

Module Template for New and Revised Modules¹

Module Code	MEU23B10
Module Name	3D Computer Aided Design
ECTS Weighting ²	5 ECTS
Semester taught	Semester 1
Module Coordinator/s	Associate Professor Daniel Trimble (dtrimble@tcd.ie)

Module Learning Outcomes with reference to the Graduate Attributes and how they are developed in discipline

On successful completion of this module, students will be able to:

1. **Apply parametric CAD techniques** to create fully defined sketches and three-dimensional models of engineering components.
2. **Construct complex part geometries** using feature-based modelling tools including extrusions, revolves, sweeps, patterns and reference geometry.
3. **Develop engineering assemblies** by applying appropriate constraints, standard fasteners and component relationships.
4. **Generate professional engineering drawings** from 3D models, including orthographic views, sections, auxiliary views, dimensions and annotations in accordance with ISO standards.
5. **Use CAD tools to evaluate assemblies**, including interference detection, clearance verification and exploded views.
6. **Organise parametric models efficiently** using design tables, configurations and feature management tools

Graduate Attributes: levels of attainment

To act responsibly - Choose an item.

To think independently - Choose an item.

To develop continuously - Choose an item.

To communicate effectively - Choose an item.

¹ [An Introduction to Module Design](#) from AISHE provides a great deal of information on designing and re-designing modules.

² [TEP Glossary](#)

Module Content

Topics include:

- Parametric sketching and constraint definition
- Feature-based 3D modelling
- Advanced modelling features (revolve, sweep and loft operations)
- Patterning and reference geometry
- Assembly modelling and component relationships
- Use of standard fasteners and mechanical components
- Hole Wizard and toolbox components
- Configurations and design tables for families of parts
- Creation of engineering drawings in accordance with ISO standards
- Assembly drawings, exploded views and bill of materials
- Interference detection and clearance verification in assemblies

Teaching and Learning Methods

- The module is delivered through a combination of **lectures and laboratory-based practical sessions**.
- Lectures introduce key CAD concepts, modelling strategies and engineering drawing standards. Laboratory sessions provide students with guided hands-on experience using industry-standard CAD software.
- Students complete weekly modelling exercises supported by online instructional material and demonstration videos available through Blackboard.
- Learning is reinforced through **structured modelling tasks and timed in-class CAD assessments**, allowing students to demonstrate practical modelling competence and technical understanding.

Assessment Details³ Please include the following: <ul style="list-style-type: none"> • Assessment Component • Assessment description • Learning Outcome(s) addressed • % of total • Assessment due date 	Assessment Component	Assessment Description	LO Addressed	% of total	Week due
	Continuous Assessment	MCQ quizzes assessing theoretical CAD knowledge	1–6	30%	Weeks 4, 9, 12
	Practical CAD Exams	Timed in-class modelling assessments requiring students to construct engineering parts using CAD software	1-6	70%	Weeks 4, 9, 12

Reassessment Requirements Continuous assessment

Contact Hours and Indicative Student Workload³	Contact hours: 44 hours
	Independent Study (preparation for course and review of materials):
	Independent Study (preparation for assessment, incl. completion of assessment):

- Recommended Reading List**
- No prescribed texts – class notes and instruction should suffice.
 - The following text may provide useful additional information:
 - Beginner's Guide to SOLIDWORKS 2024 - Level I

³ [TEP Guidelines on Workload and Assessment](#)