

SENSORS AND TRANSDUCERS FOR REMOTE APPLICATIONS

Course Code	19EC4701F	Year	IV	Semester	I
Course Category	Programme Elective-IV	Branch	ECE	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 basic concepts and characteristics of Sensors (L2)
CO2	Discuss the construction, working principle, characteristics and applications of various resistive Sensors.(L4)
CO3	Discuss the construction, working principle, characteristics and applications of various Capacitive Sensors.(L4)
CO4	Discuss the construction, working principle, characteristics and applications of Self-Generating Sensors.(L4)
CO5	Understands the basic concepts of telemetry systems (L2)

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

Note: 1- Weak correlation 2-Medium correlation 3-Strong correlation

* - Average value indicates course correlation strength with mapped PO

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	2	2			1	1	1		1	2	1
CO2	3	3	2	2	2			1	1	1		1	2	1
CO3	3	3	2	2	2			1	1	1		1	2	1
CO4	3	3	2	2	2			1	1	1		1	2	1
CO5	3	3	2	2	2			1	1	1		1	2	1
Average* (Rounded to nearest integer)	3	3	2	2	2			1	1	1		1	2	1

Syllabus

Unit No.	Contents	Mapped CO
I	Introduction to Sensors based measurement systems- General Concepts and Terminology, Sensor Classification-sensors, General input-output Configuration, Static characteristics of measurement system, Dynamic Characteristics, Other sensor characteristics.	CO1
II	Resistive Sensors - Potentiometers, Strain Gages, Resistive Temperature Detectors (RTD), Thermistors, Magneto resistors, Light-Dependent Resistors (LDR), Resistive Hygrometers, Resistive Gas Sensors.	CO2

III	Capacitive Sensors - Variable capacitor, Differential capacitor. Inductive sensors - Variable reluctance sensors, Eddy current sensors, Linear variable differential transformers (LVDT), variable transformers, Magneto elastic and magnetostrictive sensors.	CO3
IV	Self-Generating Sensors- Thermoelectric Sensors, Piezoelectric Sensors, Pyroelectric Sensors, Photovoltaic sensors, Electrochemical Sensors.	CO4
V	Introduction to Telemetry principles, Basic System, Classification, Non-electrical Telemetry system, Voltage and Current Telemetry System, Local transmitters and convertors, frequency telemetering, Satellite Telemetry, Fibre optic telemetry	CO5

Learning Resources

Text Books

1. Ramon Pallas-Areny, Jhon G. Webster, "Sensors and Signal Conditioning" -2nd Edition, John Wiley and Sons
2. D Patrabis, "Telemerty Principles", Tata McGraw Hill, 2007.

Reference Books

1. A.K. Sawhney, "Electrical and Electronic Measurements and Instrumentation", Dhanpat Rai.
2. Er. R.K. Rajput, "Electronic Measurements and Instrumentation", S. Chand & Company Ltd. 3rd Edition.
3. Bentley, John P., "Principles of Measurement Systems", 4th edition, Pearson/Prentice Hall, 2005.
4. Jon. S. Wilson, "Sensor Technology Hand Book", Elsevier Inc., 2005.
