Subject Code: 01ME0742
Subject Name: Sensorics
B. Tech. Year –III (Semester - 7)

Type of course : Program Elective

Rationale : The course is prepared to provide the detail knowledge of Sensors used in Machine and proces Automation

Course Outcome :
After completion of this course, student will be able to

1. Understand working principal and construction of different types of sensors
2. Apply the knowledge of different sensors to prepare Automated Machines and processes

Teaching and Examination Scheme :

Teaching Scheme			Credits	Examination Marks					Total Marks
				Theory Marks			Practical Marks		
Theory	Tutorial	Practical	C	ESE(E)	IA	CSE	Viva (V)	Term Work (TW)	
4	0	2	5	50	30	20	25	25	150

Content :

Sr. No.	Content	Total Hrs.
1	Basic need of a sensors, Classification of sensors, Static and Dynamic characteristics of sensors, Types of Sensors: Displacement, Linear and Rotary displacement,Potentiometer, Capacitive and Inductive type displacement sensor, position sensors, Optical encoder, Photoelectric sensor, Hall Effect Sensor	--
2	Eddy current proximity sensor- Inductive Proximity sensor- Capacitive Proximity sensor -Pneumatic Proximity sensors: Proximity Switches: Contact type and Noncontact type, Strain Gauge , Piezoelectric Sensor, Tactile sensor,Diaphragm Pressure Sensor, Capsule Pressure sensors, Bellows Pressure Sensor,Bourdon tube pressure sensor. MEASUREMENT OF VELOCITY, FLOW AND LEVEL : Tachogenerator - Pyroelectric sensors - Ultrasonic sensor – Resistive sensor- Pitot tube – Orificeplate - flow nozzle- Venturi tubes – Rotameter- Electromagnetic flow meter. Float level sensor- Pressure level sensor- Variable capacitance sensor. Non conventional Measurement Sensors	--

3	MICRO SENSORS AND ACTUATORS : Micro Sensors: Principle Force and pressure micro sensors,position and speed micro sensors, acceleration micro sensors, chemical sensors,biosensors, temperature micro sensors and flow micro sensors.Micro Actuators: Actuation principle, shape memory effects-one way, two way and pseudo elasticity. Types of micro actuators- Electrostatic, Magnetic, Fluidic, Inverse piezo effect, other principles	--

Distribution of Theory Marks

R Level	**U** Level	**A** Level	**N** Level	**E`** Level	**C** Level
10	**20**	**25**	**25**	**10**	**10**

Legends: R: Remember**; U:** Understand**; A:** Apply**; N:** Analyze**; E:** Evaluate**; C**: Create

Reference books :

1. Sensors and Transducers by Ian R.Sin clair Newnes
2. Master book on Sensors by P. Ripka and A. Tipek
3. Hand book of Modern Sensors by Jacob Fraden Springer
4. Understanding Smart Sensors by Randy Frank

List of Open Base Software / learning website :

1. http://nptel.ac.in/courses