S. No.	Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
								Sessional	Final Exam	Max. Marks
2	ECE-402	Analog and Digital Communication	PCC	4	3	1	0	50	100	150

Course Outcomes:

At the end of the course the student will be able to:	
CO1	Analyze the behavior of a communication system in presence of noise and compare different analog modulation schemes for their efficiency and bandwidth
CO2	Investigate pulsed modulation system and analyze their system performance
CO3	Analyze different digital modulation schemes and can compute the bit error performance
CO4	Describe different information coding techniques and compare the performance
CO5	Explain the concepts involved in optical fiber communication

Detailed Syllabus
Section-A

Unit 1: The essentials of communication systems, Noise in communication system, Signal to noise ratio & noise figure, Concept & need for modulation, Types of modulation, Amplitude Modulation and Demodulation, Generation of DSBSC waves, Coherent detection of DSBSC waves, Single side band modulation and demodulation, vestigial sideband modulation (VSB),Theory of FM, Representation & frequency spectrum of FM, Pre-Emphasis, De-Emphasis, Wide band & Narrow band FM, Generation & detection of FM signal, Comparison with PM & AM, Introduction to receivers, Super heterodyne receivers.

(15Hrs)

Unit 2: Basic model of digital communication system, Sampling Process, Quantization Process, Pulse-Amplitude Modulation and Other forms of Pulse Modulation, Pulse-Code Modulation, Delta Modulation, Linear Prediction, Differential Pulse-Code Modulation and Adaptive Differential Pulse-Code Modulation, Time division multiplexing.

(7Hrs)

Unit3: Introduction to Digital Modulation Techniques, Types of digital modulation techniques, FSK, ASK, BPSK, DPSK, QPSK generation and reception, Differentially encoded PSK (DEPSK), M-ray PSK, MSK, Comparison of digital modulation techniques.

(8 Hrs)

Section-B

Unit 4: Information rate, Entropy, source coding & coding efficiency, Shannon Fanno coding, Huffman coding, channel capacity theorem, Block codes coding and decoding, Soft and hard decision, Convolution coding and decoding, State & Trellis diagrams, Viterbi Algorithm.

(8 Hrs)

Unit 5: Introduction to optical fiber communication, Nature of light, Advantages of Optical communication, Fiber Structures, Wave guiding, Basic optical laws and Definition, Optical fiber modes and Configuration, Mode theory for circular waveguides, Single mode fibers, Graded index fiber, Fiber materials and applications.

(8Hrs)

Text Books

S.No	Name of the Books	Author	Publisher Name	Edition (Pub. Yr.)
1	Principles of Communication Systems	Taub and Schilling	Tata McGraw Hill	3rd (2009)
2	Communication Signals and Systems	S. Haykins	Wiley-India	3rd (2010)
3	Digital Communications: Fundamentals and Applications	Bernard Sklar	Prentice-Hall PTR	3rd (2017)

Reference Books

S.No	Name of the Books	Author	Publisher Name	Edition (Pub. Yr.)
1	Digital Communications	J.G. Proakis,	Prentice Hall	2nd (2002)
2	Communication Systems: Analog & Digital	RP Singh, S D Sapre	Tata McGraw Hill	2nd (2008)
3	Optical Fiber Communications	Gerd Keiser,	Tata McGraw Hill	2nd (2008)
4	Electronic Communication Systems	George Kennedy, Bernard Davis, S. R. M Prasanna	McGraw Hill	6th (2017)