

## **SCHEME OF COURSE WORK**

### Course Details:

<b>Course Title</b>	: 3D EXPERIENCE LAB		
<b>Course Code</b>	: 22ME11S3	<b>L T P C</b>	: 1 0 2 2
<b>Program:</b>	: B. Tech.		
<b>Specialization:</b>	: Mechanical Engineering		
<b>Semester</b>	: III		

### Course Outcomes (COs):

At the end of the course, the student will be able to

<b>CO1:</b>	generate part models and combine parts to create an assembly
<b>CO2:</b>	develop models using generative shape design
<b>CO3:</b>	illustrate simulation of mechanisms
<b>CO4:</b>	use limits, fits and tolerances while drafting sectional views of assembled components
<b>CO5:</b>	analyze mechanical components and describe process planning

### Program Outcomes (POs):

At the end of the program, the students will be able to

PO1	Apply the knowledge of mathematics, science, engineering fundamentals to solve complex mechanical engineering problems
PO2	Attain the capability to identify, formulate and analyze problems related to mechanical engineering
PO3	Design solutions for mechanical system components and processes that meet the specified needs with appropriate consideration for public health and safety.
PO4	Perform analysis, conduct experiments and interpret data by using research methods such as design of experiments to synthesize the information and to provide valid conclusions
PO5	Select and apply appropriate techniques from the available resources and current mechanical engineering and software tools.
PO6	Carry out their professional practice in mechanical engineering by appropriately considering and weighing the issues related to society.
PO7	Understand the impact of the professional engineering solutions on environmental safety and legal issues.
PO8	Transform into responsible citizens by resorting to professional ethics and norms of the engineering practice.
PO9	Function effectively in individual capacity as well as a member in diverse teams and in multidisciplinary streams.
PO10	Communicate fluently with the engineering community and society, and will be able to prepare reports and make presentations effectively.

PO11	Apply knowledge of the engineering and management principles to managing projects and finance in multidisciplinary environments.
PO12	Engage themselves in independent and life-long learning to continuing professional practice in their specialized areas of mechanical engineering

**Course Outcome Versus Program Outcomes:**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO-1					3	2						3
CO-2					3	2						3
CO-3					3	2						3
CO-4					3	2						3
CO-5					3	2						3

*1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), put -: No Correlation*

**Program Specific Outcomes (PSOs):**

Week	Contents	Course Outcomes	Sample Viva Questions	Teaching Learning Strategy	Assessment Method & Schedule
1	<b>Introduction to COs and POs</b> <b>Introduction to all experimental setup</b>				
2	<b>Experiment -1</b> Part modeling and assembly of Bench Vice.	CO - 1	1. What do you mean by 3D Experience and the scope of the application? 2. What is Sketcher Workbench?	Design using software	End Exam

3	<b>Experiment -2</b> Water bottle surface creation	CO - 2	1. Where do we utilize axis?	Design using software	End Exam
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The student must attain the knowledge and skills to

<b>PSO-1</b>	Design, analyse and optimize mechanical systems along with control mechanisms
<b>PSO-2</b>	Manufacture mechanical components by selecting effective processing methods and efficient tools
<b>PSO-3</b>	Design, analyse and evaluate thermal systems

Course Outcome Versus Program Specific Outcomes:

COs	PSO1	PSO2	PSO3
CO-1	3		
CO-2	3		
CO-3	3		
CO-4	3		
CO-5	3		

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), put -: No Correlation

<b>Assessment Methods:</b>	End Exam
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### **Teaching-Learning and Evaluation**

4	<b>Experiment -3</b> Water jug surface creation	CO - 2	1. What is the importance of sketch tools?	Design using software	End Exam
5	<b>Experiment -4</b> Badminton bat surface creation	CO - 2	1. State the difference between axis and construction components?	Design using software	End Exam
6	<b>Experiment -5</b> Nut and bolt with threads	CO - 1	1. What is the utilization of Cut Part by Sketch Plane?	Design using software	End Exam
7	<b>Experiment -6</b> Surface generation of sheet metal and converting into a solid model	CO - 2	1. List the different commands available to create surfaces?	Design using software	End Exam

8	<b>Experiment -7</b> Design Assembly and Simulation of Four Bar Link Mechanism	CO - 3	2. What is the function of mirror command in the sketch.	Design using software	End Exam
9	<b>Experiment -8</b> Design, assembly and simulation of a slider-crank mechanism	CO - 3	1. What is smoothing of curves?	Design using software	End Exam
10	<b>Experiment -9</b> Drafting of solid models with dimensions, cut sections and projection	CO - 4	1. What is Tolerance 2. What is meant by Datum	Design using software	End Exam
11	<b>Experiment -10</b> Drafting of solid models with indications of limits, fits and tolerances	CO - 4	1. What is meant Geometric Dimension & Tolerance (GD&T)	Design using software	End Exam
12	<b>Experiment -11</b> A basic introduction to SIMULIA and static analysis of cantilever beam	CO - 5	2. What is static analysis.	Design using software	End Exam
13	<b>Experiment -12</b> Basic introduction to DELMIA and demo on process planning, assembly evaluation and generating the Gantt chart of a radial engine assembly	CO - 5	1. What are the areas covered in production planning? 2. State prerequisites of PPC.	Design using software	End Exam
14	<b>Make up class for backlog experiments</b>				