Free epub Elements of engineering electromagnetic [PDF]

Introduction to Engineering Electromagnetic Fields Handbook of Engineering Electromagnetics Engineering Electromagnetic Fields and Waves Elements of Engineering Electromagnetics Fundamentals of Engineering Electromagnetics Engineering Electromagnetic Fields and Waves Introduction to Engineering Electromagnetic Fields Engineering Electromagnetic Compatibility Introduction to Electromagnetic Engineering Electromagnetic Field Theory Engineering Electromagnetics Electromagnetics Engineering Handbook Electromagnetics Electromagnetic Fields and Waves Manual Engineering Electromagnetic Fields and Wave S Electromagnetic Field Theories for Engineering Essentials of Electromagnetics for Engineering Electromagnetic Fields and Waves: Fundamentals of Engineering MATLAB-based Electromagnetics Wavelet Applications in Engineering Electromagnetics Fundamentals of Electromagnetics 2 Fields and Waves in Communication Electronics Electromagnetics for Engineers Fundamentals of Electromagnetics for Electrical and Computer Engineering Introduction to Electromagnetic and Microwave Engineering Fundamentals of Engineering Electromagnetics Fundamentals of Engineering Electromagnetics Electromagnetic Wave Propagation, Radiation, and Scattering Electromagnetic Waves Electromagnetic Fields in Electrical Engineering From ER to E.T. Fundamentals of Electromagnetics with MATLAB APPLIED ELECTROMAGNETIC THEORY Periodic Structures Introduction to Electromagnetic Fields ELECTROMAGNETISM Volume 2 —Applications ELECTROMAGNETISM Volume I (Theory) Engineering Electromagnetics Electromagnetic and Optical Pulse Propagation Electromagnetic Foundations of Electrical Engineering

Introduction to Engineering Electromagnetic Fields

1989

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

Handbook of Engineering Electromagnetics

2004-09-01

engineers do not have the time to wade through rigorously theoretical books when trying to solve a problem beginners lack the expertise required to understand highly specialized treatments of individual topics this is especially problematic for a field as broad as electromagnetics which propagates into many diverse engineering fields the time h

Engineering Electromagnetic Fields and Waves

1991-01-16

presents the introductory theory and applications of maxwell s equations to electromagnetic field problems unlike other texts maxwell s equations and the associated vector mathematics are developed early in the work allowing readers to apply them at the outset its unified treatment of coordinate systems saves time in developing the rules for vector manipulations in ways other than the rectangular coordinate system the following chapters cover static and quasi static electric and magnetic fields wave reflection and transmission at plane boundaries the poynting power theorem rectangular waveguide mode theory transmission lines and an introduction to the properties of linear antennas and aperture antennas includes an expanded set of problems many of which extend the material developed in the chapters

Elements of Engineering Electromagnetics

1991

emphasizing practical applications this approach integrates ibm pc basic programs and numerical techniques with the principles of engineering electromagnetics this book discusses on line parameters by numerical techniques and inserts a section on capacitance conductance and inductance

Fundamentals of Engineering Electromagnetics

2018-10-08

electromagnetics is too important in too many fields for knowledge to be gathered on the fly a deep understanding gained through structured presentation of concepts and practical problem solving is the best way to approach this important subject fundamentals of engineering electromagnetics provides such an understanding distilling the most important theoretical aspects and applying this knowledge to the formulation and solution of real engineering problems comprising chapters drawn from the critically acclaimed handbook of engineering electromagnetics this book supplies a focused treatment that is ideal for specialists in areas such as medicine communications and remote sensing who have a need to understand and apply electromagnetic principles but who are unfamiliar with the field here is what the critics have to say about the original work accompanied with practical engineering applications and useful illustrations as well as a good selection of references those chapters that are devoted to areas that i am less familiar with but currently have a need to address have certainly been valuable to me this book will therefore provide a useful resource for many engineers working in applied electromagnetics particularly those in the early stages of their careers alastair r ruddle the iee online a tour of practical electromagnetics written by industry experts provides an excellent tour of the practical side of electromagnetics a useful reference for a wide range of electromagnetics problems a very useful and well written compendium alfy riddle ieee microwave magazine fundamentals of engineering electromagnetics lays the theoretical foundation for solving new and complex engineering problems involving electromagnetics

