COURSE TITLE	**TE142319: Digital Communication Systems** Credits: 3 Semester: I
LEARNING OBJECTIVES	To study principles of information theory, coding and digital modulation techniques to address various problems in digital communication system.
COMPETENCY	The students are expected to able to: • Understand basics of information theory: source entropy, mutual information, asymptotic equipartition property (AEP), and channel capacity, as well as source coding technique • Design optimal digital communication system and analyze its performance under degrading effects of transmission media, by using statistical model and framework
SUBJECTS	• Communication system concepts • Signals classification • Correlation and autocorrelation • Sampling and quantization • Line coding, bandwidth, bit rate & symbol rate • Entropy and information, mutual information • Memoryless source and source with memory • Markov information source, state diagram • Channel matrix, binary symmetric channel (BSC) • Bursty error channel, Gilbert model. Channel modeling • Kraft inequality, McMillan theorem, Variable length codes: Shannon-Fano code, Lempel-Ziv code & Huffman coding. Arithmetic coding. • Optimum receiver concepts, Matched filter • Signal representation in vector space. Signal space dimension and signal constellation • Passband modulation: ASK, PSK, FSK, QPSK, MSK • Demodulation and detection. BER performance • Channel induced distortion: ISI • Eye pattern. MMSE and zero-forcing equalizers
MAIN REFERENCES	• John G. Proakis & Massoud Salehi, Digital Communications, 5th ed., McGraw-Hill, 2007.
OPTIONAL REFERENCES	• Bernard Sklar, Digital Communications: Fundamentals and Applications, 2nd ed., Prentice Hall, 2001. • IEEE Trans. on Communication • IEEE J. on Selected Areas in Communications • IEEE Trans. on Wireless Communications
PREREQUISITE	-