E C E 320, Electrodynamics II

1. Credits : 3  Contact Hours : 4.0

a. Other Supplemental Materials : None

• Specific Course Information :

a. Brief description of the content of the course (Course Catalog Description) : Static and dynamic electromagnetic fields; forces and work in electromechanical systems; magnetic circuits; plane wave propagation; reflection of plane waves; generalized transmission line equations; current and voltage on transmission lines; impedance transformation and matching; Smith charts.

b. Pre-requisites or Co-requisites : ECE 220; Math 319 or 320 or concurrent registration, or consent of instructor

c. EE-required, CMPE-selected elective

• Specific Goals for the Course :

a. Course Outcomes :

1. Ability to carry out design-related analysis of a electromagnetic systems and device;
2. Development of skills in technical quantitative engineering analysis for systems containing components whose behavior is governed by electrodynamics; e.g. transmission lines, antennas, waveguides, etc.
3. Impart knowledge of fabrication, assembly, and cost of manufacture issues for systems containing components whose behavior is governed by electrodynamics
• ABET Student Learning Outcomes :

(a) Ability to apply mathematics, science and engineering principles.
(d) Ability to function on multidisciplinary teams.
(k) Ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

• Brief List of Topics to be Covered :

1. Review
2. Faraday's Law and induced emf
3. Transformers
4. Displacement Current
5. Time-dependent Maxwell's equations and electromagnetic wave equations, phase velocity
6. Time-harmonic wave problems, plane waves in lossless media, Poynting's vector and theorem
7. Plane waves in lossy media
8. Group velocity and dispersion
9. Incidence of plane waves on interfaces between dissimilar media
10. Transmission Lines with emphasis on transients and pulses