SAMRAT ASHOK TECHNOLOGICAL INSTITUTE
(Engineering College), VIDISHA M.P.
(An Autonomous Institute Affiliated to RGPV Bhopal)
Department of Electrical Engineering

Semester/Year		I/I	Program		B.Tech
Subject Category	BSC	Subject Code:	EEA102	Subject Name:	**Electronics Instrumentation**

Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks				
End Sem	Mid-Sem	Quiz	Ass	End Sem	lab	Assg		L	T	P	
60	20	10	10	-	-	-	100	3	-	-	3

Prerequisites:

Fundamental of Electrical Engineering, Laws of Electrical Engineering

Course Objective:

1. To understand CRO and its practical application
2. To understand the different types of AC bridges for measurement of resistance, inductance, capacitance & frequency and quality factor.
3. To understand and study transducers and multiplexing, A/D & D/A.
4. To understand digital instruments

Course Outcomes:

CO1: Understand and distinguish the different types of transducers.
CO2: Apply the knowledge and identify different types of signal generators used in different applications.
CO3: Apply the knowledge and identify different types of wave analyzer used in harmonics elimination.
CO4: Demonstrate different types of digital instruments used in day to day applications.
CO5: Illustrate different types and parts of CRO.

UNITs	Descriptions	Hrs.	CO's
I	**Transducers** Transducers definition and classification, Characteristic & choice of Transducers, Resistive inductive and capacitive transducers, strain gauge and gauge factor, Thermistor, Thermo couples, LVDT, Piezo-Electric transducers, Hall effect transducers, Opto-electronic transducers.	9	1,2,3,5
II	**Signal Generators** Fixed & variable frequency AF oscillators, Sine wave generators, Standard signal generator, AF Sine and Square wave generator, Function generator, Square and pulse generator, Random noise generator, Sweep generator, TV Sweep generator, Marker generator, Sweep- Marker generator, Beat frequency oscillator.	9	1,2,3,4
III	**Wave analyzer** Basic wave analyzer, Frequency selective wave analyzer, Heterodyne wave analyzer, Harmonic distortion, analyzer, spectrum analyzer digital Fourier analyzer.	5	1,2,3,4
IV	**Digital Instruments** Advantages of Digital instruments over analog instruments, resolution and sensitivity of Digital meters.Digital Voltmeter - Ramp type, Dual slope integration type, Integrating type, Successive approximation type, Continuous balance DVM or Servo balancing potentiometer type DVM,Digital Multimeter, Digital frequency meter, Time period measurement, High frequency measurement, Electronic counter, Digital tachometer, Digital PH meter, Digital phase meter, Digital capacitance meter.	9	1,2,3,4
V	**Introduction to CRO/DSO** Different parts of CRO, Its Block diagram, Electrostatic focusing, Electrostatic deflection, post deflection acceleration, Screen for CRTs, Vertical & Horizontal deflection system, Time base circuit, Oscilloscope probes and transducers, Attenuators, Application of CROs, Lissajous patterns, Special purpose CROs- Multi input, Dual trace, Dual beam, Sampling, Storage (Analog & Digital) Oscilloscopes.	8	1,2,3,4,5

Guest Lectures (if any)		
Total Hours	40	

Text Book-

1. Kalsi H.S., "Electronic Instrumentation", TMH
2. Electronics & Electrical Measurements & Instrumentation, S.K. Kataria & Sons., J.B. Gupta.
3. Sawhney A.K. Instrumentation & Measurement –Dhanpat Rai & Co.
4. Rajput R.K. Electronic Instrumentation-S.Chand.

Reference Books-

1. Albert. D. Helfrick, W.D. Cooper, "Modern Electronic Instrumentation and measurement techniques", PHI.
2. Morris A.S., "Principles of Measurement & Instrumentation", PHI
3. Rangan C.S., G.R. Sarma, Mani, "Instrumentation : Devices & systems", TMH
4. Murthy BVS, "Transducers and Instrumentation", PHI.
5. Doeblin D.O., "Measurement Systems- Applications and Design".

Modes of Evaluation and Rubric

Theory (60)	Midsem (20)	Assignment (10)	Quiz (10)	Total (100)
Practical (30)	LW (10)	Quiz (10)		Total (50)

List/Links of e-learning resource

NPTEL

Recommendation by Board of studies on	14/6/22
Approval by Academic council on	16/6/22
Compiled and designed by	Dr. Jitendra Tandekar
Subject handled by department	Electrical Engg.