

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

1.	Title of the Course	Analog Circuits
2.	Course Number	EE3101
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> The objective of this course is to introduce the fundamental concepts of analog systems and apply the same in real world applications.	
12.	<b>Course Content:</b> Diodes: review; Operational amplifier (op-amp): op-amp based building blocks, linear and non-linear system, feedback theory, negative/positive feedback, stability criterion, ideal op-amp, inverting amplifier, adder, integrator, differentiator, non-inverting amplifier, applications, active-RC analog filters; Bipolar Junction Transistor (BJT): review of BJT operation and dc biasing, small signal model, BJT biasing for discrete circuit design, single stage amplifier analysis, static characteristics, internal capacitances and second order effects; Metal Oxide Semiconductor Field-Effect Transistor (MOSFET): Depletion and Enhancement MOSFET operation, characteristic and DC biasing, MOSFET as amplifier, biasing of MOS amplifier circuits, single stage integrated circuit (IC)-MOS amplifiers, Complimentary MOS (CMOS) logic inverter, MOSFET as switch, Small signal model of MOSFET for high and low frequencies.; Spice model and analysis of FET circuits, frequency response analysis; Output stage and power amplifier: classification of output stages, Class A, Class B, Class AB amplifiers, power BJT, IC power transistors and MOS power transistors; Differential and multistage amplifiers;	
13.	Text book(s): 1. Sedra A and Smith K, <i>Microelectronic circuits: theory and applications</i> , Oxford (2017).	
14.	Reference(s): 1. Boylestad R L and Nashelsky L, <i>Electronic devices and circuit theory</i> , Pearson (2009).	