

Module No.	Unit No.	Topics	Hrs.
1		<b>Principle of Measurement, Testing and Measuring instruments</b>	04
	1.1	Introduction to Basic instruments: Components of generalized measurement system Concept of accuracy, precision, linearity, sensitivity, resolution, hysteresis, calibration.	
	1.2	Measurement of Resistance: Kelvin's double bridge, Wheatstone bridge and Mega ohm bridge Measurement of Inductance: Maxwell bridge and Hey bridge Measurement of Capacitance: Schering bridge	
2		<b>Sensors and Transducers</b>	06
	2.1	Basics of sensors and Transducers-Active and passive transducers, characteristics and selection criteria of transducers	
	2.2	Displacement and pressure- Potentiometers, pressure gauges, linear Variable differential transformers (LVDT) for measurement of pressure and displacement strain gauges	
	2.3	Temperature Transducers- Resistance temperature detectors (RTD). Thermistors and thermocouples, their ranges and applications	
3		<b>Introduction to control system Analysis</b>	08
	3.1	Introduction: Open and closed loop systems, example of control systems	
	3.2	Modelling: Modelling, Transfer function model	
	3.3	Block diagram reduction techniques and Signal flow graph	
4		<b>Response of control system</b>	04
	4.1	Dynamic Response: Standard test signals, transient and steady state behavior of first and second order systems, steady state errors in feedback control systems and their types	
	4.2	Concept of lag and lead compensator.	
5		<b>Stability Analysis in Time Domain</b>	08
	5.1	Concept of stability: Routh and Hurwitz stability criterion	
	5.2	Root locus Analysis: Root locus concept, general rules for constructing root-locus, root locus analysis of control system	
6		<b>Stability Analysis in frequency domain</b>	09
	6.1	Introduction: Frequency domain specification, Relationship between time and frequency domain specification of system, stability margins	
	6.2	Bode Plot: Magnitude and phase plot, Method of plotting Bode plot, Stability margins and analysis using bode plot. Frequency response analysis of RC, RL, RLC circuits	
	6.3	Nyquist Criterion: Concept of Polar plot and Nyquist plot, Nyquist stability criterion, gain and phase margin	
Total			39