Module-1
Digital Manufacturing and 3D Printing

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Description of the Module

This module:

- Introduces the fundamentals of digital manufacturing and 3D printing, focusing on aerospace applications;
- Addresses the principles of process digitalisation, main software tools used in additive manufacturing workflows, process modelling and simulation, and design methodologies specific to 3D printing (e.g., Design for Additive Manufacturing – DfAM);
- Explores the integration of additive manufacturing into digitally driven and sustainable production systems, preparing learners to meet the challenges posed by digital transformation in additive manufacturing for aerospace applications.

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Description of the Module

1. Introduction
2. Digital Tools for Additive Manufacturing
3. Modelling, Simulation, and Print Preparation
4. Digital Design Methodologies
5. Integration of 3D Printing in Digital Production Systems
6. Conclusions

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Targets

DIGI3D

Students from

Aerospace Engineering

Aeronautical Engineering

Materials Engineering

Mechanical Engineering

Engineers

Technical staff

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CTEI

VILNIUS TECH

universidade de aveiro

theoria poiesis praxis

Learning Objectives

1	2	3	4	5	6
Understand the fundamental manufacturing concepts of digital and 3D printing	Recognise and apply digital tools (CAD/CAM/CAE) in additive manufacturing workflows	Recognise digital design strategies to optimise 3D printed components	Understand the influence of process parameters on the printing quality of components for the aerospace industry	Understand the complete digital workflow required to prepare parts for additive manufacturing	Understand the integration of 3D printing into digitally enabled and sustainable production systems

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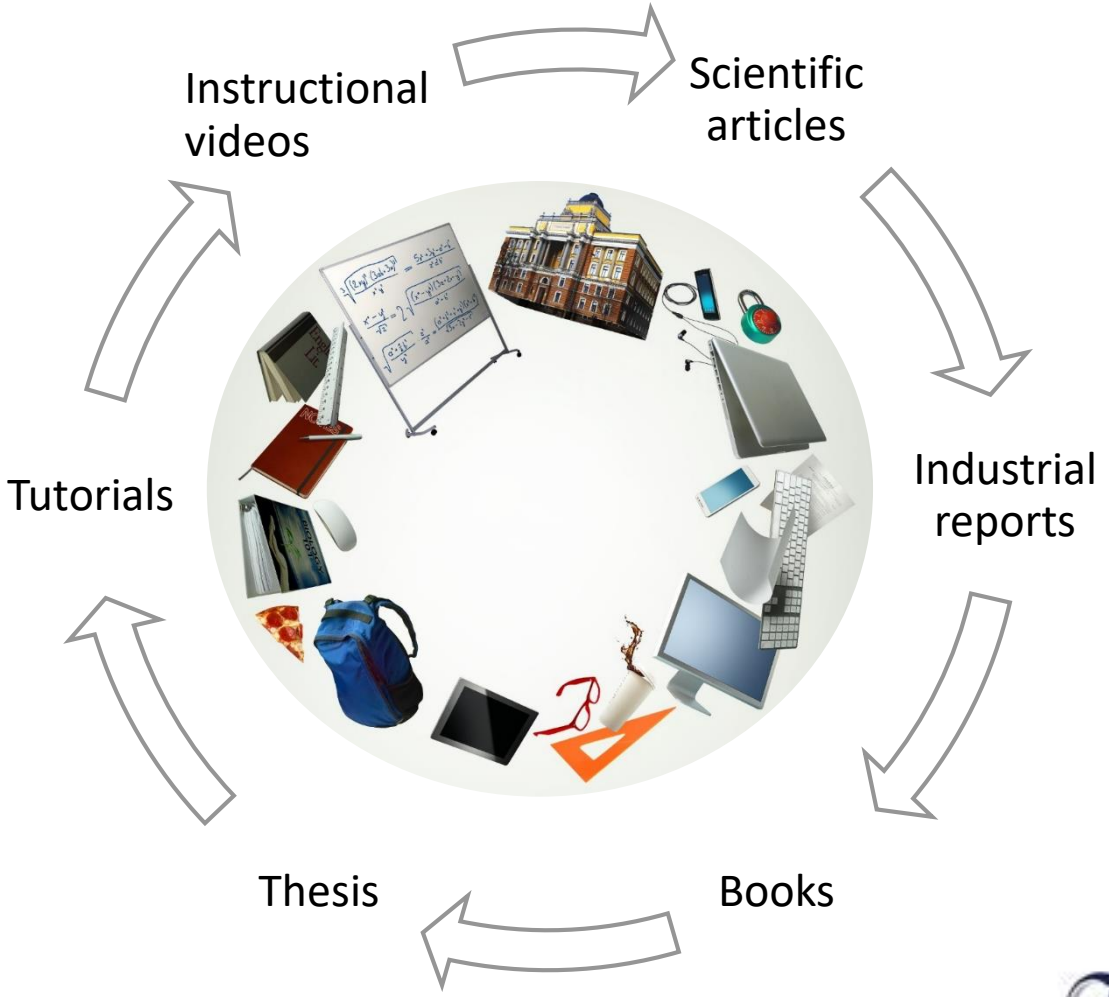
Learning Resources



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Self-assessment and Learning Activities

Textbook

Lesson presentations

Lesson reviews

Quizzes

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