



GOVERNMENT OF TAMILNADU
DIRECTORATE OF TECHNICAL EDUCATION, CHENNAI
STATE PROJECT COORDINATION UNIT
(Established under Canada India Institutional Cooperation Project)
CURRICULUM

Course Name	PARAMETRIC DESIGN USING AUTODESK INVENTOR
Course Code	ME/2020/031
Course Duration	60 Hours
Minimum Eligibility Criteria	ITI/10 th /+2/Diploma/Graduates
Pre-requisites (if any)	-
Course Objectives	Training module has been designed to provide the participants to • Ensure the basics of 3D Model creation for design, visualization, analysis, animation and prototype used in manufacturing industries. • Design the product as if it were in the real world of manufacturing
Course Outcomes	At the end of training, the trainees will be able to • Identify and apply the concepts for creating 3D models used for manufacturing the real-time components and other industrial application. • Develop 3D models, 2D drawings, assembly models and assembly drawings using Autodesk Inventor software with manufacturing standards in an industry.
Expected Job Roles	Design Engineer

TEACHING AND SCHEME OF EXAMINATION						
Course Code	Course Name	Hours		Assessment Marks		Duration of the Examination
				Min	Max	
ME/2020/031	PARAMETRIC DESIGN USING AUTODESK INVENTOR	Theory	20	10	20	3 Hours
		Practical	40	40	80	
		Total	60	50	100	

ME/2020/031 - PARAMETRIC DESIGN USING AUTODESK INVENTOR

DETAILED SYLLABUS

Unit No	Modules	No. of Hours	
		Theory	Practical
I	Introduction to CAD/CAM and Autodesk Inventor	5 Hours	
1.1	Autodesk Inventor Fundamentals	03	
1.2	Introduction to - CAD/CAM – B-Rep and CSG Techniques Working Features		
1.3	Primitive Base Features		
1.4	Practical: ➤ Base features practice for the given drawing		02
II	Sketching Fundamentals	12 Hours	
2.1	Creation of sketches – Entity creation and modification	03	
2.2	Sketching Base Features using dimensions and constraints.		
2.3	Practical: ➤ Sketching Base Features to create part models for the given drawing.		09
III	Creation of 3D Models	15 Hours	
3.1	Extruding Features	05	
3.2	Revolving Features, Sweep and Loft		
3.3	Coil, Thread and Emboss.		
3.4	Practical: ➤ Creating Extrude, Revolve sweep exercise for the given drawing.		10
IV	Creation of Reference Features and Engineering Features	10 Hours	
4.1	Creation of Work Planes, Axis and Points	03	
4.2	Creation of Holes – Linear, Axial, Radial holes		
4.3	Creation of Ribs & Shell		
4.4	Creation of Fillet and Chamfer.		
4.5	Practical: ➤ Creating Datum, Hole, ribs, Shell, etc., for the given drawings.		07
V	Sectioning and Isometric Drawings & Dimensioning	10 Hours	
5.1	Copy, Paste, Mirror & Move	03	
5.2	Pattern – Rectangular and Circular		
5.3	Split & combine – Bending parts		
5.4	Editing sketch and Feature editing.		

5.5	Import & Export: Creation of STL, IGES, STEP and JPEG models.		
5.6	Practical: ➤ Feature editing Exercise for the given drawings		07
VI	Introduction to Assembly modeling	8 Hours	
6.1	Creation of Assembly models – Mate – Align – Fix	03	
6.2	Practical: ➤ Assembling the component for the given part models		05
Total Theory and Practical hours		20	40
Total hours		60	

HARDWARE REQUIREMENTS

S. NO.	LIST OF TOOLS /EQUIPMENTS
1	High End Workstation (with Intel Processor i5 or i7)
2	1 TB HDD / 16 GB DDR4 RAM / 2GB PCI Graphics Card / KBD / Mouse
3	LCD / LED Monitor - 22" Wide
4	Microsoft Operating system (Windows 8 / 10 - 64 Bit Support)

SOFTWARE REQUIREMENT

S. NO.	LIST OF SOFTWARE
1	Autodesk Inventor Professional 2018 (Educational or Commercial License)

REFERENCE BOOKS

S. No.	Name of the Book	Author	Publisher & Year
1	Autodesk Inventor Professional 2018 for Designers – 18 th Edition	Sham Tickoo	CADCIM Technologies, 2017
2	Autodesk Inventor Professional 2018 Help Manuals	Autodesk	Autodesk Inc, USA, 2018

ASSESSMENT AND CERTIFICATION

S. No.	Criteria for Assessment
1.	A trainee will be assessed based on the performance in End Examination for Theory and Practical conducted internally in the Project Polytechnic College for a duration of 3 hours
2.	A trainee must have 75% of attendance to appear for End examination in Theory and Practical.
3.	The assessment for theory part will be based on the marks scored in the end examination on the knowledge bank of questions (1 word/objective type questions)
4.	The assessment for practical part will be based on the marks scored in the end examination conducted by the Project Polytechnic and assessed by the Examiners approved by Strategic Plan Implementation Committee (SPIC) of the project polytechnic.
5.	The passing criteria for successful completion of training is every trainee should score 50% of marks in theory and practical examination.
6.	On successful completion of training, Certificate will be issued to the participants by the Directorate of Technical Education through the Project Polytechnics.

END EXAMINATION

ALLOCATION OF MARKS

S.NO	Description	Max.Marks
1.	Theory Examination	20
2.	Practical Examination	
	a) Aim and Procedure	20
	b) Demonstration / Execution	25
	c) Result & Viva Voce	15
	d) Record	20
Total Marks		100

THEORY MODEL QUESTION PAPER

ME/2020/031 - PARAMETRIC DESIGN USING AUTODESK INVENTOR

(Maximum Marks: 20)

Answer any **twenty** questions:

20x1=20 Marks

1. The type of 3D model that has edges, but no surfaces or volume, is the_____.
2. A 3D model that has edges and surfaces but no interior or mass is a_____.
3. Which of the Inventor Base environments and file extension names is .ipt?
4. Which of the Inventor Base environments and file extension names is .idw?
5. What tool could use to add depth to a created sketch?
6. When a 2D sketch is completed, which command used to exit sketch mode?
7. In Autodesk Inventor, which tool can use to view your design from any angle?
8. A line or plane that just barely touches a curved surface at only one point is the_____.
9. What key should press to exit a command in Inventor?
10. Which file type is used to create a new part?
11. The constraint that forces two selected lines or curves to lie at right angles to one another is _____.
12. What is the file extension for Autodesk Inventor Assembly Files?
13. What must be done first before to create a 3D object?
14. What type of file used to create exploded views?
15. When an extrusion is created from a sketch, the sketch is
16. In a drawing file, dimensions are found under the.....tab.
17. To create a Square to Round, which command should be used?
18. Which command is used to create ribs for the drawing?
19. Is reorientation of view is possible after the mode is saved?
20. The command enables to move the view to a different position.
21. How to edit or add attributes such as dimension style or precision?
22. What are the three types of options used for making hole?
23. Is it possible to create revolved model without using centerline?
24. What is the option used to draw threads or springs?
25. The feature raises or recesses a profile relative to the model face by a specified depth and direction.