

Module Title:	3D Rapid Prototyping	
Language of Instruction:	English	
Credits:	5	
NFQ Level:	7	
Module Delivered In	2 programme(s)	
Teaching & Learning Strategies:	The learner is immersed in a range of collaborative, problem-solving activities, to investigate and evaluate where design can propose solutions for commercial and social benefit. The holistic, student-centred studio-based approach, facilitated by faculty, is intended to negotiate, facilitate and guide learner engagement and scaffold a deep-learning using the following strategies: • Lectures, • Studio based learning, • Peer-to-peer group/team learning, • Seminars, • E-Learning, • Presentation, • Workshop, • Facilitated peer-to-peer critique/review, • Self-directed independent learning,	
Module Aim:	The aim of the module is to immerse the learner in key areas of a design project and to develop their understanding of what 3D Rapid Prototyping and design workshop brings to the design process. 3D Design Prototype modelling offers opportunity for research, specification, exploration of existing products & trends. Disassembly of products allows for examination of componentry, manufacturing techniques and assembly. This approach develops a learner's knowledge of the design of the product from the inside out. These internal constraints will be married to ergonomic external constraints and the development of modelling techniques to capture these criteria. Learners will engage with 3D printing and rapid prototyping technologies along with traditional modelmaking skills as a mechanism for producing detailed models and be able to produce a prototype of a working model. Through the development of these skills an enhanced approach to representational modelling will be developed.	
Learning Outcomes		
On successful completion of this module the learner should be able to:		
LO1	To engage in product disassembly and capturing of details to aid the design process	
LO2	To employ model making skills in investigation of existing products and reverse engineer	
LO3	To produce a bill of materials & component specification	
LO4	To develop new rapid prototyping skills	
Pre-requisite learning		
Module Recommendations		
This is prior learning (or a practical skill) that is recommended before enrolment in this module.		
No recommendations listed		
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		
6858	INTL H3424	Industrial Design
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
Product Analysis (Studio Project link)

Learners engage in a Product disassembly, testing and ACCESS FM which coincides with the studio design module. Through this process there will be a cataloging of components/parts. These will be categorised and grouped for assessment of manufacturing details and materials. Internal components will be recorded before disassembly and stored for reassembly in a prototype. Learners will learn how to record and compile a bill of materials including specification sheets. Based on the information learned through disassembly learners will be expected to generate iterations to explore form opportunities.

3D Print single part Mold

Learners through the workshop module will engage in rapid prototyping technologies to develop a single part mold from their original disassembled product. This single part mold will allow the learners to engage with technologies like fusion deposition 3D printing to create full size moldings and parts and give them the understanding, knowledge and experience to create these parts. Through lectures and practice-based learning they will be walked through the good practice, running and maintenance of the rapid prototyping technologies. Learners will be made aware of appropriate material use for the machine. Learners will engage in this practical applied project to allow them run through the process and deliver a model at the conclusion. Sign off on 3D printer control / use.

Fully working 3D Printed Model

In unison with the industrial design module learners will engage in a workshop modelling exercise to create a fully working prototype product. Through a combination of traditional model making skills and rapid prototyping technologies the learner will develop a final representational model showing attention to detail, finish specification, working components and be completed to a professional level. Learner will engage with rapid prototyping technologies in alignment with the computer modelling module. Prototypes will be printed and used for the alignment of original product components. The assembly of this prototype will be assessed to identify potential clashes and rectify them

Workshop/Materials (Resource)

This is a dedicated space to allow learners to test, evaluate and represent the application of their research through 3D physical workshop made models. Resourcing of a workshop space include machinery, tools and materials. Materials such as modelling foam, MDF, Jelutong, Cardboard, foam board are all essential to investigate and develop a design solution.

Design Studio (Resource)

A dedicated space designed to allow for studio-based learning. This space is specific to a particular learning group. While used to deliver studio-based education the space is available to accommodate learners outside scheduled/timetabled hours. It provides a safe learner-driven, peer-reviewed environment, supported on a one-to-one basis. The room must also be fitted with good quality projector, document visualisers and sound equipment for delivery of hybrid approaches. It supports the synthesis of parallel concurrent modular knowledge, skills and competency with prior learning & personal aesthetic judgement, to resolve specific design research question/s.

Technician (Resource)

A dedicated design technician to support, demonstrate and maintain equipment while auditing and stocking of materials for the design workshop and studio practice

Prototyping Equipment (Resource)

There are a number of prototyping machines used including a laser cutter for cutting acrylic, paper, card, wood & engraving of anodised aluminium. Fusion deposition 3D printer with associated materials.

Computers / plotters / Printing (Resource)

Each learner requires access to studio computers with suitable software used on the Design program. There should be access to printing and plotting facilities in order to complete Design Projects

Assessment Breakdown	%
Continuous Assessment	100.00%

Continuous Assessment

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Project	Product Testing and Disassembly – Product disassembly and categorisation of components, assessment of manufacturing details and materials. Delivery of a bill of materials including specification sheets	1,2,3	10.00	Week 3
Project	Single part mold. Alignment of original product to create a single part 3D printed molding.	1,2,4	20.00	Week 7
Project	Working Prototype. 3D printed prototype model. Dry assembly sequence with testing of working components.	1,2,4	30.00	Week 12
Project	Representational Model – professional level final model showing attention to detail, high finish specification, decals and branding along with working components,	1,2,3,4	30.00	Week 15
Reflective Journal	Planning & Management Reflective Practice: reviewing approach, engagement, performance, collaborative style, synthesis with aligned modular elements and identification of future developmental need/s.	1,2,3,4	10.00	Week 15

No Project

No Practical

No End of Module Formal Examination

Module Workload

Workload: Full Time		
<i>Workload Type</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Studio Based Learning	Every Week	4.00
Independent Learning Time	Every Week	5.00
Total Hours		9.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_DHPDI_B	Bachelor of Arts (Honours) in Product Design Innovation	5	Mandatory
CW_DHIDE_D	Bachelor of Arts in Design	5	Mandatory