CENTRE OF EXCELLENCE

Maharana Pratap Institute of Technology

Approved by AICTE New Delhi, and affiliated to Dr. A.P.J. Abdul Kalam Technical University Lucknow

Lachhipur, Sonauli Road, Gorakhnath, Gorakhpur, UP-273015

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Advanced Certificate Program in Computer Aided Design & 3D Printing

Course Duration	6 Weeks	**Course start date: 01 Jun 2026 (Tentative)**
Days per Week	5	
Learning hrs. per day	3 – 4 Hrs.	
Total Learning Hrs.	90 Hours	
Intended Audience	Students/ faculties/ researchers/ Innovators/ Industry Professional with any of the below mentioned academic qualification and having intreset in the area of CAD/CAM/Additive Manufacturing • Pursuing/Passed Diploma in Mechanical or Electronics Engineering • Pursuing/Passed B.Tech in Any Descipline • Startup founders/Innovators/ Industry Professionals working in the domain of Additive Manufacturing/CAD/CAM • **Diploma/B.Tech students seeking to undertake summer internship as per BTE/AICTE/UGC norms.**	

Course Description

This advanced program is designed for engineering and science students to develop in-depth knowledge and hands-on expertise in CAD, additive manufacturing technologies, and product development. The course emphasizes multi-technology exposure (FDM, SLA, SLS), advanced design methodologies, and real-world applications. It prepares participants for industry, research, and entrepreneurship in digital manufacturing.

Learning Outcomes: By the end of this course, participants will be able to:

- Develop advanced 3D models using CAD tools (SolidWorks/Fusion 360)
- Apply design for additive manufacturing (DfAM) principles
- Understand and operate multiple 3D printing technologies
- Optimize slicing parameters for quality and efficiency
- Perform reverse engineering using 3D scanning tools
- Analyze materials and process parameters
- Develop functional prototypes and product concepts
- Understand startup opportunities in additive manufacturing

Industry Partner: Phillips Machine Tools India Pvt. Ltd. Is the industry partner, supporting training and skill development for students in this program.

Certification: Training Certificates will be provided to students upon completeion of the course subject to fulfilment of following conditions: (i) maintaining at least 80% attendance in the course (ii) Satisfactory performance in the end test/assessment (iii) Submission of the project and presentation during Week 6.

Registration Process: Students are required to complete the initial registration by submitting the Google Form**.** **https://forms.gle/6CGcExEq4yy9qxgm9**

Note: After registration, please visit the Centre of Excellence, MPIT Gorakhpur, for fee submission and final enrolment.

Module 1: Advanced Manufacturing & CAD (Week 1)

S.No	Lesson Title	Topics Covered	Hours
1	Manufacturing Ecosystem	Additive vs subtractive, digital manufacturing systems	3
2	AM Technologies	FDM, SLA, SLS overview, industrial applications	3
3	CAD Advanced Intro	SolidWorks/Fusion UI, advanced tools	3
4	Design Thinking	Engineering problem solving, workflow	3
5	Case Study	Industry use cases, discussion	4

Module 2: Advanced CAD & DfAM (Week 2)

S.No	Lesson Title	Topics Covered	Hours
1	Advanced Modeling	Complex geometry, parametric design	4
2	Assemblies	Multi-component design, constraints	4
3	DfAM Basics	Design for additive manufacturing, optimization	3
4	Design Validation	Analysis, tolerances, corrections	3
5	Practice	Advanced design exercises	5

Module 3: AM Technologies Deep Dive (Week 3)

S.No	Lesson Title	Topics Covered	Hours
1	FDM Deep Dive	Process parameters, material behaviour	3
2	SLA Technology	Resin systems, curing process	3
3	SLS Technology	Powder systems, sintering basics	3
4	Materials	Engineering materials, composites	3
5	Comparative Study	Technology comparison, applications	4

Module 4: Machine Hands-on (Week 4)

S.No	Lesson Title	Topics Covered	Hours
1	FDM Hands-on	Machine operation, printing workflow	4
2	SLA Practice	Setup, printing process, post-curing	4
3	SLS Demo	Powder handling, process understanding	3
4	Optimization	Parameter tuning, quality improvement	3
5	Practical Session	Multi-machine exposure, evaluation	5

Module 5: Reverse Engineering (Week 5)

S.No	Lesson Title	Topics Covered	Hours
1	Product Design	End-to-end workflow	3
2	Prototype Development	Functional part creation	4
3	Business Model	Startup, costing, applications	3
4	Project Work	Final prototype development	4
5	Final Demo	Presentation, evaluation	5

Module 6: Product Development & Startup (Week 6)

S.No	Lesson Title	Topics Covered	Hours
1	Product Design & Design Thinking	End-to-end workflow, design thinking fundamentals	3
2	Prototype Development	Ideation, Brainstorming, Functional part creation	4
3	Business Model	Startup, costing, applications	3
4	Project Work	Final prototype development	4
5	Final Demo	Presentation, evaluation	5

With Best Regards

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