

Sanjeev Gupta Electromagnetic Field Theory

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MARKS MOORE

Electromagnetic Fields Technical Publications

The book *Electromagnetic Field Theory* caters to the students of BE/BTech Electronics and Communication Engineering, Electrical and Electronics Engineering, and Electronic Instrumentation Engineering, as electromagnetics is an integral part of their curricula. It covers a wide range of topics that deal with various physical and mathematical concepts, including vector functions, coordinate systems, integration and differentiation, complex numbers, and phasors. The book helps in understanding the electric and magnetic fields on different charge and current distributions, such as line, surface, and volume. It also explains the electromagnetic behaviour of waves, fields in transmission lines, and radiation in antennas. A number of electromagnetic applications are also included to develop the interest of students.

SALIENT FEATURES

- Simple and easy-to-follow text
- Complete coverage of the subject as per the syllabi of most universities
- Lucid, well-explained concepts with clear examples
- Relevant illustrations for better understanding and retention
- Some of the illustrations provide three-dimensional view for in-depth knowledge
- Numerous mathematical examples for full clarity of concepts
- Chapter objectives at the beginning of each chapter for its overview
- Chapter-end summary and exercises for quick review and to test your knowledge

Electromagnetic Field Theory Oxford University Press

Principles of Electromagnetic Theory is an essential component of the physics curriculum and this comprehensive textbook introduces undergraduate students to the basic principles of electromagnetic theory. Although several excellent textbooks on electromagnetic theory are available, the author has tried to make this book lucid for better comprehension. The contents have been arranged in a systematic manner, covering all the major topics of electromagnetic theory, viz, propagation of electromagnetic waves through isotropic and anisotropic medium, their reflection and transmission at an interface, transmission lines and waveguides. Wherever necessary, a brief recapitulation of the fundamental knowledge has been provided. Each chapter has a collection of worked out numerical and objective questions. This book is a complete package in itself as it sufficiently covers the syllabus of various institutions which offer a course on electromagnetic theory. It also prepares the student for various competitive exams by providing a conceptual insight into the topics covered.

Electromagnetic Field Theory Dr. Yosry Moustafa

This is a first year graduate text on electromagnetic field theory emphasizing mathematical approaches, problem solving and physical interpretation. Examples deal with guidance, propagation, radiation and scattering of electromagnetic waves, metallic and dielectric wave guides, resonators, antennas and radiating structures, Cerenkov radiation, moving media, plasmas, crystals, integrated optics, lasers and fibers, remote sensing,

geophysical probing, dipole antennas and stratified media.

Electro Magnetic Field Theory Cambridge University Press

Although the fundamental concepts of Maxwell remain for the most part unchanged since their inception, electromagnetic theory has continued to evolve, extending, most significantly, to shorter and shorter wavelengths. This has revealed many of nature's mysteries. And led to a myriad of applications that have literally changed our world. The second edition of *Electromagnetic Theory and Wave Propagation* begins by presenting the basic concepts of electromagnetic theory, then explores the field's extended areas primarily discovered after World War II. The author elaborates on the work of pioneer investigators, particularly with respect to the identity of light and electromagnetic waves and then derives the fundamental laws of optics from electromagnetic considerations. He has also added several new topics including meteor astronomy, remote sensing and, most notably, discussions on relativistic electrodynamics.

Elements Of Electromagnetic Fields CRC Press

The study of electromagnetic field theory is required for proper understanding of every device wherein electricity is used for operation. The proposed textbook on electromagnetic fields covers all the generic and unconventional topics including electrostatic boundary value problems involving two- and three-dimensional Laplacian fields and one- and two- dimensional Poissonion fields, magnetostatic boundary value problems, eddy currents, and electromagnetic compatibility. The subject matter is supported by practical applications, illustrations to supplement the theory, solved numerical problems, solutions manual and Powerpoint slides including appendices and mathematical relations. Aimed at undergraduate, senior undergraduate students of electrical and electronics engineering, it: Presents fundamental concepts of electromagnetic fields in a simplified manner Covers one two- and three-dimensional electrostatic boundary value problems involving Laplacian fields and Poissonion fields Includes exclusive chapters on eddy currents and electromagnetic compatibility Discusses important aspects of magneto static boundary value problems Explores all the basic vector algebra and vector calculus along with couple of two- and three-dimensional problems

