

Liverpool John Moores University

Title: Engineering Design using Solidworks
Status: Definitive
Code: **7132ENG** (120343)
Version Start Date: 01-08-2016

Owning School/Faculty: Maritime and Mechanical Engineering
Teaching School/Faculty: Maritime and Mechanical Engineering

Team	Leader
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Academic Level: FHEQ7 **Credit Value:** 10 **Total Delivered Hours:** 12
Total Learning Hours: 100 **Private Study:** 88

Delivery Options

Course typically offered: Runs Twice - S1 & S2

Component	Contact Hours
Tutorial	12

Grading Basis: 50 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Test	AS1		100	6

Aims

The module will introduce students to computer aided design using Solidworks software. It will be delivered via a virtual learning environment and supported by tutorial sessions. It is intended for students who join the programme with little or no prior experience of CAD and is specifically designed to provide them with the key skills required of an engineer operating at postgraduate level.

Learning Outcomes

After completing the module the student should be able to:

- 1 Design 3D Parts
- 2 Design 3D assemblies
- 3 Produce engineering part and assembly drawings from 3D models
- 4 Produce 3D part models using advanced solid and surface modelling techniques

Learning Outcomes of Assessments

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

Invigilated Blackboard	1	2	3	4
Test				

Outline Syllabus

3D part modelling

Preparation - design intent, location of origin, selection of planes and units.

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.

Determine properties of 3D object e.g. distance, area, volume, mass, radius of gyration, centre of gravity.

3D 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.

Converting a 3D model into an engineering drawing

Creating part drawings and assembly drawings from 3D models, drawing templates and modification, sheet format and editing, dimensioning and specialized views.

Annotations, machining and general symbols and other conventions.

Advanced Modelling Techniques

Multi-bodied solids, developing sweep paths using 3D sketching complex shapes with Lofts. Clash detection.

Import of sketch pictures into CAD. Creation of surface based features, construction surfaces. Use of splines, advanced filleting, deleting faces, face deformation, utilizing

shape and dome features, offset surfaces, extend surfaces, intersection curves.

Learning Activities

Delivery via virtual learning environment and supported by tutorial sessions

Notes

The module will introduce the students to Solidworks software at a level expected of a practicing engineer at postgraduate level.