

INDUSTRIAL 3D PRINTING DESIGN & MANUFACTURING

Eligibility: B.E./B.Tech. / Diploma in Engineering(Bio-medical, Mechanical, Production, Electrical, EC, Mechatronics, IC or equivalent.) (Pursuing / Completed) (Year of passing: 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

12 WEEKS

TATA IIS

TATA INDIAN INSTITUTE OF SKILLS

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