SRM UNIVERSITY
Faculty of Engineering and Technology

DEPARTMENT OF EIE

Course Code :15EI203J
Course Title :Transducer Engineering
Year& Semester : II / III
Course duration : ODD semester (June - Nov 2016)
Location :
Faculty Details:

Name of the staff	Section	Office	Office Hours	Mail ID
Mrs.N.Deepa	EIE	IT TECH PARK 14th floor	9.00am to 4.00pm	deepa.n@ktr.srmuniv.ac.in
Mrs.B.Hemalatha	EIE	IT TECH PARK 14th floor	9.00am to 4.00pm	hema.b@ktr.srmuniv.ac.in

REFERENCE BOOKS

1. Sawhney. A.K, "*A Course in Electrical and Electronics Measurements and Instrumentation*", 18th Edition, Dhanpat Rai & Company Private Limited, 2007.
2. Renganathan. S,"*Transducer Engineering*", 4th edition Allied Publishers, Chennai, 2003.
3. Doebelin. E.A, "*Measurement Systems – Applications and Design*", Tata McGraw Hill, New York, 2000.
4. Patranabis. D, "*Sensors and Transducers*", 2nd edition ,Prentice Hall of India, 1999.
5. John. P, Bentley, "*Principles of Measurement Systems*", III Edition, Pearson Education, 2000.
6. Murthy.D.V.S, "*Transducers and Instrumentation*", 11th edition Prentice Hall of India, 2005.

Web Resource:

- http://en.wikipedia.org/wiki/Transducer
- http://homepage.hik.se/staff/tkuwl/Measure_Sensors/Lect_4_Transducers_Intr_v07.pdf
- http://www.antonine-education.co.uk/Electronics_AS/Electronics_Module_1/Topic_5/Resistive%20Transducers_files/frame.htm
- http://en.wikipedia.org/wiki/Potentiometer
- http://en.wikipedia.org/wiki/Self-reconfiguring_modular_robot#Inductive_Transducers
- http://en.wikipedia.org/wiki/Position_sensor

Prerequisite :

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

Objective:

1. To know about various types of errors in instruments
2. To obtain the knowledge about various types of Sensors & Transducers and their working principle
3. To understand the various types of transducers like Resistive, Capacitive and Inductive
4. To learn some of the miscellaneous transducers

Tentative test details and portions:

Cycle Test - I:	24.07.16	Unit I
Cycle Test –II:	23.08.16	Unit II & III
Cycle Test - III:	25.09.16	Unit IV & V

Assessment details

Cycle test I	10 Marks
Cycle test I	15 Marks
Cycle test - III	15 Marks
Surprise test	05 Marks
Quiz	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: MEASUREMENTS AND INSTRUMENTATION OF TRANSDUCERS	
DAY 1	Introduction	Sawhney, A. K., A *Course in Electrical and Electronic Measurement and Instrumentation*
DAY 2	General configuration and description of measuring Instruments	Sawhney, A. K., A *Course in Electrical and Electronic Measurement and Instrumentation*
DAY 3	Basic method of measurement , Generalized scheme for measurement systems ,	Sawhney, A. K., A *Course in Electrical and Electronic Measurement and Instrumentation*
DAY 4	Units and standards requirement of transducers.	Sawhney, A. K., A *Course in Electrical and Electronic Measurement and Instrumentation*
DAY 5	Errors – Classification of errors, error analysis	Sawhney, A. K., A *Course in Electrical and Electronic Measurement and Instrumentation*
DAY 6	Statistical methods	Sawhney, A. K., A *Course in Electrical and Electronic Measurement and Instrumentation*
	UNIT II: CHARACTERISTICS OF TRANSDUCERS	
DAY 7	Static and dynamic characteristics of instrument systems. Errors in Instrumentation system	Sawhney, A. K., A *Course in Electrical and Electronic Measurement and Instrumentation*
DAY 8	Mathematical model of transducer – Zero, first order transducers	Sawhney, A. K., A *Course in Electrical and Electronic Measurement and Instrumentation*
DAY 9	Response to step, ramp, impulse input	Sawhney, A. K., A *Course in Electrical and Electronic Measurement and Instrumentation*
DAY 10	Mathematical model of transducer – second order transducers	Sawhney, A. K., A *Course in Electrical and Electronic Measurement and Instrumentation*
DAY 11	Active and passive transducers and their classification	Sawhney, A. K., A *Course in Electrical and Electronic Measurement and Instrumentation*
DAY 12	Surprise test II	Sawhney, A. K., A *Course in Electrical and Electronic Measurement and Instrumentation*

	UNIT III: RESISTIVE TRANSDUCERS	
DAY 13	Potentiometer- Loading effect	Deoblin E.O., *Measurement System Application and Deisgn*, McGraw Hill, 1990
DAY 14	Strain gauge – Theory, types,	Deoblin E.O., *Measurement System Application and Deisgn*, McGraw Hill, 1990
DAY 15	Temperature compensation Applications of strain gauge	Deoblin E.O., *Measurement System Application and Deisgn*, McGraw Hill, 1990
DAY 16	Torque measurement– Proving Ring, Load Cell	Deoblin E.O., *Measurement System Application and Deisgn*, McGraw Hill, 1990
DAY 17	Resistance thermometer, Thermistors materials – Constructions, Characteristics, Thermistors materials – Constructions, Characteristics	Deoblin E.O., *Measurement System Application and Deisgn*, McGraw Hill, 1990
DAY 18	Hot wire anemometer	Deoblin E.O., *Measurement System Application and Deisgn*, McGraw Hill, 1990
	UNIT IV: INDUCTIVE AND CAPACITIVE TRANSDUCER	
DAY 19	Self inductive transducer, Mutual inductive transducers, Linear Variable Diferential Transformer	Sawhney, A. K., A *Course in Electrical and Electronic Measurement and Instrumentation*
DAY 20	LVDT Acelerometer – RVDT	Sawhney, A. K., A *Course in Electrical and Electronic Measurement and Instrumentation*
DAY 21	Synchros – Microsyn	Sawhney, A. K., A *Course in Electrical and Electronic Measurement and Instrumentation*
DAY 22	Capacitve transducer – Variable Area Type	Sawhney, A. K., A *Course in Electrical and Electronic Measurement and Instrumentation*
DAY 23	Variable Air Gap type, Variable Permitivity type, Capacitor microphone	Sawhney, A. K., A *Course in Electrical and Electronic Measurement and Instrumentation*
DAY 24	Quiz	
	UNIT V: MISCELLEANEOUS TRANSDUCERS	
DAY 25	Piezoelectric Transducer, Hall Effect transducers	Dr.S.Renganathan.,Transducer Engineering
DAY 26	Proximity sensors Radiation sensors	Dr.S.Renganathan.,Transducer Engineering

DAY 27	Smart sensors, Fiber optic sensors	Dr.S.Renganathan.,Transducer Engineering
DAY 28	Biosensors	Dr.S.Renganathan.,Transducer Engineering
DAY 29	Film sensors, MEMS	Dr.S.Renganathan.,Transducer Engineering
DAY 30	Nano sensors, Digital transducers	Sawhney, A. K., A *Course in Electrical and Electronic Measurement and Instrumentation*
DAY 43		Sawhney, A. K., A *Course in Electrical and Electronic Measurement and Instrumentation*
DAY 44		Sawhney, A. K., A *Course in Electrical and Electronic Measurement and Instrumentation*
DAY 45	Revision	