INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI
PROFORMA FOR NEW COURSE

1.	Title of the Course	Principles of Measurement
2.	Course Number	EE3204
3.	Status of the Course	Core
4.	Structure of Credits	3-0-2-4
5.	Offered To	UG
6.	New Course/Modification to	New
7.	To be Offered by	Department of Electrical Engineering
8.	To take effect from	July 2018
9.	Prerequisite	Nil
10.	Whether approved by the Department	Yes
11.	**Course Objective:** To introduce the basic principles of conducting electrical and electronic measurements. The laboratory part of the course provides a hands-on experience of commonly used electrical and electronic measuring instruments (e.g., oscilloscopes, digital multimeters, etc).	
12.	**Course Content:** Units, significant digits; Errors in measurements: systematic and random errors, propagation of errors; Analog indicating instruments: permanent magnet moving coil meter, moving iron meter, electrodynamometer, wattmeter and energy meter; Digital methods of measurement: counter-timer, analog-to-digital converters, digital multimeter, data-acquisition systems; Graphical methods of measurement: oscilloscopes; Null balance method: dc and ac potentiometers, dc and ac bridges; Voltage and current scaling: current transformers and voltage transformers; The laboratory experiments are based on 1. Statistics and random variables 2. Measurement of opamp parameters 3. B-H curve for transformers 4. Power measurement 5. Bridges 6. Analog-to-Digital converters 7. Application of the above mentioned concepts towards measurement of sensor parameters.	
13.	Text book(s): 1. Bell D A, *Electronic instrumentation and measurements,* Oxford (2013). 2. Helfrick A D and Cooper W D, *Modern electronic instrumentation and measurement techniques,* Pearson (2015).	
14.	Reference(s): 1. Frank E, *Electrical measurement analysis,* Mc-Graw Hill (1959). 2. Golding E W and Widdis F C, *Electrical measurements and measuring instruments,* Wheeler Publishing House (2011).	