
Import and manage your BIM model in Navisworks, setup rules for object and geometry and run clash detection on your models.

Assessment Breakdown	%
Project	100.00%

No Continuous Assessment

Project					
Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*	
Project	Building Interior Fit-out	1,2,3,4,5,6,7,8	25.00	Week 6	
Project	Existing Building Refurbishment and Upgrade	1,2,3,4,5,6,7,8	25.00	Sem 1 End	
Project	Thesis Project	1,2,3,4,5,6,7,8	50.00	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

Module Workload

Workload: Full Time

Workload Type	Frequency	Average Weekly Learner Workload
Lecture	30 Weeks per Stage	2.00
Tutorial	30 Weeks per Stage	2.00
Estimated Learner Hours	30 Weeks per Stage	6.00
	Total Hours	300.00