

w h e r e n e x t ?



project based learning



SDC TEC

PREPARATION FOR LIFE

St David's College
Llandudno Conwy LL30 1RD



CLIENT REQUIREMENTS 01

Initial discussions will be made between the client and the College Hub team(s). These talks will be in-depth and set the parameters for the brief. Subsequent talks and an on-going dialogue will be paramount to success*.



OUR TIMELINE 02

Based on our discussion and subsequent outcomes from the initial talks, we will aim to deliver all agreed drawings, 3D models, prototypes etc within the agreed deadline. *The client will have access to the designated College Hub team manager (a member of staff) via email at any time.



DELIVERY 03

We will deliver all of the agreed brief requirements at the end of the designated time. The client will then take ownership of all items and the job will be signed off by the College Hub manager.

Welcome to SDC TEC

This is an innovative programme which is designed to build upon our excellent in-house skills and capabilities in CAD, model making, physical prototyping and rapid prototyping.

Many of our students have very advanced capabilities in both 2D and 3D CAD as well as great skills in manufacturing processes.

The aims of SDC TEC are:

To enable our students, *under the guidance of expert staff, to work on real-life projects with achievable and realistic outputs; we call this Project Based Learning. We already have an excellent track record in collaborative work with a range of industrial and architectural clients and wish to build upon and extend our portfolio.

To enable our clients to avail themselves of our capabilities in using comprehensive industrial software, rapid prototyping and our extensive workshop expertise.

Because we understand how modern production processes work, we can support you at all stages of your product development cycle.

We believe that every designer, engineer or architect should have easy access to design verification that matches reality. We are here to help you find the optimal prototype solutions for your design projects and if desired, we can help you get your early design files ready for 3D printing.



Headphones: Jack Butcher

Appearance Prototype:

A visual of the real product conveying the aesthetic value of look, feel, material finish and form. These are photo-realistic models that can be used for marketing, visualisation, crowd-funding videos and anywhere you need to show what the final product will look like without having to create tooling.

A rapid prototyping service is often used to produce a physical sample of a product design. It can be used to evaluate the form, fit and function of a part or to test out new and innovative ideas.

Prototypes are often made quickly using cheaper and less robust materials. We produce 'rapid' prototypes because many clients need to produce a physical part quickly in order to validate a design or to capture a fleeting sales opportunity.

Functional Prototype:

These prototypes include all the visual properties of an appearance model but include some or all of the functionality built in. These are often more complex and can be made to be almost like the real thing.



Multi-purpose Ice Tool: Tom Wright

Project based learning explained



OUR APPROACH

Our method of teaching will allow our students to acquire new knowledge and skills in the course of designing, planning, and producing meaningful work in order to solve real-world problems. It is our wish to form new partnerships with our industrial and architectural clients which will be mutually beneficial.



PBL AND THE WORKPLACE

In the 21st Century workplace, success requires more than basic knowledge and skills. In a project, students learn how to take initiative and responsibility, build their confidence, solve problems, work in teams, communicate ideas, and manage themselves more effectively. PBL helps address standards



THE TRIGGER

Problem-based learning is a student-centered pedagogy in which students learn about a subject through the experience of solving an open-ended problem found in trigger material.



WHAT IS PBL?

Project Based Learning is a teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to an authentic, engaging and complex question, problem, or challenge.

HOW MUCH WILL IT COST?

Our intention is to give our students the best form of education possible, and our aims are fully pedagogical. Innovative schemes such as this are expensive to set up and run. We will not charge our clients a single penny for our services. It is our hope that our clients will bring to the table their expertise and knowledge in their given sphere and that our students will benefit greatly from this. However, for this innovation to move forward and in order to offer the best service in the future (purchasing and maintaining equipment and software, for example), we invite our clients to donate to our cause to enable this to happen. Please note that this is not a prerequisite.

Every project that we complete will form part of our 'case studies' programme (with the client's agreement) and will be included as an integral part of our promotion and advertising campaign.

Each and every project will be discussed fully at the start in order to ascertain our suitability for delivering the content and for our students and clients to understand our remit fully.

OUR LEAD STAFF:

The lead staff will be:

Martin O'Leary - Professional Design and Development Engineer and Teacher of Design, Technology and CAD/CAM

Jonathan Demery - Professional Product and Industrial Designer and Teacher of Design, Technology and CAD/CAM

More information:

In addition to their full-time teaching roles, both Martin and Jonathan work on external projects with industrial clients. Martin is a practising Design Engineer and Jonathan's interests are in aviation, automotive and product modelling.

