

NIELIT AURANGABAD

Future Skill Prime "Additive Manufacturing Technology"

Course Name: GOT in ADDITIVE MANUFACTURING/3D PRINTING

Course duration : 40 hrs

Date: 05/07/2021 to 15/07/2021

Course outcomes :

- To gain knowledge and skills related to 3D printing technologies.
- To learn the selection of material, equipment and development of a product for Industry 4.0
- To understand the various software tools, process and techniques for digital manufacturing.
- To apply these techniques into various applications.

An approach after completion of this course, the students will be able to: Develop CAD models for 3D printing.

- Import and Export CAD data and generate .stl file.
- Select a specific material for the given application.
- Select a 3D printing process for an application.
- Produce a product using 3D Printing or Additive Manufacturing (AM).

Course Contents:

PART-1 THEORY & TUTORIAL

1. 3D Printing/Additive Manufacturing

S.K.Gera, 8Hrs

- Introduction, Process, Classifications, Advantages, Additive v/s Conventional Manufacturing processes, Applications. CAD for Additive Manufacturing
- CAD DESIGN Data formats, Data translation, Data loss, STL format. Additive

2. Manufacturing Techniques

Sharad,8Hrs

- Stereo- Lithography, LOM, FDM, SLS, SLM, Binder Jet technology.
- Process, Process parameter, Process Selection for various applications.
- Additive Manufacturing Application Domains: Aerospace, Electronics, Health Care,
- Defence, Automotive, Construction, Food Processing, Machine Tools

3. Materials

Pawan,8Hrs

- Polymers, Metals, Non-Metals, Ceramics Process, Process parameter, Process Selection for
- Various applications. Various forms of raw material- Liquid, Solid, Wire, Powder; Powder Preparation and their desired properties, Polymers and their properties.
- Support Materials

4. Additive Manufacturing Equipment

B.B.Sorte, 8HRS

- Process Equipment- Design and process parameters
- Common faults and troubleshooting
- AM Process Design
- Processing: Requirement and Techniques Support Removal, Sanding, Acetone treatment, polishing,

5. Reverse Engineering /Model /Product Quality

Yogesh, 4Hrs

- Inspection and testing
- Defects and their causes

PART-II , PRACTICABLE AND DEMOS

6. LIST OF PRACTICALS

1.AM Pre processing,

SKG, 04hrs

- 3D Modelling of a single component. Assembly of CAD modelled Components
- Exercise on CAD Data Exchange.
- Generation of .stl files.

2.AM Pre & Post processing,

Sharad,04hrs

- Identification of a product for Additive Manufacturing and its process plan.
- Printing of identified product on an available AM machine.

3.AM Post processing,

B.B.Sorte,04hrs

- Post processing of additively manufactured product.
- Inspection and defect analysis of the additively manufactured product.

4. AM Pre & Post processing,

Pawan/Yogesh 04hrs

- Comparison of Digital fabrication / Additively manufactured products 3D printed via CAD model & 3D Scan Model Design optimization etc.

Future Skill Prime Additive Manufacturing for GOT, Day wise schedule:

Sr. No.	Date Time	Faculty	Theory (04 Hrs)	Practical's/Demo's (04 Hrs)
1	05/07/2021 & 06/07/2021	S.K.GERA, NIELIT	Introduction, Process, Classifications, Advantages, Additive v/s Conventional Manufacturing processes, Applications. CAD for Additive Manufacturing CAD Design, Data formats, Data translation, Data loss, STL format. Additive	CREO, 3D Modelling of a single part, CAD Data Exchange, Conversion of .stl file.
2	07/07/2021 & 08/07/2021	SHARAD, SAHAS MUMBAI	Stereo- Lithography, LOM, FDM, SLS, SLM, Binder Jet technology. Process, Process parameter, Process Selection for various applications. Additive Manufacturing Application Domains: Aerospace, Electronics, Health Care, Defence, Automotive, Construction, Food Processing, Machine Tools	Identification of a product for Additive Manufacturing and its process plan. Printing of identified product on an available AM machine
3	09/07/2021 & 12/07/2021	B.B.SORTE, NIELIT	Process Equipment- Design and process parameters Common faults and troubleshooting AM Process, Design Processing: Requirement and Techniques Support Removal, Sanding, Acetone treatment, polishing,	Online, demonstration on FDM 3D Printers i.e. Makerbot/Mojo with slicing software's for Post processing of additively manufactured product. Inspection and defect analysis of the additively manufactured product.
4	13/07/2021 & 14/07/2021	PAWAN, NIELIT	Polymers, Metals, Non-Metals, Ceramics Process, Process parameter, Process Selection for Various applications. Various forms of raw material- Liquid, Solid, Wire, Powder; Powder Preparation and their desired properties, Polymers and their properties	Video tutorial and working of AM for various materials pre recorded videos.
5	15/07/2021	YOGESH, NIELIT	Reverse Engineering Techniques & concepts optimizations, uses of Software Tools & Hardware for translation of data to AM AM process	& 3DScan Model Design optimization using Rtech studio and live Demo on uses of 3D Scanner for digitization.
6	16/07/2021	SKG/BBS	AM Vs CNC Machines	Course Evaluation online mode Certificate & Feed Back