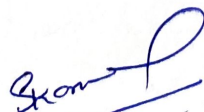


B. E. MECHANICAL ENGINEERING			
Choice Based Credit System (CBCS) and Outcome Based Education (OBE)			
SEMESTER – III			
MECHANICAL MEASUREMENTS AND METROLOGY LAB			
Course Code	18MEL37B/47B	CIE Marks	40
Teaching Hours/Week (L:T:P)	0:2:2	SEE Marks	60
Credits	02	Exam Hours	03
Course Learning Objectives:			
<ul style="list-style-type: none"> • To illustrate the theoretical concepts taught in Mechanical Measurements & Metrology through experiments. • To illustrate the use of various measuring tools & measuring techniques. • To understand calibration techniques of various measuring devices. 			
Sl. No.	Experiments		
PART A			
1	Calibration of Pressure Gauge		
2	Calibration of Thermocouple		
3	Calibration of LVDT		
4	Calibration of Load cell		
5	Determination of modulus of elasticity of a mild steel specimen using strain gauges.		
PART B			
6	Measurements using Optical Projector / Tool makers' Microscope.		
7	Measurement of angle using Sine Centre / Sine bar / bevel protractor		
8	Measurement of alignment using Autocollimator / Rollerset		
9	Measurement of cutting tool for cesusing:		
10	Measurements of Screw thread parameters using two wire or three-wire methods.		
11	Measurements of surface roughness using Tally Surf/Mechanical Comparator		
12	Measurement of gear tooth profile using gear tooth Vernier/Gear tooth micrometer		
13	Calibration of Micrometer using slip gauges		
14	Measurement using Optical Flats		
Course Outcomes: At the end of the course, the student will be able to:			
CO1: Understand Calibration of pressure gauge, thermocouple, LVDT, load cell, micrometre.			
CO2: Apply concepts of Measurement of angle using Sine Centre/ Sine Bar/ Bevel Protractor, alignment using Autocollimator/ Roller set.			
CO3: Demonstrate measurements using Optical Projector/Tool maker microscope, Optical flats.			
CO4: Analyse tool forces using Lathe/Drill tool dynamometer.			
CO5: Analyse Screw thread parameters using 2-Wire or 3-Wire method, gear tooth profile using gear tooth Vernier/Gear tooth micrometre			
CO6: Understand the concepts of measurement of surface roughness.			
Conduct of Practical Examination:			
1. All laboratory experiments are to be included for practical examination.			
2. Breakup of marks and the instructions printed on the cover page of answer script to be strictly adhered by the examiners.			
3. Students can pick one experiment from the questions lot prepared by the examiners.			
Scheme of Examination:			
ONE question from part -A: 30 Marks			
ONE question from part -B: 50 Marks			
Viva -Voice: 20 Marks			
Total: 100 Marks			


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B. E. MECHANICAL ENGINEERING			
Choice Based Credit System (CBCS) and Outcome Based Education (OBE)			
SEMESTER – III			
WORKSHOP AND MACHINE SHOP PRACTICE			
Course Code	18MEL38A/48A	CIE Marks	40
Teaching Hours/Week (L:T:P)	0:2:2	SEE Marks	60
Credits	02	Exam Hours	03
Course Learning Objectives:			
<ul style="list-style-type: none"> • To guide students to use fitting tools to perform fitting operations. • To provide an insight to different machine tools, accessories and attachments. • To train students into fitting and machining operations to enrich their practical skills. • To inculcate team qualities and expose students to shop floor activities. • To educate students about ethical, environmental and safety standards. 			
Experiments			
PART A			
Sl. No			
1	Preparation of at least two fitting joint models by proficient handling and application of hand tools- V-block, marking gauge, files, hack saw drills etc.		
PART B			
2	Preparation of three models on lathe involving - Plain turning, Taper turning, Step turning, Thread cutting, Facing, Knurling, Drilling, Boring, Internal Thread cutting and Eccentric turning. Exercises should include selection of cutting parameters and cutting time estimation.		
PART C			
3	Cutting of V Groove/ dovetail / Rectangular groove using a shaper. Cutting of Gear Teeth using Milling Machine. Exercises should include selection of cutting parameters and cutting time estimation.		
PART D (DEMONSTRATION ONLY)			
	Study & Demonstration of power tools like power drill, power hacksaw, portable hand grinding, cordless screw drivers, production air tools, wood cutter, etc., used in Mechanical Engineering.		
Course Outcomes: At the end of the course, the student will be able to:			
CO1: To read working drawings, understand operational symbols and execute machining operations.			
CO2: Prepare fitting models according to drawings using hand tools- V-block, marking gauge, files, hack saw, drills etc.			
CO3: Understand integral parts of lathe, shaping and milling machines and various accessories and attachments used.			
CO4: Select cutting parameters like cutting speed, feed, depth of cut, and tooling for various machining operations.			
CO5: Perform cylindrical turning operations such as plain turning, taper turning, step turning, thread Cutting, facing, knurling, internal thread cutting, eccentric turning and estimate cutting time.			
CO6: Perform machining operations such as plain shaping, inclined shaping, keyway cutting, Indexing and			
Conduct of Practical Examination:			
1. All laboratory experiments are to be included for practical examination.			
2. Breakup of marks and the instructions printed on the cover page of answer script to be strictly adhered by the examiners.			
3. Students can pick one experiment from the questions lot prepared by the examiners.			
4. Change of experiment is allowed only once and 15% Marks allotted to the procedure part to be made zero.			


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