**EC-205 Electromagnetic Field Theory and Wave Propagation L T P C**

Fourth Semester ECE 3 1 0 4

Pre-requisite-None

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| S.no. | Topic | lectures | CO | PO |
| 1 | *Fundamental Concepts of static fields*: Physical interpretation of gradient, divergence and curl; | 1,2 | CO1 | PO1 |
| 2 | Coordinate systems; Review of static fields; Current continuity equation; Displacement current; | 3,4,5 | CO1 | PO1 |
| 3 | *Maxwell’s equations and Plane Waves*: Maxwell’s equations in static & time varying fields | 6,7 | CO2 | PO2 |
| 4 | Maxwell’s equation in phasor form Wave equation in an isotropic homogeneous medium and its solution, | 8 to 12 | CO2 | PO2 |
| 5 | polarization of waves, Poynting vector. | 13,14 | CO3 | PO2 |
| 6 | *Reflection of Electromagnetic Waves:* Reflection and refraction of plane waves at plane boundaries, | 15 to 17 | CO3 | PO1, PO2 |
| 7 | Normal incidence, standing waves, laws of reflection, reflection of obliquely incident waves, Brewster’s angle | 18 to 22 | CO4 | PO2 |
| 8 | *Transmission lines:* Circuit model for transmission lines, loss less and lossy lines, field analysis of transmission lines, Smith chart, impedance matching. | 23 to 30 | CO5 | PO3 |
| 9 | *Antenna & Wave Propagation:* Retarded potential, Hertzian dipole, Antenna parameters, Ground Wave Propagation, | 31 to 34 | CO3, CO6 | PO3, PO9 |
| 10 | Space Wave Propagation, Propagation over Plane Earth and spherical earth, Duct Propagation, Troposphere Propagation | 35 to 38 | CO6 | PO9 |

Course outcome of Electromagnetic field and wave propagation are

The Graduates will be able to

CO1: Understand the fundamental knowledge of vector analysis in different coordinate systems  
CO2: Apply Maxwell’s equations.  
CO3: Apply the concept of the wave equation in an isotropic homogeneous medium  
CO4: Analyse the reflection of Electromagnetic Waves and its properties  
CO5: Design the transmission lines and analyze its characteristics  
CO6: Design the various types of Antennas and analyze the wave propagation