Analog Communications and Transmission Line Theory

Instructor: Deepak Ghodgaonkar

Course Code: CT215

Students: B. Tech. 4th Semester

Structure: 3-0-2-4

Pre-Requisite: Signals and Systems, Electromagnetic Theory

Time Table:

Syllabus

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 (12 hours)

Types of two-conductor transmission lines, Circuit model of uniform transmission line, Transients on a transmission line, Sinusoidal excitation of uniform transmission lines, Lossless, Low-loss and lossy transmission lines, Terminated transmission lines, Reflection coefficients and SWR of lines terminated in short circuit, open circuit, pure reactance, pure resistance and complex impedance, Power flow along transmission lines, Return loss and reflection losses. (10 Hours)

Impedance transformation using half-wavelength and quarter-wavelength lines, Basics of Smith chart, Smith chart computations, Matching transmission lines with loads using stubs, Transmission line analogy with plane wave reflection, Nonuniform transmission lines. (12 Hours)

References:

7. David M. Pozar, Microwave Engineering, Addison-Wesley, 1993

**Evaluation:**

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**Office Hours:** Monday 4:30 to 5:30 pm