Martin has 45 years of engineering and technical design experience and 32 years of technology teaching.

Jonathan has 28 years of product design and 20 years of technology teaching experience.

OUR STUDENTS:

All of the students involved in the teams will be studying for Advanced CAD qualifications along with some of the following relevant Advanced Level courses:

Mathematics
Physics
Chemistry
Biology
Design and Technology
Business Studies

All of the students involved will have up-to-date advanced skills in 2D and 3D computer modelling.

Those following both the CAD and DT courses will have a wealth of practical workshop skills in addition to their technical knowledge base.

****Please note that all of the work featured in this brochure was completed by students of St David's College except the Sentry projects marked ** which were completed by staff member Martin O'Leary**

CASE STUDY: SENTRY**

Sentry integrates into existing security systems. When activated Sentry stains a burglar with an indelible dye which can last for weeks, the dye contains bio-synthetic DNA which is totally unique to each alarm. The robber is forensically linked to the crime so delivering irrefutable evidence which can convict in court. This is a multi-award winning product.

Redweb Security approached Martin O'Leary to design the enclosure for the Sentry alarm. This work was completed successfully and the final designs for injection moulding were presented to the client. The design of the Sentry has since won many awards in engineering, industrial design, and specifically at the Innovation Awards.



Sentinel Enclosure: Martin O'Leary



NATIONAL AWARDS



Pictured left:
Jonathan Lynn with Carwyn Jones AM

The Innovation Awards is a prestigious competition and an interactive showcase for the most innovative project work in design and technology. We are working in conjunction with the Welsh Government's Department of Economy, Science and Transport to encourage young people in Wales to be technologically innovative and appreciate the importance of design and technology.



Modular Shelving System: Olivia Johnson



Drone:
Joshua Bradburn

We are extremely proud of the fact that we have been included in the Innovation Awards every year since its inception



L-R: Carwyn Jones AM
Jonathan Lynn, Student
Martin O'Leary, Lead member of staff

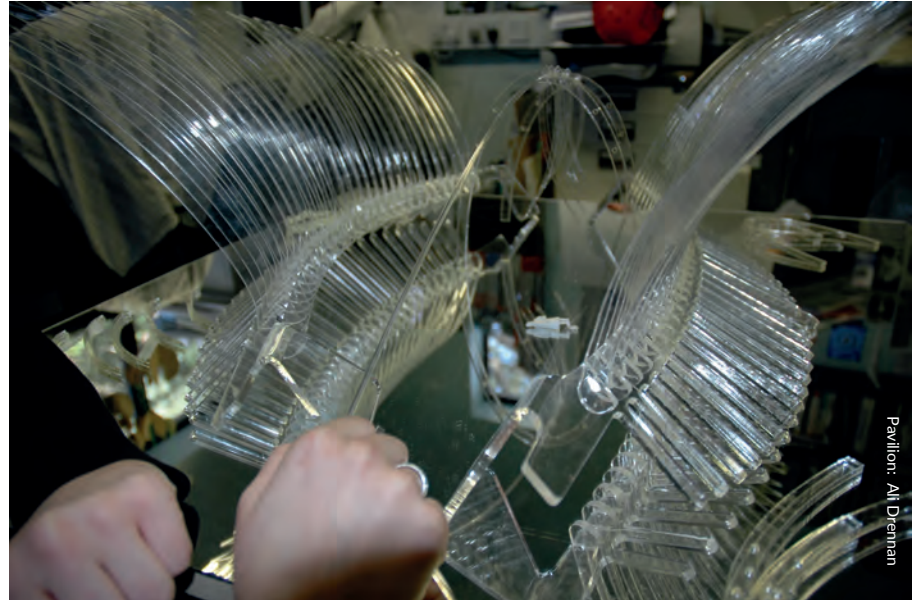


Architecture:
Caroline Bayliss



Architectural Model Making

We have a long history of excellent architectural model making, particularly to supply physical models for client appreciation and planning support. We use 3D printing, vacuum forming, CNC machining and traditional workshop based techniques to deliver accuracy and beauty. We can model from your own 2D or 3D CAD files either using an exchange format (DXF, STEP, ACIS, IGES etc), or native formats including Revit, ArchiCAD and AutoCAD Architectural



