



## DEPARTMENT OF MECHANICAL ENGINEERING

### Lesson Plan & Work-Done Diary for AY:2025-26, Even Semester

Course with Code: Machining Science & Metrology [BME402]				Faculty: Prof. Devaraj M R			Semester & Section: 4 <sup>th</sup> Sem	
Class No.	Date Planned (DD/MM)	Topics to be covered	TLP Planned	Class No.	Date of Conduction (DD/MM)	Topics Covered	TLP Executed	Remarks if any deviation
<b>MODULE-1:</b>								
1	26.2.2026	<b>Introduction to Metal cutting:</b> Orthogonal and oblique cutting.	Chalk & Talk PPT					
2	27.2.2026	Classification of cutting tools: single, and multipoint; tool signature for single point cutting tool.	Chalk & Talk PPT					
3	27.2.2026	Mechanics of orthogonal cutting; chip formation, shear angle and its significance,	Chalk & Talk PPT					
4	27.2.2026	Merchant circle diagram. Numerical problems.	Chalk & Talk PPT					
5	02.3.2026	Merchant circle diagram. Numerical problems.	Chalk & Talk PPT					
6	05.3.2026	Cutting tool materials and applications.	Chalk & Talk PPT					
7	06.3.2026	<b>Introduction to basic metal cutting machine tools: Lathe-</b>	Chalk & Talk PPT					



## DEPARTMENT OF MECHANICAL ENGINEERING

		Parts of lathe machine, accessories of lathe Machine and						
8	06.3.2026	various operations carried out on lathe. Kinematics of lathe.	Chalk & Talk PPT					
9	06.3.2026	Turret and Capstan lathe.	Chalk & Talk PPT					
Class No.	Date planned. (DD/MM)	Topics to be covered	TLP Planned	Class No.	Date of Conduction (DD/MM)	Topics Covered	TLP Executed	Remarks if any deviation
<b>MODULE-2:</b>								
10	09.3.2026	<b>Milling Machines:</b> up milling & down milling, classification of milling machines,	Chalk & Talk PPT & Video					
11	12.3.2026	constructional features (Column and Knee and vertical milling machine), milling cutter nomenclature,	Chalk & Talk PPT & Video					
12	13.3.2026	various milling. operations, calculation of machining time.	Chalk & Talk PPT & Video					
L1	27.3.2026	Preparation of one model on lathe involving – Facing, Plain Turning and Knurling.	Lab Visit	1				
L2	17.4.2026	Preparation of one model on lathe involving - Step Turning, Taper Turning.	Lab Visit	2				



## DEPARTMENT OF MECHANICAL ENGINEERING

13	13.3.2026	<b>Indexing:</b> Need of indexing Simple, compound and differential indexing	Chalk & Talk PPT					
14	13.3.2026	calculations. Simple numerical on indexing.	Chalk & Talk PPT					
15	16.3.2026	<b>Shaping, Slotting and Planning Machines Tools:</b> Driving mechanisms of Shaper, Slotter, and Planer.	Chalk & Talk PPT					
16	20.3.2026	Operations done on Shaper, Planer & Slotter Difference between shaping and planning operations.	Chalk & Talk PPT					
17	20.3.2026	<b>Drilling Machines:</b> Constructional features (Radial & Bench drilling Machines), operations,	Chalk & Talk PPT					
18	20.3.2026	types of drill & drill bit nomenclature. Calculation of machining time.	Chalk & Talk PPT					
19	23.3.2026	<b>Grinding:</b> Grinding operation, classification of grinding processes: cylindrical, surface & centreless grinding	Chalk & Talk PPT					
Class No.	Date planned. (DD/MM)	Topics to be covered	TLP Planned	Class No.	Date of Conduction (DD/MM)	Topics Covered	TLP Executed	Remarks if any deviation

### MODULE-3:



## DEPARTMENT OF MECHANICAL ENGINEERING

20	26.3.2026	<b>Thermal aspects, Tool wear, and Machinability</b> <b>Temperature in Metal Cutting:</b> Heat generation in metal cutting; temperature distribution in metal cutting,	Chalk & Talk PPT					
21	27.3.2026	<b>Temperature in Metal Cutting:</b> Heat generation in metal cutting; temperature distribution in metal cutting,	PPT & Video					
22	06.4.2026	effect of cutting speed on temperatures, measurement of cutting temperatures.	Chalk & Talk PPT					
23	09.4.2026	Tool life and tool Wear: progressive tool wear.	Chalk & Talk PPT					
24	13.4.2026	<b>forms of wear in metal cutting:</b> crater wear, flank wear, tool-life criteria,	Chalk & Talk PPT					
25	16.4.2026	cutting tool materials: basic requirements of tool materials,	Chalk & Talk PPT					
26	17.4.2026	major classes of tool materials: high-speed steel, cemented carbide, ceramics,	Chalk & Talk PPT					
27	23.4.2026	CBN and diamond, tool coatings; the work material and its machinability	Chalk & Talk PPT					



