SUBJECT NO-IE30002, SUBJECT NAME- INSTRUMENTATION DEVICES-II

LTP- 3-0-0,CRD- 3

SYLLABUS :-

Piezoelectric transducers: construction, properties and equivalent circuit, Charge amplifier, Measurement of force and vibration. Seismic transducers: Construction and frequency response. Accelerometers: Piezoelectric, Electrodynamic and Capacitive type, MEMS capacitive accelerometer. Ultrasonic transducers: Electromechanical equivalent circuit and transfer function of a piezoelectric transmitter, natural frequencies, crystal oscillator; Theory of propagation of sound in a medium; Reflection, Refraction and Characteristics Impedance; Ultrasonic Nondestructive Testing and Imaging techniques. Optical sources and detection schemes, Fiber optic sensors. Digital transducers: position and speed sensing.Use of feedback principle in Instrumentation and its applications; Elements of pneumatic control systems: Flapper-nozzle amplifier, Air relay, Valve positioner, Electropneumatic converter. Control Valves: construction and characteristics. Hydraulic servomotor. A.C servomotor. Stepper motors: constructions, operations and driving schemes. Introduction to Programmable Logic Controller.Sources of noise and interference and their reduction techniques, Grounding and Shielding. Signal transmission: 4-20 mA current loops, Serial data communication, Optical fiber links, Wireless sensors.