

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

Programme: B.Sc.

Semester: V

**ELECTRONICS PAPER V
COMMUNICATION**

Course Code: 18VEL5

No. of Hours: 45

COURSE OBJECTIVES:

- To understand the Propagation of EM waves, to understand the parameters of Antenna & Transmission Lines.
- To study modulation and demodulation techniques.
- To get familiarize with the TV Technology.
- To get familiarize with Radar Systems.
- To understand working of Transmitters and Receivers.

LEARNING OUTCOMES

- Analyse analog modulation and Demodulation
- Compute the power required for AM / FM transmission
- Understand the working of AM / FM transmission / receivers
- Have the basic understanding of noise, transmission lines and antenna
- Understand the basic working of Television receivers

UNIT I

INTRODUCTION TO COMMUNICATION

10 HRS

Electromagnetic Spectrum-Terrestrial Propagation of EM Waves-Surface Waves-Space Waves and Sky Wave Propagation. Numerical.

Transmission Lines-Types-Equivalent Circuit of Transmission Line-Primary and Secondary Constants. (only Quantitative).

Antenna Radiation Mechanism-Antenna Parameters- Directive gain, Radiation resistance, Efficiency, Bandwidth, Beam width. Yagi-Uda Antenna- construction. Brief about antennas-horn and dish. Numerical.

Types of Noise (Examples for Internal and External Noise) - Signal to Noise Ratio- Noise Figure. Numerical.

UNIT II

ANALOG MODULATION TECHNIQUES

12 HRS

Introduction -Modulation- Need for Modulation-Types of Modulation-AM, FM, PM. Amplitude Modulation-Representation-Modulation Index-Expression for instantaneous voltage-Frequency Spectrum-Power Relations-Generation of AM-Collector Modulator.

Frequency Modulation- representation- Expression for instantaneous Voltage-Modulation Index-Frequency Spectrum(Qualitative)- Bandwidth requirements- FM generation-FET Reactance Modulator and varactor Diode Modulator. Comparison of AM and FM.

UNIT III

TELEVISION

07 HRS

Introduction, scanning, interlaced scanning, T.V. camera tube (vidicon), composite video signal – blanking and synchronizing pulses, vestigial side band transmission, TV systems and standards – comparison between American and European systems. Block diagrams of monochrome TV transmitter and receiver. basic principles of colour TV, primary and secondary colours, colour combinations, chromo and luminance processing as per PAL system. Colour TV receiver (PAL). Concept of CCTV, HDTV, Picture in Picture, Picture phones, TV games, numerical examples wherever applicable.

UNIT IV

RADAR SYSTEMS

06 HRS

RADAR – Principles, frequencies and power used in RADAR, maximum Unambiguous range, detailed block diagram of pulsed RADAR system, RADAR range equation-derivation, factors influencing maximum range, effect of ground on RADAR antenna characteristics.

UNIT V

TRANSMITTERS AND RECEIVERS

10 HRS

Block diagram of AM transmitter-AF and RF section –Function of Different stages. Block Diagram of FM Transmitter- Functions of Different Stages- Pre Emphasis and De Emphasis. Characteristics of Radio Receiver-AM Super Hetrodyne Receiver-Diode And Transistor Detectors-Principle Of AGC-Choice of IF-Image Frequency And Rejection. FM Superhetrodyne Receiver-FM Detectors-Balanced Slope Detectors.

TEXT BOOKS

1. Electronic Communication Systems, Kennedy & Davis – IV th Edition-TMH-1999.
2. Electronic Communication Systems-Wayne Tomasi- Vth Edition- Pearson Education-2006
3. Monochrome and colour television, R.R.Gulati, New Age International copyright ©2005.
4. Introduction to RADAR systems – Skolnik- McGraw Hill. Edition 2001.

REFERENCE BOOKS

1. Television Engineering- A.M. Dhake-Tata Mc Graw Hill,2E-Sixteenth Reprint 2006
2. Electronic Communications, Dennis Roddy & John Coolen- IV th Edition-PHI-1997.
3. Advanced Electronic Communication Systems, Wayne Tomasi-VI th Edition-Pearson Education. 2005.
4. Hand book of experiments in Electronics and communication-Poornachandra Rao and Sasikala- Vikas publication , 2004.

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

1. Amplitude modulation and demodulation
2. Frequency modulation
3. Pre- Emphasis and de emphasis
4. Saw tooth wave generator using IC555
5. Schmitt Trigger using IC555

6. Audio cross over network
7. Frequency Mixer
8. Frequency multiplier using transistors
9. Automatic gain control(AGC)