RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	*0*	*2*	*4*	*0*	*4*	*1*	*1*	

COURSE NAME	**Engineering measurement and maintenance practice.**
CO Description	Explain linear dimension using instrument, comparator and gauges.
LO Description	Describe concepts of inspection.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	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.	Interactive classroom lecture method Handout, video display, tutorials	Students will learn the processes through the discussion with the teacher on content provided by teacher and random quiz taken by them.	6	0	Text book, charts, Paper Pen, Power point presentation, Video Lectures.	Nil

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Paper pen test	Student will be asked to explain the concepts as per learning content.	10	Test paper + Rating scale	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of Progressive 1

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	*0*	*2*	*4*	*0*	*4*	*1*	*2*	

COURSE NAME	**Engineering measurement and maintenance practice**
CO Description	Explain linear dimension using instrument, comparators and gauges.
LO Description	Describe principle, construction, working of linear measuring instrument, gauges and comparators**.**

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	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	Interactive classroom lecture method Handout, video display, tutorials	Students will learn the processes through the discussion with the teacher on content provided by teacher and random quiz taken by them.	8	0	Text book, charts, Paper Pen, Power point presentation, Video Lectures.	Nil

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Theory Exam	Student will be asked to explain construction and working of any two instrument/gauges/comparators	10	Question paper + Rating scale	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)
Part of end semester theory exam

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		M	*0*	*2*	*4*	*0*	*4*	*1*	*3*	

COURSE NAME	**Engineering measurement and maintenance practice**
CO Description	Explain linear dimension using instrument, comparators and gauges.
LO Description	Measure linear dimension of a given job using Vernier calliper, micrometer and slipgauge.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Linear Measurement using-Vernier Callipers, Micrometers, slip gauges.	Lab demonstration, hands on practice, lab assignment, quiz, assignments.	Teacher will demonstrate the procedure of job preparation. The students will learn through practice.	0	6	Text book, charts, Hand out/ lab manual, Power point presentation, Video Lectures.	Nil

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Laboratory test by observation	Measure linear dimension of a given job using Vernier caliper, micrometer and slip gauge.	10	Observation schedule/ check list/ Rubric / Rating scale	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of lab work

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		M	*0*	*2*	*4*	*0*	*4*	*2*	*1*	

COURSE NAME	**Engineering measurement and maintenance practice**
CO Description	Measure angle, screw thread geometry, surface finish, geometrical attributes.
LO Description	Describe different screw threads.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Screw Thread- types, construction, working and error.	Interactive classroom lecture method Handout, video display, tutorials	Students will learn the processes through the discussion with the teacher on content provided by teacher and random quiz taken by them.	4	0	Text book, charts, Paper Pen, Power point presentation, Video Lectures.	Nil

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Assignment/ Quiz	Student will be asked to submit assignment/ quiz on learning content	10	Observation schedule/check list/Rubric /Rating scale	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of Term work

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	*0*	*2*	*4*	*0*	*4*	*2*	*2*	

COURSE NAME	**Engineering measurement and maintenance practice**
CO Description	Measure angle, screw thread geometry, surface finish, geometrical attributes.
LO Description	Explain principle, construction, working of bevel protector, sine bar, angle gauge, Clinometer, angle Dekkor and Talysurf surface roughness tester.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Construction and working of bevel protector, sine bar, angle gauge, clinometer, angle Dekkor and Talysurf surface roughness tester.	Interactive classroom lecture method Handout, video display, tutorials	Students will learn the processes through the discussion with the teacher on content provided by teacher and random quiz taken by them.	8	0	Text book, charts, Paper Pen, Power point presentation, Video Lectures.	Nil

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Theory exam	Student will be asked to explain construction and working of any two given instrument.	10	Question paper + Rating scale	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end semester theory exam

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		M	*0*	*2*	*4*	*0*	*4*	*2*	*3*	

COURSE NAME	**Engineering measurement and maintenance practice**
CO Description	Measure angle, screw thread geometry, surface finish, geometrical attributes.
LO Description	Measure angular dimension of a given job using sine bar, bevel protector.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Angle measurement using Bevel protractor, Sine Bar.	Lab demonstration, hands on practice, lab assignment, quiz, assignments.	Teacher will demonstrate the procedure of job preparation. The students will learn through practice.	0	6	Text book, charts, Hand out/ lab manual, Power point presentation, Video Lectures.	Nil

