SEMESTER S7

COMMUNICATION TECHNIQUES

Course Code	PEBMT751	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)	None	Course Type	PE

Course Objectives:

1. This course introduces the fundamentals of electronic communication systems. Topics include the basic Analog and Digital communication techniques, fundamentals of wireless communication, and Internet of Things healthcare applications.

SYLLABUS

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Module No.	Syllabus Description	Contact Hours
1	Introduction to Electronic Communication, Communication Systems, Types of Electronic Communication, Modulation. Amplitude Modulation-AM Concepts, Expression for AM wave, Modulation Index, AM Power. Sideband Modulation, Amplitude Modulators-Low-Level and High-Level AM, Amplitude Demodulators-Diode Detectors	9
2	Frequency Modulation-Basic Principles of Frequency and Phase Modulation, Expression for FM wave, Modulation Index and Sidebands, Bandwidth., FM modulators: Varactor diode, and reactance modulators. PM to FM and FM to PM conversion. Frequency Demodulators:Slope Detectors.	9
3	Radio transmitters- AM and FM Transmitter fundamentals, Communication Receivers, AM and FM superheterodyne receivers. Intermediate frequency and images-frequency relationship and images, Noise-Signal to Noise Ratio, external noise, internal noise.	8

4	Pulse modulation: Principles and types. Digital communication techniques- Digital transmission of data, parallel and serial transmission, PCM modulation. Multiplexing and Demultiplexing- FDM, TDM, Cell Phone Technologies-Cellular Concepts-, Base Stations and Small Cells..GSM: Principle and block diagram. Wireless Technologies-Wireless LAN, Wi-Fi, Wi MAX, Bluetooth, ZigBee, and Internet of Things Healthcare Applications (Overview Only)	**10**

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**

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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	Explain different types of electronic communication systems and the role of modulation and multiplexing in facilitating signal transmission	**K2**
CO2	Describe transmitter and receiver configurations in radio transmission systems.	**K2**
CO3	Discuss different digital communication techniques.	**K2**
CO4	Classify widely used wireless communication technologies and its relevance in healthcare applications.	**K2**

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

CO-PO Mapping Table:

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1										
CO2	2											1
CO3	2	1				1						1
CO4	2	1				1						1

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	Principles of Electronic Communication Systems	Louis E. Frenzel Jr	McGraw-Hill Education.	Fourth Edition,
2	Communication Systems.	Simon Haykin, Michael Moher,	John Wiley & Sons	Fifth Edition 2009,
3	Modern Digital and Analog Communication ,.	B.P. Lathi, ZhiDing	University Press	Fourth Systems, edition Oxford,2011

Reference Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Electronics communication systems	George Kennedy ,	McGraw-Hill Education	2011
2	Advanced Electronic Communications Systems	Wayne Tomasi,	Pearson	International Edition
3	Communication System Engineering,	John G Proakis	Prentice Hall India	2002

Video Links (NPTEL, SWAYAM…)	
Module No.	**Link ID**
1	https://nptel.ac.in/courses/117105143
2	https://onlinecourses.nptel.ac.in/noc21_ee74/preview
3	https://archive.nptel.ac.in/courses/117/105/117105144/
4	https://archive.nptel.ac.in/courses/117/102/117102062/

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