18CE745 ADVANCED ELECTROMAGNETICS 3-0-1-4

Objectives

Applications of Electromagnetic Fields has caused great impact in various fields such as medical, communications, integrated circuits and space technology. This course is intended for post graduate students as well as doctoral students specializing in the above areas.

Keywords:

Maxwell's equations, Plane waves, Transmission Lines, Antennas, Compuational Electromagnetics

Contents:

Maxwell's Equations-Electromagnetic Boundary Conditions-Wave Equations and their Solutions --Plane Waves in Lossless and Lossy Media-Group Velocity-Poynting Vector- Normal and Oblique Incidence of Plane Waves at Plane Conducting and Dielectric Boundary-Normal Incidence of Plane Waves at Multiple Dielectric Interfaces--Transmission Lines-General Transmission Line Equations with load-Wave Characteristics-Transients on Transmission Lines-Smith Chart -Transmission-Line Impedance Matching--Wave guides-Parallel-Plate Waveguide -Rectangular Waveguides-Circular Waveguides-Dielectric Waveguides-Cavity Resonators--Antennas-Elemental Dipoles-Antenna Specifications-Antenna Arrays--Introduction to Computational Electromagnetics-Finite Element Method-Method of Moments-Finite Difference Time Domain Method.

Outcomes:

- Theory of Electromagnetic Fields, wave propogation and interaction of electromagnetic wave propagation with different media.
- Introduction to numerical metods to solve maxwells equations subjected to boundary conditions.

TEXT BOOKS / REFERENCES:

1. Cheng, D K, *Field and Wave Electromagnetics*, Pearson education Inc, Second edition, 2008

2. Pozar D M, *Microwave Engineering*, John Wiley & sons Pvt Ltd, Third Edition, 2007

3. X.-Q. Sheng and W. Song, *Essentials of Computational Electromagnetics*. Wiley, 2012.