

Branch Name:	Mechanical Engineering
Program Code:	ET402
Course Title:	Computer Aided Design
Course Code:	2ET4020406
Pre-requisite Course:	Computer Aided Machine Drawing

Course Objectives:

1. Familiarize students with the basic concepts and functionalities of CAD software. This may include understanding the user interface, tools, and menus within a specific CAD program.
2. Drafting practices, symbols, codes, norms, and standards generally used in industries.
3. Product design to suit the customer needs.
4. Introduction of computers the task of incorporating frequent changes as per requirement is becoming simpler.
5. This course has been introduced at the Diploma level to develop the drafting and modeling skills in students so that they can generate various digital production drawings/models of machines as required in industry using various CAD software.

Teaching and Examination Scheme:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
2	0	2	3	60	40	20	30	150

Course Contents:

Unit No	Topic	Total Hours	Weightage (%)
1	Fundamentals of CAD: • Computer graphics and its terminology, CAD definition, concept and 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.	04	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.	04	13
3	G3. geometric modeling: • Difference between 2D and 3D models, Geometric modeling – concept, types, features, and applications. • Solid modeling methods like Constructive Solid Geometry, Pure primitives and boundary Representation. • Feature base modeling-concept, illustrative examples, Parametric and nonparametric modelling-concept, differences and illustration. Allowances and Tolerances • Introduction and Applications. • Definitions.	06	24
4	3D parametric modeling: • Introduction to parametric modeling software. (Anyone from Creo, Unigraphics, CATIA, Solid Works, Inventor, etc.).	14	50

	- Sketching interfacing overview, 3D working plane introductions, 3D modeling, Assembly modeling, and Views generation. - List of Mechanical Analysis software.		
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List of Practical:

1. Prepare a 2D drawing using AutoCAD and a 2D parametric sketcher environment, prepare 3D solid models using AutoCAD, and Prepare simplesurface models using AutoCAD.
2. Prepare a 3D solid model using any one of the parametric software. Models should contain base features, Extrude/Protrude/ Revolve.
3. Prepare a 3D solid model using any one of the parametric software. Models should contain engineering features.
4. Prepare solid models of details and an assembly. Get orthographic production of all models in detail and an assembly Prepares the bill of material (BOM). Prepare a presentation of the project.

Reference Books:

1. Creo 2.0 for designers and engineers, Sham Tickoo, Dreamtech press.
2. Designing with Creo Parametric 2.0, Dr. Michel J Rider, SDC Publications.
3. Unigraphics for designers and 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 and tolerancing, Alex rules, Cengage publication.
7. CAD/CAM and Automation, Farzak haidaree, Nirali.

List of Open-Source Software/learning website:

1. latest Version of Autodesk AutoCAD Mechanical.
2. latest Version of Modeling software.
3. Autodesk Exchange/ AUGI.
4. PTC university tutorials.
5. Video tutorials from YouTube and other resources.

Course Learning Outcomes (CLO):

1. Demonstrate basic concepts of computer-aided design and its applications.
2. Make use of various concepts and characteristics in geometric modeling.
3. Analyze geometric transformations.
4. Determine stress and strain in structural elements through FEA.
5. Summarized optimization techniques for the design of machine elements.

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes(PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CLO1						M			L							
CLO2			H								H		M		L	
CLO3	M	M	H										M		M	
CLO4		L	H		M						M		M		M	
CLO5		H	H						M					H		

H: High, M: Medium, L: Low