

RGPV (DIPLOMAWING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No.1/5
Branch	Opto-Electronics Engg. (O01)			Semester	4
Course Code	401	Course Name	Electronics Measurement		
Course Outcome 1	Explain characteristics of measuring instruments			Teach Hrs	Marks
Learning Outcome 1	Define static and dynamic characteristics of measuring instruments. (Cognitive domain)			9	10
Contents	Significance of Measurement and block diagram of Measurement System, Static characteristics- Accuracy, Precision, Sensitivity, Linearity, Repeatability, Reproducibility, Resolution, Threshold, Drift, Stability, Dead zone, hysteresis, Dynamic Characteristics- speed of response, measuring lag, fidelity, dynamic error,				
Method of Assessment	External				
Learning Outcome 2	To describe various types of errors and loading effect (Cognitive domain)			6	10
Contents	Types of Errors – Gross error, systematic errors, Random errors, loading effect,				
Method of Assessment	External				
Learning Outcome 3	To perform calibration process (Psychomotor domain)			6	10
Contents	Calibration -static and dynamic				
Method of Assessment	Internal				

RGPV(DIPLOMA WING) BHOPAL		OBECURRICULUMFOR THECOURSE		FORM AT 3	Sheet No.2/5
Branch	Opto-Electronics Engg. (O01)		Semester	4	
Course Code	401	Course Name	Electronics Measurement		
Course Outcome2	Explain measuring instruments and range extension			Teach Hrs.	Marks
LearningOutcome4	Differentiate between moving iron and moving coil type instruments(Cognitive domain)			7	10
Contents	Construction, principle and working of PMMC and MI (moving iron) instruments				
Methodof Assessment	External				
LearningOutcome5	Extend the measuring range of the meters. (CognitiveDomain)			7	10
Contents	DC voltmeter and current meters and their range extension(Shunt and Multiplier) Electronic voltmeter and its block diagram,				
Method of Assessment	External				
LearningOutcome6	Measure voltage and current (DC&AC) using analogue/ and digital multimeter(Psychomotor Domain)			7	10
Contents	Measurement of voltage, current and Resistance using Analog and Digital Multi Meter (DMM).				
Methodof Assessment	External				

RGPV(DIPLOMA WING) BHOPAL		OBECURRICULUM FOR THECOURSE		FORMAT3	Sheet No.3/5
Branch	Opto-Electronics Engg. (O01)		Semester	4	
Course Code	401	Course Name	Electronics Measurement		
CourseOutcome3	To measure electrical parameters using Bridges and Analyzers			Teach Hrs.	Marks
LearningOutcome 7	Explain working and application of AC &DC Bridges (Cognitive domain)			8	10
Contents	DC Bridge- Wheatstone bridge, Kelvin's Double Bridge, AC Bridges- Maxwell's Bridge, Hay's bridge, Schering bridge and Wien's Bridge.				
Method of Assessment	External				
LearningOutcome 8	Explain working principle of spectrum analyzer.(CognitiveDomain)			6	10
Contents	Principle and working of different Signal Analyzers i.e, Frequency Selective and Heterodyne Wave Analyzers, Spectrum Analyzers.				
Method of Assessment	Internal				
LearningOutcome 9	To analyze signal waveforms using spectrum analyzers (PsychomotorDomain)			6	10
Contents	Analysis of various waveforms using Spectrum Analyzers.				
Method of Assessment	External				

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RGPV (DIPLOMA WING)BHOPAL		OBECURRICULUM FOR THECOURSE		FORMAT3	Sheet No.4/5
Branch	Opto-Electronics Engg. (O01)		Semester	4	
Course Code	401	Course Name	Electronics Measurement		
Course Outcome 4	Classify differentOscilloscopes and their application			Teach Hrs.	Marks
LearningOutcome10	Describefunction of basic building blocks of CRO(Cognitive domain)			8	10
Contents	Cathode Ray Tube (CRT), Electrostatic Deflection, Post Deflection and Acceleration of Electron Beam, Screens for CRT's. Block diagram of CRO- Time-Base Generator, Delay line, Attenuators, probes.				
Method of Assessment	External				
LearningOutcome11	Explain working principle of digital storage oscilloscope.(Cognitivedomain)			6	10
Contents	Digital Storage Oscilloscope (DSO): block diagram, principle, working and its application				
Methodof Assessment	Internal				
LearningOutcome 12	Measure various parameters like Amplitude, frequency and time period using CRO.(Psychomotordomain)			8	10
Contents	Dual trace oscilloscope, .Applications of CRO Measurement of Phase and Frequency by CRO using Lissajous Pattern.				
Methodof Assessment	Internal				

