

MACHINE TOOLS AND METROLOGY LABORATORY

V Semester: ME								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
AME110	Core	L	T	P	C	CIA	SEE	Total
		-	-	2	1	30	70	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 42				Total Classes: 42		

COURSE OBJECTIVES:
The course should enable the students to:

- I. To learn the Step turning and taper turning and thread cutting Drilling and Tapping on the lathe machine
- II. To the operations of Shaping and Planing and milling
- III. To learn the measurement of the Angle and tapers by Bevel protractor, Sine bars, etc.

COURSE LEARNING OUTCOMES (CLOs):
At the end of the course, the student will have the ability to:

1. Perform plain turning, step turning and Grooving on a circular rod
2. Perform the step turning and taper turning on a circular rod
3. Perform thread cutting and knurling on a circular C.S rod and using the lathe machine
4. Drill a hole and perform tapping once given work piece.
5. Slotting operation on a given specimen
6. Surface finish of given work piece
7. Shaping of square block, V- groove
8. Measure the length and diameter using vernier calipers
9. Determine angle of given specimen
10. Perform an alignment test on the Lathe Milling Machine

LIST OF EXPERIMENTS	
Week - 1	LATHE MACHINE
Step turning, taper turning, Thread cutting and knurling using lathe machine	
Week - 2	DRILLING AND STEP BORING
Drilling, tapping and step boring using drilling machine.	
Week - 3	PLANNING AND SHAPING
Shaping of V-groove using shaper	
Week - 4	SLOTTING
Slotting of a keyway using Slotter machine.	
Week - 5	MILLING AND SURFACE GRINDING
Milling of gear and surface grinding.	
Week - 6	VERNIER CALIPERS AND MICROMETER
Length, depth, diameter measuring using vernier calipers and micrometer.	

Week - 7	SCREW THREAD MEASUREMENT
Screw thread measurement by three wire method.	
Week - 8	SURFACE ROUGHNESS MEASUREMENT
Surface roughness by talysurf	
Week - 9	BORE GAUGE
Bore measurement using bore gauge.	
Week - 10	GEAR TEETH CALIPER/MICROMETER
Use of gear teeth caliper for checking the chordal addendum and chordal height of spur gear.	
Week - 11	ANGLE MEASUREMENTS
Tool angle measurements using bevel protractor, sine bar, slip gauges	
Week - 12	TAPER MEASUREMENTS
Taper measurements using Tool Maker's microscope.	
Week - 13	REVIEW
Spare session for additional repetitions and review	
Week - 14	EXAMINATIONS
Reference Books:	
1. B. S. Raghu Vamshi, —Workshop Technology Vol – II, 9 th Edition, Dhanpat Rai Publishers, New Delhi, India. 2010. 2. H.M.T. (Hindustan Machine Tools), —Production Technology, Tata McGraw-Hill Education (P) Ltd, New Delhi, India, 2 nd Edition, 1980. 3. Jain R.K., —Engineering Metrology, Khanna Publishers, 1 st Edition, 2005.	
Web References:	
1. https://www.ocw.mit.edu/courses/mechanical-engineering/ 2. http://www.nptel.ac.in/courses/112106138	

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HOD, ME