

GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT**COURSE CURRICULUM****COMPUTER AIDED DRAFTING****(Code : 3340103)**

Diploma Programme in which this course is offered	Semester in which offered
Aeronautical Engineering	Fourth

1. RATIONALE

With a vision that the students pursuing Diploma in Aeronautical Engineering may be involved in modelling, designing, manufacturing, inspection and planning activities (such as preparing design and production drawing, process plans etc.) in industries. This course has been introduced at Diploma level in order to develop the skills in student so that they can generate computer aided drawings as required by industry using appropriate CAD software.

2. LIST OF COMPETENCIES

The course content should be taught and implemented with the aim to develop different types of skills so that students are able to acquire following competency:

- **Develop computer aided drawings and models using codes, norms, standards and CAD software.**

3. TEACHING AND EXAMINATION SCHEME.

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	ESE	PA	ESE	PA	
02	00	04	06	70	30	20	30	

Legends: L-Lecture; T – Tutorial/Teacher Guided Theory Practice; P -Practical; C – Credit, ESE - End Semester Examination; PA - Progressive Assessment.

4. DETAILED COURSE CONTENTS

Unit	Major Learning Topics and Sub-topics	Outcomes (in cognitive domain)
UNIT- I INTRODUCTION TO CAD	1. To study about the need of CAD and its application. 2.Perform Geometric 2D transformation.	1.1 Computer graphics & its terminology. 1.2 CAD definition, concept & need. 1.3 CAD process. 1.4 Functional areas of CAD. 1.5 Coordinate systems. 1.6 Geometric transformation-concept and types.

		1.7 2 dimensional (2D) geometric transformation- translation, scaling, rotation and mirror with numeric examples.
UNIT– II CAD HARDWARE	1.Describe functions of CAD Workstation, its types, and configuration. 2.Use input/output CAD devices.	2.1 CAD Workstation-types, functions and configuration. 2.2 Input and output devices (including voice, gesture, 3 dimensional (3D) printer, etc)-types, configuration and applications.
UNIT– III GEOMETRIC MODELING	1.Explain types of solid modeling 2.Describe characteristics of features based CAD packages 3.Differentiate graphics packages used for modeling	3.1 Difference between 2D & 3D models. 3.2 Geometric modeling – concept, types, features and applications. 3.3 Solid modeling methods like Constructive Solid Geometry, Pure primitives & Boundary Representation 3.4 Feature base modeling-concept, illustrative examples. 3.5 Parametric & non parametric modeling-concept, differences and illustration.
UNIT – IV 3D MODELING USING AUTOCAD	1.Use appropriate UCS for the given situation. 2.Prepare solid model of industrial parts and its assembly using Auto CAD. 3.Prepare simple surface model using AutoCAD	4.1 Introduction to AutoCAD-3D features and 2D commands overview. 4.2 3D primitives-types and defining parameters. 4.3 User coordinate system (UCS) and its options. 4.4 3D draw commands. 4.5 3D modify and editing commands. 4.6 3D viewing & views generation.

5. SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY).

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	INTRODUCTION TO CAD	04	07	07	00	14
II	CAD HARDWARE	04	06	06	00	12
III	GEOMETRIC MODELING	06	04	06	08	18
IV	3D MODELING USING AUTOCAD	08	06	08	12	26
TOTAL		22	23	27	20	70

Legends: R = Remember U= Understand; A= Apply and above levels (Bloom's revised taxonomy).

6. SUGGESTED LIST OF EXERCISES/PRACTICALS.

The tutorial exercises should be properly designed and implemented with an attempt to develop different types of skills leading to the achievement of the above mentioned competencies.

SR. NO.	UNIT NO.	EXPERIMENT	HOURS REQUIRED
1	ALL	Preparatory Activity Prepare a 2D drawing using AutoCAD and 2D parametric sketcher environment.	6
2	II	3D Solid Modeling Prepare 3D solid models using AutoCAD (Four components).	8
3	IV	3D Surface Model Prepare simple surface model using AutoCAD (Four components).	8
4	IV	Mini Project And Presentation Using AutoCAD. a. Prepare solid models of dismantled parts of an assembly b. Assemble the parts. c. Present the project.	8

7. SUGGESTED LIST OF STUDENT ACTIVITIES.

Following is the list of proposed student activities like:

SR.NO. ACTIVITY

- 1 Design, develop and model the given part using AutoCAD.
- 2 Visit design section of different industry and observe various hardware and software, procedure, standards they are following for designing a product.
- 3 Course based mini-projects etc.

NOTE These could be individual or group-based.

8. SUGGESTED LEARNING RESOURCES.

A. List of Books:

SR. NO.	TITLE OF BOOK	AUTHOR	PUBLICATION
1.	Computer aided design: A conceptual approach	Jayanta Sarkar	CRC press
2.	CAD/CAM	By Groover	Pearson
3.	Computer-aided graphics and design	By Daniel I. Ryan	Marcel Dekker
4.	AutoCad	James Leach	SDC Publication
5.	Creo 2.0 for designer and engineers	Sham Tickoo	Dreamtech press

B. List of Major Equipment/ Instrument

- i. CAD Workstations.

- ii. Laser printer-A3 size.
- iii. AutoCad.
- iv. Latest educational network version of Creo, AutoCAD software (Any one).

C. List of Software/Learning Websites

- i. <https://www.youtube.com/watch?v=WY0YuCkJWdw>
- ii. https://www.youtube.com/watch?v=OIYrkF_FId8
- iii. https://www.youtube.com/watch?v=zoMW_usjaJo
- iv. <https://www.youtube.com/watch?v=fx6kt9djIpc>
- v. <https://www.youtube.com/watch?v=8wdOIHxICxw>
- vi. <https://www.youtube.com/watch?v=srnm--IKtl4>
- vii. <https://www.youtube.com/watch?v=rtjDfZXscrI>

9. COURSE CURRICULUM DEVELOPMENT COMMITTEE

Faculty Members from Polytechnic

- **Prof. ANKIT PATEL**, H.O.D., Aeronautical Dept. Parul institute of engg. & tech-Diploma studies.
- **Prof. KARNAIL SAINI**, Lecturer. Aeronautical Dept. Parul institute of engg. & tech-Diploma studies.

Coordinator and Faculty Members from NITTTR Bhopal.