

PDEA'S

Mamasaheb Mohol College, Paud Road, Pune – 38

Electronics Department

F. Y. B. Sc. Electronics of B. Sc. (Computer Science) CBCS 2019-20

Course Name: SEMESTER II PAPER I ELC 121: Instrumentation Systems (2 Credits, 36 lectures)

After completion of this course the students will be able to

Course Outcome #	Course Outcome
CO 121.1	to explain instrumentation system
CO 121.2	to explain sensors and actuators and their selection for application
CO 121.3	to explain recent trends in sensor technology viz smart,nano,IOT sensors
CO 121.4	to identify, draw OPAMP configurations and will be able to find output of OPAMP circuits

Sr.No.	Chapter	Course Specific Outcomes	Teaching Methodology	Reference
1	Introduction to Instrumentation System (6 L) Block diagram of Instrumentation system, Definition of sensor, transducer and Actuators, Classification of sensors: Active and passive sensors. Specifications of sensors: Accuracy, range, linearity, sensitivity, resolution, reproducibility	Students will be able to • Draw block diagrams • Explain working • Define sensor parameters • Solve problems based on sensor parameters	Lecture method(PPT), Use of ICT	Sensors and Transducers : D. Patranabis, PHI publication, 2 nd Edition
2	Sensors and Actuators (12 L) Temperature sensor (Thermistor, LM-35), optical sensor (LDR), Passive Infrared sensor (PIR), Tilt Sensor, ultrasonic sensor, Motion sensor, Image Sensor, Actuators: DC Motor, stepper motor	Students will be able to • To draw symbols and block diagrams • Explain systems using sensors • Explain actuator	Lecture method(PPT) , Engineers garage website, Use of animation	Sensors and Transducers : D. Patranabis, PHI publication, 2 nd Edition

		• Explain significance of sensors and actuators in system development		
3	Smart Instrumentation System and Smart Sensors (6 L) Block diagram of Smart Instrumentation system, Concept of smart sensor, Film sensors, Nano sensor	Students will be able to • Draw and explain smart systems • Explain recent trends in smart sensors • Link the significance with recent trends as IOT	Flipped classroom	Sensors and Transducers : Prof A.D.Shaligram Internet open source information collection
4	OPAMP as signal Conditioner (12 L) Concept, block diagram of Op amp, basic parameters (ideal and practical): input and output impedance, bandwidth, differential and common mode gain, CMRR, slew rate, IC741/ LM324, Concept of virtual ground, Op amp as inverting and non-inverting amplifier, Unity gain follower, Opamp as adder, subtractor, Op amp as current to voltage and voltage to current convertor, Voltage to frequency converter, Op amp as comparator, Problems based on above Op Amp applications.	Students will be able to • Draw circuit diagrams of OPAMP configurations • Find the output voltage of the circuits of various OPAMP configurations • Define OPAMP parameters • Solve problems based on OPAMP	Lecture method , Problem solving sessions	Op Amp and Linear Integrated Circuits: Ramakant Gaykwad