

Subject Code: 1ET4020406	Subject Title: Computer Aided Design
Pre-Requisite	--

RATIONALE:

Industrial activity of Mechanical Engineers are mainly involved in drafting, manufacturing, inspection and planning like preparing process plans, preparing bill of materials etc For all such activities, reference document is the drawing of component/assembly to be manufactured. As Drawing is second language for Mechanical Engineer, it is of utmost importance to prepare, read and interpret these drawings correctly for production of components and assemblies accurately and precisely.

This course is included in the curriculum to provide such necessary knowledge and skills in the area of mechanical equipment specially aware of modelling and designing practices, symbols, codes, norms and standards generally used in industries.

COURSE OBJECTIVE:

The subject caters drafting practices, symbols, codes, norms and standards generally used in industries. Now a days the market driven economy demands frequent changes in product design to suit the customer needs. With the introduction of computers the task of incorporating frequent changes as per requirement is becoming simpler. This course has been introduced at Diploma level in order to develop the drafting and modeling skills in student so that they can generate various digital production drawings/model of machines as required in industry using various CAD software..

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)			
Lecture	Tutorial	Practical	Credit	Theory		Practical	
				University Assessment	Continuous Assessment	University Assessment	Continuous assessment
2	-	2	3	60	40	20	30

SUBJECT CONTENTS:

SR NO	TOPIC	TOTAL HOURS	WEIGHTAGE %
1	Fundamentals of CAD: Computer graphics & its terminology, CAD definition, concept & need, CAD Workstation, CAD process, Functional areas of CAD, . Coordinate systems. Geometric transformation-concept and types. Dimensional (2D) geometric transformation- translation, scaling, rotation and mirror with numeric examples.	4	13
2	CAD Hardware : CAD Workstation : types, functions and configuration, Input and output devices (including voice, gesture, 3 dimensional (3D) printer, etc)-types, configuration and applications	4	13
3	Geometric modelling : Difference between 2D & 3D models, Geometric modelling – concept, types, features and applications, Solid modelling methods like Constructive Solid Geometry, Pure primitives & Boundary Representation, Feature base modelling-concept, illustrative examples, Parametric & non parametric modelling-concept, differences and illustration.	6	24
4	3D parametric modelling: Introduction to parametric modelling software. (Any one from Creo, Unigraphics, CATIA, Solid Edge, Inventor etc), Sketching interfacing overview, 3D working plane introductions, 3D modelling, Assembly modelling, Views generation.	14	50

COURSE OUTCOMES:

The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

- a) Select configuration of CAD workstation.
- b) Select type of modeling technique for given part.
- c) Design, develop and model the given part using various CAD software like- Creo/Catia / Unigraphics / Solid edge/Inventor/ AutoCAD, etc.
- d) Prepare solid models & assembly of mechanical parts.

SUGGESTED LIST OF EXERCISES / PRACTICALS:

1	Preparatory Activity: Prepare a 2D drawing using AutoCAD and 2D parametric sketcher environment, Prepare 3D solid models using AutoCAD, Prepare simple surface model using AutoCAD
2	3D Solid Modelling Prepare 3D solid model using any one of parametric software. Models should contain base features, Extrude/Protrude/ Revolve.
3	3D Solid Modelling Prepare 3D solid model using any one of parametric softwares. Models should contain engineering features.
4	Industrial Project Using Any One of the Parametric Softwares. Prepare solid models of details & an assembly Get orthographic production of all models in details & an assembly Prepare the bill of material (BOM) . Prepare presentation of project.

SUGGESTED LEARNING RESOURCES:

(A) List of Books:

Sr.No.	Title of Books	Author	Publication
1	Creo 2.0 for designer and engineers	Sham Tickoo	Dreamtech press
2	Designing with Creo Parametric 2.0	Dr. Michel J Rider	SDC Publications
3	Unigraphics for designer & engineers	Sham Tickoo	Dreamtech press
4	Machine design	K.C.Jhon	PHI
5	Production drawing	K.L.Narayan	New age publication
6	Fundamental of Geometric dimensioning & tolerancing	Alex kruleski	Cengage publication
7	CAD/CAM & Automation	Farzak haidaree	Nirali
8	Machine drawing including AutoCAD	Ajeet singh	McGraw-hill

(B) List of equipments:

- i. CAD Workstations.
- ii. Laser printer-A3 size.

(C) List of Software:

- i. latest Version of Autodesk AutoCAD Mechanical.
- ii. latest Version of Modeling softare.

(D) Learning Websites:

- i. Autodesk Exchange/ AUGI.
- ii. PTC university tutorials.
- iii. Video tutorials from YouTube and other resources