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Laboratory test by observation	Student will be ask to measure angular dimension of a given job using bevel protector and sine bar.	8	Observation schedule/check list/Rubric /Rating scale	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end semester practical exam

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	*0*	*2*	*4*	*0*	*4*	*2*	*4*	

COURSE NAME	**Engineering measurement and maintenance practice**
CO Description	Measure angle, screw thread geometry, surface finish, geometrical attributes.
LO Description	Inspect geometrical attributesusing Straight edge method, feeler gauge method, dial indicator, try square.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	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.	Lab demonstration, hands on practice, lab assignment, quiz, assignments.	Teacher will demonstrate the procedure of job preparation. The students will learn through practice.	0	6	Text book, charts, Hand out/ lab manual, Power point presentation, Video Lectures.	Nil

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Laboratory test by observation	Student will be ask to inspect straightness/ flatness/roundness/ squareness of a given job using an appropriate instrument.	7	Observation schedule/check list/Rubric /Rating scale	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end semester Practical exam

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	*0*	*2*	*4*	*0*	*4*	*3*	*1*	

COURSE NAME	**Engineering measurement and maintenance practice**
CO Description	Explain limit, fit, tolerance and gauging.
LO Description	Calculatefundamental deviation, tolerance, allowances.

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Limits, fits and tolerances, selection of fit for assembly, calculation of fundamental deviation, tolerance and allowances.	Interactive classroom lecture method Handout, video display, tutorials	Students will learn the processes through the discussion with the teacher on content provided by teacher and random quiz taken by them.	6	0	Text book, charts, Paper Pen, Power point presentation, Video Lectures.	Nil

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Paper pen test	Student will be asked to calculate fundamental deviation, tolerance and allowances.	10	Test paper + Rating scale	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of progressive Test II

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	*0*	*2*	*4*	*0*	*4*	*3*	*2*	

COURSE NAME	**Engineering measurement and maintenance practice**
CO Description	Explain limit, fit, tolerance and gauging.
LO Description	Explain gauge and gauging.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	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.	Interactive classroom lecture method Handout, video display, tutorials	Students will learn the processes through the discussion with the teacher on content provided by teacher and random quiz taken by them.	8	0	Text book, charts, Paper Pen, Power point presentation, Video Lectures.	Nil

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Theory exam	Student will be asked to describe construction and working of any two gauges.	10	Question paper + Rating scale	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end semester theory examination

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		M	*0*	*2*	*4*	*0*	*4*	*4*	*1*	

COURSE NAME	**Engineering measurement and maintenance practice**
CO Description	Force, torque, pressure, strain, speed, displacement, flow, humidity, temperature measurement using instrument and gauges.
LO Description	Explain principle, construction and working ofdifferent transducers.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Transducers- Introduction, Characteristics and classification of transducers, Construction and working of resistance, inductance, capacitance and piezoelectric transducers.	Interactive classroom lecture method Handout, video display, tutorials	Students will learn the processes through the discussion with the teacher on content provided by teacher and random quiz taken by them.	8	0	Text book, charts, Paper Pen, Power point presentation, Video Lectures.	Nil

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal

1	Theory Exam	Student will be ask construction and working of any two transducers.	10	Question paper + Rating scale	External
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)					
Part of end semester theory exam					

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	*0*	*2*	*4*	*0*	*4*	*4*	*2*	

COURSE NAME	**Engineering measurement and maintenance practice**
CO Description	Force, torque, pressure, strain, speed, displacement, flow, humidity, temperature measurement using instrument and gauges.
LO Description	Force, torque, pressure, temperature measurement using instrument and gauges.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	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.	Interactive classroom lecture method Handout, video display, tutorials	Students will learn the processes through the discussion with the teacher on content provided by teacher and random quiz taken by them.	8	0	Text book, charts, Paper Pen, Power point presentation, Video Lectures.	Nil

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal

1	Theory Exam	Student will be asked any two of force, torque, pressure, temperature measurement using given instrument /gauges.	10	Question paper + Rating scale	External
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)					
Part of end semester theory examination					

