NITTTR BHOPAL

MEE-2/2025-2026
Advanced Composite Materials: Fabrication and Applications
21-07-2025 to 25-07-2025
NITTTR Bhopal

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Rationale

The course "Advanced Composite Materials: Fabrication and Applications" is designed to provide learners with comprehensive knowledge and practical skills in the rapidly advancing field of composite materials, with a particular focus on advanced composites and surface composites. These materials play a vital role in industries such as aerospace, automotive, biomedical, defense, and energy, owing to their exceptional mechanical strength, thermal stability, and corrosion resistance. The course emphasizes the significance of surface composites, introducing learners to innovative processing techniques such as Friction Stir Processing (FSP), laser surface engineering, and thermal spray coatings—all of which are essential for improving surface integrity and wear resistance and extending the service life of structural components.

Programme Outcomes

Design innovative composites by applying advanced knowledge of material behavior and structural requirements for high-performance engineering applications.
Acquire hands-on insights into the advanced processing and joining of composites.
Analyze structure, property performance relationships in advanced and surface-modified composites.
Integrate sustainability and performance metrics in material selection and engineering decisions.

Programme Content

The content to deliver spans a wide spectrum—from theory of composite material mechanics and matrix–reinforcement interactions to modern fabrication methods like autoclave processing, filament winding, additive manufacturing of composites, and application case studies across industries. By blending theoretical concepts with experimental methods and case-based learning, this course empowers learners with the skills necessary for research, design, and innovation in the domain of advanced materials.

Target Group

Faculty of Mechanical Engineering and allied disciplines

Coordinator & Co-Faculty

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