

<b>Module Title:</b>	Digital Modelling and Materials
<b>Language of Instruction:</b>	English
<b>Credits:</b>	5
<b>NFQ Level:</b>	6
<b>Module Delivered In</b>	<a href="#">2 programme(s)</a>
<b>Teaching &amp; Learning Strategies:</b>	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.
<b>Module Aim:</b>	Introduce the learner to engineering materials and 3D form generation for industrial design. The module will introduce the major classes of materials, their typical properties and some example usecases. Through the use of parametric CAD these materials will be modeled and presented as basic designs suitable for workshop production. The sketch environment and the feature generation part environment will be the primary focus of the CAD elements presented.

Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Demonstrate an understanding of material types, their properties, and their impact on product design
LO2	Perform basic materials selection for the production of both manufactured products and prototypes and provide a supporting rationale for their choice through primary and secondary research
LO3	Create 3D forms through the use of parametric CAD software and translate these forms to 2D representation suitable for use in the prototype workshop for model creation
LO4	Explain and illustrate the relationship between 3D form generation and the realisation of a design as a material artifact

Pre-requisite learning	
<b>Module Recommendations</b> <i>This is prior learning (or a practical skill) that is recommended before enrolment in this module.</i>	
No recommendations listed	
<b>Incompatible Modules</b> <i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module.</i>	
No incompatible modules listed	
<b>Co-requisite Modules</b>	
No Co-requisite modules listed	
<b>Requirements</b> <i>This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.</i>	
None	

## Module Content & Assessment

### Indicative Content

#### Materials in design

Providing a historical perspective on materials with particular emphasis on the explosion of new materials in the 20th century and co-evolution of modern materials and the industrial design discipline. The use of case study examples illustrate these points

#### Material Properties

Examining the classification of materials (metals, polymers, ceramics, glass and hybrid) and through this classification exploring the typical structure/property relationships of these materials types and their typical usecases

#### Introduction to 3D form generation using parametric CAD

Following a general introduction to CAD the core concepts of parametric modeling using CAD are explored and the CAD software is used in the creation of geometric forms. These forms are translated to 2D designs suitable for use in the workshop for model manufacture

#### Workshop materials handbook

Application of acquired materials knowledge in conjunction with the 3D representation to create a handbook of workshop materials typically used in the production of design models and sketch model prototypes

#### 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

100.00%

No Continuous Assessment

### Project

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Project	Project work to produce a materials handbook covering a range of materials used in high volume product manufacture and more specifically the materials utilized in design prototype development	1,2	50.00	End-of-Semester
Project	Through the use of parametric CAD, the learner should produce a range of 3D digital designs and 2D technical drawings suitable for use in a modelmaking workshop situation. These 3D designs should be annotated to include material information and material/form relationships	3,4	50.00	n/a

No Practical

No End of Module Formal Examination

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

**Module Workload**

<b>Workload: Full Time</b>		
<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	<a href="#">Bachelor of Arts (Honours) in Product Design Innovation</a>	1	Mandatory
CW_DHIDE_D	<a href="#">Bachelor of Arts in Design</a>	1	Mandatory