

Liverpool John Moores University

Title: Additive Manufacturing Processes
Status: Definitive
Code: **7113MAN** (121998)
Version Start Date: 01-08-2021

Owning School/Faculty: Engineering
Teaching School/Faculty: Engineering

Team	Leader
Tahsin Opoz	Y

Academic Level: FHEQ7
Credit Value: 20
Total Delivered Hours: 44
Total Learning Hours: 200
Private Study: 156

Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	22
Practical	9
Tutorial	11

Grading Basis: 50 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Examination	70	2
Portfolio	AS2	Portfolio	30	

Aims

To enable students to understand additive manufacturing processes, particularly those that contribute to the concept of "high value manufacturing".

Learning Outcomes

After completing the module the student should be able to:

- 1 Recognise a range of additive manufacturing processes and identify relevant processes to consider for a particular application
- 2 Analyse and estimate process parameters for processing a given application
- 3 Critically examine the practical and commercial constraints and benefits of adopting an additive manufacturing approach.
- 4 Design for Additive Manufacture

Learning Outcomes of Assessments

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

Examination	1	2	3	
Portfolio	1	2	3	4

Outline Syllabus

The list below provides an indicative list of topics that may be covered in this module.

Introduction to the seven types of additive manufacture (AM)

Stereolithography / VAT Photopolymerisation

Fused deposition modelling

Sheet lamination, Binder jetting, material jetting

MarkForged MetalX, Sintering, MIM comparison

Review of lasers and laser processing of materials

Laser welding/cutting/

Powder bed fusion: selective laser melting, electron beam melting

Blown powder laser directed

Case studies from industry

Design for AM

Powder metallurgy

Metallurgy of AM

Mechanical properties of AM material

Fatigue and defects

Multi material AM

Future of AM, industry 4.0

Commercial considerations, choosing a system

Learning Activities

The module delivery will incorporate lectures, tutorials, and practical work

Notes

The module will provide students with an in depth understanding of additive

manufacturing processes.