

Course code	Course Name	L-T-P-Credits	Year of Introduction
BM361	COMMUNICATION TECHNIQUES	3-0-0-3	2016
<b>Prerequisite : Nil</b>			
<b>Course Objectives</b> <ul style="list-style-type: none"> <li>To study different types of communication and the effect of noise in communication.</li> <li>To study the importance and different methods of modulation</li> <li>To get an introduction to digital Communication.</li> </ul>			
<b>Syllabus</b> Introduction to communication systems: Definitions & elements – types – Modulation – Channel & Noise. Amplitude modulation: Frequency spectrum – modulation index - AM Generation – SSB –ISB, VSB, AM Transmitter and receiver (Block level). Angle modulation: FM - bandwidth requirement. Generation – FM transmitters & receivers. Phase modulation. Pulse modulation – Need, & different types and principles of operation. Introduction to digital communication: digital codes – Modems & interfacing.			
<b>Expected Outcome</b> After the completion of the course, students will be able to <ol style="list-style-type: none"> <li>Understand the fundamental concepts of communication systems</li> <li>Compare different modulation schemes.</li> <li>Understand the application of amplitude and frequency modulation.</li> <li>Able to detect and correct the errors that occur due to noise during transmission</li> </ol>			
<b>Reference Books:</b> <ol style="list-style-type: none"> <li>Dennis Roody and John Coolen: Electronic Communication, Prentice Hall of India, New Delhi.</li> <li>George Kennedy &amp; Davis: Electronic communication Systems, Tata Mc Graw Hill, 1999.</li> <li>Sam Shanmugham: Digital and Analog Communication Systems, John Wiley &amp; Sons, 1985.</li> <li>Taub and Schilling: Principles of Communication Systems, Mc Graw Hill.1987</li> <li>William Schweber: Electronic Communication Systems – A complete course, 4th edition, Prentice Hall of India, 2002.</li> </ol>			
<b>Course Plan</b>			
Module	Contents	Hours	Sem. Exam Marks
<b>I</b>	Introduction to communication systems–Definition of communication Information –transmitter –receiver.	2	<b>15%</b>
	Analog and digital communication systems –comparison, Need for modulation.	2	
	Channel –noise –white noise –narrow band noise–noise figure	3	
<b>II</b>	Amplitude modulation: Frequency spectrum –representation of AM, modulation index.	3	<b>15%</b>
	Power relations in AM wave - AM Generation – modulated transistor amplifier (one example).	4	
<b>FIRST INTERNAL EXAM</b>			

<b>III</b>	Evolution and description of SSB – Balanced modulator	3	<b>15%</b>
	Suppression of unwanted sideband – extension of SSB - ISB, VSB, AM Transmitter and receiver (Block level).	3	
<b>IV</b>	Angle modulation: Frequency modulation - mathematical representation, waveforms, frequency deviation, bandwidth requirement	3	<b>15%</b>
	Generation of FM – direct & indirect methods – FM transmitters. FM receivers - block diagram – demodulators – balanced slope detector. Phase modulation.	4	
<b>SECOND INTERNAL EXAM</b>			
<b>V</b>	Pulse modulation–Need for pulse modulation – different types	4	<b>20%</b>
	Pulse Width Modulation, Pulse Position Modulation and Pulse Code Modulation – principles of operation	4	
<b>VI</b>	Introduction to digital communication: digital codes – error detection and correction – redundant codes, parity check codes, forward error correcting codes	4	<b>20%</b>
	Modems – classification, modes of operation, modem interfacing.	3	
<b>END SEMESTER EXAM</b>			

**QUESTION PAPER PATTERN:**

Maximum Marks: 100

Exam Duration: 3 Hours

There shall be three parts for the question paper.

**Part A** includes Modules 1 & 2 and shall have three questions of fifteen marks out of which two are to be answered. There can be subdivisions, limited to a maximum of 4, in each question.

**Part B** includes Modules 3 & 4 and shall have three questions of fifteen marks out of which two are to be answered. There can be subdivisions, limited to a maximum of 4, in each question.

**Part C** includes Modules 5 & 6 and shall have three questions of twenty marks out of which two are to be answered. There can be subdivisions, limited to a maximum of 4, in each question.

**Note:** Each part shall have questions uniformly covering both the modules in it.