

Module Title:	Digital Modelling and Process
Language of Instruction:	English
Credits:	5
NFQ Level:	6
Module Delivered In	2 programme(s)
Teaching & Learning Strategies:	A mixture of didactic lectures, SBL/PBL elements, and practical instruction using the computer labs will be used to support the learners self-directed engagement with the project tasks
Module Aim:	Introduce the learner to manufacturing processes and design for manufacture and assembly. The module will introduce the major production processes used in product manufacture and through the use of parametric CAD explore the impact of process on product design. The CAD element of the module explores the assembly environment and the 2D drawing environment to build and effectively communicate multipart designs
Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Demonstrate an understanding of major production processes used in high volume manufacture and be able to relate these to material choices and design intent
LO2	Analyze existing products to understand their manufacturing route and extrapolate that understanding to inform manufacturing and materials selection for their own product design.
LO3	Utilise CAD software to create basic assemblies and also as a tool to support their product design workflow through base part modeling
LO4	Create 2D drawing specifications for multipart assemblies which conform to international drawing standards and show consideration for manufacture and assembly
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

High volume manufacturing processes

The module will explore the major high volume manufacturing processes involved in the manufacture of products and components of polymer, metal, ceramic, glass, and composite materials. Processes such as injection molding, casting, forging, slip casting and blow molding are explored and their relevance to particular products discussed.

Product analysis

Analysis of existing products to determine materials choice and production processes involved in their manufacture. The learner is then invited to explore the rationale that informed these choices and apply these learnings to proposed manufacture of a product of their own design.

CAD assembly

Using a bottom-up assembly workflow multicomponent CAD assemblies will be produced and fully configured such that part relationships are defined and materials properties are specified. The use of component properties and standard geometric mates are explored in the creation of a multi part assembly.

Design communication through technical specification

Through the use of the CAD software's drawing environment, the learner will use the technical drawing standard to detail out the specification of a multi-component product design. This specification will typically feature a GA, BOM, and component part drawings

Resources Computer Lab

Access to a dedicated computer lab with suite of software (SolidWorks, PhotoView 360, KeyShot and Adobe Creative Cloud Suite). Lecturer workstation connected to an overhead projector, projection screen and white board

Resources Computers/Plotters/Printers

In this year each learner requires the use of a personal computer of suitable specification to run software used on the design programme. There should be access to printing and plotting facilities in order to complete final deliverables

Resources Studio

Access to a shared studio space with dedicated work stations and group work areas to facilitate project work and peer learning

Assessment Breakdown	%
Project	75.00%
Practical	25.00%

No Continuous Assessment

Project

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Project	Analysis of existing product case studies to identify materials and production techniques used in their manufacture and support the findings through both physical evidence and an understanding of the underlying design rationale	1,2	10.00	Week 25
Project	Analysis of existing high-volume products to determine materials selection and production techniques involved in their manufacture. This production process will consider the complete product lifecycle. Learnings from this process should then be transferred into a proposal for materials selection and processing route for a product of the learners own design.	1,2,3	65.00	n/a

Practical

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Assembly build-up and production of technical drawings to specify a part for prototype production. Assembly will consist of a mixture of prebuilt template components and self-built CAD models.	3,4	25.00	Week 25

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>
Studio Based Learning	Every Week	1.00
Lab/Lecture	Every Week	2.00
Independent Learning Time	Every Week	3.00
Independent Learning Time	Every Week	3.00
Total Hours		9.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_DHPDI_B	Bachelor of Arts (Honours) in Product Design Innovation	2	Mandatory
CW_DHIDE_D	Bachelor of Arts in Design	2	Mandatory