

INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI
PROFORMA FOR NEW COURSE

1.	Title of the Course	Communication Systems
2.	Course Number	EE3107
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.	Course Objective: To introduce the fundamentals of communication systems including difference between analog and digital communication, signal processing techniques required for understanding communication signals, modulation techniques, noise modeling, and optimal demodulation.	
12.	Course Content: Signal processing for communication: review of LTI systems and Fourier transforms, baseband and passband signal representation, up-conversion and down-conversion; Amplitude modulation (AM): conventional AM, double-sideband suppressed carrier (DSB-SC), single-sideband (SSB), vestigial-sideband (VSB); Angle modulation: phase modulation (PM), frequency modulation (FM), superheterodyne receiver, basics of phase-locked loops; Digital modulation: signal constellations, power spectral density, bandwidth occupancy, Nyquist sampling theorem, Nyquist criterion for ISI avoidance, orthogonal and biorthogonal modulation; Noise modeling: review of basic probability, joint Gaussianity, stationarity and wide-sense stationarity, Gaussian random process; Optimal demodulation: ML and MAP decision rules, signal-space concepts, bit-error probability, link-budget analysis.	
13.	Text book(s): 1. Madhow U, <i>Introduction to Communication Systems</i> , Cambridge University Press (2014).	
14.	Reference(s): 1. Haykin S, <i>Communication Systems</i> , Wiley (2006). 2. Lathi B P and Ding Z, <i>Modern Digital and Analog Communication Systems</i> , Oxford University Press (2009).	