SENSOR TECHNOLOGY
(Open Elective – I)

Course Code	20EC2501A	**Year**	III	**Semester**	I
Course Category	OE-1	**Branch**	Offered by EC	**Course Type**	Theory
Credits	3	**L-T-P**	3-0-0	**Prerequisites**	Nil
Continuous Internal Evaluation:	30	**Semester End Evaluation:**	70	**Total Marks:**	100

Course Outcomes	
Upon successful completion of the course, the student will be able to	
CO1	**Understand** the concept of sensors and its characteristics. (L2)
CO2	**Select** the physical principles of sensing based on sensor signals and systems (**L**3)
CO3	**Identify** the sensor interfacing with various electronics circuits (L3)
CO4	**Utilize** the practical approach in design of technology based on different sensors.(L3)
CO5	**List** various sensor materials and technology used in designing sensors.(L4)

Mapping of course outcomes with Program outcomes (CO/ PO/PSO Matrix)

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	√											√		
CO2	√												√	
CO3	√				√								√	
CO4	√				√								√	
CO5		√												√

Syllabus

Unit No.	**Contents**	**Mapped CO**
I	**Sensors Fundamentals and Characteristics** Sensors, Signals and Systems; Sensor Classification; Units of Measurements; Sensor Characteristics	CO1,CO2
II	**Physical Principles of Sensing** Electric Charges, Fields, and Potentials; Capacitance; Magnetism; Induction; Resistance; Piezoelectric Effect; Hall Effect; Temperature and Thermal Properties of Material; Heat Transfer; Light; Dynamic Models of Sensor Elements	CO1,CO2
III	**Interface Electronic Circuits** Input Characteristics of Interface Circuits, Amplifiers, Excitation Circuits, Analog to Digital Converters, Direct Digitization and Processing, Bridge Circuits, Data Transmission, Batteries for Low Power Sensors	CO1,CO3

IV	**Sensors in Different Application Area** Occupancy and Motion Detectors; Position, Displacement, and Level; Velocity and Acceleration; Force, Strain, and Tactile Sensors; Pressure Sensors, Temperature Sensors	CO1,CO4
V	**Sensor Materials and Technologies** Materials, Surface Processing, Nano-Technology	CO1,CO5

Learning Resources
Text Books
1. J. Fraden, Handbook of Modern Sensors:Physical, Designs, and Applications, AIP Press, Springer 2. D. Patranabis, Sensors and Transducers, PHI Publication, New Delhi
Reference Books
1. Mechatronics- Ganesh S. Hegde, Published by University Science Press (An imprint of Laxmi Publication Private Limited).
e- Resources & other digital material
1. http://www.infocobuild.com/education/audio-video-courses/electronics/IndustrialInstrumentation-IIT-Kharagpur/lecture-34.html