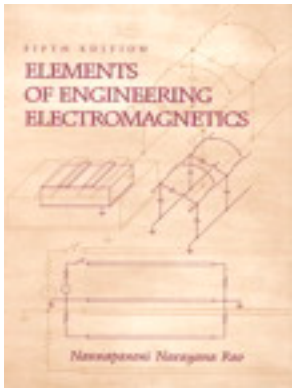
Elements of Engineering Electromagnetics, 5/e

Nannapaneni Narayana Rao, University of Illinois at Urbana-Champaign

Copyright 2000, 788 pp.
Cloth format
ISBN 0-13-013201-2



Summary

For one/two-semester, junior/senior-level courses in Electromagnetics, Transmission Lines and Waveguides, and Electromagnetic Fields and Waves, in the departments of Electrical and Computer Engineering. First course in introductory electromagnetics required for electrical engineering and computer engineering students.

Successful text with a versatile approach including thorough coverage of statics with an emphasis on the dynamics of engineering electromagnetics. It integrates practical applications, numerical details, and the thorough coverage of principles.

top

Features

- NEW **Two-part coverage: Fundamental Elements, and Applied Elements** Associates the chapters on Applied Elements with major technologies based on Maxwell's equations.
  - Serves the needs of twenty-first century electromagnetics education, with *Chapters 1-6* comprehensive for a

one-semester introductory course and *Chapters 7-12* accessible for follow-up on elective courses for electrical engineering majors.

- NEW **Material on Crosstalk on Transmission Lines; Pulse Broadening in Dispersive Medium; and Finite-Difference Time-Domain Method.**
    - Topics previously covered in higher level courses, now becoming increasingly important to be taught in beginning courses, because of advances in technology.
- NEW **Review problems** Follow homework problems in each chapter.
    - Serve as review of material covered in a chapter by integrating concepts introduced in more than one section of the chapter.
- **Uniform plane waves** Presents topic immediately following Maxwell's equations chapters, which are introduced collectively, in integral form and then in differential form.
    - Allows material on uniform plane waves to be taught earlier in the course.
- **Comprehensive coverage of field and line topics** Begins with p-n junction and circuit elements, progresses through transmission-line time-domain analysis, leading to interconnections between logic gates, and culminating in crosstalk on transmission lines.
    - This material is essential to computer engineering students, some of which is generally not covered by the traditional approach.
- **Coverage of principles of guided waves developed in one chapter** For both electronics and optoelectronics.
    - Confines the treatment to one-dimensional wave guides comprising parallel-plate metallic waveguides followed by dielectric slab waveguides.
- **Devotes a full chapter to pertinent topics of electronics and photonics** Ch. 10 including two-dimensional metallic waveguides and optical fibers; interference and diffraction; and wave propagation in an anisotropic medium.
    - Introduces students to an advanced selection of topics so that they can choose among them for the elective courses.
- **Focus on numerical methods** Comprising the finite-difference method; method of moments; finite-element method; and finite-difference time-domain method.
    - Provides students with all numerical methods pertinent to undergraduate electromagnetics in one chapter.
- **Dynamic field approach** Builds basic material upon time varying fields while retaining important topics of static fields.
    - Allows students to grasp many field concepts and mathematical techniques.
- **Sinusoidal steady-state analysis of transmission lines.**
    - Familiarizes students with graphical and computer solutions.
- **Radiation introduction followed by basic concepts of antennas.**

- Demonstrates for students the complete field solution to the Hertzian dipole field through the magnetic vector potential.

- **Solid pedagogy** 105 worked examples, 162 drill problems with answers, marginal notes, chapter summaries, and review questions.
  - Enables students to extend and test their knowledge of concepts and chapters throughout the text before moving on.
- **Practical application discussions and experiment demonstrations.**
  - Encourages student interest in field concepts and phenomena, interspersed among presentation of subject mater.

Table of Contents

top

Instructor Supplements

Solutions Manual (ISBN: 0130136190)