



Maharaja Agrasen Institute of Technology

(Approved by AICTE & Affiliated to GGSIP University, New Delhi)

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Department of Electrical & Electronics Engineering

SENSORS AND TRANSDUCERS (ETEE-305)

ACADEMIC PLAN FOR SEMESTER-V 2022

S.No.	TOPICS TO BE COVERED	Total No. of Lectures (42)	CO
UNIT-I(Introduction to sensors)			
1	Introduction to Sensors and Transducers	2	CO1
2	Principles and Classification of Sensors	2	
3	Characteristics of Sensors	2	
4	Mechanical and Thermal Characterization	2	
5	Specific Sensor Types and the Bath-Tub Curve	2	
UNIT-II (Thermal, Magnetic & Radiation sensors)			
7	Introduction to Thermal Sensors, Classification, and Basic Principles.	2	CO2
8	Study of Thermal Sensors, Including Gas thermometric sensors, Dielectric constant, and refractive index thermo-sensors.	2	
9	Advanced Thermal Sensors: Nuclear thermometers, Resistance Change Type Sensors, and Thermoemf Sensors.	2	
10	Introduction to Magnetic Sensors, Covering Magnetostrictive, Hall Effect, Eddy Current, and SQUID Sensors.	3	
11	Radiation Sensors Overview, Including Photo-Detectors, Photo-Emissive Sensors, Photomultiplier Tubes, and Scintillation Detectors.	2	
After Mid Term			
UNIT-III(Electroanalytical sensors)			
13	Introduction to Electrochemical Cells, Standard Hydrogen Electrode (SHE), Polarization, Reference Electrodes, and Metal and Membrane Electrodes.	2	CO3
14	Overview of Smart Sensors, Film Sensors, Introduction to Semiconductor Integrated Circuit (IC) Technology, Micro Electro Mechanical Systems (MEMS), and Nanosensors.	2	
15	Introduction to Biosensors and Their Applications in Healthcare and Biotechnology.	2	
16	Exploration of Electroceramic Materials and Their Use in Sensors.	2	
17	Recent Developments in Sensor Technology	2	

UNIT-IV(Different Transducers)			
18	Introduction to LVDT (Linear Variable Differential Transformer), RTD (Resistance Temperature Detector), and Thermistor, including their principles and applications.	2	CO4
19	Exploring Wire Anemometers for measuring airflow and Piezoresistors for pressure sensing, discussing their operational principles and usage.	3	
20	Variable Diaphragm Capacitance Transducers and Angular Movement Transducers	2	
21	Seismic Mass Transducer and Interferometer Transducer	1	
22	Understanding various Feedback Transducer Systems, including Inverse Transducers, Self-Balancing Transducers, Servo-Operated Manometers, Feedback Pneumatic Load Cells, and Integrating Servo Transducers.	3	

Course Outcomes

CO.305.1	Understand the concept of sensor & transducers along with their classifications & characteristics and various types of sensors.
CO.305.2	Learn about the basic design, working principle of magnetic, thermal & radiation sensors along with their application.
CO.305.3	Comprehend the principle of electro analytical sensor along with the various types of electrodes & advancement in sensor technology.
CO.305.4	Understand the different types of transducers & their applications.