Pavilion: Ali Drennan



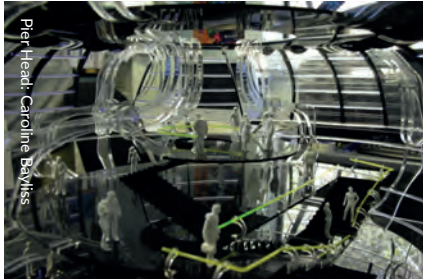
Pavilion (Exterior)



Pavilion (Detail)



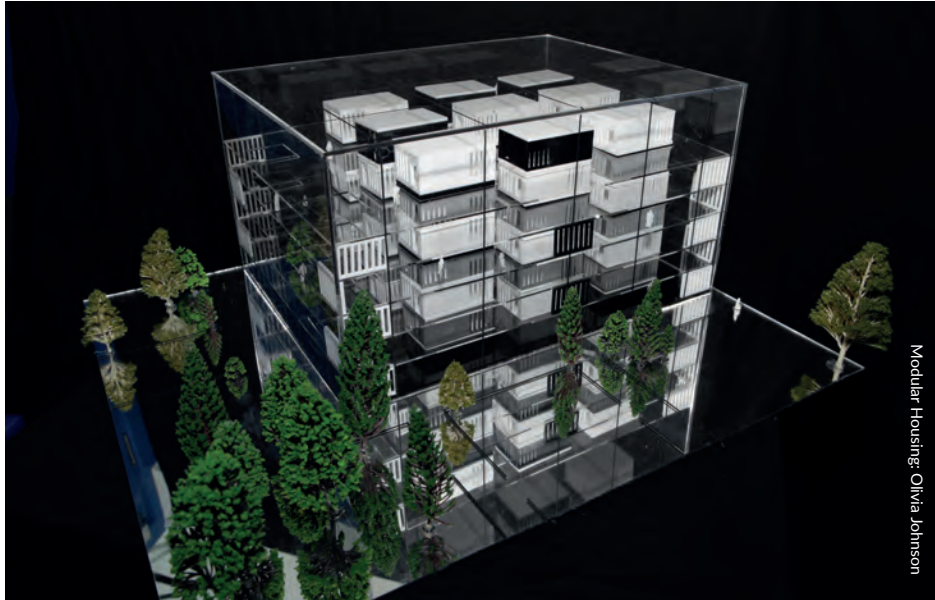
City Complex



Pier-Head: Caroline Bayliss



Eco Housing: Sean Last



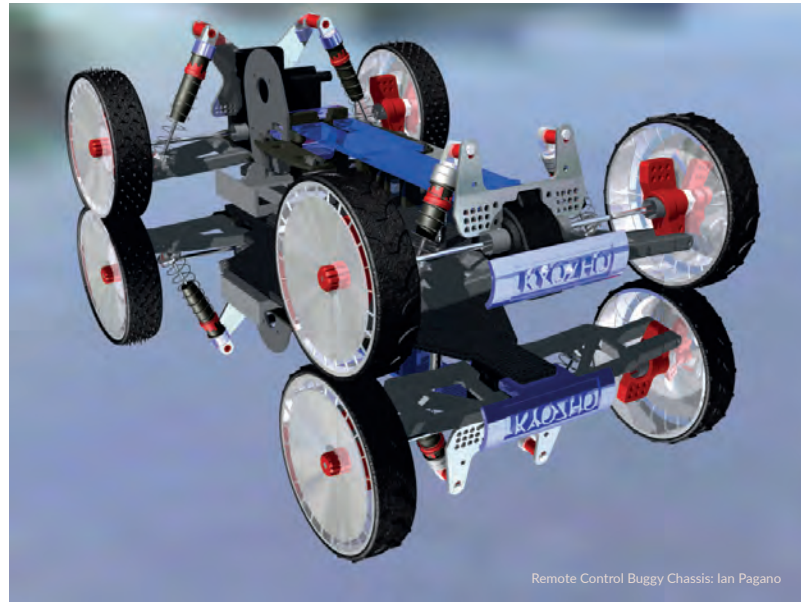
Modular Housing: Olivia Johnson



Product Design Industrial Design

For over 30 years we have been building products, models and prototypes for all kinds of applications. We are at the forefront of CAD modelling and we can combine our skills in this area with sophisticated CAE and traditional workshop techniques in most materials.

