



**Subject Code: 01CT0303**

**Subject Name: Introduction to Communication Engineering**

**B. Tech. Year – II (Semester III)**

**Objective:**

This course explores the fundamentals of electronic communication systems it provides the basic knowledge of Analog and Digital transmission, multiplexing, Transmission medium and reception. It also provides a brief overview of satellite and fiber optics communication.

**Credits Earned:** 04 Credits

**Course Outcomes:** After completion of this course, student will be able to:

1. To understand basics of electronic communication.
2. To discuss the role of modulation and multiplexing in facilitating signal transmission
3. To identify different role of radio receiver circuit and role of AGC.
4. To understand basics of satellite and able to understand various application of satellite.
5. To apply fundamental principles of optics and light wave to understand optical fiber communication systems.

**Pre-requisite of course:** Basic electronics, Digital Electronics, Basic Mathematics

**Teaching and Examination Scheme:**

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial / Practical Marks		Total Marks
				E	I		V	T	
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term Work	
3	0	2	4	50	30	20	25	25	150



**Contents:**

Unit	Topics	Contact Hours
1	<b>Introduction to Electronic Communication</b> Significance of Human Communication, Communication systems, Types of electronic Communication, Modulation and Multiplexing, The electromagnetic Spectrum, A survey of Communication Applications.	04
2	<b>Introduction to Data Communication</b> Data Communication, Networks, The internet, Protocols and Standards.	02
3	<b>Data and Signals</b> Analog and Digital, Periodic analog signals, Digital Signals, Transmission Impairment, Data rate limits, Performance.	04
4	<b>Digital and Analog Transmission</b> Digital to Digital conversion, Analog to Digital conversion, Transmission modes, Digital to Analog conversion, Analog to Analog conversion.	04
5	<b>Multiplexing and Spreading</b> Frequency division multiplexing, Wavelength division multiplexing, Time division multiplexing Spread Spectrum.	04
6	<b>Radio Receiver</b> Tuned circuit, Filters, Classification of Noise, Functions of radio receivers, Types of Receiver, working of super heterodyne radio receivers, tuning ranges, tracking, sensitivity and gain, image rejection, spurious responses, Adjacent channel selectivity, Automatic gain control, Automatic Frequency control.	07
7	<b>Transmission Media</b> Guided media- Twisted Pair Cable, Co-axial cable, Fiber optic cable, Unguided media- Radio waves, Microwaves, Infrared	03
8	<b>Switching Network</b> Circuit switched network, Datagram networks, Virtual circuit networks.	03
9	<b>Introduction to telecommunication system</b> Telephone network, Dial-up modems, Digital subscriber line, Cable TV networks.	03
10	<b>Introduction to satellite communication system</b> Satellite orbits, Three categories of satellite, Satellite communication systems, Satellite application, Global Positioning System(GPS).	05
11	<b>Introduction to Optical Communication</b> Optical Principles, Optical Communication systems, Advantages and application of optical fibre.	03
<b>Total Hours</b>		42



**Suggested Text books / Reference books:**

1. Principles of Electronic Communication Systems by Louis E. Frenzel (3rd Edition), Tata-McGraw Hill.
2. Data Communication and Networking by Behrouz A Forouzan ( 4th Edition), Tata-McGraw Hill.
3. Introduction to Data and Network Communications by Michael A. Miller, Cengage Learning.
4. Satellite Communication, by Dennis Roddy, TataMcGraw Hill.
5. Optical Fiber Communication by John M. Senior (PHI/Pearson)

**Suggested Theory distribution:**

The suggested theory distribution as per Bloom’s taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process.

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
15%	30%	25%	20%	5%	5%

**Suggested List of Experiments:**

1. To obtain Frequency response of Series tuned circuit.
2. To obtain Frequency response of Parallel tuned circuit.
3. To find Frequency response of High pass filter.
4. To find Frequency response of Low pass filter.
5. To find Frequency response of Band passes filter.
6. To find Frequency response of Band stop filter.
7. To observe voice and Data communication using satellite communication.
8. To setting up analog and digital link using fiber optic trainer.
9. To perform AM reception using superhetrodyne receiver.
10. To build and test FM receiver.
11. Fourier analysis of Sinusoidal, Square and Triangular wave.
12. To perform various line codes for a given digital bit stream.
13. To observe the structure of various wired medium and give comparative analysis for the same.
14. To perform TDM of analog signals.

**Supplementary Resources:**

1. [www. mhhe.com/frenzel/ecs3e](http://www.mhhe.com/frenzel/ecs3e)
2. NPTEL Videos.
3. MIT open course ware website