

Liverpool John Moores University

Title: COMPUTER AIDED DESIGN FOR CIVIL ENGINEERING
Status: Definitive
Code: **4507ICBTCE** (126966)
Version Start Date: 01-08-2021

Owning School/Faculty: Civil Engineering and Built Environment
Teaching School/Faculty: ICBT, Colombo

Team	Leader
Alison Cotgrave	Y

Academic Level: FHEQ4 **Credit Value:** 15 **Total Delivered Hours:** 47

Total Learning Hours: 150 **Private Study:** 103

Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	15
Workshop	30

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	AS1	Project Based Report (1500 words)	30	
Exam	AS2	Practical Examination	70	2

Aims

This unit provides learners with the skills needed to produce 2D and 3D drawings using industry-standard computer-aided design (CAD) software. Learners will also gain skills to model and analyse civil engineering schedule problems

Learning Outcomes

After completing the module the student should be able to:

- 1 Produce 2D drawings using industry-standard CAD software applications
- 2 Produce 3D drawings using industry-standard CAD software applications
- 3 Apply computer software to plan complex civil engineering project

Learning Outcomes of Assessments

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

Report	1	2	3
Examination	1	2	3

Outline Syllabus

2D drawings: setting up, data input, drawing, modifying, text, dimension, insert, file formats, views

Setting up: open software application, use of templates, entities, aids, snap, polar, User Coordinate System (UCS), layers, line types, units, model space, paper space, viewports, scale, drawing page, title block

Data input: dynamic input, menu and icon input

Drawing: line, multiline, polyline, spline, circles, arcs, rectangles, polygons, ellipse, hatching, boundaries, triangulation

Modifying: erase, copy, trim, extend, scale, stretch, mirror, move, rotate, chamfer, array, fillet, break, join, lengthen

Text: multiline, single line, text style

Dimension: aligned, linear, ordinate, angular, diameter, arc length, baseline, continuation, dimension style

Insert: blocks, attributed blocks, dynamic blocks, raster image, text, spreadsheets, images, copy/paste, explode, purge

File formats: DWG, DXF, OLE, 3ds, Xrefs

Views: zoom, pan, aerial, named, viewports

3D drawings: setting up, data input, 3D surface models, 3D solids, solid modelling, modify, rendering, shade, views

Setting up: open software application, use of templates, entities, aids, snap, Osnap, polar, UCS, layers, line types, units, model space, paper space, viewports, scale, drawing page, title block

Data input: dynamic input, menu and icon input

3D surface models: edge, mesh, revolved, tabulated, ruled, edge, loft, sweep, 3D polyline

3D solids: box, sphere, cylinder, cone, wedge, torus

Modify: 3D array, 3D mirror, 3D rotate

Rendering: scene, materials, background, lighting

Shade: wireframe, hidden, flat, edges

Views: viewpoint, isometric, plan view, 3D orbit, viewports, UCS

Software related to construction: e.g. Primavera, MS Project

Resources: human (direct and sub-contract labour, management and supervision), plant and machinery, materials, sub-contractors, production of long- and short- term

programmes, scheduling of material requirements

Use of MS Project for construction planning: defining the project data (adding a new project, defining activity codes, defining work breakdown structure, defining calendars), working with activities and relationships (adding activities, assigning activity IDs, activity types, assigning activity codes to activities), project organising (organising the activities, view layouts, copy, backup and restore data), defining logic and scheduling (assigning predecessors and successors, imposing constraints to activities, calculating the schedule, adjusting the schedule), tabular and graphical reports.

Learning Activities

Students will be supported in their learning, to achieve the above learning outcomes, in the following ways:

By a series of lectures and practical approach to apply various tools & packages to produce detailed drawings & building information in construction and manufacturing sectors of buildings, service & civil engineering structures.

Self-managed studies to understand various industry standard tools & packages for construction and manufacturing sectors of building, service & civil engineering structures and skills requirements to ensure the competitive effectiveness of the software applications in the industry.

A recommended resource list - indicating key reading, virtual and physical learning assistance, is provided to help enable students to undertake self-directed study.

Notes

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