

Subject Code:1SC2050405

Subject Title: Signal Processing and Satellite Communication

COURSE OBJECTIVE:

Physics is a science to understand the nature. This course is designed to get basic understanding of the physical world.

LEARNING OUTCOMES:

- To get basic concepts of Signal Processing and Satellite Communication.

Teaching scheme (hours) per week		Credit		University Examination		Internal Examination		Total
Theory	Practical	Theory	Practical	University Assessment	Practical	Internal Assessment	Practical	
4	--	4	--	60	--	40	--	100

Unit	Content	Lectures	Weight (%)
1	Introduction to Communication Systems and Analog Modulation: Nature of communication systems, Signals in time and frequency-domains, Need for modulation, Frequency-translation using non-linear impedance - Frequency multiplication, mixing and frequency suppression, Noise sources: external noise-atmospheric noise, extraterrestrial noise, industrial noise, internal noise-thermal agitation noise, shot noise, transit time noise, miscellaneous noise. Characterizing parameters- signal to noise ratio, noise figure .Analog modulation: Amplitude, Frequency and Phase modulations, Spectra, , Single Side Band amplitude modulation.	15	25
2	Analog Modulation, Demodulation and receivers : Principles of generating and demodulating AM – Plate and Grid modulated Class C-Amplifier,SSB – The Filter, Phase Shift & The Third Methods, and FM signals – Direct Method, Varactordiode modulator. Signal Conditioning and Recovery. Tuned radio frequency and Superhetrodyne receiver, Choice of IF and image rejection, Automatic gain and frequency controls, Generation of composite video signals, TV transmitter and receiver..	15	25
3	Digital, Microwave and Optical Communication Techniques: Pulse Amplitude Modulation and sampling theorem, Pulse Code Modulation, Effects of noise and companding, Data communication systems - transmission speeds and bandwidths, Synchronisation, modems. Digital modulation and demodulation: Frequency shift keying, Phase shift keying. Microwave repeaters, Geostationary satellites, Transponder and earth stations, Principles of multiple access systems- Frequency Division Multiplexing, Time Division Multiplexing. Optical fibers, Single and multimode, Advantages, Optical fiber communication link	15	25
4	Principles of Mobile Application: Wireless mobile communication, Transceiver, Cellular telephones-principle of operation, idea about cell structure, Principle and operation of International Mobile Equipment Identity(IMEI)number and its importance, Global System for Mobile communication(GSM)- Definition, frequency range, Advantages, limitations, Operation of Code Division Multiple Access (CDMA), advantages, limitations, comparison between GSM and CDMA ,	15	25

Basic Reference book:

1. Electronic Communication, D. Roody and J. Coolen Prentice Hall.
2. Electronic Communication Systems, G. Kennedy, Mc-Graw Hill.
3. Electronic Communication Systems, F. R. Dungan, Delmar Publishers Inc.
4. Microwave Principles, H. J. Reich, J. G. Skalnik, P. F. Ordung and H. L. Krauss, East-West Press
5. Modern Microwave Technology, V. F. Velley, Prentice Hall.