LESSON PLAN 2025-26

NAME OF THE TEACHER :

Subject: Manufacturing Engineering (AEPC201)

Program: Diploma in Automobile Engineering

Semester: 3rd

Total Contact Hours: 45

Total Marks: 100

Assessment: Progressive – 30, End Term – 70

Credits: 3

COURSE OBJECTIVES:

At the end of the course, the students will be able to:

CO1 Identify various cutting fluids, lubricants and lathe operations.

CO2 Describe various broaching machines and drilling processes.

CO3 Explain different welding and milling operations.

CO4 Identify various types of gear making and press working operations.

CO5 Describe various grinding and finishing processes.

Class No.	Topic	Subtopics	Teaching Aids / Activities	Course Objective
Unit I: Cutting Tools & Lathe Operations (9 Classes)				
1	Introduction to Manufacturing	Importance, applications, relevance in automobile industry	PPT, Real-life examples	CO1
2	Cutting Tools	Chisels, hacksaw blades, dies, reamers	Physical samples, videos	CO1
3	Tool Geometry	Turning tool geometry, tool angles and functions	Charts, diagrams, tool models	CO1
4	Machining Parameters	Speed, feed, depth of cut	Calculation sheet, charts	CO1
5	Coolants & Lubricants	Purpose, types, usage in machining	Sample bottles, video explanation	CO1
6	Lathe Machine – Types	Light duty, medium duty, heavy duty, CNC lathe	Images, videos, lab visit	CO1
7	Parts of Lathe	Headstock, tailstock, carriage, etc.	Real model / Workshop demo	CO1
8	Lathe Operations – I	Turning, facing, parting off, boring	Tool samples, process animation	CO1
9	Lathe Operations – II	Knurling, threading, taper & step turning	Workshop tool demo, model part drawing	CO1
Unit II: Casting & Drilling (12 Classes)				
10	Introduction to Casting	Definition, classification	Foundry video, chart	CO2
11	Sand Mould Casting	Procedure, applications	Sand mould demo model	CO2
12	Moulding Sand	Types, composition, properties	Samples, table chart	CO2
13	Patterns and Allowances	Types of patterns, allowances (shrinkage, draft, etc.)	Pattern samples, PPT	CO2
14	Cores in Casting	Types and functions	Core box, animations	CO2
15	Furnaces for Casting	Cupola and Crucible furnaces – construction and working	Diagrams, process video	CO2
16	Die Casting	Procedure, uses, advantages	Die casting video, discussion	CO2
17	Centrifugal Casting	True centrifugal, centrifuging – advantages, limitations	Case study, video demonstration	CO2
18	Casting Defects	Types, causes, remedies	Defect chart, defected parts	CO2
19	Introduction to Drilling	Classification, parts and functions of drilling machines	Drill machine model or lab visit	CO2
20	Drilling Operations	Radial drilling, operations like reaming, boring, tapping	Real part demo, video	CO2
21	Drills & Reamers	Types, uses, specifications	Drill bit set, visual demo	CO2

Unit III: Welding & Milling (9 Classes)				
22	Welding – Introduction	Classification, gas welding, types of flames	Welding torch demo, video	CO3
23	Arc Welding	Principle, equipment, applications	Welding simulator video	CO3
24	Advanced Welding Methods	TIG, MIG, Submerged Arc Welding	Practical video, equipment photo	CO3
25	Resistance Welding	Spot, seam, projection welding	Process animation, sample parts	CO3
26	Welding Defects	Types, causes, remedies	Defect images, group discussion	CO3
27	Brazing and Soldering	Principles, types, applications	Hands-on demo/video	CO3
28	Milling Machines – Types	Plain, universal, vertical milling machines	Machine images/video tour	CO3
29	Milling Operations	Simple, compound, differential indexing	Indexing head demo, PPT	CO3
30	Milling Tools & Holding Devices	Cutter types, nomenclature, tool signature, holding devices	Tool charts, cutter samples	CO3
Unit IV: Gear Making & Press Working (9 Classes)				
31	Gear Manufacturing – I	Casting, moulding, stamping, coining	Flowchart, real-world examples	CO4
32	Gear Manufacturing – II	Extruding, rolling, machining	Process animation, case study	CO4
33	Gear Shaping	Pinion & rack cutter method	Animated video, sketches	CO4
34	Gear Hobbing	Hobbing machine, hob types	Machine video, sample gears	CO4
35	Gear Finishing	Lapping, shaving, grinding, burnishing	Finishing chart, gear samples	CO4
36	Gear Materials & Heat Treatment	Materials, carburizing, nitriding, quenching	Metallurgy chart, video	CO4
37	Press Working – I	Press types, specifications, working	Machine images/video	CO4
38	Press Operations – II	Cutting, bending, drawing, blanking	Punching video, workshop demo	CO4
39	Die Components & Clearances	Punch, die shoe, guide pin, clearances	Die set model, animation	CO4
Unit V: Grinding & Finishing (6 Classes)				
40	Introduction to Grinding	Significance, applications	Grinding wheel demo	CO5
41	Grinding Wheel Manufacturing	Process, types, bond types	Sample wheels, process video	CO5
42	Grinding Wheel Selection	Selection criteria, examples with specifications	Wheel chart, selection exercise	CO5
43	Types of Grinding Machines	Cylindrical, Surface, Centreless	Lab video or machine visit	CO5
44	Surface Finish & Super Finishing	Surface finish definition, importance, super finishing processes	Finish comparison samples	CO5
45	Lapping Process	Principle, applications, materials used	Lapping video, lab demo	CO5

Signature of Teacher

11/7/25

Signature of HOD