MERI College of Engineering and Technology
(MERI - CET)

Session: 2020-21

Lesson Plan

Name of the Faculty : Mr. Sandeep Chhillar (Theory & Practical)

Discipline : Mechanical Engineering

Semester : 5th

Subject : Computer Aided Design & Manufacturing (**PCC-ME-301G**)

Lesson Plan Duration : 15 Weeks (from Aug., 2020 to Nov., 2020)

** Work Load (Lecture/Practical) per week (in hours): Lectures-02, Practicals-01

Week	Theory		Practical	
	Lecture Day	Topic (including assignment/test)	Days	Topic
1st	1st	Introduction: Introduction to CAD/CAM/CAE, Design Process	The students will be required to carry out the following exercises using software packages (e.g. Solid works / Pro Engineer/AutoCAD/ I-Deas/ Solid Edge/CURA etc.)	
	2nd	Importance and Necessity of CAD, Applications of CAD		
2nd	3rd	Hardware and Software requirement of CAD	1st	CAD Modeling Assignments (i) Use and learn import/export techniques and customization of software. (ii) Construction of simple machine parts and components like Coupling, Crankshaft, Pulley, Piston , Connecting rod, nuts, bolts, gears and helical springs (iii) Assembly drawing with sectioning and bill of materials from given detailed drawings of assemblies: Lathe Tail stock, Machine vice, Pedestal bearing, Drill jigs and Milling fixture. (iv) Make the part family/family table of a bolt.
	4th	Fundamentals of Additive Manufacturing (AM), Basic steps to perform AM		

3rd	5th	Classification of AM, Applications of AM: Aerospace, Biomedical, Automotive, Bio-printing	2nd	CAM Assignments Tool path generation, Part programming, G & M codes development for machining operations, Physical interpretation of machining features and tool geometries.
	6th	Tissue & Organ Engineering, Architectural Engineering, Surgical simulation, Art, Health care		
4th	7th	Basics of geometric and solid modeling, coordinate systems. Transformations: Introduction, transformation of points and line	3rd	To perform reverse engineering of a product using 3D scanner.
	8th	2-D rotation, reflection, scaling and combined transformation, homogeneous coordinates		
5th	9th	3-D scaling, shearing, rotation, reflection and translation, combined transformations	4th	To print coupling, crankshaft, pulley, piston, connecting rod, nuts, bolts with FDM 3D printer with suitable filament like Nylon, ABS etc.
	10th	Curves: Algebraic and geometric forms, reparameterization		
6th	11th	Analytical and Synthetic curves, cubic splines, Bezier curves and B-spline curves.	5th	To print a product with FDM 3D printer which is developed with reverse engineering.
	12th	Surfaces and Solids: Plane surface, ruled surface, surface of revolution		
7th	13th	Surfaces and Solids: Plane surface, ruled surface, surface of revolution	6th	To Draw Orthographic Projection Drawings (Front, Top and side) of boiler safety valve giving name the various components of the valve.
	14th	Surfaces and Solids: Plane surface, ruled surface, surface of revolution		
8th	15th	Surfaces and Solids: Plane surface, ruled surface, surface of revolution	7th	Make an Isometric dimensioned drawing of a connecting Rod using isometric grid and snap
	16th	Finite Element Method: Introduction, Procedure		

9th	17th	Finite Element Method: Introduction, Procedure	8th	raw 3D models by extruding simple 2D objects, dimension and name the objects
	18th	Analysis of 1D, 2D structural problems		
10th	19th	Analysis of 1D, 2D structural problems		
	20th	Difference between machining and additive manufacturing.		
11th	21th	Photo polymerization Processes, Powder bed fusion processes		
	22nd	Extrusion Based systems		
12th	23rd	Printing Processes, Effects of significant parameters		
	24th	Flexible Manufacturing Systems & Computer aided process planning: Introduction		
13th	25th	FMS components, types of FMS		
	26th	FMS layouts, planning for FMS, advantages and applications		
14th	27th	Conventional process planning, types of CAPP		
	28th	Steps in variant process planning, planning for CAPP.		