B.Tech. II (CSE) Semester – III (EC209)
DIGITAL COMMUNICATION (CORE-4)
(Interdisciplinary Subject)

Subject Coordinator : Prof. N. B. KANIRKAR, ECED.

	L	T	P	Credit
Scheme	3	0	2	04

Marks 100 + 50 = Total 150

1. Course Outcomes (COs): At the end of the course, students will be able to	
CO1	acquire knowledge about the basics of communication theory.
CO2	apply different modulations schemes for designing the communication network.
CO3	analyse different modulations schemes to design better schemes for different types of channels.
CO4	evaluate and compare different communication topology, modulations schemes and their performance over various types of channels.
CO5	design robust communication network based of advanced modulations scheme.

SYLLABUS COVERED THROUGH ONLINE TEACHING TILL 30 SEPT 2020 IS AS HEREUNDER.
YELLOW HIGHLIGHTED TOPICS ARE NOT COVERED AND WILL BE COVERED AFTER MID SEM EXAM.

2. Syllabus

- **INTRODUCTION** **(05 Hours)**

  History, Concept of Transmitter, Receiver, Channel, Noise, Modulation, Types of Modulation, Different communication systems based on Input and Output. Classification Of Signals, Unit Impulse Signals, Correlation Of Signals, Orthogonal Signal Set, Exponential Fourier Series, Types of Noises, Internal: Shot, Thermal, Agitation, Transit Time Noise and External: Atmospheric, Extra-Terrestrial, Industrial Noise, White Noise and Filtered Noise, AWGN Properties, Signal To Noise Ratio.

- **AMPLITUDE MODULATION (AM)** **(06 Hours)**

  AM, AM Index, Frequency spectrum, Average Power for Sinusoidal AM, Effective Voltage and Current, Non sinusoidal Modulation, DSBFC & DSBSC Modulation, Amplitude modulator and Demodulator Circuits, AM Transmitters.

- **SINGLE-SIDEBAND (SSB) MODULATION** **(06 Hours)**

  SSB Principles, Balanced Modulators, SSB Generation and Reception.

- **ANGLE MODULATION** **(06 Hours)**

  Frequency Modulation (FM), Frequency spectra, Average power, Deviation Ratio, Measurement of Modulation Index, Phase Modulations (PM), Sinusoidal PM, Digital PM, Angle Modulator Circuits, FM Transmitters, Angle Modulations Detectors.

- **PULSE MODULATION** **(07 Hours)**

  Pulse Amplitude Modulation, Pulse Code Modulation, Delta Modulation, Pulse Frequency Modulation, Pulse Time Modulation, Pulse Position modulation and Pulse Width Modulation.

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- **DIGITAL CARRIER SYSTEM** **(06 Hours)**

  Introduction and representation of Digital Modulated Signal, ASK, PSK, FSK, QAM with Mathematics and Constellation Diagram, Spectral Characteristics of Digitally Modulated Signals. M-Ary Digital Carrier Modulation.

- **FIBER-OPTIC COMMUNICATIONS** **(06 Hours)**

  Principles of Light Transmission in Fiber Losses in Fibers, Dispersion, Light Sources and Detectors for Fiber Optics.

(Total Contact Time: 42 Hours + 28 Hours = 70 Hours)

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4. Books Recommended:

1. Dennis Roddy & John Coolen, “Electronic Communications”, PHI, 4/E, 2014 Print.
2. George Kennedy, “Electronic Communication Systems”, 3/E, McGraw Hill Book Co., 1993.
3. Simon Haykin, “Communication Systems”, 2/E, Wiley Eastern Ltd, 1994.
4. Taub and Schilling, “Principles of communication Systems”, 3/E, Mc Graw Hill Publication, 1992.
5. B.P.Lathi, ”Modern digital and analog communication systems”, 4th Ed., Holt, Sounders Pub. 1998.

ADDITIONAL REFERENCE BOOKS

1. Lathi B. P. and Ding Zhi, "Modern Digital and Analog Communication Systems", Oxford University Press, 4th Ed., 2010.
2. Proakis J. and Salehi M., "Fundamental Of Communication Systems", PHI/Pearson Education-LPE, 2nd Ed., 2006.