RGPV (DIPLOMA WING) BHOPAL	OBE CRRICULUM FOR THE COURSE	FORMAT-3	Sheet No. 1/6

Branch	ELECTRICAL AND ELECTRONICS ENGINEERING	Semester	3

Course Code	304	Course Name	Electrical and Electronics Measurements and Measuring Instruments (EEMMI)

Course Outcome 1	Identify various type of measuring instruments	Teach Hrs	Marks
Learning Outcome 1	Explain fundamentals of measuring instruments (Cognitive domain)	7	10
Contents	• Measurement: Significance, units, fundamental quantities and standards. • Static and dynamic characteristics of instruments, types of errors. • Calibration: Need and procedure.		
Method of Assessment	Internal: Assignment and viva voce		
Learning Outcome 2	Classify measuring instruments (Cognitive domain)	6	9
Contents	• Static and dynamic characteristics, types of errors. • Calibration: Need and procedure. • Classification of Instruments: Null and deflection type instruments, absolute and secondary instruments, analog and digital instruments, indicating, recording and integrating instruments.		
Method of Assessment	External: End semester theory examination (Pen paper test)		
Learning Outcome 3	Calibrate given measuring instruments (Psychomotor domain)	4	6
Contents	• To perform calibration and calculation of errors for Ammeter and Voltmeter • To perform calibration and calculation of errors for Wattmeter.		
Method of Assessment	Internal: Performance of given task and viva voce		

RGPV (DIPLOMA WING) BHOPAL	OBE CRRICULUM FOR THE COURSE	FORMAT-3	Sheet No. 2/6

Branch	Electrical Engineering	Semester	3
Course Code	303	Course Name	Electrical and Electronics Measurements and Measuring Instruments (EEMMI)

Course Outcome 2	Use different types of measuring instruments for measuring current, voltage and frequency.	Teach Hrs	Marks
Learning Outcome 4	Explain basics of electrical measuring instruments and their construction (Cognitive domain)	7	10
Contents	• Basics of measuring instruments. • Electrical measuring instruments: Construction of PMMC meter, Electrodynamometer, Moving iron and Induction type instruments. • Construction of Instrument transformers and Tong tester. • Frequency meter: Construction of Weston and Resonance type meter.		
Method of Assessment	Internal: Mid semester-I theory examination (Pen paper test)		
Learning Outcome 5	Identify use of electrical measuring instruments and explain their working (Cognitive domain)	7	9
Contents	• Electrical measuring instruments: Operation of PMMC meter, Electrodynamometer, Moving iron and Induction type instruments • Working of instrument transformers. • Frequency meter: Operation of Weston and Resonance type meter. Extension of range of Ammeter and Voltmeter using shunt, multiplier, CT and PT. Simple numerical problems.		
Method of Assessment	External: End semester theory examination (Pen paper test)		
Learning Outcome 6	Extend the range of instruments for given requirement (Psychomotor domain)	6	9
Contents	• To measure current and voltage using C.T. and P.T. for extension of instrument range.		
Method of Assessment	Internal: Performance of given task and viva voce		

RGPV (DIPLOMA WING) BHOPAL	OBE CRRICULUM FOR THE COURSE	FORMAT-3	Sheet No. 3/6

Branch	Electrical Engineering	Semester	3
Course Code	303	Course Name	Electrical and Electronics Measurements and Measuring Instruments (EEMMI)