Engineering Electromagnetic Fields and Waves

1983

electrical engineering engineering electromagnetic compatibility principles measurements technologies and computer models second edition this practical enhanced second edition will teach you to avoid costly post design electromagnetic compatibility emc fixes once again v prasad kodali provides a comprehensive introduction to emc and presents current technical information on sources of electromagnetic interference emi emc emi measurements technologies to control emi computer simulation and design and international emc standards features added to this second edition include two new chapters covering emc computer modeling and simulation and signal integrity expanded assignments at the close of each chapter illustrative examples that enhance comprehension updated information in selected bibliography and emc standards chapters a new appendix that lists

websites relevant to emc emi engineering electromagnetic compatibility second edition is presented in a concise user friendly format that combines a rigorous solutions based mathematical treatment of the underlying theories of emc with the most recent practical applications it is ideally suited as a desk reference for practicing engineers and as a textbook for students who need to understand the form and function of emc and its relevance to a variety of systems

Introduction to Engineering Electromagnetic Fields

1989

this study of electromagnetic theory introduces students to a broad range of quantities and concepts imparting the necessary vector analysis and associated mathematics and reinforcing its teachings with several elementary field problems based on circuit theory rather than on the classical force relationship approach the text uses the theory of electric circuits to provide a system of experiments already familiar to the electrical engineer a series of field concepts are then introduced as a logical extension of circuit theory virtually unobtainable elsewhere this text was written by a prominent professor whose recognition includes the prestigious ieee electromagnetics award it is appropriate for advanced undergraduate and graduate students with a background in calculus and circuit theory 176 figures 9 tables

Engineering Electromagnetic Compatibility

2001-01-19

the comprehensive study of electric magnetic and combined fields is nothing but electromagnetic engineering along with electronics electromagnetics plays an important role in other branches the book is structured to cover the key aspects of the course electromagnetic field theory for undergraduate students the knowledge of vector analysis is the base of electromagnetic engineering hence book starts with the discussion of vector analysis then it introduces the basic concepts of electrostatics such as coulomb s law electric field intensity due to various charge distributions electric flux electric flux density gauss s law divergence and divergence theorem the book continues to explain the concept of elementary work done conservative property electric potential and potential difference and the energy in the electrostatic fields the detailed discussion of current density continuity equation boundary conditions and various types of capacitors is also included in the book the book provides the discussion of poisson s and laplace s equations and their use in variety of practical applications the chapter on magnetostatics incorporates the explanation of biot savart s law ampere s circuital law and its applications concept of curl stoke s theorem scalar and vector magnetic potentials the book also includes the concept of force on a moving charge force on differential current element and magnetic boundary conditions the book covers all the details of faraday s laws time varying fields maxwell s equations and poynting theorem finally the book provides the detailed study of uniform plane waves including their propagation in free space perfect dielectrics lossy dielectrics and good conductors the book uses plain lucid language to explain each topic the book provides the logical method of explaining the various complicated topics and stepwise methods to make the understanding easy the variety of solved examples is the feature of this book which helps to inculcate the knowledge of the electromagnetics in the students each chapter is well supported with necessary

illustrations and self explanatory diagrams the book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting

Introduction to Electromagnetic Engineering

2003-01-01

engineering electromagnetics is an outstanding new textbook for students of electrical engineering electronics and communication engineering electromagnetic theory is a very important component of such courses as it has a wide variety of applications in wireless technology which are relevant to all aspects of electrical engineering worldwide the book consists of 12 chapters each with applied examples problems and solutions professor wadhwa is both an outstanding academic and a proven successful author of international repute his various books on aspects of electrical engineering are used on courses worldwide

