MECHINE TOOLS & METROLOGY LABORATORY

Course code	23SO8552	**Year**	III	**Semester**	I
Course-category	ProfessionalCore	**Branch**	ME	**Course Type**	Lab
Credits	1.5	**L-T-P**	0-0-3	**Prerequisites**	-
Continuous Internal Evaluation	30	**Semester End Evaluation**	70	**Total Marks**	100

Course outcomes		
Upon successful completion of the Machine Tools and Metrology Laboratory, students will be able to:		**Blooms Level**
CO 1	Demonstrate proficiency in operating conventional machine tools such as lathes, milling machines, drilling machines, and grinders to produce components with specified dimensions.	**L3**
CO 2	Execute machining processes to fabricate components within given tolerances, using appropriate cutting parameters.	**L4**
CO 3	Utilize precision measuring instruments to measure linear and angular dimensions of machined components.	**L4**
CO 4	Apply principles of metrology to assess geometric features like linearity, flatness, roundness, and surface roughness.	**L4**
CO 5	Perform alignment tests on various machine tools	**L4**

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations(3-High,2:Medium, 1: Low)

CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2		2				3	3		2	3	3
CO2	3	2	2	2				3	3		2	3	3
CO3	3	2	2	2				3	3		2	3	3
CO4	3	2	2	2				3	3		2	3	3
CO5	3	2	2	2				3	3		2	3	3

Experiments	Machine Tools	**Mapped CO'S**
E1	Introduction of general-purpose machines -Lathe, drilling machine, Milling machine, Shaper, Planing machine, Slotting machine, cylindrical grinder, Surface grinder and Tool and cutter grinder.	**CO1**
E2	Operations on Lathe machines- Step turning, Knurling, Taper turning, Thread cutting and Drilling	**CO1, CO2**

E3	Operations on Drilling machine - Drilling, reaming, tapping, rectangular drilling, circumferential drilling.	**CO1, CO2**
E4	Operations on Shaping machine - (i) Round to square (ii) Round to Hexagonal	**CO1, CO2**
E5	Operations on Slotter - Keyway cutting	**CO1, CO2**
E6	Operations on milling machines - Gear manufacturing	**CO1, CO2**
	Metrology (Any Six Experiments)	
E1	Calibration of vernier calipers, micrometers, vernier height gauge and dial gauges.	**CO1, CO3**
E2	Measurement of bores by internal micrometers and dial bore indicators.	**CO1, CO3**
E3	Use of gear tooth vernier caliper for tooth thickness inspection and flange micrometer for checking the chordal thickness of spur gear.	**CO1, CO3**
E4	Angle and taper measurements with bevel protractor, Sine bar, rollers and balls.	**CO1, CO3**
E5	Use of spirit level in finding the straightness of a bed and flatness of a surface.	**CO1, CO3**
E6	Thread inspection with two wire/ three wire method & tool makers microscope.	**CO1, CO3**
E7	Measurement linear and angular dimensions using Profile projector	**CO1, CO3**
E8	Surface roughness measurement with roughness measuring instrument.	**CO1, CO3**
E9	Machine tool alignment test on lathe / milling machine	**CO5**
E10	Machine tool alignment test on drilling machine	**CO5**