

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. SEMESTER: V

Electronics Engineering/Electronics & Communication
Engineering/Electronics & Telecommunication

Subject Name: **Electronic Communication**

Subject Code: **151004**

Teaching Scheme				Evaluation Scheme		
Theory	Tutorial	Practical	Total	University Exam (Theory) (E)	Mid Sem Exam (Theory) (M)	Practical (I)
4	0	2	6	70	30	50

Sr. No	Course Content
1.	Communication Introduction Communication system, Analog and digital Messages, Channel effect, Modulation and detection, Historical review of telecommunication.
2.	Passive Circuits : Series tuned circuit, Parallel tuned circuit, Self-capacitance of a coil, Skin effect, Mutual inductance, High frequency transformers, Tapped inductor, Capacitive tap, Low-frequency transformers
3.	Noise : Noise (Thermal noise, Shot noise, Partition noise, Low frequency or flicker noise, Burst noise, Avalanche noise, Bipolar transistor noise, Field-effect transistor noise, Equivalent input noise generators and comparison of BJTs and FETs, Signal – to – noise ratio, S/N Ratio of a tandem connection, Noise factor, Amplifier input noise in terms of F, Noise factor of amplifiers in cascade, Noise factor of a lossy network, Noise temperature, Measurement of noise temperature and noise factor, Narrowband band-pass noise.
4.	Receivers : Superheterodyne receivers, Tuning range, Tracking, Sensitivity and gain, Image rejection, Spurious responses, Adjacent channel selectivity, AGC, Double conversion, Electronically Tuned Receivers(ETRs), Integrated-Circuit Receivers.
5.	Analysis and Transmission of Signals: A periodic signal representation by fourier integral, Transform of some useful function, Some properties of the fourier transform, Signal transmission through a linear system, Ideal and practical filters, Signal distortion over a communication channel, Signal energy and energy spectral density, Signal power and power spectral density.
6.	Amplitude Modulation and Demodulation: Baseband versus carrier communications, Double-Sideband amplitude modulation, Amplitude modulation, Bandwidth-efficient amplitude modulation, Amplitude modulations: Vestigial sideband, Local carrier synchronisation, Frequency division multiplexing, Phase-locked loop with applications, Frequency synthesizers.

7.	Angle Modulation and Demodulation: Nonlinear modulation, Bandwidth of Angle-Modulated waves, Generating FM waves, Demodulation of FM signals, Effect of non linear distortion and interference, Superheterodyne analog AM/FM receivers, FM Broadcasting System.
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List of Experiments:

List of experiments with emphasis on test kits and breadboard implementation for the following communication circuits.

1. To generate amplitude modulation (AM) waveform and to measure modulation index of AM wave using waveform method and trapezoidal method.
2. To observe frequency modulated waveform and to measure peak frequency deviation for 2V peak to peak modulating signal.
3. To extract information signal from the AM wave using diode detector.
4. To extract information signal from the FM wave using FM detector.
5. To obtain frequency response of pre-emphasis and de-emphasis circuits.
6. To generate SSB signal using balance modulator and single sideband filter.
7. To demodulate SSB signal.
8. To obtain frequency response of RF amplifier.
9. To obtain frequency response of RF amplifier of AM receiver.
10. To understand block diagram of super-heterodyne AM and FM receiver.
11. To understand working of AGC circuit.
12. To obtain fidelity of the AM and FM receiver.
13. To design implement and obtain the frequency response of single tuned amplifier.

Mini Project:

To construct FM transmitter and receiver.

Note: Visit to nearest Radio Station.

Reference Books:

1. Electronic Communications by Dennis Roddy & John Coolen IV Edition PHI.
2. Digital and analog communication system by B.P.Lathi .Zhi Ding (international 4th Edition), OXFORD university press.
3. Electronic Communications by Kennedy McGraw Hill Publication.
4. Electronic Communications Systems by Wayne Tomasi. Pearson education India.
5. Electronic Communication Systems by Roy Blake By Cengage learning.
6. Communication Systems By Simon Haykins By Wiley India.
7. Theory and Problem Of Electronic Communication By Lloyd Temes and Mitchel E.Schulz(Second edition), McGraw Hill Publication.