3/4 B.Tech. FIFTH SEMESTER

ME5L2 METROLOGY & MACHINE TOOLS LAB Credits: 2

Lecture:- - Internal assessment: 25marks
Lab Practice: 3 periods/week Semester end examination: 50 marks

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Objectives:

1. Demonstrate the usage of metrology lab equipment.
2. Know the working principles of different instruments.
3. Familiarize different machine tools used in production floor.
4. Impart hands on experience on lathe, drilling, shaping, milling, slotting, grinding and tool and cutter grinding machines.

Learning outcomes:

At the end of course the students will have:

1. Apply the procedures to measure length, width, depth, bore diameters, internal and external tapers, tool angles, and surface roughness by using different instruments.
2. Measure effective diameter of Thread profile using different methods
3. Conduct different machine alignment tests
4. Demonstrate knowledge of different machine tools used in machine shop.
5. Perform step, taper turning, knurling and threading.
6. Produce stepped surface using shaper and keyway using milling machine.

Pre-Requisites:

Metrology, Metal cutting and Machine Tools

METROLOGY LAB

Any 6 Experiments of the following

1. Measuring internal diameter using bore dial gauge
2. Measuring gear tooth thickness using gear tooth vernier
3. Measuring angles using universal bevel protractor and Sine bar

4. Measuring linear and angular dimensions of a tool using tool - makersmicroscope.
5. Measurement of surface finish using Talysurf
6. Measuring effective diameter of the thread using three wire method
7. Alignment test on a lathe machine
8. Measurements using Outside micrometer and Vernier caliper.

MACHINE TOOLS LAB

Any 6 Experiments of the following

1. Introduction of general purpose machines -lathe, drilling machine, milling machine, shaper, planing machine, slotting machine, cylindrical grinder, surface grinder and tool and cutter grinder.
2. Step turning and taper turning on lathe machine
3. Thread cutting and knurling on lathe machine.
4. Drilling and tapping
5. Shaping
6. Slotting
7. Planing
8. Milling
9. Surface grinding
10. Grinding of tool angles.