Faculty of Engineering and Technology

DEPARTMENT OF ICE

Course Code :IC0204
Course Title :Transducers Engineering
Year& Semester : II / IV
Course duration : EVEN semester (JAN-APRIL2014)

Faculty Details :

Name of the staff	Section	Office	Office Hours	Mail ID
A.Dominic savio	ICE-A	TECH PARK 14 th floor	8.30AM to 4 PM	dominicsavio.a@ktr.srmuniv.ac.in

REFERENCE BOOKS

1. *Deoblin E.O., Measurement System Application and Deisgn, McGraw Hill, 1997*
2. *Patranabis D., Principle of Industrial Instrumentation, Tata McGraw Hill, 2004*
3. *Dr.S.Raenganathan.,Transducer Engineering*
4. *Neubert, HKP, Instrument Transducers, Oxford University Press, 1999*
5. *D.V.S. Murty,Transducers And Instrumentation ,PHI,2008*
6. *Sawhney A. K., A Course in Electrical and Electronics Measurements and Instrumentation, Dhanpat Rai and Sons, New Delhi,*

Web Resource:

- http://www.electronics-tutorials.ws/io/io_1.html
- http://www.eee.metu.edu.tr/~koray/exp1.pdf
- http://www.instrumentationtoday.com/tag/inductive-transducers/
- http://www.scribd.com/doc/38881940/Capacitive-Transducer
- http://www.ndt-ed.org/EducationResources/CommunityCollege/Ultrasonics/EquipmentTrans/piezotransducers.htm

Prerequisite :

Basic knowledge of resistor, capacitor, inductor, and sensor and transducer

Objective:

It deals with various types of Sensors & Transducers and their working principle.

Tentative test details and portions:

Cycle Test – I	**:**	Unit I & II
Cycle Test –II	:	Unit III & IV
Model Exam	**:**	All five units

Assessment details

Cycle test I	10 Marks
Cycle test I	10 Marks
Model test	20 Marks
Surprise test	05 Marks
Attendence	05 Marks
TOTAL	50 Marks

Outcomes

Students who have successfully completed this course

Course outcome	Program outcome
• It deals with various types of Sensors & Transducers and their working principle • It deals with Resistive, Capacitive and Inductive transducers • It deals with some of the miscellaneous transducers also	• To enable the students to select and design suitable instruments to meet the requirements of industrial applications. • The students will be able to to understand the use of sensors & transducers in the field of instrumentation.

Detailed Session Plan

Day	Name of the topics	Reference
	UNIT-I INTRODUCTION	
DAY 1	Sensors - Transducer	Sawhney, A. K., A *Course in Electrical and Electronic Measurement and Instrumentation*
DAY 2	Classification of Transducer	
DAY 3	Basic requirements of a transducer.	
DAY 4	Generalised scheme for measurement system	
DAY 5	Basic method of measurement	
DAY 5	Static characteristics	
DAY 6	Errors in measurement- Types of errors	
DAY 7	Statistical analysis of measurement data - Mean	
DAY 8	Standard Deviation, Probability errors.	
DAY 9	SURPRISE TEST I	
	UNIT II: RESISTIVE TRANSDUCER	
DAY 10	Potentiometer - Loading effect - Application	Deoblin E.O., *Measurement System Application and Deisgn*, McGraw Hill
DAY 11	Strain gauge - Theory,	
DAY 12	Strain gauge - Types, Temperature compensation-Applications	
DAY 13	Torque measurement, Proving Ring, Load Cell	
DAY 14	Resistance thermometer	
DAY 15	Thermistors materials- Constructions,	
DAY 16	Thermistors materials - Characteristics	
DAY 17	Hot wire anemometer -LDR.	
	Surprise test II	
	. **UNIT II: INDUCTIVE TRANSDUCERS**	
DAY 18	Self inductive transducer	Sawhney, A. K., A *Course in Electrical*

DAY 19	Mutual inductive transducers	*and Electronic Measurement and Instrumentation*
DAY 20	Reluctance pick up	
DAY 21	Linear Variable Differential Transformer	Sawhney, A. K., A *Course in Electrical and Electronic Measurement and Instrumentation*
DAY 22	LVDT Accelerometer	
DAY 23	RVDT - Synchros - Proximity sensors	
DAY 24	Microsyn - Induction Potentiometer -	
DAY 25	Variable Reluctance Accelerometer	
DAY 26	Magnetostrictive Transducers-Applications(thickness & level measurement).	
	UNIT II: CAPACITIVE TRANSDUCERS	
DAY 27	Capacitive transducer	Dr.S.Raenganathan.,Transducer Engineering
DAY 28	Variable Area Type	
DAY 29	Variable Air Gap type	
DAY 30	Variable Permittivity type-Applications(Measurement of level,)	
DAY 31	Variable Permittivity type-Applications(pressure, thicknes)	
DAY 32	Variable Permittivity type-Applications(sound	
DAY 33	Frequency response	
	UNIT V: MISCELLEANEOUS TRANSDUCERS	
DAY 34	Piezoelectric Transducer	*D.V.S. Murty,Transducers And Instrumentation ,PHI,2008*
DAY 35	Piezoelectric Crystals	
DAY 36	Accelerometer - Charge Amplifier	
DAY 37	Hall Effect transducers	
DAY 38	Applications-Shaft Encoder	
DAY 39	IC sensors for Temperature and Pressure	
DAY 40	Intelligent Sensors	