



**NITTTR
BHOPAL**



MEE-5/2025-2026

Advanced Manufacturing Techniques: 3D Printing, IoT, and Robotics in Engineering

06-10-2025 to 10-10-2025

NITTTR Bhopal

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Rationale

Advanced Manufacturing enables the rapid and precise production of parts and components through the use of technologies such as digitization, 3D printing, IoT and Robotics. 3D printing or additive manufacturing is a powerful technique in engineering that creates 3D solid objects from digital models, layer by layer. Unlike traditional subtractive methods, it adds material, allowing for complex geometries and customization. IoT in engineering, particularly within advanced manufacturing, utilizes connected devices and sensors to optimize processes, enhance efficiency, and improve decision-making by providing real-time data and insights. This technology revolutionizes traditional manufacturing by enabling predictive maintenance, automation, and smart factories, leading to increased productivity, reduced waste, and better resource management. Robotics refers to using robots to perform tasks in an automated manner. Robots with high-precision manipulators and vision systems can perform intricate tasks with unparalleled accuracy and consistency in assembly processes. This level of precision reduces errors, minimizes waste, and improves overall product quality.

Programme Outcomes

Design part for 3D printing.

Manufacture part by 3D printing.

Develop IoT-based automation solutions.

Develop Robot Programming for welding.

Programme Content

The 3D printing process and technologies will be covered, starting from prepossessing, processing, and post-processing. Hands-on practical sessions will be performed for a selected part, from design to 3D printing.

IoT, the impact of IoT on manufacturing, the benefits of IoT in manufacturing, and IoT Use Cases in Manufacturing will be covered with a demonstration of IoT usage.

Target Group

Faculty of Mechanical Engineering and allied disciplines

Coordinator & Co-Faculty

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