

Liverpool John Moores University

Title: COMPUTER AIDED MANUFACTURING
Status: Definitive
Code: **5508NCCG** (129441)
Version Start Date: 01-08-2021

Owning School/Faculty: Engineering
Teaching School/Faculty: Nelson Campus

Team	Leader
Christian Matthews	Y

Academic Level: FHEQ5 **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	48
Practical	12

Grading Basis: 40 %

Assessment Details

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

Competency	NCC Group Pass/Fail
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Aims

This module will introduce students to various manufacturing/machining scenarios. These encompass manufacture of automotive, aerospace and engineering components. It will cover manufacturing methods and techniques currently used within these application sectors.

Learning Outcomes

After completing the module the student should be able to:

- 1 Create, modify and document a CAD model suitable for CAM processing.
- 2 Select or specify suitable equipment (e.g. machine tools, cutting tools, work-holding devices, additive manufacturing) to enable the manufacture of a specified product.
- 3 Produce a machining / manufacturing plan to produce a component to a specified brief using CAD/CAM techniques
- 4 Manufacture a component to a specified brief using CAD/CAM techniques

Learning Outcomes of Assessments

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

Assignment	2	3	4
NCC Group Pass/Fail	1		

Outline Syllabus

Inputs: CAD model, material specifications, tooling data, spindle speeds and feed rate data calculations *Outputs: CAM files, program code and coordinates, manufacturing sequences, tooling requirements, auxiliary data*

Programming methods: CAD/CAM, manual programming, conversational programming *Component set-up: zero datum setting, tool set-up and offsets, axis of movements*

Work-holding: machine vice, chuck, fixtures, clamping, jigs

Tooling: milling cutters, lathe tools, drills, specialist tooling, tool holders, tool turrets and carousel

Import solid model: set-up, model feature and geometry identification, stock size, material *Manufacturing simulation: operations, pockets, slots, profiling, holes, tool and work change positions, tool sizes and IDs, speeds and feeds, cutter path simulations, program editing*

CNC machine types: machining centres, turning centres, MCUs e.g. Fanuc, Siemens, and Heidenhain

Data transfer: structured data between CAD and CAM, file types, transfer to CNC machine

Inspection: manual inspection, automated inspection, stages of inspection throughout manufacturing process

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.

Practical Work

This module contains directed practical work that students will undertake under the supervision of teaching staff and/or technicians. Some elements of this practical work will form part of the assessment for this module.

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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