

Liverpool John Moores University

Title: Additive Manufacturing Processes
Status: Definitive
Code: **7113MECH** (121664)
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	11
Online	11
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 (AM) processes.