

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

1.	Title of the Course	Power Electronics
2.	Course Number	EE4101
3.	Status of the Course	Core
4.	Structure of Credits	3-1-0-4
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.	<b>Course Objective:</b> To introduce basics of power electronic devices and converters. Working principles, operating modes and analysis of DC-DC, DC-AC, AC-DC, and AC-AC converters would be covered for a variety of loads. Control of power electronic converters would be explained. Certain specialized concepts in power electronics like matrix converter, active rectifiers and SiC/GaN devices would be included, along with some of the popular applications of power electronics such as renewable energy conversion and power quality enhancement.	
12.	<b>Course Content:</b> Introduction and applications of power electronics; Difference between power electronics and low power analog electronics; Characteristics of semiconductor power devices: diode, thyristor, triac, GTO, MOSFET, IGBT; Diode rectifiers; Single and three phase configuration of uncontrolled and controlled rectifiers; Line commutated thyristor based converters; DC to DC conversion: buck, boost and buck-boost converters; Bidirectional AC to DC voltage source converters; Issues of line current harmonics; Power factor; Distortion factor of ac to dc converters; Single phase and three phase inverters; Sinusoidal pulse width modulation.	
13.	Text book(s): 1. Rashid M H, <i>Power Electronics</i> , Pearson Education (2018).	
14.	Reference(s): 1. Mohan N, Undeland and Robbins , <i>Power Electronics: Converters Applications and Design</i> , Wiley India (2018).	