Electromagnetic Field Theory

2020-11-01

electromagnetic fields both static and dynamic form the foundational basis of all electrical and electronic engineering devices and systems aimed at undergraduate students university teachers design and consultant engineers and researchers this book presents an in depth simple and comprehensive reference source on electromagnetics engineering in much of electrical and electronics engineering including analogue and digital telecommunications engineering biomedical monitoring and diagnostic equipment power systems engineering and sensor technology getting back to the fundamental principles that govern the technologies namely electromagnetic fields and waves has become crucial for future customer friendly technology and systems electromagnetics engineering handbook has been written to enable undergraduate students studying electromagnetics engineering for the first time to gain an understanding of the essentials of the largely invisible but powerful electromagnetic fields governed by the four elegant maxwell s equations moreover the book helps to apply that knowledge through analytical and computational solutions of these frequency and material dependent electric and magnetic fields as electrical and electronic engineering grows and subdivides into many specialities this book aims to inform the reader of the basic principles that govern all of these specialised systems and on how to apply that knowledge to understand and design devices and systems that may operate at vastly different frequencies and in various media e g semiconductor materials magnetic materials biological tissues outer space and sea water it also deals with a range of different functions dependant on the area of application for example at very low power frequencies electromagnetic fields perform vastly different functions from device to device such as in power transformers current transformers infrared sensors synchronous generators superconducting devices electric motors and electric powered transport systems this handbook will be of great help to students engineers innovators and researchers working in a wide variety of disciplines

Engineering Electromagnetics

2014

electromagnetics is a thorough text that enables readers to readily grasp em fundamentals develop true problem solving skills and really understand and like the material it is meant as an ultimate resource for undergraduate electromagnetics

Electromagnetics Engineering Handbook

2013

this textbook is intended for a course in electromagnetism for upper undergraduate and graduate students the main concepts and laws of classical macroscopic electrodynamics and initial information about generalized laws of modern electromagnetics are discussed explaining some paradoxes of the modern theory the reader then gets acquainted with electrodynamics methods of field analysis on the basis of wave equation solution emission physics are considered using an example of the huygens fresnel kirchhoff canonic principle the representation about strict electrodynamics task statement on the base of maxwell equations boundary conditions emission conditions and the condition on the edge is given different classes of approximate boundary conditions are presented which essentially simplify understanding of process physics the canonic fresnel functions are given and their generalization on the case of anisotropic impedance the free waves in closed waveguides and in strip slotted and edge dielectric transmission lines are described a large number of mathcad programs for illustration of field patterns and its properties in different guiding structures are provided the material is organized for self study as well as classroom use

Electromagnetics

2011

a four year electrical and electronic engineering curriculum normally contains two modules of electromagnetic field theories during the first two years however some curricula do not have enough slots to accommodate the two modules this book electromagnetic field theories is designed for electrical and electronic engineering undergraduate students to provide fundamental knowledge of electromagnetic fields and waves in a structured manner a comprehensive fundamental knowledge of electric and magnetic fields is required to understand the working principles of generators motors and transformers this knowledge is also necessary to analyze transmission lines substations insulator flashover mechanism transient phenomena etc recently academics and researches are working for sending electrical power to a remote area by designing a suitable antenna in this case the knowledge of electromagnetic fields is considered as important tool

Electromagnetic Fields and Waves

2018-08-27

a clearly written introduction to the key physical and engineering principles of electromagnetics first published in 2000

