

Internship Course Curriculum for AutoCAD, SolidWorks and 3D Printing (30 Hours Total)

Offered by: GUIITAR Council, GSFC University

Mode: Hands-on Training (Lab-Based) in Maker Lab - 2

Duration: 30 Hours

Target Audience: Students from SoT, SoS and SOM & LA

Prerequisites: Basic knowledge of drawing and computer operations.

1. AutoCAD Module – 10 Hours

Learning Objectives:

- To understand 2D drafting and annotation tools.
- To create and modify engineering drawings using AutoCAD.
- To develop practical skills in dimensioning, layering, and plotting

Session	Topics	Duration (hrs)	Activities/Outcomes
1	Introduction to AutoCAD Interface, Units, Limits, Coordinate System	1.5	Explore UI, set drawing limits and units
2	Basic Drawing Commands (Line, Circle, Arc, Rectangle, Polygon)	1.5	Create simple geometric figures
3	Modify Commands (Move, Copy, Trim, Extend, Fillet, Offset)	1.5	Edit drawings using modification tools

4	Layers, Line Types, Dimensioning, Text & Hatch	2	Create layered drawings with annotations
5	Orthographic Projections and Isometric Drawings	2	Draw front, top, side, and isometric views
6	Plotting and Printing Layouts	1.5	Set up sheets, scales, and print drawings

2. SolidWorks Module – 10 Hours

Learning Objectives:

- To understand 3D parametric modeling concepts.
- To develop skills in part modeling, assembly, and drawing generation.
- To apply design principles for real-world components.

Session	Topics	Duration (hrs)	Activities/Outcomes
1	Introduction to SolidWorks Interface and Sketching Tools	1.5	Sketch basic 2D profiles
2	Applying Dimensions and Relations	1	Constrain and define sketches fully
3	3D Features: Extrude, Revolve, Cut, Fillet, Chamfer	2	Create solid models

4	Advanced Features: Pattern, Mirror, Shell, Rib	1.5	Use complex modeling tools
5	Assembly Modeling: Mates, Constraints, Exploded Views	2	Assemble parts into a mechanism
6	Drawing Generation: Orthographic Views, BOM, Dimensions	2	Create 2D drawing sheets from 3D models

3. 3D Printing (FDM Technology) Module – 10 Hours

Sessi on	Topics Covered	Durati on	Learning Outcomes
1	Introduction to Additive Manufacturing and FDM Process	1 hr	Understand basics of 3D printing technology
2	Components and Working of FDM 3D Printers	1 hr	Identify printer parts, filaments, and mechanisms
3	3D Model Preparation and File Formats (STL, OBJ)	1 hr	Understand file conversion and compatibility
4	Slicing Software (Crealty/Ultimaker Cura) – Settings and Parameters	2 hrs	Learn slicing parameters: layer height, infill, support, and speed

5	Printer Setup, Bed Leveling, and Material Loading	1.5 hrs	Operate and prepare FDM printers for printing
6	Hands-on Printing of a CAD Model	2 hrs	Print and monitor 3D part fabrication
7	Post-Processing – Support Removal, Surface Finishing	1 hr	Perform part finishing and evaluate quality
8	Troubleshooting Common Printing Issues	0.5 hr	Learn to identify and fix print defects

4. Final Evaluation

- **Mini Project:** 2D drafting of components in AutoCAD and its 3D modeling in SolidWorks.
- **Assessment Criteria:** Accuracy of geometry, use of features, and drawing presentation.
- **Certification:** Certificate of Internship issued by GUIITAR Council, GSFC University.

5. Expected Tangible Outcomes

By the end of the internship, students will be able to:

- Develop engineering drawings as per BIS/ISO standards.
- Model, assemble, and document 3D parts using SolidWorks.
- Apply CAD tools for design visualization and fabrication support.

- Strengthen design skills for academic projects, internships, and competitions.
- Execute a complete CAD-to-Print workflow for academic and prototype applications.
- Demonstrate improved technical and design thinking skills for projects and internships.
- Operate and maintain FDM 3D printers safely.