

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No. 1/3
Branch	Mechanical Engineering			Semester	IV
Course Code	404	Course Name	Engineering Measurement and Maintenance Practice		
<b>Course Outcome 1</b>	<b>Explain linear dimension using instrument, comparator and gauges.</b>			Teach Hrs	Marks
<b>Learning Outcome 1</b>	Describe concepts of inspection			6	10
<b>Contents</b>	Need, definition, classification and application of inspection. Definition of precision, accuracy, sensitivity, repeatability, range, threshold, hysteresis, errors and calibration of measuring instruments. Cost and accuracy, interchangeability and selective assembly.				
<b>Method of Assessment</b>	Paper pen test (Progressive Test -1)				
<b>Learning Outcome 2</b>	Describe principle, construction, working of linear measuring instrument, gauges and comparators.			8	10
<b>Contents</b>	Linear Measurement: Standards of length, classification of linear measuring instrument, construction, working and least count -Vernier Callipers, Micrometers, Vernier Height Gauge, Dial Vernier, Dial Height Gauge. classification and use of slip gauges, wringing phenomenon in slip gauges, precautions while using slip gauges, Working and application of mechanical, electrical, optical and pneumatic comparators				
<b>Method of Assessment</b>	End semester theory exam				
<b>Learning Outcome 3</b>	Measure linear dimension of a given job using Vernier calliper, micrometer and slip gauge.			6	10
<b>Contents</b>	Linear Measurement using-Vernier Callipers, Micrometers, slip gauges.				
<b>Method of Assessment</b>	Laboratory test by observation ( Part of Lab work)				
<b>Course Outcome 2</b>	<b>Measure angle, screw thread geometry, surface finish, geometrical attributes</b>			Teach Hrs	Marks
<b>Learning Outcome 1</b>	Describe different screw threads.			4	10
<b>Contents</b>	Screw Thread- types, construction, working and error.				
<b>Method of Assessment</b>	Assignment/ Quiz (Part of Term work)				
<b>Learning Outcome 2</b>	Explain principle, construction, working of bevel protector, sine bar, angle gauge, Clinometer, angle Dekkor and Talysurf surface roughness tester.			8	10
<b>Contents</b>	Construction and working of bevel protector, sine bar, angle gauge, clinometer, angle Dekkor and Talysurf surface roughness tester.				
<b>Method of Assessment</b>	End semester theory exam.				
<b>Learning Outcome 3</b>	Measure angular dimension of a given job using sine bar, bevel protector			6	8
<b>Contents</b>	Angle measurement using Bevel protractor, Sine Bar.				
<b>Method of Assessment</b>	Laboratory test by observation (End semester practical exam)				

<b>Learning Outcome 4</b>	Inspect geometrical attributes using Straight edge method, feeler gauge method, dial indicator, try square.	<b>6</b>	<b>7</b>
<b>Contents</b>	Measurement of straightness and Flatness using straight edge method, light gap and feeler gauge method, wedge method, Roundness using V- Block and dial indicator and Squareness using Try square and Engineers square.		
<b>Method of Assessment</b>	Laboratory test by observation (End semester practical exam)		
<b>Course Outcome 3</b>	<b>Explain limit, fit, tolerance and gauging.</b>	<i>Teach Hrs</i>	<i>Marks</i>
<b>Learning Outcome 1</b>	Calculate fundamental deviation, tolerance, allowances.	<b>6</b>	<b>10</b>
<b>Contents</b>	Limits, fits and tolerances, selection of fit for assembly, calculation of fundamental deviation, tolerance and allowances.		
<b>Method of Assessment</b>	Paper pen test (Progressive Test II)		
<b>Learning Outcome 2</b>	Explain gauge and gauging.	<b>8</b>	<b>10</b>
<b>Contents</b>	Gauge and gauging- Definition, necessity, Classification, difference between workshop, inspection and reference gauges, measurement using limit gauges Go, No Go, plug gauge, snap gauge, screw pitch gauge, template feeler gauge. Selection and specification as per IS 2251, 3455, 3484. Statement of Taylor's principle for 'Go' and 'No Go' gauge.		
<b>Method of Assessment</b>	End semester theory exam.		
<b>Course Outcome 4</b>	<b>Force, torque, pressure, strain, speed, displacement, flow, humidity, temperature measurement using instrument and gauges.</b>	<i>Teach Hrs</i>	<i>Marks</i>
<b>Learning Outcome 1</b>	Explain principle, construction and working of different transducers.	<b>8</b>	<b>10</b>
<b>Contents</b>	Transducers- Introduction, Characteristics and classification of transducers, Construction and working of resistance, inductance, capacitance and piezoelectric transducers.		
<b>Method of assessment</b>	End semester theory exam.		
<b>Learning Outcome 2</b>	Force, torque, pressure, temperature measurement using instrument and gauges.	<b>8</b>	<b>10</b>
<b>Contents</b>	Measurement of force, torque, and pressure: Introduction, Force measurement, Spring Balance, Proving ring, Load cell; Pressure measurement: Diaphragm type pressure gauge- Bourdon tube pressure gauge, McLeod gauge. Temperature measurement- classification, principle and working of resistance thermometer, thermistor, thermocouple, pyrometer.		
<b>Method of Assessment</b>	End semester theory exam.		
<b>Learning Outcome 3</b>	Measure displacement, speed, flow, humidity using a given instrument/ gauge.	<b>9</b>	<b>15</b>
<b>Contents</b>	Speed measurement: Classification of tachometers, Revolution counters, Eddy current tachometers; Displacement measurement: Linear Variable Differential Transformers (LVDT); Flow measurement: Rotameters, Turbine meter; Miscellaneous measurements: Humidity measurement: hair hygrometer; Density measurement: hydrometer; Liquid level		

	measurement: sight glass, Float gauge.		
<b>Method of Assessment</b>	Laboratory test by observation (End semester practical exam)		
<b>Course Outcome 5</b>	<b>Explain plant Maintenance, fault tracing, wear and lubrication.</b>	Teach Hrs	Marks
<b>Learning Outcome 1</b>	Explain type, function and procedure of plant maintenance.	<b>8</b>	<b>10</b>
<b>Contents</b>	Introduction to Plant Maintenance: Introduction to maintenance, its need and scope, functions of the maintenance department. Different maintenance practices, procedure of corrective or break down maintenance, scheduled maintenance, preventive maintenance and predictive maintenance, methods of keeping records for condition of equipment, maintenance and replacement of parts, standard data for maintenance form, time standards (time to complete the maintenance job).		
<b>Method of Assessment</b>	End semester theory exam.		
<b>Learning Outcome 2</b>	Fault tracing and repair in a given situation.	<b>6</b>	<b>10</b>
<b>Contents</b>	Fault Tracing: -Trouble Shooting and Remedies, Sequence of activities in fault finding, methods and procedures of repair, measures to prevent repetition of similar faults. Remedial actions.		
<b>Method of Assessment</b>	Laboratory test by observation (Part of lab work)		
<b>Learning Outcome 3</b>	Explain wear and lubrication.	<b>8</b>	<b>10</b>
<b>Contents</b>	Wear and its effect:Definition, types, causes of wear, effects of wear on performance. Lubrication Systems:Need, properties of lubricant, selection criteria, principle of lubrication, centralized and decentralized lubrication systems, use of greases and oil. Methods of preserving lubricants, handling of lubricants.		
<b>Method of Assessment</b>	End semester theory exam.		