

Electronic Instrumentation

S.E. Sem. III [EXTC]

EVALUATION SYSTEM

	Time	Marks
Theory Exam	3 Hrs	100
Practical Exam	–	–
Oral Exam	–	25
Term Work	–	25

SYLLABUS

Objective To understand Basic Principles of Electronic Measurements.

Pre-requisite To understand Principles of Advanced Electronic Instruments and its applications. The course begins with linear DC and AC circuits and familiarizes the student with standard measurement tools. The relationship between time and frequency domain measurements of circuits is a fundamental component.

1. Sensors for Transducers :

Potentiometers, Differential Transformers, Resistance Strain Gauges, Capacitance Sensors, Eddy-Current Sensors, Piezoelectric, Photoelectric, RTD, Thermistors, Thermocouple Sensors.

2. Oscilloscopes :

Specifications of general purpose Oscilloscope, Controls, sweep modes, applications Digital storage oscilloscope and its feature like Roll, Refresh, and sampling rate, applications of DSO in Communication, recent trends in oscilloscope technology.

3. Signal Analyzers :

Introduction to total harmonic distortion, wave analyzer and its applications, FFT analyzer and Network and their applications.

4. Measuring Instruments and Test Equipments :

True RMS meter, Q meter, Standard AC and DC sources, Instruments for digital and analog circuit testing and automatic test equipment.

5. Converters and digital Instruments :

A/D and D/A converters and their types, specifications, data loggers, significance of 3½ and 4½ digit, Automation in digital instruments, DMM, Digital frequency meter, Universal counter and their applications like event, ratio, totalizing and timers etc.

6. Data Transmission Techniques :

Introduction to data transmission techniques, Pulse modulation, digital modulation techniques like Amplitude shift Keying, Phase shift Keying, telemetry and its application in Instrumentation.

Reference :

1. Electronic Measurement and Instrumentation (*H. Oliver and J. M. Cage*) – McGraw Hill, 2nd edition.
2. Instrumentation for Engineering Measurements (*James Dally, William F. Riley and Kenneth G. McConnell*) – John Wiley and Sons, Inc., 2nd Edition, 1993.
3. Digital Instrumentation (*A. J. Bowens*) – McGraw-Hill, 1986.
4. Instrumentation Devices and Systems (*C. S. Rangan, G. R. Sarma, V.S.V. Mani*) – Tata McGraw Hill, 9th Edition.
5. Elements of Electronic Instrumentation and Control (*J. J. Carr*) – Prentice Hall, 3rd edition.
6. Electronic Instrumentation and Measurement Techniques (*W. Cooper, A. Helfric*) – PHI, 3rd edition.
7. Electronic Instrumentation (*J.A. Allocai*) – Prentice Hall, 2nd edition.
8. Handbook of Electronic Instrumentation (*Coombs*).

