

# GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

## COURSE CURRICULUM

### COMPUTER AIDED MODELLING & DESIGN

(Code : 3360102)

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

#### 1. RATIONALE

The main objective of this course is to understand the modeling and drawing of component/assembly to be manufactured. This course has been introduced at Diploma level in order to develop the skills in student so that they can generate various modeling and digital production drawings as required by industry using appropriate CAD software.

#### 2. LIST OF COMPETENCIES

The course content should be taught and implemented with an aim to develop different types of skills leading to the achievement of the following competencies:

- To know about modeling fundamentals and use of CAD Software's.
- To study about details information of modeling & designing.

#### 3. TEACHING AND EXAMINATION SCHEME.

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE	PA	ESE	PA	150
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**

<b>Unit</b>	<b>Major Learning Topics and Sub-topics</b>	<b>Outcomes (in cognitive domain)</b>
<b>UNIT – I INTRODUCTION ABOUT COMPUTER AIDED MODELING &amp; DESIGN</b>	<ul style="list-style-type: none"> <li>• To study about types of solid modeling..</li> <li>• To study about Computer Aided Design Software</li> <li>• Differentiate graphics packages used for modeling</li> </ul>	1.1 Difference between 2D & 3D Models. 1.2 Geometric modeling concept, types, features an applications. 1.3 Solid modeling methods like Constructive Solid Geometry, Pure primitives & Boundary Representation 1.4 Parametric & non parametric modeling-concept, differences and illustration. 1.5 AutoCAD Software 1.6 CREO Software 1.7 CATIA Software 1.8 Solid Work Software 1.9 NX Software
<b>UNIT– II 2D &amp; 3D MODELING USING AUTOCAD</b>	<ul style="list-style-type: none"> <li>• To study about AutoCAD 3D Command</li> <li>• To study AutoCAD 3D Command.</li> </ul>	2.1 Introduction to AutoCAD-2D commands overview. 2.2 2D Draw Command 2.3 2D Modify & Editing Command 2.4 Dimension of Object 2.5 3D primitives-types and defining parameters. 2.6 3D draw commands. 2.7 3D modify and editing commands.
<b>UNIT– III 2D MODELLING BY CREO SOFTWARE</b>	<ul style="list-style-type: none"> <li>• To study about Sketch Modeling.</li> <li>• To study about draw command.</li> <li>• To study about Sketch Constrains.</li> </ul>	3.1 Introduction to parametric modeling Creo software. 3.2 Sketching interfacing overview. 3.3 Draw Command 3.4 Modify Command 3.5 Dimensions of Object 3.6 Sketch Constrains
<b>UNIT– IV 3D MODELLING BY CREO SOFTWARE</b>	<ul style="list-style-type: none"> <li>• To Study about 4a. Part Modeling</li> </ul>	4.1 Sketch of Part 4.2 Model Shapes 4.3 Model Engineering 4.4 Model Editing
<b>UNIT- V ASSEMBLY MODELLING BY CREO SOFTWARE</b>	<ul style="list-style-type: none"> <li>• Prepare solid model of industrial parts assembly using creo software.</li> </ul>	5.1 Assembly modeling. 5.2 Assembly Constrain 5.3 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 ABOUT COMPUTER AIDED MODELING & DESIGN	05	04	04	02	10
II	2D & 3D MODELING USING AUTOCAD	05	05	04	06	15
III	2D MODELLING BY CREO SOFTWARE	04	04	05	06	15
IV	3D MODELLING BY CREO SOFTWARE	10	06	08	06	20
V	ASSEMBLY MODELLING BY CREO SOFTWARE	04	04	02	04	10
<b>TOTAL</b>		<b>28</b>	<b>23</b>	<b>23</b>	<b>24</b>	<b>70</b>

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

**6. SUGGESTED LIST OF 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.	PRACTICAL
1	I	<b>Preparatory Activity</b> Prepare a 2D drawing using AutoCAD and 2D parametric sketcher environment.
2	II	<b>3DSolid Modeling-I</b> Prepare 3D solid models using AutoCAD (Three Mechanical components).
3	III	<b>3D Surface Model</b> Prepare simple surface model using AutoCAD (Two Mechanical components).
4	IV	<b>3D Solid Modeling-III:</b> Prepare 3D solid models using from Creo, software. (Four models that includes engineering features).
5	V	<b>Mini Project And Presentation Using From CREO Software.</b> a. Prepare solid models of dismantled parts of an assembly (selected as student activity 1). b. Assemble the parts. c. Get orthographic production drawings of solid models prepared at "a" above. d. Get orthographic production drawings of assembly model prepared at "b" above. e. Prepare the bill of material (BOM) . f. Present the project.

**7. SUGGESTED LIST OF STUDENT ACTIVITIES.**

Following is the list of proposed student activities like:

**SR.NO. ACTIVITY**

- 1 Preparation of CAD models.
- 2 Visit design section of different industry and observe various hardware and software, procedure, standards they are following for designing a product.

**8. SUGGESTED LEARNING RESOURCES.****A. List of Books:**

SR. NO.	TITLE OF BOOK	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.	Pro/Engineer wildfire 5.0 instructor	David S. Kelley	McGraw-hill
4.	AutoCAD for engineers and Designers	Sham Tickoo	Dreamtech press

**B. List of Software/Learning Websites**

- a. <https://www.youtube.com/watch?v=WY0YuCkJWdw>
- b. [https://www.youtube.com/watch?v=OIYrkF\\_FId8](https://www.youtube.com/watch?v=OIYrkF_FId8)
- c. [https://www.youtube.com/watch?v=zoMW\\_usjaJo](https://www.youtube.com/watch?v=zoMW_usjaJo)
- d. <https://www.youtube.com/watch?v=fx6kt9djIpc>
- e. <https://www.youtube.com/watch?v=8wdOIHxICxw>
- f. <https://www.youtube.com/watch?v=srnm--IKtl4>
- g. <https://www.youtube.com/watch?v=rtjDfZXscrI>

**9. COURSE CURRICULUM DEVELOPMENT COMMITTEE****Faculty Members from Polytechnic.**

- **Prof. Ankitkumar Patel**, H.O.D., Aeronautical Dept. Parul institute of Engg. & Tech.-Diploma studies.

**Faculty Members from Engineering.**

- **Prof. Jignesh Vala**, Asst. Professor, Aeronautical Dept. SVIT, Vasad.
- **Prof. Arpit Patel**, Asst. Professor, Aeronautical Dept. SVIT, Vasad.

**Coordinator and Faculty Members from NITTTR Bhopal**