

Year & Sem: E2S1	Course Code: EC2101	Course Name: Electromagnetic Engineering	No. of Credits: 4	L 2	T&PS 2	P 0
UNIT-I: Coordinate systems and Transformation: Cartesian Coordinate System, Circular cylindrical coordinates, spherical coordinates Vector Calculus: Differential Length, area, Volume, Line, surface, Volume Integrals, Del Operator, Gradient of a scalar, Divergence of a vector and Divergence theorem, Curl of a vector and Stokes Theorem, Laplacian of a Scalar. UNIT-II: ElectroStatic Fields: Coloumbs law and Field Intensity, Electric Flux Density, Gauss Law, Electric potential, Relationship Between E and V, Energy Density in Electrostatic fields. UNIT-III: Electric Fields in Material Space: Conductors, Polarisation in Dielectrics, Dielectric Constant and Strength, Linear, Isotropic and Homogeneous dielectrics, Continuity equation and relaxation time, Boundary conditions, Poisson's and Laplace equations. UNIT-IV: Magnetostatic fields: Biotsavarts law, Amperes circuit law, Magnetic flux density, Magnetic scalar and Vector potentials, Derivation of Biotsavarts law and Amperes circuit law. Maxwells equations: Faradays law, Displacement current, Maxwells equations in final forms. UNIT-V: Electromagnetic Wave propagation: Waves in general, Wave propagation in Lossy Dielectrics, Plane waves in Lossy dielectrics, Plane waves in Free space, Plane waves in good conductors, Power and Poynting vector, Reflection of a plane wave at Normal incidence. Reflection of a plane wave at Oblique incidence. UNIT-VI: Transmission Lines: Transmission Line parameters, Transmitter line equations, Input Impedance, SWR and Power. References/Text Books: 1. Mathew N.O Sadiku, "Elements of Electromagnetics", Oxford University press, 6th edition, 2014 2. William H. Hayt, John A. Buck, "Engineering Electromagnetics", McGraw Hill 6th edition., 2001 1. Edward C. Jordan, Keith G. Balmain, "Electromagnetic waves and radiating systems", PHI learning private limited, 2nd edition., 1968 2. Nannapaneni Narayana Rao, "Elements of Engineering Electromagnetics", Illinois ECE series, 6th edition, 2006 Lecture Plan: Unit-I & -II syllabus for MID-I, Unit-III & -IV syllabus for MID-II and Unit-V & -VI syllabus for MID-III examinations. Video Lectures (Web Links): 1. http://nptel.ac.in/courses/115101005/ 2. http://nptel.ac.in/courses/108104087/ 3. http://nptel.ac.in/courses/117102061/						