COURSE TITLE	**3D MODELING AND PRINTING**
COURSE CODE	**01ME0106**
COURSE CREDITS	**2**

Objective:

1 To develop students' skills in designing and modeling 3D components using CAD tools and to provide practical exposure to additive manufacturing and laser cutting processes for product realization.

Course Outcomes: After completion of this course, student will be able to:

1 Utilize CAD software to create 2D sketches and convert them into 3D models.

2 Apply dimensions and constraints to make accurate and correct 3D models.

3 Analyse different CAD features and operations to select suitable tools for creating different shapes.

4 Analyse the steps of 3D printing and laser cutting to understand how digital models are turned into real objects.

Pre-requisite of course:NIL

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
0	0	4	0	0	0	50	50

Contents : Unit	Topics	Contact Hours
Total Hours		

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**Experiment 1** Introduction to CAD Software - Overview of the interface, tools and basic operations.	4
2	**Experiment 2** Creating 2D Sketches - Practice of simple geometric shapes and layouts using line, circle, Rectangle and other sketching commands.	4
3	**Experiment 3** Applying Geometric Constraints - Making lines parallel, perpendicular and tangent.	4

DR. RAMESHKUMAR MULJIBHAI BHORANIYA
Digitally signed by (Name of HOD)

DR. RAJENDRASINH BAHADURSINH JADEJA
Digitally signed by (Name of Dean/ Principal)

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
4	**Experiment 4** Dimensioning and Constraints - Specifying lengths, angles and relations for given shapes.	4
5	**Experiment 5** Extrusion Operations - Converting 2D sketches into 3D models using extrusion.	4
6	**Experiment 6** Revolve Operations - Creating axis-symmetric 3D models from 2D profiles.	4
7	**Experiment 7** Sweep Features - Modeling complex shapes using Sweep command.	4
8	**Experiment 8** Drawing using feature command i.e. Fillet, Chamfer, Hole, Round, Shell and Rib Command.	4
9	**Experiment 9** Drawing using Pattern and other engineering feature tools.	4
10	**Experiment 10** 3D Printing Hands-On Session -1	4
11	**Experiment 11** 3D Printing Hands-On Session -2	4
12	**Experiment 12** Laser Cutting Session	4
Total Hours		**48**

Textbook :

1 Engineering Graphics, Dr. R.L. Jhala, McGraw Hill Education, 2015

2 Creo Parametric 10.0 for Designers, 10th Edition, Prof. Sham Tickoo, CADCIM Technologies, 2024

References:

1 Parametric Modeling with Creo Parametric 12, Parametric Modeling with Creo Parametric 12, R. H. Shih, SDC Publications, 2025

2 A Text Book of Engineering Graphics, A Text Book of Engineering Graphics, P.J. Shah, S. Chand, 2014

3 Engineering Drawing, Engineering Drawing, Dhananjay Jolhe, McGraw Hill Education, 2017

4 Engineering Drawing, Engineering Drawing, N.D.Bhatt, Charotar Publishing House, 2012

5 Computer Aided Design, Computer Aided Design, Wilson R. Nyemba, CRC Press, 2022

Suggested Theory Distribution:

The suggested theory distribution as per Bloom’s taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking / Creative**
0.00	0.00	50.00	40.00	10.00	0.00

Instructional Method:

1 Hands on

Supplementary Resources:

1 https://nptel.ac.in/courses/112103019

DR. RAMESHKUMAR MULJIBHAI BHORANIYA
Digitally signed by (Name of HOD)

DR. RAJENDRASINH BAHADURSINH JADEJA
Digitally signed by (Name of Dean/ Principal)