

## Lecture Plan

**Name of Subject: E16I-606 Electronic Instrumentation**

**Class: M.Tech. EI**

**Semester: 2<sup>nd</sup>**

Unit	Topic	Number of Lectures Required
Unit1: Error Analysis	Types of errors, Methods of error analysis	2
	Uncertainty analysis	1
	Statistical analysis	2
	Gaussian error distribution, Chi-Square test, Correlation coefficient, Students t-test,	2
	Method of least square, Curve fitting, Graphical analysis, rejection of data	1
Unit II: Static and Dynamic characteristics	Dynamic analysis of instrumentation system	2
	Relative merits of analytical and experimental modeling of dynamic behavior	2
	Response of zero, first and 2nd order system to step, Pulse, Harmonic and random test signals,	2
	Frequency spectra, Auto correlation spectral density	2
	Loading effects under static and dynamic conditions, Simulation of dynamic response	2
Unit III: Transducers	Classification, selection of transducers	1
	Resistance, inductance and capacitance type of transducers	2
	measurement of displacement, strain, force	1
	measurement of liquid level, pressure	1
	measurement of velocity and acceleration	1
Unit IV: Measurement of RLC	Measurement of low, medium, and high resistance	1
	A.C. Bridges, Measurement of inductance and capacitance	1
	R.L.C. Measurement, DeSauty's, Maxwell's, Anderson's, Schering and Campbell's bridges, errors in bridge measurements	1
Unit V: Radioactive instrumentation and Refractometry	X-ray spectrometry: Instrumentation for X-ray spectrometry, X-ray diffractometer	1
	Bragg's law, Auger emission spectroscopy	1
	Electron spectroscopy for chemical analysis (ESCA).	1
	Radiation detectors: Ionization chamber, Geiger-Muller counter, proportional counter, scintillation counters	2
	Refractometry: Principle, Abbe and Differential refractometer	1
UNIT VI: Methods of Data transmission	General telemetry systems	1
	DC and AC telemetry system	2
	Modulation, Pulse telemetry systems, Digital telemetry	2
UNIT VII: Graphic Recorders	Graphic analog recorder	1
	Magnetic tape analog recorders	1
	oscillographic analog recorders, digital recorders	2
	Total	42