We can model from your own 2D or 3D CAD files either using an exchange format (DXF, STEP, ACIS, IGES etc), or native formats including all Autodesk products, ProE, Creo and Solidworks.



Remote Control Buggy Chassis: Ian Pagano



Travel Toothbrush:
Jake Stockings



Personal Protection:
Caroline Bayliss



Fishing Reel:
Jack Williams



Canoe Trolley:
Hugh Hutchinson-Smith



Hand-Held Input Device:
Matt Whitehead



Drift Trike: Jack Harley-Walsh



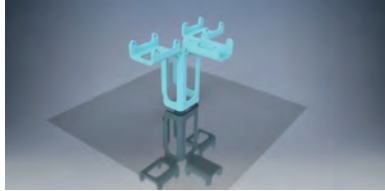
Interior Design

We have developed our expertise in interior design as a natural extension of our architecture course. In our extensive workshops we can create physical scale models for any project in addition to creating photorealistic visuals from our 3D computer modelling systems.

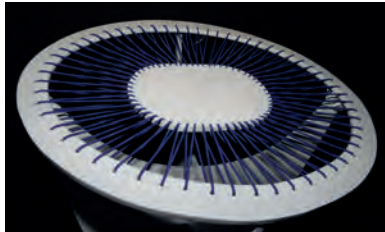
We can model from your own 2D or 3D CAD files either using an exchange format (DXF, STEP, ACIS, IGES etc), or native formats including all Autodesk Products, ProE, Creo and Solidworks.



Exhibition Display:
Rebecca Lawrence-Jones



Modular Shelving Support:
Olivia Johnson



Chair / Seat:
Rebecca Lawrence-Jones



Glamping Pod:
Emma Donnelly



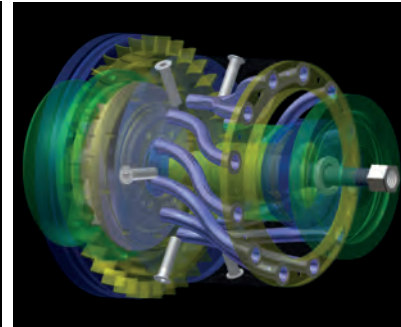
CAD | CAM | CAE Engineering

We have access to industrial 2D and 3D computer modelling systems and can produce 3D models for production, analysis, visualisation and rapid prototyping. We can output to most industrial CAD standards.

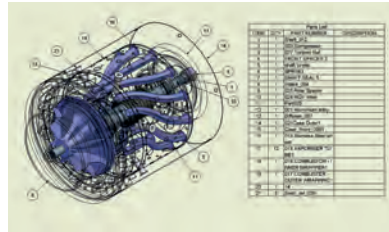
We can also produce complex engineering drawings for production purposes including assembly and fabrication drawings which include weldments, sheet metal forms and tabular data.



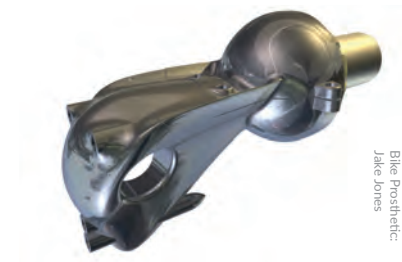
Turbo:
Jonathan Jones



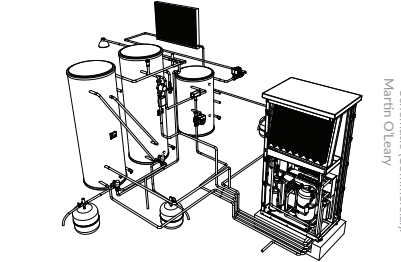
Drone Body Shell:
Joshua Bradham



Wren Jet Engine:
Group Project



Bike Prosthetic:
Jake Jones



**Schematic (Commercial):
Martin O'Leary



Steel Fabrication:
Ben Morris



CGI | CAD | FILM Prototyping

Creating props and models for stage and screen has been an integral part of our offering for many years. As our computer systems have become more sophisticated, we now have the extended capabilities to produce super-realistic models by utilising a host of rapid prototyping techniques coupled with extensive traditional workshop practices directly related to model making.