Course Outcome 3	Use different types of measuring instruments for measurement of power, energy and power factor.	Teach Hrs	Marks
Learning Outcome 7	Explain construction of instruments used in power and energy measurement (Cognitive domain)	**7**	**10**
Contents	• Dynamometer type Wattmeter: Construction. • Single phase and three phase electronic energy meter: Constructional features (block diagram). • Dynamometer type power factor meter and digital power factor meter (block diagram)		
Method of Assessment	Internal: Mid semester-II theory examination (Pen paper test)		
Learning Outcome 8	Make use of various instruments for measurement of power, energy and power factor (Cognitive domain)	**10**	**14**
Contents	• Power measurement using Voltmeter - Ammeter method. • Dynamometer type Wattmeter: Working, errors, compensations and extension of range of Wattmeter using CT and PT. • Single phase and three phase electronic energy meter: Working principle and constructional features (block diagram). • Dynamometer type power factor meter and digital power factor meter (block diagram) • Synchroscope: Working principle and application.		
Method of Assessment	External: End semester theory examination (Pen paper test)		
Learning Outcome 9	Use of given instrument for measurement of electrical quantities (Psychomotor and affective domain)	**10**	**14**
Contents	• Measurement of P.F. by Ammeter, Voltmeter and Wattmeter method. • Measurement of 3-phase power by two Wattmeter method and follow standard safety norms. • Demonstration and measurement of energy by digital Energy meter.		
Method of Assessment	External: Performance of given task and Observation / viva voce		

RGPV (DIPLOMA WING) BHOPAL	OBE CRRICULUM FOR THE COURSE	FORMAT-3	Sheet No. 4/6

Branch	Electrical Engineering	Semester	3

Course Code	303	Course Name	Electrical and Electronics Measurements and Measuring Instruments (EEMMI)

Course Outcome 4	Measure circuit parameters using DC and AC bridges.	Teach Hrs	Marks
Learning Outcome 10	Apply various methods used to measure resistance (Cognitive domain)	**8**	**11**
Contents	• Measurement of resistance • Low resistance: Kelvin's double bridge. • Medium resistance: Voltmeter-Ammeter method, Wheatstone bridge. • High resistance: Megger and Ohm meter. • Earth resistance: Earth tester.		
Method of Assessment	External: End semester theory examination (Pen paper test)		
Learning Outcome 11	Use of AC bridges for measurement of inductance, capacitance and frequency (Cognitive domain)	**7**	**9**
Contents	• Measurement of self-inductance: Maxwell's bridge, Hay's bridge, Anderson bridge (No phasor diagrams). • Measurement of capacitance: De-Sauty's bridge & Schering bridge (No phasor diagram) • Measurement of frequency by Wien's bridge.		
Method of Assessment	External: End semester theory examination (Pen paper test)		
Learning Outcome 12	Measure given electrical circuit parameters (Psychomotor domain)	**8**	**12**
Contents	• Measurement of low resistance by Kelvin's Double bridge. • Measurement of medium resistance by Wheatstone bridge. • Measurement of insulation resistance by Megger. • Measurement of inductance by Maxwell's bridge.		
Method of Assessment	External: Performance of given task / viva voce		

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Branch	Electrical Engineering	Semester	3

Course Code	303	Course Name	Electrical and Electronics Measurements and Measuring Instruments (EEMMI)

Course Outcome 5	Apply electronic and digital instruments for measurement of various electrical quantities.	Teach Hrs	Marks
Learning Outcome 13	Explain working of oscilloscope and utilize it for measurement of various electrical quantities (Cognitive domain)	**6**	**9**
Contents	• Single & dual trace CRO: Basic block diagram, specification & working, Cathode ray tube, electrostatic deflection, vertical amplifier, time base generator, horizontal amplifier. • Use of CRO: Measurement of voltage, time period, frequency & phase difference (Lissajous patterns). • Digital Storage Oscilloscope (DSO): Block diagram and functioning.		
Method of Assessment	External: End semester theory examination (Pen paper test)		
Learning Outcome 14	Use of electronic and digital instruments for measurement of various electrical quantities (Cognitive domain)	**6**	**9**
Contents	• Electronic Voltmeter: Block diagram and functioning of TVM, FETVM and Rectifier type voltmeter. • Digital LCR meter: Block diagram and functioning. • Digital Voltmeter: Block diagram and working of ramp type DVM. • Digital frequency meter: Block diagram and functioning.		
Method of Assessment	External: End semester theory examination (Pen paper test)		
Learning Outcome 15	Perform measurement of voltage, frequency and phase difference by oscilloscope (Psychomotor domain)	**6**	**9**
Contents	• Use of CRO for measurement of voltage, frequency and phase difference. • Demonstration of digital storage oscilloscope.		
Method of Assessment	External: Performance of given task and viva voce		

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