

## Liverpool John Moores University

Title: COMPUTER AIDED DESIGN  
Status: Definitive  
Code: **4506NCCG** (129425)  
Version Start Date: 01-08-2021

Owning School/Faculty: Engineering  
Teaching School/Faculty: Nelson Campus, Nelson and Colne College

Team	Leader
Christian Matthews	Y

**Academic Level:** FHEQ4  
**Credit Value:** 20  
**Total Delivered Hours:** 60  
**Total Learning Hours:** 200  
**Private Study:** 140

### Delivery Options

Course typically offered: S1, S2, Sum, NS2 (S2 for Jan)

Component	Contact Hours
Lecture	60

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	Assignment	Assignment	100	

Competency	NCC Group Pass/Fail

### Aims

*The aim of this module is to provide skills in the use of computer-aided design and 3D modelling systems to solve design problems. Product designers communicate their designs through CAD software packages. It is used at all stages of the design task, from conceptualisation to production of working drawings. It provides the basis for manufacturing products. Engineers must master computer-aided design techniques in order to ensure design intent is accurately taken through to manufacture and service. In this module students will practice the*

*techniques involved in producing advanced 3D models.*

## **Learning Outcomes**

After completing the module the student should be able to:

- 1 Demonstrate basic CAD skills by undertaking 3D modelling tasks using appropriate software
- 2 Evidence an ability to use the various tools and options available in the software to modify and manipulate existing drawings
- 3 Perform computer-aided design drawing tasks in response to technical design problems
- 4 Design, develop, optimise and predict the properties and performance a simple structural component

## **Learning Outcomes of Assessments**

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

Assignment	3	4
NCC Group Pass/Fail	1	2

## **Outline Syllabus**

*Drawing files: load and create and edit a drawing file from source*

*Record modifications: update the drawing and record modifications; produce updated documentation using a word-processing package with inserted views relating to modifications Produce hard copy: produce hard copy of updated drawing using scaled plots, scaled views, different printer/plotters and reconfiguring CAD software to suit*

*Coordinate systems: manipulate co-ordinate systems to suit required geometry*

*Correct geometry: using polylines to construct shapes for surfacing and constructing splines; using polyedit to restructure line/arcs into continuous geometry*

*Surface construction: generate the bounded geometry required for any surface; use generated geometry to create surfaces; use of all methods of surface*

*Facet numbers: numbers required to smooth surface; memory problems using high numbers of facets*

*Viewing medium: use of Hide, Shade and Render to visualise the product; print or plot finish drawing; the use of different textures; lighting controls*

*Coordinate systems: manipulate UCS and WCS to suit required geometry*

*Solid model: using polylines to construct shapes for extruding, using polyedit to restructure line/arcs into continuous geometry; use of Hide, Shade and Render to visualise the product; applying various materials to generated slides; cutting the solids and sectioning; different lighting; textures Construction techniques: the effects of subtract, union, intersect extrude, sweep and revolve in model construction; editing the geometry using fillet, chamfer etc; using primitives to create geometry*

*Properties of solids: using solid model to find the mass, radius of gyration, centre of gravity and surface area Printing image: generating image*

*Dimension a solid: dimensions are correctly added to a solid composite drawing in*

*multiscreen mode; dimensions are correctly added to true shapes previously extracted from solid composite*

## **Learning Activities**

### **Lectures**

These will not normally be traditional didactic lectures in which the student plays little active part, but will be delivered in small groups of up to 20 students in which their interaction with their tutor is a key ingredient of their learning experience.

The material of this module requires the development of significant practical skill.

This will be taught within the lecture time, making these sessions a blend of lecture and workshop time. The sessions will be timetabled in spaces with physical resources appropriate to the delivered content.

Students will receive approximately 30 hours of taught material, supported by in-class exercises and discussions designed to help student assimilate learning and to provide early informal feedback on their progress.

### **Independent Study**

Students are expected to undertake personal reading and research into topic areas that have been stimulated from the lectures and seminars. This reading will enhance their academic work and enable valid contribution to lectures and seminars.

### **VLE support**

This will provide links to academic web-sites and on-line journals, facilitate group discussion outside of the classroom, access to outline lecture notes, and provide students with assessment details.

## **Notes**

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