**13EC3104-ANTENNAS AND WAVE PROPAGATION** Credits: 4

Lectures/Week: 4Hrs. Sessional Marks: 40

Univ. Exam.Duration:3Hrs Univ.Exam.Marks:60

**UNIT I**

 **Transmission Lines:** Primary and Secondary Constants of the Line, Transmission Line Equations, Propagation Constant, Characteristic Impedance, Distortionless Line, Input Impedance of Open and Short Circuited Lines, Standing Waves, Reflection Coefficient, Smith Chart, Impedance Matching Using Smith Chart(Single Stub Only)

**Unit II**

 **Radiation Fundamentals:** Definition of antenna, Retarded Potentials, Relation between Potential and Time Varying Fields, Far Field Approximation, Radiation from a current Element, Half Wave Dipole and Monopole Antennas.

**Antenna Parameters:** Radiation Pattern, Radiation Intensity, Directivity, Gain, HPBW, Effective Aperture, Relation between Directivity and Maximum Effective Aperture

**UNIT III**

**Linear Wire Antennas:** Current Distribution on Thin Linear Wire Antennas, Array of Two Point Sources, Principle of Pattern Multiplication, Uniform Linear Arrays: Broad Side and Endfire Array and Binomial Arrays.

**Travelling Wave Antennas:** Long Wire and Rhombic Antennas, Yagi-Uda Antenna, Folded Dipole Antennas (Without Analysis)

**UNIT IV**

**Surface and Space Wave Propagation:** Friis’s Transmission Formulae, Salinet Features of Summerfield Theory, Ground Wave Field Strength Calculation, Antennas located over Flat Earth, Effect of Curvature of Earth, Refraction of Radio Waves in Trophoshere, Effective Radius of Earth, Radio Horizon and Maximum Radio Range.

**UNIT V**

**Sky Wave Propagation:** Structure of Ionosphere, Mechanism of Wave Refraction in Ionosphere, Critical Frequency, MUF, Virtual Height, Skip Distance, Effect of Earth’s Magnetic Field, Faraday Rotation

**TEXT BOOKS:**

1. Antennas by John D Krauss - ISE

2. Antennas and Wave Propagation by K.D.Prasad -Khanna Publication

**REFERENCE:**

1.Tansmission Lines and Networks by Umesh Sinha-Sathya Prakash Publication

2.Electromagnetic Waves and Radiating Systems by Jordan AND Balmain-PHI