



GUJARAT TECHNOLOGICAL UNIVERSITY
Syllabus for Bachelor of Vocation (B.Voc.), 6th Semester
Branch: Production Technology
Subject Name: Additive Manufacturing & 3D Printing
Subject Code: 21160304

Type of course: Elective

Prerequisite: Basic knowledge of engineering graphics, product design, and computer-aided design (CAD)

Rationale: To provide students with practical knowledge and skills in the field of 3D printing. The course is designed to cover the fundamentals of 3D printing technology, designing for 3D printing, the 3D printing process, and quality control in 3D printing. The course is intended to prepare students for careers in additive manufacturing and related fields by providing them with hands-on experience with different types of 3D printers and post-processing techniques.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
0	0	15	15	0	0	100	100	200

Sr. No.	Topic	No. of Hours
01	Introduction to 3D Printing: Overview of 3D printing technology, Types of 3D printers, Materials used in 3D printing, Applications of 3D printing	40
02	Designing for 3D Printing: Introduction to CAD software, Designing for additive manufacturing, Design optimization techniques, Preparing models for 3D printing	60
03	3D Printing Process: Overview of the 3D printing process, Types of 3D printing technologies, Understanding the slicing process, Post-processing techniques	60
04	Quality Control in 3D Printing: Introduction to quality control in manufacturing, Quality control techniques in 3D printing, Inspection and testing methods, Troubleshooting common issues	40
Total		200

Course Outcome:

Sr. No.	CO statement	Marks % weightage
CO 1	Understand the fundamentals of 3D printing technology and its applications.	20
CO 2	Develop proficiency in CAD software and designing for additive manufacturing.	30
CO 3	Gain hands-on experience with different types of 3D printers and post-processing techniques.	30
CO 4	Learn quality control techniques and inspection methods for ensuring product quality.	20



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Reference Books:

1. Olaf Diegel, Axel Nordin, Damien Motte, “A Practical Guide to Design for Additive Manufacturing”, Springer Series in Advanced Manufacturing August 2020
2. R. Noorani, “3D Printing Technology, Applications and Selection”, CRC Press, 2017.
3. “Additive Manufacturing Technologies and Applications”, Special Issue Editors Salvatore Brischetto Paolo Maggiore Carlo Giovanni Ferro, MDPI.

List of Open Source Software/learning website:

<https://nptel.ac.in>