Field Theory of Guided Waves Krishna Prakashan Media

This book covers a wide range of topics on the interaction of alternating magnetic field with condensed matter, including superradiant process, proton echo, gamma resonance, scattering of light by condensed matter near critical points, electromagnetically induced phase transitions and some mathematical problems describing the phenomena mentioned. Contents: Algebraic Methods in the Theory of the Interaction of Radiation with Matter (V P Karassiov et al.) Functional Methods in Quantum Optics (V N Popov & V S Yarunin) Theory of Collective Raman Scattering in Intense Laser Field (A S Shumovsky & T Quang) Polarization Echo Spectroscopy (I V Yevseyev & V M Yermachenko) Short-wave Stimulated Coherent Emission (V I Yukalov) Optical Superradiance in Mixed Molecular Crystals (P V Zinoviev et al.) and other papers Readership: Condensed matter

physicists. Keywords: Electromagnetic Field; Superradiant Process; Proton Echo; Gamma Resonance; Quantum Optics; Raman Scattering; Optical Superradiance

Essays on the Formal Aspects of Electromagnetic Theory Wiley-Interscience

Including examples and problems throughout and background revision material where appropriate, this book introduces undergraduate students to the basic concepts of electrostatic and magnetostatic fields. It also covers Maxwell's equations, propagation, transmission and radiation, and includes chapters on the Finite Element and Finite Difference method. A CD containing many MathCad examples is included with the book, and a comprehensive solutions set is also available. First Edition published by Brooks/Cole Publishing Co. (1997): 0-534-95504-5

The Spatial Structure of Electromagnetic Fields Brooks/Cole

The book deals with formal aspects of electromagnetic theory from the classical, the semiclassical and the quantum viewpoints in essays written by internationally distinguished scholars from several countries. The fundamental basis of electromagnetic theory is examined in order to elucidate Maxwell's equations, identify problematic aspects as well as outstanding problems, suggest ways and means of overcoming the obstacles, and review existing literature. This book will be especially valuable for those who wish to go in depth, rather than simply use Maxwell's equations for the solution of engineering problems. Graduate students will find it rich in dissertation topics, and advanced researchers will relish the controversial and detailed arguments and models.

Concepts of Electromagnetic Theory Artech House Publishers

Guru and Hiziroglu have produced an accessible and user-friendly text on electromagnetics that will appeal to both students and professors teaching this course. This lively book includes many worked examples and problems in every chapter, as well as chapter summaries and background revision material where appropriate. The book introduces undergraduate students to the basic concepts of electrostatic and magnetostatic fields, before moving on to cover Maxwell's equations, propagation, transmission and radiation. Chapters on the Finite Element and Finite Difference method, and a detailed appendix on the Smith chart are additional enhancements.

Electromagnetic Wave Theory Springer Science & Business Media

Only 30% Of This Book Deals With Theory, The Rest Of It Is Application Of This Theory To Various Situations Of Different Levels Of Complexity. In Each Case The Reason For The Choice Of The Method Is Explained, And Various Doubts Which Assail The Minds Of Most Students Have Been Tackled. The Solved Examples In The Book Do Not Deal With Mere Substitution Of Numerical Values Of Formulae. They Are Aimed At Establishing A Strong Foundation Of Knowledge. All The Required Mathematics Has Been Explained In The First Chapter To Avoid The Need To Refer Frequently To Other Books In Mathematics. At The End Of Each Chapter A Summary Of The Achievements Is Given Along With Comments On The Nature Of Difficulties Encountered, And The Reader Is Thereafter Prepared For The Objectives To Be Attained In The Following Chapter. The Emphasis Throughout The Book Is On A Physical Understanding Of Fields And Waves And Their Characteristics, Rather Than Getting Lost In A Maze Of Mathematical Manipulations. This Is An Introductory Textbook Intended To Give The Reader A Solid Grounding In The Subject And To Prepare Him To Deal With More Advanced Texts. The Material Has Been Tested In One-Semester Courses Given By The Author In Various Colleges In Pune.