Manual Engineering Electromagnetic Fields and Wave S

1975-03

publisher s note products purchased from third party sellers are not guaranteed by the publisher for quality authenticity or access to any online entitlements included with the product understand electromagnetic field principles engineering techniques and applications this core introductory level undergraduate textbook offers a solid coverage of the fundamentals of electromagnetic fields and waves written by two electrical engineering experts and experienced educators the book is designed to accommodate both one and two semester curricula electromagnetic fields and waves fundamentals of engineering presents detailed explanations of the topic of em fields in a holistic fashion that integrates the math and the physics of the material with students realistic preparation in mind you will learn about static and time varying fields wave propagation and polarization transmission lines and waveguides and more coverage includes an introduction to electromagnetic fields and waves transmission lines and wave equations transition to electrostatics electrostatic fields electric flux and gauss law electric force field energy and potential materials conductors and dielectrics poisson s and laplace s equations uniqueness theorem and graphical and numerical solutions magnetic fields and flux magnetic materials magnetic circuits and inductance time varying fields and faraday s law wave propagation plane waves wave polarization and propagation in multiple layers waveguides and cavity resonators historical review of em scientists

Electromagnetic Field Theories for Engineering

2014-04-03

this title can be used to either complement another electromagnetics text or as an independent resource designed primarily for undergraduate electromagnetics it can also be used in follow up courses on antennas propagation microwaves advanced electromagnetic theory computational electromagnetics electrical machines signal integrity etc this title also provides practical content to current and aspiring industry professionals matlab based electromagentics provides engineering and physics students and other users with an operational knowledge and firm grasp of electromagnetic fundamentals aimed toward practical engineering applications by teaching them hands on electromagnetics through a unique and comprehensive collection of matlab computer exercises and projects essentially the book unifies two themes it presents and explains electromagnetics using matlab on one side and develops and discusses matlab for electromagnetics on the other matlab codes described and listed in tutorials or proposed in other exercises provide prolonged benefits of learning by running codes generating results figures and diagrams playing movies and animations and solving

a large variety of problems in matlab in class with peers in study groups or individually readers gain a deep understanding of electromagnetics

Essentials of Electromagnetics for Engineering

2001

written from an engineering perspective this unique resource describes the practical application of wavelets to the solution of electromagnetic field problems and in signal analysis with an even handed treatment of the pros and cons a key feature of this book is that the wavelet concepts have been described from the filter theory point of view that is familiar to researchers with an electrical engineering background the book shows you how to design novel algorithms that enable you to solve electrically large electromagnetic field problems using modest computational resources it also provides you with new ideas in the design and development of unique waveforms for reliable target identification and practical radar signal analysis the book includes more then 500 equations and covers a wide range of topics from numerical methods to signal processing aspects

Electromagnetic Fields and Waves: Fundamentals of Engineering

2019-12-27

this book is the first of two volumes which have been created to provide an understanding of the basic principles and applications of electromagnetic fields for electrical engineering students fundamentals of electromagnetics vol 1 internal behavior of lumped elements focuses upon the dc and low frequency behavior of electromagnetic fields within lumped elements the properties of electromagnetic fields provide the basis for predicting the terminal characteristics of resistors capacitors and inductors the properties of magnetic circuits are included as well for slightly higher frequencies for which the lumped elements are a significant fraction of a wavelength in size the second volume of this set fundamentals of electromagnetics vol 2 quasistatics and waves examines how the low frequency models of lumped elements are modified to include parasitic elements upon completion of understanding the two volumes of this book students will have gained the necessary knowledge to progress to advanced studies of electromagnetics

MATLAB-based Electromagnetics

2014

this comprehensive revision begins with a review of static electric and magnetic fields providing a wealth of results useful for static and time dependent fields problems in which the size of the device is small compared with a wavelength some of the static results such as inductance of transmission lines calculations can be used for microwave frequencies familiarity with vector operations including divergence and curl are developed in context in the chapters on statics packed with useful derivations and applications

