SENSORS AND ACTUATOR DEVICES FOR IOT

Course Code	20EC5502	Year	III	Semester	I
Course Category	Minor	Branch	ECE	Course Type	Theory
Credits	4	L-T-P	3-1-0	Prerequisites	IOT
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	**Illustrate** the working principles of different types of sensors and actuators (L2)
CO2	**Analyse** the phenomena that define behaviour of various sensors and actuators. (L4)
CO3	Apply the concepts in common methods for converting a physical parameter into an electrical quantity. (L3)
CO4	**Identify** suitable sensors and actuator for real time applications. .(L3)

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:High, 2: Medium, 1:Low)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2									1				1
CO2		3								2				2
CO3	3									2				2
CO4	3									2				2
Avg.	3	3								2				2

Syllabus		
Unit No.	**Contents**	**Mapped CO**
I	**Sensors/Transducers**, Principles, Classification, Characterization. Mechanical and Electromechanical Sensors: Introduction, Resistive Potentiometer, Inductive Sensors, Capacitive Sensors- Parallel plate & serrated plate types, Ultrasonic Sensors.	CO1-CO3
II	**Thermal Sensors**: Introduction, Helium Low Temperature Thermometer, Nuclear Thermometer, Magnetic Thermometer, Junction Semiconductor Types, Magnetic Sensors: Introduction, Sensors and the Principles Behind, Force & displacement Sensors.	CO1-CO3
III	**Radiation Sensors**: Introduction – Basic Characteristics – Types of Photo sensistors /Photo detectors– X-ray and Nuclear Radiation Sensors – Fiber Optic Sensors.	CO1-CO3
IV	**Smart Sensors**: Introduction, Primary Sensors, Excitation, Amplification, Filters, Converters, , Information Coding/Processing, Data Communication, Standards for Smart Sensor Interface, the Automation. **Sensors Applications**: Introduction, On-board Automobile Sensors (Automotive Sensors), Home Appliance Sensors, Medical Diagnostic Sensors, Sensors for Manufacturing, Sensors for environmental Monitoring	CO1-CO4

V	**Actuators**: Pneumatic and Hydraulic Actuation Systems, Valves, Rotary actuators, Mechanical Actuation Systems Electrical Actuation Systems.	CO1, CO2, CO4

Learning Resources

Text Books

1. D. Patranabis-Sensors and Transducers, PHI Learning Private Limited.
2. W. Bolton-Mechatronics, Pearson Education Limited.

Reference Books

1. Patranabis-Sensors and Actuators- 2nd Ed., PHI, 2013.
2. Robert H. Bishop-The Mechatronics Handbook, 2nd Ed., Mechatronic Systems, Sensors and Actuators, fundamentals and modelling

e- Resources & other digital material

1. https://nptel.ac.in/content/syllabus_pdf/108108147.pdf