



Course Title: Introduction to 3D printing technology

Credit Units: 02

Course Level: UG

Course Code:

L	T	P/S (hrs.)	SW/F W	TOTAL CREDIT UNITS
0	1	0	2	02

Course Objectives: The objective of this course is to impart students to the fundamentals of various 3D Printing Techniques for application to various industrial needs. Student will be able to convert part file into STL format and will understand the method of manufacturing of liquid based, powder based and solid based techniques.

Pre-requisites: Basics of Engineering Graphics, Product design and Computer Aided Design

Student Learning Outcomes:

On completion of the course the student will be able to:

1. Use software tools for 3D printing
2. Prepare 3D printed modules
3. Construct products using LOM and FDM technologies

Course Contents/Syllabus:

Module I: Introduction	
Introduction to Design, Prototyping fundamentals. Introduction to 3D printing, its historical development, advantages. Commonly used terms, process chain, 3D modelling, Data Conversion, and transmission, Checking and preparing, Building, Post processing, RP data formats, Classification of 3D printing process, Applications to various fields.	30%

Module II: Liquid Based 3D Printing	
Stereo lithography apparatus (SLA): Models and specifications, process, working principle, photopolymers, photo polymerization, layering technology, laser and laser scanning, applications, advantages and disadvantages, case studies. Solid ground curing (SGC): Models and specifications, process, working ,principle, applications, advantages and disadvantages, case studies	35%
Module III :Solid Based 3D Printing	
Laminated object manufacturing(LOM): Models and specifications, Process, Working principle, Applications, Advantages and disadvantages, Case studies. Fused Deposition Modeling (FDM): Models and specifications, Process, Working principle, Applications, Advantages and disadvantages, Case studies, practical demonstration	35%

Assessment/ Examination Scheme:

Theory L/T (%)	Lab/Practical/Studio/SW (%)	Total (%)
0	100	100

Lab/ Practical/ Studio/SW Assessment:

Internal Components (Drop down)	Presentation (P)	Home Assignment (HA)	Case Discussion (CD)	Project	Viva Voce (V)	Attendance (A)
Weightage (%)	10	10	10	50	15	5

Text & References:

1. Chua C.K., Leong K.F. and LIM C.S Rapid prototyping: Principles an Applications, World Scientific publications, 3rdEd., 2010
2. D.T. Pham and S.S. Dimov, “Rapid Manufacturing”, Springer, 2001
3. Terry Wohlers, “ Wholers Report 2000”, Wohlers Associates, 2000
4. Paul F. Jacobs, “ Rapid Prototyping and Manufacturing”–, ASME Press, 1996
5. Ian Gibson, Davin Rosen, Brent Stucker “Additive Manufacturing Technologies, Springer, 2nd Ed, 2014.