Electromagnetic Field Theory and Transmission Lines World Scientific

This book presents a new, student-oriented perspective on the study of electromagnetic fields. It has been built from the ground up using: clear explanations of basic concepts (with coverage of vector analysis as needed), numerous exercises, worked examples, review questions, and chapter-ending summaries (with equations) that effectively bridge the gap between formal theories and their practical applications. The result is a uniquely student-oriented text that builds student's problem-solving skills and an intuitive understanding of the subject. The book begins (in Chapter 1-6) with an introduction to static fields, such as electrostatic fields, magnetostatic fields, and fields produced by steady currents. The book presents developments of Maxwell's equations in both the time and phasor (frequency) domains in Chapter 7, and then deals with the propagation, transmission, and radiation of electromagnetic fields in a medium under various constraints.

Electromagnetic Field Theories for Engineering World Scientific

Electromagnetic Field Theory and Transmission Lines is an ideal textbook for a single semester, first course on Electromagnetic Field Theory (EMFT) at the undergraduate level. This book uses plain and simple English, diagrammatic representations and real life examples to explain the fundamental concepts, notations, representation and principles that govern the field of EMFT. The chapters cover every aspect of EMFT from electrostatics to advanced topics dealing with Electromagnetic Interference (EMI)/Electromagnetic Compatibility (EMC), EMC standards and design methods for EMC. Careful and deta.

Fundamentals of Electromagnetic Field Theory Alpha Science International, Limited

Review of Electrostatic and Magnetostatics. Time Varying Fields Maxwell's equations in differential and integral forms concept of displacement current. Boundary conditions. Electromagnetic Waves Wave equation and its solution in different media, Plane wave, Sinusoidal time variation, Polarization. Reflection of waves by perfect dielectrics and by perfect insulators. Surface impedance, Poynting theorem and Poynting vector. Guided Waves Waves between parallel planes. TE and TM waves and their characteristics. TEM waves, Velocities of propagation, Attenuation in parallel plane guides, Wave impedance. Transmission Lines Circuit representation of parallel plane transmission lines. Parallel plane transmission line with losses. Low loss RF and UHF transmission lines. Distortionless condition. Transmission line charts-impedance matching. Waveguides Rectangular and circular waveguides. TE and TM waves in rectangular waveguides. Impossibility of TEM wave in waveguides. Wave impedance and characteristics impedances. Transmission line analogy for waveguides. Attenuation and factor of waveguides. Dielectric slab waveguides.

Electromagnetic Field Theory Fundamentals Prabhat Prakashan

This comprehensive new resource focuses on applied electromagnetics and takes readers beyond the conventional theory with the use of contemporary mathematics to improve the practical use of electromagnetics in emerging areas of field communications, wireless power transfer, metamaterials, MIMO and direction-of-arrival systems. The book explores the existing and novel theories and principles of electromagnetics in order to help engineers analyze and design devices for today's applications in wireless power transfers, NFC, and metamaterials. This book is organized into clear and logical sections spanning from fundamental theory, to applications, promoting clear understanding through-out. This resource presents the theory of electromagnetic near fields including chapters on reactive energy, spatial and spectral theory, the scalar antenna, and the morphogenesis of electromagnetic radiation in the near field zone. The Antenna Current Green's Function Formalism is

explored with an emphasis on the foundations, the organic interrelationships between the fundamental operational modes of general antenna systems, and the spectral approach to antenna-to-antenna interactions. The book offers perspective on nonlocal metamaterials, including the material response theory, the far-field theory, and the near-field theory.