Wavelet Applications in Engineering Electromagnetics

2002

this book covers the basic electromagnetic principles and laws from the standpoint of engineering applications focusing on time varying fields numerous applications of the principles and law are given for engineering applications that are primarily drawn from digital system design and electromagnetic interference electromagnetic compatibility or emc clock speeds of digital systems are increasingly in the ghz range as are frequencies used in modern analog communication systems this increasing frequency content demands that more electrical engineers understand these fundamental electromagnetic principles and laws in order to design high speed and high frequency systems that will successfully operate

Fundamentals of Electromagnetics 2

2007

fundamentals of electromagnetics for electrical and computer engineering first edition is appropriate for all beginning courses in electromagnetics in both electrical engineering and computer engineering programs this is ideal for anyone interested in learning more about electromagnetics dr n narayana rao has designed this compact one semester textbook in electromagnetics to fully reflect the evolution of technologies in both electrical and computer engineering this book s unique approach begins with maxwell s equations for time varying fields first in integral and then in differential form and also introduces waves at the outset building on these core concepts dr rao treats each category of fields as solutions to maxwell s equations highlighting the frequency behavior of physical structures next he systematically introduces the topics of transmission lines waveguides and antennas to keep the subject s geometry as simple as possible while ensuring that students master the physical concepts and mathematical tools they will need rao makes extensive use of the cartesian coordinate system topics covered in this book include uniform plane wave propagation material media and their interaction with uniform plane wave fields essentials of transmission line analysis both frequency and time domain metallic waveguides and hertzian dipole field solutions material on cylindrical and spherical coordinate systems is presented in appendices where it can be studied whenever relevant or convenient worked examples are presented throughout to illuminate and in some cases extend key concepts each chapter also contains a summary and review questions note this book provides a one semester alternative to dr rao s classic textbook for two semester courses elements of engineering electromagnetics now in its sixth edition

Fields and Waves in Communication Electronics

1994-02-09

filled with illustrations examples and approximately 300 homework problems this accessible and informative text provides an extensive treatment of electromagnetism and microwave engineering with particular emphasis on microwave and telecommunications applications also stresses

computational electromagnetics through the use of mathcad and finite element methods to elucidate design problems analysis and applications tutorials on the use of mathcad and pspice are included an accessible textbook for students and valuable reference for engineers already in the field

Electromagnetics for Engineers

2004

the purpose of this book is to meet the demand for a textbook that not only presents the fundamentals of electromagnetism in a concise and logical manner but also includes a variety of engineering applications

Fundamentals of Electromagnetics for Electrical and Computer Engineering

2009

fundamentals of engineering electromagnetics is designed for an undergraduate course in electromagnetism for students of electrical and electronics and communication engineering the book aims to provide students with understanding of the fundamentals of electromagnetic fields and their applications in electrical engineering and related domains

Introduction to Electromagnetic and Microwave Engineering

1998-01-05

one of the most methodical treatments of electromagnetic wave propagation radiation and scattering including new applications and ideas presented in two parts this book takes an analytical approach on the subject and emphasizes new ideas and applications used today part one covers fundamentals of electromagnetic wave propagation radiation and scattering it provides ample end of chapter problems and offers a 90 page solution manual to help readers check and comprehend their work the second part of the book explores up to date applications of electromagnetic waves including radiometry geophysical remote sensing and imaging and biomedical and signal processing applications written by a world renowned authority in the field of electromagnetic research this new edition of electromagnetic wave propagation radiation and scattering from fundamentals to applications presents detailed applications with useful appendices including mathematical formulas airy function abel s equation hilbert transform and riemann surfaces the book also features newly revised material that focuses on the following topics statistical wave theories which have been extensively applied to topics such as geophysical remote sensing bio electromagnetics bio optics and bio ultrasound imaging integration of several distinct yet related disciplines such as statistical wave theories communications signal processing and time reversal imaging new phenomena of multiple scattering such as coherent scattering and memory effects multiphysics applications that combine theories for different physical phenomena such as seismic coda waves stochastic wave theory heat diffusion and temperature rise in biological and other media metamaterials and solitons in

optical fibers nonlinear phenomena and porous media primarily a textbook for graduate courses in electrical engineering electromagnetic wave propagation radiation and scattering is also ideal for graduate students in bioengineering geophysics ocean engineering and geophysical remote sensing the book is also a useful reference for engineers and scientists working in fields such as geophysical remote sensing bio medical engineering in optics and ultrasound and new materials and integration with signal processing

