

Module-4

Case Studies from Aerospace Applications

Description of the Module



This module focuses on 3D printing case studies involving both polymeric and metallic materials used in aerospace applications. The polymer-based case study addresses the manufacturing of airframe structures for drones, while the metallic material case study centers on the production of aero-engine components. The module discusses appropriate manufacturing methods based on the type of material and provides a step-by-step algorithm outlining the entire process.



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Description of the Module



The content of the module is outlined below.

1. Introduction
2. Case-1: 3D Printing of a Polymeric Material for Airframe Structures
3. Case-2: 3D Printing of a Metallic Material for Aero-engine Components
4. Conclusions



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Targets

- Students from;
 - Aerospace Engineering
 - Aeronautical Engineering
 - Materials Engineering
 - Mechanical Engineering
- Engineers
- Technical staff



Learning Objectives



Upon completion of this module, participants will be able to:

- Identify process requirements specific to aerospace materials.
- Select appropriate process parameters for 3D printing operations.
- Design and sequence process steps involved in 3D printing workflows.
- Understand and apply digital tools used in 3D printing processes.



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Learning Resources



- Scientific articles
- Industrial reports
- Books
- Thesis
- Tutorials
- Application videos



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Self-assessment and Learning Activities



- Textbook
- Lesson presentations
- Lesson reviews
- Quizzes



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