

**INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI**  
**PROFORMA FOR NEW COURSE**

1.	Title of the Course	Transducers
2.	Course Number	EE5030
3.	Status of the Course	Elective
4.	Structure of Credits	3-0-0-3
5.	Offered To	PG
6.	New Course/Modification to	New
7.	To be Offered by	Department of Electrical Engineering
8.	To take effect from	July 2019
9.	Prerequisite	Nil
10.	Whether approved by the Department	Yes
11.	<b>Course Objective:</b> To familiarise the student about the different transducers and how to use them to make measurement on physical parameters such as displacement, velocity, temperature, torque and speed.	
12.	<b>Course Content:</b> Transducers and their characteristics: definition of terminologies, generalized performance characteristics; Resistive transducers: resistance potentiometer, noise, resolution, signal conditioning, strain gauges and associated electrical circuitry, temperature compensation, load cells, torque and pressure measurement using strain gauges, resistive temperature device (RTD), three-lead arrangement, thermistors, linearization - hot-wire anemometers, measurement of direction of flow, peizo resistive transducers; Inductive transducers: self-inductance transducers, transverse armature and plunger type, sensitivity and linearity, signal conditioning circuits, choice of components, linear variable differential transducer: lead and lag compensation; Capacitive transducers: single, push-pull, angle transducer, humidity sensor, parasitic effects, solutions, signal conditioning circuits; Miscellaneous transducers: peizo electric, thermo couples, mass-spring accelerometer; Applications of transducers: measurement of displacement (linear and angular), velocity, acceleration, force, torque, pressure, flow, temperature.	
13.	Text book(s): 1. Neubert H K, <i>Instrument transducers-an introduction to their performance and design</i> , Oxford (2003).	
14.	Reference(s): 1. Doebelin E O, <i>Measurement systems: Application and Design</i> , McGraw - Hill (2004). 2. Pallas-Areny R and Webster J G, <i>Sensors and signal conditioning</i> , Wiley (2013).	