Program : **Diploma in Mechanical Engineering / Manufacturing Technology**	
Course Code : **3029**	Course Title: **Advanced CADD Lab**
Semester : **3**	Credits: **0**
Course Category: **Program Core**	
Periods per week: **4 (L:0, T:0, P:4)**	Periods per semester: **60**

Course Objectives:

- To familiarize the basics of designing software and improve the time utilized in making drawings
- To impart skills for preparing drawings of complex machine components using CAD software
- To identify basic concepts of Three-dimensional modeling

Course Prerequisites:

Topic/Description	Course Code	Course Title	Semester
Basic knowledge about all aspects of drawing, Orthographic projection		Engineering Graphics	1
CAD software basic tools		Basic CAD lab	2
Fastening devices, cotter joints, couplings, bearings, GD & T, surface finish		Machine Drawing	3

Course Outcomes

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

COn	Description	Duration (hours)	Cognitive Level
CO1	Draw various fastening devices by choosing proper tools in the software.	12	Applying
CO2	Prepare detailed drawing of a complex component in a fast and effective manner	21	Applying

CO3	Implement GD&T symbols and surface finish symbols in a CAD drawing.	12	Applying
CO4	Identify the basic concepts of 3D modeling in a software environment.	9	Applying
	Lab Exam	6	

CO – PO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3			3			3
CO2	3			3			3
CO3	3			3			3
CO4	3			3			3

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

Course Outline

Module Outcomes	Description	Duration (Hours)	Cognitive Level
CO1	**Draw various fastening devices by choosing proper tools in the software.**		
M1.01	Retrieve concepts of fastening devices.	1	Remembering
M1.02	Recall the use of various CAD tools.	1	Remembering
M1.03	Sketch a diagram using CAD tools.	10	Applying
Contents: Exercises in CAD drawing of the following 1) Drawing assembly of a bolt, nut and a plain washer (Hexagonal and Square headed), 2) Drawing rivet heads (general purpose) and riveted joints using standard proportions. Single riveted and double riveted lap joint (Chain and zigzag), single riveted single strap butt joint and single riveted double strap butt joint.			
CO2	**Prepare detailed drawing of a complex component in a fast and effective manner**		
M2.01	Retrieve construction details of components and bill of materials required for cotter joints, couplings, bearings and machine parts.	1	Remembering

M2.02	Proficiency to prepare detailed drawings in CAD	20	Applying
	Lab Exam I	3	

Contents:
Detailed drawings of following machine parts are to be made by applying different commands in Autocad. (Sectional or plain elevations, plans and side views with dimensioning and bill of materials using CAD software.)

1) Sleeve & Cotter Joint
2) Socket & Spigot Joint
3) Knuckle Joint
4) Stuffing Box
5) Foot Step bearing or Plummer Block
6) Flanged Coupling Unprotected type

CO3	**Implement GD&T symbols and surface finish symbols in a CAD drawing.**		
M3.01	Recall the concept of GD&T and surface finish	1	Remembering
M3.02	Integrate CAD skill and the shop floor drawing knowledge.	11	Applying

Contents:
Exercise GD&T in AutoCAD.
Surface finish symbols using BLOCK
Prepare shopfloor drawing in AutoCAD for the Following

1) Slip Bush
2) Over Hung Crank
3) C- Clamp
4) Connecting Rod

CO4	**Identify the basic concepts of 3D modeling in a software environment.**		
M4.01	Identify the use of different 3D tools and commands	6	Understanding
M4.02	Prepare different 2D views of a 3D object	3	Applying
	Lab Exam II	3	

Contents:
Introduction 3D modeling- Constructing solid primitives-
Understanding UCS - viewing a 3D model - Boolean operations such as union - subtract - intersection.
Solid modeling – extrude – revolve – sweep
Draw simple solid objects by applying above 3D commands
Create sectional views of a 3D object
Create different 2D views (Orthogonal, Isometric) from 3D object using BASE tool in Layout tab.

Text / Reference:

T/R	Book Title/Author
T1	P I Varghese, K C John., Machine Drawing, VIP Publishers
T2	K C John, Textbook of Machine Drawing, PHI Learning Private Limited, New Delhi
R3	Bhatt, N.D., Machine Drawing, Charotar Publishing House, 2003.
R4	PS Gill, Machine Drawing, Katson Publishing.

Online resources

Sl No	Website Link
1	http://www.nptelvideos.in/2012/12/computer-aided-design.html
2	https://knowledge.autodesk.com/
3	https://www.thesourcecad.com/autocad-tutorials/