

# AMEE26 ANTENNA AND WAVE PROPAGATION

## UNIT-1 ANTENNA PRINCIPLES

- 1.1 Potential functions & Electromagnetic field,
- 1.2 Current Elements, Radiation from Monopole & Half Wave Dipole,
- 1.3 Power radiated by current element, radiation resistance.
- 1.4 Network Theorems Directional Properties of Dipole Antenna.
- 1.5 Antenna Gain, Effective Area, Antenna Terminal impedance,
- 1.6 Practical Antennas and Methods of Excitation,
- 1.7 Antenna Temperature and Signal. To Noise Ratio.

## UNIT-2 ANTENNA ARRAYS

- 2.1 Two Element Array,
- 2.2 Horizontal Patterns in Broadcast Arrays, Linear Arrays,
- 2.3 Multiplication of Patterns,
- 2.4 Effect of the earth on vertical patterns, Binomial array.

## UNIT-3 WAVE PROPAGATION

- 3.1 Modes of Propagation, Plane Earth Reflection.
- 3.2 Space wave and Surface Wave,
- 3.3 Reflection and refraction waves by the Ionosphere Tropospheric Wave.
- 3.4 Ionosphere Wave Propagation in the Ionosphere, Virtual Height ,
- 3.5 MUF Critical frequency,
- 3.6 Skip Distance, Duct Propagation, Space wave.

## UNIT-4 PRACTICAL ANTENNAS

- 4.1 VLF and LF transmitting antennas, effect of antenna height,
- 4.2 Field of short dipole, electric field of small loop antenna,
- 4.3 Directivity of circular loop antenna with uniform current,
- 4.4 Directivity of Circular loop antenna with uniform current,
- 4.5 Yagi-Uda array: Square corner yagi-uda hybrid, circular polarization Rhombic Antenna  
Weight and Leg length Parabolic Reflectors Properties,
- 4.6 Comparison with corner reflectors Horn Antenna: Length and Aperture.
- 4.7 Introduction to Turstile Antenna Effect of ground on antenna performance.
- 4.8 Broadband Antenna: Frequency independent concept,
- 4.9 RUMSEY'S Principle, Frequency independent planar log spiral antenna,
- 4.10 Frequency independent conical spiral Antenna.

## Reference Books:

1. Prasad, K.D./ "Antennas and Wave Propagation" /Khanna Publications.
2. Collin, R./ "Antennas and Radio wave Propagation" /Tata McGraw-Hill
3. Hayt Jr. William H./ "Engineering Electromagnetics"/Tata McGraw-Hill.
4. Das, Annapurna & Das, Sisir K. / "Microwave Engineering"/Tata McGraw Hill.