

Liverpool John Moores University

Title: ADVANCED MATERIALS
Status: Definitive
Code: **5516NCCG** (129450)
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 aims to demonstrate an understanding of where Finite Element Analysis (FEA) and Computational Fluid Dynamics (CFD) can be used in the product development process. The student will be required to deal with complex issues, both systematically and creatively, to construct numerical models of physical systems, and critically evaluate the results of that analysis. The module will also provide a conceptual understanding of the principles of FEA and CFD, including introductory

mathematical fundamentals as required.

Learning Outcomes

After completing the module the student should be able to:

- 1 Demonstrate an understanding of the properties, manufacturing processes and uses of polymers, elastomers and ceramics.
- 2 Demonstrate an understanding of the properties, manufacturing processes and uses of metallic and non-metallic composite materials
- 3 Design and manufacture a component to meet an engineering specification
- 4 Carry out non-destructive and destructive tests to determine the performance of a component against its specification

Learning Outcomes of Assessments

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

Assignment	1	2	3	
NCC Group Pass/Fail				4

Outline Syllabus

Knowledge of material properties relating to metals, polymers and ceramics.

Relationship between material properties and their structures.

Structures, properties, processing and applications of: Metals; Ceramics; Polymers; Elastomers; Composites.

Application of the knowledge gained critically to evaluate the suitability of materials for specific engineering applications.

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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