Film Props and CGI Visuals:
Danny Jones (Spaceship) Charlie Stanbury (Mars Rover)

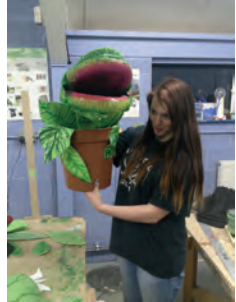
Ice Tool / Walking Pole:
Tom Wright



Tyrant:
Jack Williams



Animated Stage Props (Little Shop Of Horrors):
Daniel Mason and Jenna Soutter





Modelling and Prototyping Detail - See Page 13

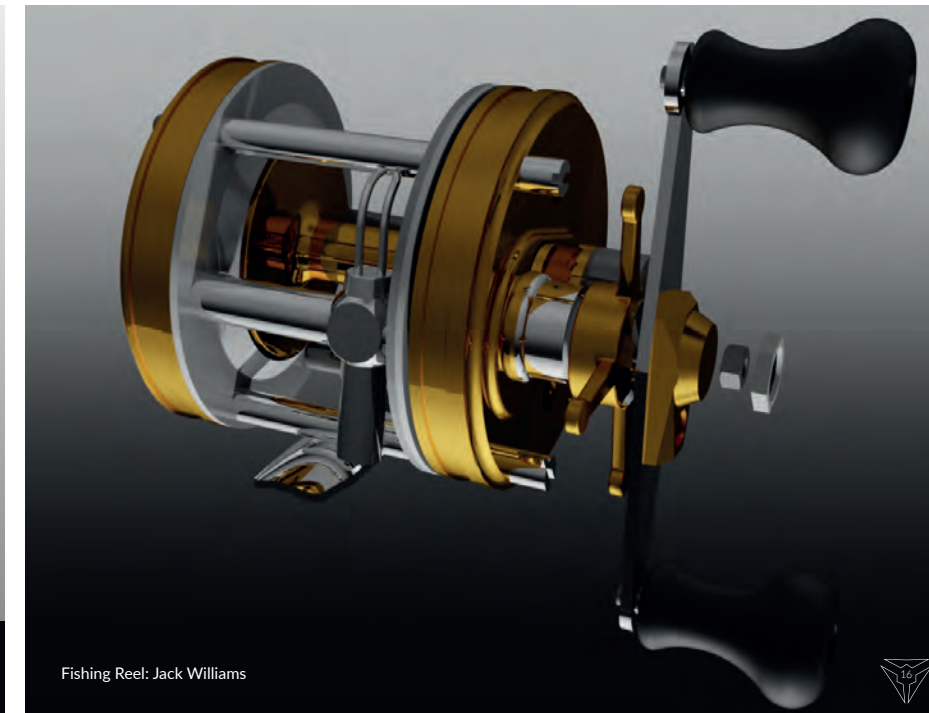
In addition to offering a computer modelling and prototype service, we also deliver courses in 2D and 3D CAD:

An Introduction to 2D Drafting using AutoCAD
 An Introduction to 3D Modelling using AutoCAD
 Intermediate AutoCAD
 Advanced AutoCAD

An Introduction to Parametric Modelling using Autodesk Inventor
 An Introduction to Parametric Modelling using PTC Creo
 An Introduction to Parametric Modelling using Solidworks
 An Introduction to Parametric Modelling using Fusion 360

Intermediate and Advanced 3D and Parametric Modelling using Autodesk Inventor

City and Guilds: 2D and 3D Modelling Levels 1-3
 City and Guilds: Parametric Modelling Levels 1-3

