**13EE3210-ELECTRONIC MEASUREMENTS**

**(EEE)**

**Credits:4**

**Instruction/week: 4 hrs. Max. Sessional marks: 40**

**Univ. Exam: 3 hrs. Univ. Exam marks: 60**

**UNIT- I**

**CATHODE RAY OSCILLOSCOPES :** Motion of electron in electric field and in magnetic field – Block diagram of CRO, CRT, Electrostatic deflection sensitivity – Vertical and Horizontal deflection systems – Principle of operation of dual beam, dual trace, sampling and storage CROs – Measurements with CRO (voltage, current, time, frequency, phase angle, lissajous figures).

**UNIT-II**

**DIGITAL INSTRUMENTS:** Digital voltmeters-Ramp- Dual slope- stair case- successive approximation types- Digital multimeter- universal counter- Digital tachometer- Digital phase meter Auto ranging- 3,3 $\frac{1}{2}$ ,3$\frac{3}{4}$ Digit display.

**UNIT -III**

**SIGNAL ANALYZERS:** AF, HF Wave Analyzers. Harmonic Distortion, Heterodyne wave Analyzers, Spectrum Analyzers, Power Analyzers-oscillators-

Potentiometric recorders-Rectifier type instrument half wave and full wave, true RMS meter-

Q-meter,

**UNIT -IV**

**TRANSDUCERS:** Classification, Strain gauges, Bonded, unbonded; Force and Displacement Transducers. Resistance Thermometers-LVDT- Thermocouples, Digital Temperature sensing system. Piezoelectric Transducers, Variable Capacitance Transducers. Magneto strictive Transducers.

**UNIT -V**

**MEASUREMENT OF PHYSICAL PARAMETERS:** Flow Measurement. Displacement Meters, Liquid level Measurement, Measurement of Humidity and Moisture, Velocity, Force, Pressure - High Pressure, Vacuum level, Temperature -Measurements, Data Acquisition Systems.

**TEXT BOOKS:**1. “Electronic Measurements and Instrumentation” , K. Lal Kishore, Pearson Education 2010.
2. “Electronic Instrumentation”, H.S.Kalsi, TMH, 2ndEdition 2004.

**REFERENCES:**
1. “Electronic Instrumentation and Measurements”, David A. Bell, Oxford Univ. Press, 1997.
2. “Modern Electronic Instrumentation and Measurement Techniques” A.D. Helbincs. W.D.

Cooper: PHI 5aEdition 2003.
3.“ Electronic Measurements and Instrumentation”, B.M. Oliver, J.M. Cage TMH Reprint 2009.