

INDUSTRIAL 3D PRINTING DESIGN & MANUFACTURING



Eligibility: Graduates and final year students from Diploma in Engineering, B.E./B.Tech (all streams), BSc, BCA & other graduates | Year of graduation: 2019 - 2026

Modules:

- 1. Introduction to additive manufacturing**
Introduction, history, and process steps of additive manufacturing (AM), market trends, benefits, and challenges, various AM technologies in polymers and metals, detailing their advantages and limitations.
- 2. Materials in additive manufacturing**
Additive manufacturing (AM) materials, including their significance, selection criteria, types, properties, processing techniques, and future trends for polymers, metals, ceramics, biomaterials, and advanced hybrid combinations.
- 3. Design for additive manufacturing**
DFAM principles, optimization, design rules, material selection, software tools, simulation, validation, quality control, case studies, hands-on projects, topology optimization, and lattice structures.
- 4. Additive manufacturing process and techniques**
Introduction, history, and process steps of additive manufacturing (AM), market trends, benefits, and challenges. It explores various AM technologies in polymers and metals, detailing their advantages and limitations.
- 5. Sector specific additive manufacturing applications - Automotive**
AM's role in automotive manufacturing, types, materials, postprocessing, quality assurance, applications in EVs, autonomous vehicles, spare parts, sustainability, and Industry 4.0, with lectures, assignments, and exercises.
- 6. Sector specific additive manufacturing applications - Aerospace & Defense**
Aerospace and defense manufacturing requirements, materials used, applications in engine components and avionics, small arms manufacturing, notable projects, innovative defense solutions, and emerging AM technologies for military applications.
- 7. Sector specific additive manufacturing applications- Energy**
AM applications in wind and solar energy, nuclear reactor components, battery technology, testing processes, and success stories. It highlights innovative projects, best practices, and emerging technologies in sustainable energy solutions.
- 8. Sector specific additive manufacturing applications- Electronics**
AM in PCBs and microelectronics, prototyping, consumer and flexible electronics, advanced sensors, wearables, successful projects, material advancements, and sustainable electronics manufacturing.
- 9. Metrology - AM process (quality control and inspection)**
Quality assurance in additive manufacturing, including inspection techniques, SPC, measurement tools, defect detection, postprocessing, testing, standardization, compliance, and advanced methods like CT and laser scanning.
- 10. Industry visit & industrial project**
Addressing industry challenges through advanced joining techniques and additive manufacturing processes, offering innovative solutions to enhance manufacturing capabilities and efficiency.
- 11. Human skills**
Interactive workshops, role-playing, and real-world simulations, fostering empathy, communication, adaptability, and leadership for holistic skill development.

Admission Confirmation Fee: ₹ 4,000

COURSE FEES

₹ 23,000

DURATION

10 WEEKS

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TATA INDIAN INSTITUTE OF SKILLS

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