Subject Code: 01ME0407
Subject Name: Computer Aided Design Laboratory
B. Tech. Year - II (Semester - 4)

Type of course : Core

Prerequisite : Engineering Graphics

Rationale :

1. Drafting practice using computer.
2. Modeling of 2D and 3D parts.
3. Assembly of modeled parts.
4. Parametric Modelling of component.

Course Outcome :
Upon the completion of Computer aided design and manufacturing practical course, the student will be able to:

1. Draw the 3-D geometric information of machine components including assemblies, and automatically generate 2-D production drawings.
2. Understand the basic analytical fundamentals that are used to create and manipulate geometric models in a computer program.
3. Improve visualization ability of machine components and assemblies before their actual fabrication through modeling.
4. Apply animation, shading, rendering, lighting and coloring.
5. Model complex shapes including freeform curves and surfaces.

Teaching and Examination Scheme :

Teaching Scheme			Credits	Examination Marks					Total Marks
				Theory Marks			Practical Marks		
THEORY	TUTORIAL	PRACTICAL	C	ESE(E)	IA	CSE	Viva (V)	Term Work (TW)	
0	0	2	0	0	0	0	25	25	20

Content :

Sr. No.	Content	Total Hrs.
1	**Review of Drafting Package:** Basic Sketch command – Line, Circle, Rectangle, Arc, Polygon, Spline. Drafting the Orthographic views of Mechanical components.	**06**

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2	**Exercise in Solid modeling software:** Introduction & Basic Create command, Extrude, Revolve, Sweep, Loft, Rib, Web, Box, Cylinder, and Modifying command i.e. Fillet, Chamfer, Shell, Split Body. Modeling of Simple Mechanical Components, Modeling of components with sweep and loft feature, Modeling of temporary fasteners.	08
3	**Exercise of Parametric drawing:** Parametric drawing of components.	04
4	**Exercise on assembly of components:** Assembly of components, Conversion of 3D to 2D and mass property calculations, Assembly Drawing for Screw jack, Assembly Drawing for Connecting rod, Working Drawing for tolerances in Part and Assembly drawing.	08
5	**Production drawing:** Generating the Bill of material, Seat size and manufacturing settings, Industry drawing layout.	02

Distribution of Theory Marks

R Level	**U** Level	**A** Level	**N** Level	**E`** Level	**C** Level
20	30	25	15	10	--

Legends: R: Remember**; U:** Understand**; A:** Apply**; N:** Analyze**; E:** Evaluate**; C**: Create

Reference books :

1. Farid Amirouche, "Principles of Computer-Aided Design and Manufacturing, Pearson, 2nd Edition, 2004.
2. Sham Tickoo, "Autodesk Fusion 360: A Tutorial Approach", CADCIM Technologies, 2nd Edition, 2019.
3. Cameron Coward, "A Beginner's Guide to 3D Modeling: A Guide to Autodesk Fusion 360", No Starch Press, 1st Edition, 2019.
4. Coll, "Fusion 360 Step by Step", 1st Edition, 2021.
5. Cline, Lydia Sloan, "Fusion 360 for Makers", Make Community LLC, 2nd Edition, 2021.

List of Open Base Software / learning website :

1. http://www.3ds.com/
2. http://www.3ds.com/products-services/enovia
3. http://www.mece.ualberta.ca/tutorials/ansys/
4. http://learningexchange.ptc.com/tutorials/listing/product_version_id:44

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