Electromagnetic Field Theory and Transmission Lines Pearson Education India

Considered the most comprehensive account of electromagnetic theory and analytical methods for solving waveguide and cavity problems, this text is now in a new second edition that has been completely revised and thoroughly updated, with approximately forty percent new material. Packed with examples and applications *Field Theory of Guided Waves* provides solutions to a large number of practical structures of current interest. The book includes a complete discussion of scalar and dyadic Green's function. As a valuable source of basic information on applied mathematical topics and a hands-on guide to solution methods and techniques, this book belongs on the desk of all engineers working on microwave and antenna systems.

Electromagnetic Fields and Waves World Scientific

This self-contained book provides techniques for use in determining electromagnetic fields in layered dielectric media. You'll find useful problem sets and practical examples with solutions, as well as a simplified model for approaching problems.

Electromagnetic Field Theory Springer

This Book Offers Comprehensive Coverage Of The Subject Electromagnetism, With A Clear Exposition Of The Theory Along With Practical Application. The Presentation Is Very Simple To Facilitate The Independent Learning By The Readers. For Each Topic, There Are A Large Number Of Solved Examples So As To Aid The Readers In Grasping The Concepts. The Revised Edition Includes: * Expanded Coverage Of Some Topics In Electrostatic And Magnetostatics. * A New Section On Circuit Theory And Field Theory. * A Complete New Set Of Solved Problems In Chapter 7. This Book Would Serve As A Useful Text For The Students Preparing For Be, Amie, M.Sc. (Physics) And For Various Competitive Exams Concerning The Subject.

Electromagnetic Theory And Applications In Beam-wave Electronics bohem press

This book is divided into two parts. The first part deals with basic electromagnetics and the second part with beam-wave electronics in growing-wave devices including 'slow-wave' traveling-wave tubes and 'fast-wave' gyro-traveling-wave tubes.

The first part is a prerequisite for the second part, while the second part covers the application of the topics discussed in the first part. These two parts put together make the volume a self-contained treatise. In the specific application considered, both time-independent and time-dependent field concepts are exemplified, unlike in the usual topics, such as waveguides, antennas etc. of microwave engineering, where only time-dependent field concepts are applied. Stress is given to provide complete analytical derivation. However, care has been taken to see that the theme of the subject is not buried in too many mathematical details. These details are, however, not sacrificed as they are provided in a large number of appendices organised within the main text instead of being relegated to the end of the chapters.

Electro Magnetic Field Theory Pearson Education India

Electromagnetic Fields: For Anna University is an ideal textbook for the single-semester course on electromagnetic fields for electronic and communication students of Anna University. Written in a lucid and student-friendly style, this book uses many real-life examples and a simple, clear and concise presentation to explain fundamental concepts in electromagnetic field theory.

The book also explains fundamental concepts in the field of electromagnetic field theory for students of electrical and electronic engineering. The chapters cover every aspect of the subject, from fundamentals such as electrostatics to advanced topics dealing with transmission lines.

Electromagnetic Field Theory Fundamentals New Age International

This is a textbook designed to provide analytical background material in the area of Engineering Electromagnetic Fields for the senior level undergraduate and preparatory level graduate electrical engineering students. It is also an excellent reference book for researchers in the field of computational electromagnetic fields. The textbook covers ? Static Electric and Magnetic Fields: The basic laws governing the Electrostatics, Magnetostatics with engineering examples are presented which are enough to understand the fields and the electric current and charge sources. Dynamic Electromagnetic Fields: The Maxwell's equations in Time-Domain and solutions, the Maxwell's equations in Frequency-Domain and solutions. Extensive approaches are presented to solve partial differential equations satisfying electromagnetic boundary value problems. Foundation to electromagnetic field radiation, guided wave propagation is discussed to expose at the undergraduate level application of the Maxwell's equations to practical engineering problems.