## DEPARTMENT OF MECHANICAL ENGINEERING

28	24.4.2026	<b>Cutting fluids:</b> Action of coolants and application of cutting fluids.	Chalk & Talk PPT					
L3	24.4.2026	Preparation of one model on lathe involving – Knurling, Thread Cutting.	Lab Visit	3				
L4	08.5.2026	One Job, Cutting of V Groove/ Dovetail / Rectangular groove using a shaper.	Lab Visit	4				
<b>Class No.</b>	<b>Date planned. (DD/MM)</b>	<b>Topics to be covered</b>	<b>TLP Planned</b>	<b>Class No.</b>	<b>Date of Conduction (DD/MM)</b>	<b>Topics Covered</b>	<b>TLP Executed</b>	<b>Remarks if any deviation</b>
<b>MODULE-4:</b>								
29	27.4.2026	<b>Introduction:</b> Introduction to metrology & measurements, definition, objectives and classification of metrology,	Chalk & Talk PPT					
30	30.4.2026	standards of length- wavelength standard, subdivision of standards,	Chalk & Talk PPT					
31	04.5.2026	numerical problems on length calibration.	Chalk & Talk PPT					
32	07.5.2026	<b>Line &amp; End Standards:</b> Line and end standard, slip gauges,	Chalk & Talk PPT					



## DEPARTMENT OF MECHANICAL ENGINEERING

33	08.5.2026	wringing phenomena, numerical. problems on slip gauges.	PPT & Video					
34	14.5.2026	<b>Systems of Limits, Fits &amp; Tolerance:</b> Definition of tolerance, tolerance specification in assembly,	Chalk & Talk PPT					
35	15.5.2026	principle of interchangeability and selective assembly, limits of size, Indian standards,	Chalk & Talk PPT					
36	18.5.2026	concepts of limits of size and tolerances, cost v/s tolerances, compound tolerances, accumulation of tolerances,	Chalk & Talk PPT					
37	21.5.2026	definition of fits, types of fits and their designation.	Chalk & Talk PPT					
L5	15.5.2026	Cutting of Gear Teeth using Milling Machine.	Lab Visit	5				
L6	22.5.2026	Preparation of One model with Simple Drilling operation/ Grinding machine operation	Lab Visit	6				
<b>Class No.</b>	<b>Date planned. (DD/MM)</b>	<b>Topics to be covered</b>	<b>TLP Planned</b>	<b>Class No.</b>	<b>Date of Conduction (DD/MM)</b>	<b>Topics Covered</b>	<b>TLP Executed</b>	<b>Remarks if any deviation</b>
<b>MODULE-5:</b>								
38	22.5.2026	<b>Gauges:</b> Classification of gauges, Taylor's principle,	Chalk & Talk PPT					



## DEPARTMENT OF MECHANICAL ENGINEERING

39	25.5.2026	design of GO, NO GO gauges, wear allowance on gauges,	Chalk & Talk PPT					
40	29.5.2026	types of gauges- plain plug gauges, ring gauges, snap gauge, limit gauge,	Chalk & Talk PPT					
41	01.6.2026	simple problems. <b>Comparators:</b> Introduction to comparators, classification, characteristics,	PPT & Video					
42	04.6.2026	systems of displacement amplification in mechanical comparators,	Chalk & Talk PPT					
43	05.6.2026	Reed type, Sigma comparator, Zeiss ultra-optimeter	Chalk & Talk PPT					
44	11.6.2026	, Solex air gauge, ultrasonic gauges, LVDT.	Chalk & Talk PPT					
45	12.6.2026	<b>Angular Measurements:</b> Bevel protractor, sine bar, angular gauges, numerical on building of angles.	Chalk & Talk PPT					
L7	29.5.2026	<b>Demonstration on</b> Cutting force measurement with dynamometers for turning, drilling, grinding operations	Lab Visit	7				



**DEPARTMENT OF MECHANICAL ENGINEERING**

L8	05.6.2026	<b>Demonstration</b> on tool wear and tool life on anyone conventional machining process	Demo with PPT/ Chalk & Talk	8				
L9	12.6.2026	To <b>study/ Demonstration</b> on the Tool Geometry of a single point turning tool (SPTT) in the American Standards Association (ASA) system.	Demo with PPT/ Chalk & Talk	9				



## DEPARTMENT OF MECHANICAL ENGINEERING

	Activity	Planned	Actual	Remarks
1	Theory Classes	45		
2	Demonstrations & Lab Visit/ Experiment conduction	09		
3	Assignments/ Quizzes/ reports	2/ 2		
4	Tutorials/ Extra classes	-		
5	Internal Assessments	3		
6	ICT based Teaching. (% of usage in Curriculum)	85 to 90%		
<b>Planning</b>			<b>Execution</b>	
Faculty Signature:			Faculty Signature:	
HoD Signature:			HoD Signature:	