Title of Course: Analog Communication and Transmission Line Theory

Code and Credit Structure: CT215 3-0-2-4

Course Placement: Core Course for BTech (ICT & CS) – 4th Semester

Pre-Requisite: Signals and Systems, Electromagnetic Theory

Instructors: Prof. Deepak Ghodgaonkar and Prof. Sanjeev Gupta

Course Outline:

(I) Analog Communication

Introduction to Analog Communication Systems, Elements and Limitations of Communication Systems, Modulation and Coding, Historical Perspective and Societal Impact. (2 hours)

Linear CW modulation: Band pass signals and systems, AM, DSB, Signals and Spectra, Product Modulators, Square Law Modulators, Switched Modulators, Envelope Detection, SSB, VSB signals and Spectra, Generation and Synchronous Detection. (8 hours)

Angle Modulation: Phase and Frequency Modulation, Narrowband PM and FM, Single Tone and Multitone Modulations, Transmission Bandwidth, Generation and Detection of FM and PM signals, De-emphasis and Pre-emphasis filtering, Noise in Communication systems, Thermal noise, Shot noise and Other Types of Noise. (10 hours)

(II) Transmission Line Theory

Concept of Distributed Elements, Various Types of Transmission Lines, Circuit Model of a Uniform Transmission Line, Transmission Line Equations, Phase and Attenuation Constants, Propagation Constant and Characteristic Impedance, Lossless, Low-Loss and Distortion-less Lines, Travelling and Standing Waves, Reflection Coefficient, Standing Wave Ratio (SWR) and Return Loss, Matched, Short-circuit and Open-circuited Lines. (10 hours)


References:


Evaluation:

In-Semester Examination (27th Feb to 6th March 2021): 45%
End-Semester Examination (26th April to 3rd May 2021): 45%
Laboratory Work: 10%
Total marks out of 100 will be converted to a letter grade using a 10-point scale.