

Liverpool John Moores University

Title: Computer Aided Modelling
Status: Definitive
Code: **4161PDE** (121743)
Version Start Date: 01-08-2021

Owning School/Faculty: Engineering
Teaching School/Faculty: Engineering

Team	Leader
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Academic Level: FHEQ4 **Credit Value:** 20 **Total Delivered Hours:** 44
Total Learning Hours: 200 **Private Study:** 156

Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	22
Workshop	22

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Test	ICT	In-class solid modelling test	100	

Aims

To introduce students the knowledge and skills needed to use computer aided modelling techniques.

Learning Outcomes

After completing the module the student should be able to:

- 1 Demonstrate the appropriate use of CAD tools in the creation of 3D parts
- 2 Interpret 2D engineering drawings in the creation of 3D parts
- 3 Employ appropriate CAD tools in the creation of a 3D assembly

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

In class solid modelling test	1	2	3
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Outline Syllabus

File Management

How to store, retrieve and use files correctly. Parts classification and coding systems.

3D modelling

3D techniques e.g. addition and subtraction of material, 3D coordinate entry (x, y, z), wire frame modelling, 2D to 3D (thickness, extrusion); solid models.

Preparation

Design intent, location of origin, selection of planes and units.

Terminology

Basic geometry, axis, planes, origin, face, edge, vertex geometric relationships, horizontal, vertical, intersection, parallel, collinear, perpendicular, coincident, document properties and system options.

User interface

Opening and saving files, toolbars, menus' feature manager, property manager, configuration manager toolbox, standard component libraries, help and tutorials.

Navigation

View control, view display, display modes, standard views.

Sketching

Sketching environment, sketching tools, dimensioning sketches, editing sketches, applying relations in sketches, understand concept of fully defined sketch.

Solid extrusions

Creating solid and thin base features, adding bosses and cutting features.

Features

Creating chamfers, fillets, shelling, ribs, draft angles, use of hole wizard.

Common operations

Converting entities, mirroring, linear and circular patterns, revolved extrusions/cuts, sweeps, lofting, adding and editing relations, creating additional planes.

Assemblies

Creating bottom up assemblies; inserting and manipulating components, degrees of freedom, adding mate relations, create sub-assemblies, editing assembly mates, editing assembly models, mirrored and patterned components.

Interpretation of engineering drawings

Projections: Orthographic, first-angle / third angle projection. Multi-view drawings: Selection / number of views, auxiliary views, detail views and cross sections. Types of line: visible, hidden, centre, cutting planes, section and hatching. Dimensioning: Parallel, running, chain, combined, co-ordinates, tabular, holes, circles and radii. Hole and shaft based tolerancing; Bilateral and unilateral tolerancing; surface finish.

Rendering using Photo360

User interface and workflow, previewing renders, applying appearance, surface finish, decals, scenes, backgrounds, lighting, rendering a scene, camera's, model updates, image size and format' final render & save, system options & animations.

Learning Activities

This module will be delivered through an integrated series of lectures and workshops. The learning activities are student focused and develop the students' modelling and design knowledge through experiential learning.

Notes

This module is designed to give students the knowledge and skills needed to use computer aided modelling techniques and is delivered using a variety methods including lectures and hands-on workshop sessions.