RGPV(DIPLOMA WING)BHOAL		OBECURRICULUM FOR THECOURSE		FORMAT3	Sheet No.5/5
Branch	Opto-Electronics Engg. (O01)			Semester	4
Course Code	401	Course Name	Electronics Measurement		
CourseOutcome5	To measure physical quantities using Transducers			Teach Hrs.	Marks
LearningOutcome 13	Differentiate between active and passive, primary and secondary transducers. (Cognitive domain)			6	10
Contents	Requirements of Ideal Transducer Transducer and its classification: primary and secondary transducers				
Methodof Assessment	Internal				
LearningOutcome 14	Describe working of various transducers. (Cognitive Domain)			8	10
Contents	Resistive Transducer: Potentiometric type, Strain Gauge type (Gauge factor derivation, Bonded and unbounded strain gauges), Capacitive Transducers -Variable gap type, variable area type and dielectric type, LVDT, Temperature and Piezo Electric, Proximity sensor and touch screen sensor.				
Methodof Assessment	External				
LearningOutcome 15	To measure various physical quantities using transducers. (Psychomotor Domain)			7	10

Contents	Measure the given parameter of using resistive, capacitive and others transducer.		
Method of Assessment	Internal		

Suggested List of Experiments:

S.N.	Experiment	CO
1	Perform static and dynamic Calibration.	CO1
2	Measure electrical parameters using Analog and Digital Multi Meter (DMM).	CO2
3	Perform analysis of given waveforms/ frequency spectrum of AM waveform using spectrum analyzers.	CO3
4	To measure various parameters like Amplitude, frequency, phase and time period of unknown source by CRO using Lissajous pattern	CO4
5	Measure various physical quantities using transducers i.e. Temperature using Thermocouple/RTD/Thermistors	CO5
6	Measure various physical quantities using transducers i.e. the linear Displacement using LVDT.	CO5
7	To Explain the Deadweight gauge Tester.	CO5
8	Demonstration of Speed measurement.	CO5

Major Equipment/Materials:

1	CRO's
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2	DualPowerSupply
3	Thermocouples.
4	Thermistors.
5	Breadboard,discrete components,wires
6	Multimeter/Ammeter/Voltmeter
7	LCRMeter
8	StandardICs
9.	Spectrum analyzers
10.	LVDT, Strain gauge, tachometer

ReferenceBooks/WebPortals:

S.N .	Title&Publication	Author
2	ModernElectronicInstrumentsand MeasurementTechniques,PHI,ISBN: 9788120307520	HelfrickA.D.andCooperW.D.
3	ElectricalandElectronicsMeasurementsand Instrumentation., DhanpatRaiandCo.,New Delhi,;9780000279744	SawhneyA.K.
4	ElectricalMeasurements,TechnicalPublication Pune.	BakshiU.A.,BakshiA.V. andBakshiK.A.
5	ElectricalandElectronicMeasurementand Instrumentation,S.ChandandCo.NewDelhi,ISBN:9789385676017	RajputR.K.
6	ElectricalMeasurementsandMeasuring Instruments,S.K. Katariaandsons,Delhi,ISBN:9788188458264	GuptaJ.B.
7	nptel.ac.in	
8	swayam.gov.in	

SuggestionsforPractical's: Experimentsareexpectedtobeperformed

1. Using breadboard/trainer kits.

2. on simulation software viz. PSpice, TINA, Multisim, Ki CAD, TSpice, LabView, Simulink, Proteus, CircuitMaker

3. On virtual lab platforms available online like: vlab.co.in, falstad.com/circuitetc.