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		M	*0*	*2*	*4*	*0*	*3*	*4*	*3*	

COURSE NAME	**Engineering measurement and maintenance practice**
CO Description	Force, torque, pressure, strain, speed, displacement, flow, humidity, temperature measurement using instrument and gauges.
LO Description	Measure displacement, speed, flow, humidity using a given instrument/ gauge.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	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.	Interactive classroom lecturemethod Handout, video display, tutorials Lab demonstration, hands on practice, lab assignment, quiz, assignments.	Students will learn the processes through the discussion with the teacher on content provided by teacher. Teacher will demonstrate the procedure of job preparation. The students will learn through practice.	3	6	Text book, charts, Hand out/ lab manual, Power point presentation, Video Lectures.	Nil

SCHEME OF ASSESSMENT					
S. No.	**Method of Assessment**	**Description of Assessment**	**Maximum Marks**	**Resources Required**	**External / Internal**
1	Laboratory test by observation	Student will be asked to measure displacement, speed, flow, humidity (any two) using an appropriate instrument/ gauge.	15	Observation schedule/check list/Rubric /Rating scale	External
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)					
Part of end semester practical exam					

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	*0*	*2*	*4*	*0*	*4*	*5*	*1*	

COURSE NAME	**Engineering measurement and maintenance practice**
CO Description	Explain plant Maintenance, fault tracing, wear and lubrication.
LO Description	Explain type, function and procedure of plant maintenance.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	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).	Interactive classroom lecture method Handout, video display, tutorials	Students will learn the processes through the discussion with the teacher on content provided by teacher and random quiz taken by them.	8	0	Text book, charts, Paper Pen, Power point presentation, Video Lectures.	Nil

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal

1	Theory Exam	Student will be asked to describe type/ function/ procedure of plant maintenance.	10	Question paper + Rating scale	External
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)					
Part of end semester theory examination					

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	*0*	*2*	*4*	*0*	*4*	*5*	*2*	

COURSE NAME	**Engineering measurement and maintenance practice**
CO Description	Explain plant Maintenance, fault tracing, wear and lubrication.
LO Description	Fault tracing and repair in a given situation.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	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.	Lab demonstration, hands on practice, lab assignment, quiz, assignments.	Teacher will demonstrate the procedure of job preparation. The students will learn through practice.	0	6	Text book, charts, Hand out/ lab manual, Power point presentation, Video Lectures.	Nil

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Laboratory test by Observation	Student will be asked to trace a fault and describe procedure of its repair in a given situation.	10	Observation schedule/check list/Rubric /Rating scale	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of lab work

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	*0*	*2*	*4*	*0*	*4*	*5*	*3*	

COURSE NAME	**Engineering measurement and maintenance practice**
CO Description	Explain plant Maintenance, fault tracing, wear and lubrication.
LO Description	Explain wear and lubrication.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	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.	Interactive classroom lecture method Handout, video display, tutorials	Students will learn the processes through the discussion with the teacher on content provided by teacher and random quiz taken by them.	8	0	Text book, charts, Paper Pen, Power point presentation, Video Lectures.	Nil

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Theory Exam	Student will be asked toone question on wear and its effect and one question on lubrication.	10	Question paper + Rating scale	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end semester theory examination

TEXT BOOKS AND REFERENCES

S.No.	Title of Books	Author	Publication
1.	Engineering Metrology	R.K. Jain	Khanna Pub. Delhi
2.	Engineering Metrology	I.C. Gupta	Dhanpatrai and Sons
3	Inspection & Gauging	Kennedy	The Industrial Press
4.	Engineering Metrology	K.J. Hume	Macdonald & Co. Ltd. London
5	Maap Vigyan Avum Yantrikaran (Hindi)	Yogendra Varshneya	Deepak Prakashan, Morar,Gwalior
6	Industrial Instrumentation	D.P. Eckman	Wiley Easter Ltd. New Delhi
7	A Text book of Metrology	M. Mahajan	Dhanpatrai and Sons
8	Engineering Metrology and Measurement	Dr Vijay Dr R Rangappa	ARS Publication , Chennai