SEMESTER S5

ANALOG AND DIGITAL COMMUNICATION

Course Code	**PEEVT 521**	**CIE Marks**	40
Teaching Hours/Week (L: T:P: R)	3:0:0:0	**ESE Marks**	60
Credits	3	**Exam Hours**	2 Hrs. 30 Min.
Prerequisites (if any)	GBMAT401	**Course Type**	Theory

Course Objectives:

1. This course aims to develop analog and digital communication systems

SYLLABUS

Module No.	Syllabus Description	Contact Hours
1	Block diagram of a communication system. Need for modulation. Amplitude modulation, Equation and spectrum of AM signal, DSB-SC, SSB. Angle modulation: Narrow and wide band FM and their spectra, relationship between FM and PM, Carson's rule Comparison of AM and FM. Noise: external, internal, White noise.	9
2	Sampling and Quantization, Companding- A and mu-law companders. Pulse code modulation, Transmitter and receiver. DPCM transmitter and receiver. Delta modulation, Slope overload,	9
3	Baseband data transmission of digital data through AWGN channel, Mathematical model of ISI, Nyquist criterion for zero ISI, Signal modelling for ISI, Raised cosine spectrum, Vector model of AWGN channel. Matched filter and correlation receivers	9

4	Digital band pass modulation schemes-BPSK system and signal constellation. BPSK transmitter and receiver. QPSK system and Signal constellations. Plots of BER Vs SNR with analysis. QPSK transmitter and receiver. Quadrature amplitude modulation and signal constellation	9

Course Assessment Method
(CIE: 40 marks,ESE: 60 marks)

Continuous Internal Evaluation Marks (CIE):

Attendance	Assignment/ Microproject	Internal Examination-1 (Written)	Internal Examination- 2 (Written)	Total
5	**15**	**10**	**10**	**40**

End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions

Part A	Part B	Total
● 2 Questions from each module. ● Total of 8 Questions, each carrying 3 marks **(8x3 =24marks)**	● Each question carries 9 marks. ● Two questions will be given from each module, out of which 1 question should be answered. ● Each question can have a maximum of 3 sub divisions. **(4x9 = 36 marks)**	**60**

Course Outcomes (COs)

At the end of the course students should be able to:

Course Outcome		Bloom's Knowledge Level (KL)
CO1	Illustrate the principles of analog communication systems	**K2**
CO2	Explain the basic concepts of digital communication	**K2**
CO3	Analyse the baseband transmission of digital data through AWGN channel	**K3**
CO4	Apply various digital modulation techniques in the design of digital communication systems	**K3**

Note*: K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create*

CO-PO Mapping Table (Mapping of Course Outcomes to Program Outcomes)

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	-	-	-	2	-	-	-	-	-	-	-
CO2	3	-	-	-	2	-	-	-	-	-	-	-
CO3	3	3	3	3	2	-	-	-	-	-	-	2
CO4	3	3	3	3	2	-	-	-	-	-	-	2
CO5	3	-	-	-	2	-	-	-	-	-	-	-

Note: *1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), -: No Correlation*

Text Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Communication Systems	Simon Haykin	John Wiley& Sons	4th Edition, 2015
2	Principles of Communication Systems	Herbert Taub and Donald L. Schilling	McGraw-Hill Education	4th Edition, 2013
3	Communication Systems Engineering	John G. Proakis and Masoud Salehi	Pearson	2nd Edition, 2002
4	Electronic communication systems	George Kennedy McGraw Hill 6th Edition, 2017	McGraw Hill 6th Edition, 2017	George Kennedy McGraw Hill 6th Edition, 2017
5	Digital Communications	Simon Haykin	John Wiley& Sons	4th Edition, 2015
6	Digital Communications: Fundamentals and Applications	Bernard Sklar, Pabitra Kumar Ray	Pearson	2nd Edition

Reference Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Modern Digital and Analog Communication Systems	B. P. Lathi, Zhi Ding	Oxford University Press.	4th edition,
2	Communication systems	A Bruce Carlson Paul B Crilly	Mc Graw Hill	4th Edition

Video Links (NPTEL, SWAYAM…)	
Module No.	**Link ID**
1	https://www.youtube.com/watch?v=s_vmLqT_6NQ
2	ttps://archive.nptel.ac.in/courses/117/105/117105143/
3	https://www.youtube.com/watch?v=lwt2BnOUaQY
4	https://www.youtube.com/watch?v=hTAlcrqjNps