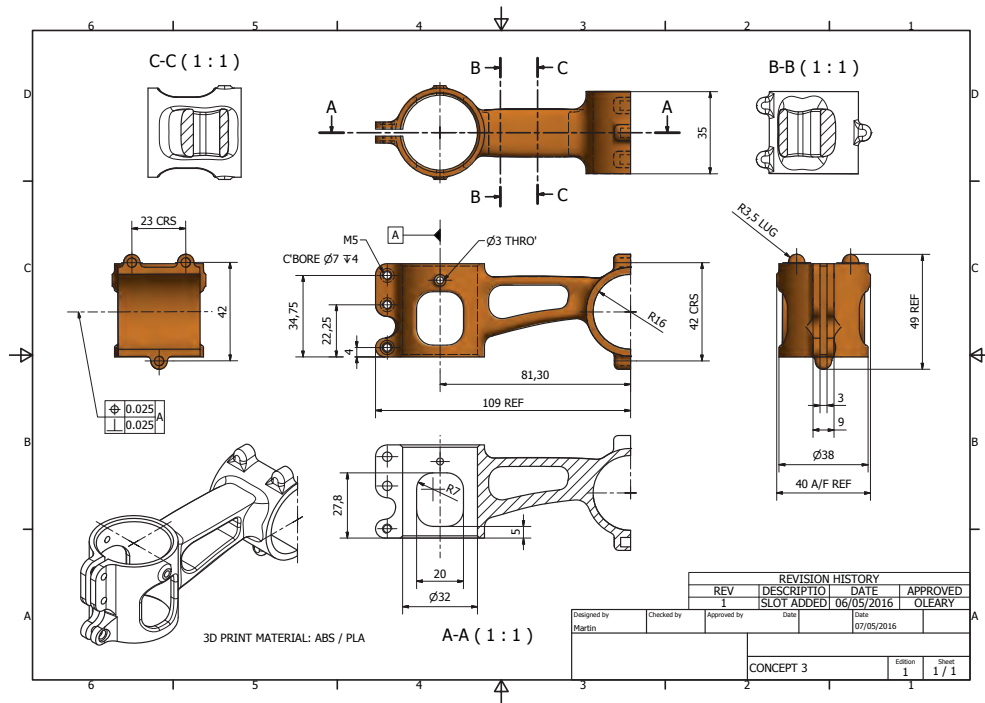


Fishing Reel: Jack Williams

7579 Scheme Computer Aided Design

We use AutoCAD for our 2D drafting and 3D modelling on this scheme. There are three sequential levels available and each one builds upon:

- principles of the 2D/3D drawing environment in relation to hardware, software and physical surroundings
- the typical composition of a CAD system
- the production of 2D and 3D component models using CAD systems
- using advanced features and parts modelling
- using advanced presentation graphics
- 2D and 3D outcomes via rapid prototyping machines (optional)
- health and safety procedures.



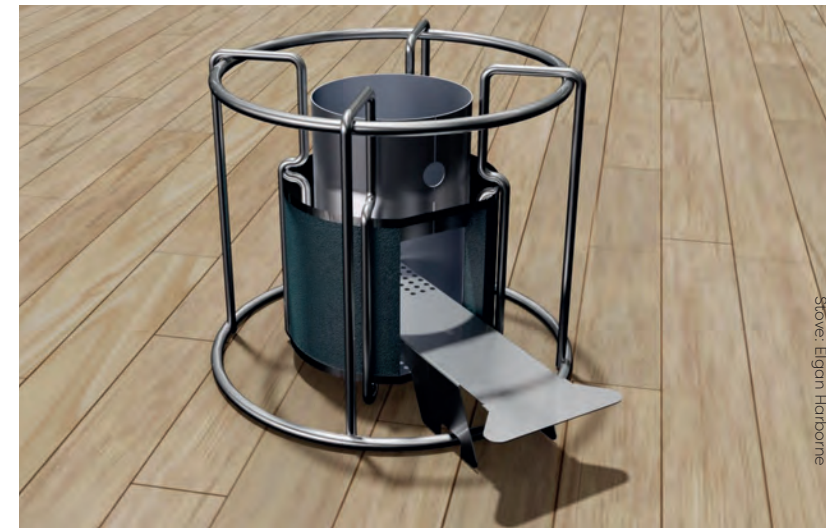
Bike Stem: Jake Jones

7689 Scheme 3D Parametric Modelling

We use Autodesk Inventor for our 3D parametric modelling on this scheme. There are three sequential levels available and each one builds upon:

We take a more advanced look into CAD to assist in the creation, modification, analysis, or optimisation of a design through the use of 2D and 3D software.

Students will use our CAD systems to generate and edit advanced models/ assemblies using data driven parameters, and create complex drawings including annotations using multiple view layouts. Students will also create and modify existing 3D objects, either surfaces or solids, at any position within three dimensional space.



7579 / 7689 Summary: Our courses provide students with the skills and knowledge required for employment as designers or draughts persons, as well as progression onto further learning in preparation for entry into the advanced manufacturing, engineering and architectural sectors or to look at pathways into product design and industrial design. We also actively encourage direct entry into the workplace.

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