

**JYOTI NIVAS COLLEGE AUTONOMOUS
SYLLABUS FOR 2018 BATCH AND THEREAFTER**

Programme: B.Sc.

Semester: VI

**ELECTRONICS PAPER VII
ADVANCED COMMUNICATION**

Course Code: 18VIEL7

No. of Hours: 45

COURSE OBJECTIVES:

- To understand Digital Communication Systems and digital modulation techniques.
- To get familiarized with Satellite Communication concepts.
- To understand Satellite multiple access techniques – TDMA, FDMA, CDMA.
- To understand the principle of fiber optical communication system.
- To study the applications and losses in fiber optic communication system.
- Basics of digital cellular system, cell structure, CDMA technology.
- Basics of RFID and NFC need of secured network, standards and application.

LEARNING OUTCOMES

- Familiarize with the advantages of digital communication
- Formalize with recent advantages in Electronic communication with satellite, fibre optics and cellular network
- Comprehend the working of wireless LAN and Bluetooth

UNIT I

DIGITAL COMMUNICATION SYSTEMS

10 HRS

Introduction-Advantages and Disadvantages-Information Capacity-Bits-Bit Rate, baud Rate and M-ary Encoding-Sampling Theorem- Shannon limit for information capacity-PM-PWM, PAM, PCM-PCM Sampling- ASK, FSK and Quadrature Amplitude Modulation.

UNIT II

SATELLITE COMMUNICATION

10 HRS

Introduction, need, geosynchronous satellite orbits, advantages and disadvantages of geostationary satellites. Satellite visibility, transponders (C – Band), path loss, ground station, simplified Block diagram of earth station, up link, down link. Satellite access – TDMA, FDMA, CDMA concepts, comparison of TDMA and FDMA. GPS navigation system (qualitative idea only)

UNIT III

OPTICAL FIBER COMMUNICATION

10 HRS

Introduction – need for OBC. Block diagram of OFC system. Fiber optic cables, light propagation through fiber – step index fiber, graded index fiber, Snell’s Law, numerical aperture (derivation), numerical. Types of optical fiber cables, light sources – requirements, LEDs and semiconductor Laser diodes. Photo detectors – PIN and avalanche photodiodes. Losses in optical fibers – Rayleigh Scattering, absorption, leaky modes, bending, joint junction Losses. Advantages and disadvantages of OFC over metallic cables.

UNIT IV

CELLULAR COMMUNICATION

10 HRS

Concept of cellular mobile communication – cell and cell splitting, frequency bands used in cellular communication, absolute RF channel numbers (ARFCN), frequency reuse, roaming and hand off, authentication of the SIM card of the subscribers, IMEI number, concept of data encryption, architecture (block diagram) of cellular mobile communication network, CDMA technology, CDMA overview, simplified block diagram of cellular phone handset, comparative study of GSM and CDMA, 3G and 4G concepts.

UNIT V

RFID NETWORK SECURITY

05 HRS

RFID (Radio Frequency Identification Device) –Introduction, principle, requirement of networks in data protection, NFC (Near field Communication) –principle, standards and application.

LIST OF EXPERIMENTS (Any 8 Experiments to be performed.)

1. Amplitude shift keying
2. Frequency shift keying
3. Pulse width modulation
4. PAM modulator and demodulator
5. Band elimination Filter
6. Numerical aperture of a given fiber.
7. Losses in fiber.
8. Setting up of analog link and digital link
9. DC characteristics of LED
10. TDM with fiber communication system

TEXT BOOKS

1. Electronic Communication, Dennis Roddy & John Coolen –IV edition-PHI, 2002
2. Electronic Communication systems, Kennedy & Davis IV the edition _TATA McGraw Hill, 2005
3. Advanced Electronic Communication System, Wayne Tomasi, PHI, VI Edition, 2005.

REFERENCE BOOKS:

1. Electronic Communication systems, Wayne Tomasi–Pearson education, Vth edition 2005.
2. Electronic devices and circuit theory, Robert Boylestad and Louis Nashelsky, PHI, 6th Edition, 2002
3. Satellite communication-Agarwal-Khanna publishers, New Delhi, 2000.
4. Communication Electronics, Frenzel, TMH, 3rd Edition, 1999.
5. Handbook of experiments in electronics and communication-Poorna Chandra Rao & Sasikala, VIKAS Publishing House, 2004
6. Basic Electronics, A text lab manual,-Paul B.Zbar, Albert P.Malvino & Michael A.Miller-Tata McGraw Hill, 1997.