Fundamentals of Engineering Electromagnetics

1993

for courses in electromagnetic fields waves electromagnetic waves continues the applied approach used in the authors successful engineering electromagnetics the second book is appropriate for a second course in electromagnetics that covers the topic of waves and the application of maxwell s equations to electromagnetic events

Fundamentals of Engineering Electromagnetics

2012-07-12

this book is the collection of the contributions offered at the international symposium on electromagnetic fields in electrical engineering isef 87 held in pavia italy in september 1987 the symposium was attended by specialists engaged in both theoretical and applied research in low frequency electromagnetism the charming atmosphere of pavia and its ancient university provided a very effective environment to discuss the latest results in the field and at the same time to enjoy the company or colleagues and friends coming from over 15 countries the contributions have been grouped into 7 chapters devoted to fundamental problems computer programs transformers rotating electrical machines mechanical and thermal effects various applications and synthesis respectively such a classification is merely to help the reader because a few papers could be put in several chapters over the past two decades electromagnetic field computations have received a big impulse by the large availability of digital computers with better and better performances in speed and capacity many various methods have been developed but not all of them appear convenient enough for practical engineering use in fact the technical and industrial challenges set some principal attributes and criteria for good computation methods they should be relatively easy to use fit into moderately sized computers yield useful design data maintain flexibility with m1n1mum cost in time and effort

Electromagnetic Wave Propagation, Radiation, and Scattering

2017-09-05

this book covers the study of electromagnetic wave theory and describes how electromagnetic technologies affect our daily lives from er to et how electromagnetic technologies are changing our lives explores electromagnetic wave theory including its founders scientific underpinnings ethical issues

and applications through history utilizing a format of short essays this book explains in a balanced and direct style how electromagnetic technologies are changing the world we live in and the future they may create for us quizzes at the end of each chapter provide the reader with a deeper understanding of the material this book is a valuable resource for microwave engineers of varying levels of experience and for instructors to motivate their students and add depth to their assignments in addition this book presents topics that investigate all aspects of electromagnetic technology throughout history explores societal and global issues that relate to the field of electrical engineering emphasized in current abet accreditation criteria includes quizzes relevant to every essay and answers which explain technical perspectives rajeev bansal phd is a professor of electrical and computer engineering at the university of connecticut he is a member of ieee and the connecticut academy of science and engineering he is a fellow of the electromagnetics academy his editing credits include fundamentals of engineering electromagnetics and engineering electromagnetics applications dr bansal contributes regular columns to ieee antennas and propagation magazine and ieee microwave magazine

Electromagnetic Waves

2000

virtually every four year electrical and computer engineering program requires a course in electromagnetic fields and waves encompassing maxwell s equations understanding and appreciating the laws of nature that govern the speed of even the smallest computer chip or largest power line is fundamental for every electrical and computer engineer fundamentals of electromagnetics with matlab 2nd edition is much more than a mere textbook the book itself offers a structural framework of principles key equations and problems with that crucial supporting structure each instructor student or reader can turn to the supplemental files provided with this book or available online to customize and decorate each topic room this second edition is the result of extensive user feedback and includes a 100 standalone transmission line chapter for flexible course placement expanded problem sets matched to text sections and checked for clarity and separate chapters for electrostatics and magnetostatics supplementary materials for professors and or students are available upon request via email to books theiet org

<u>Electromagnetic Fields in Electrical Engineering</u>

2012-12-06

designed as a textbook for the students of electronics and communi cation engineering and electrical and electronics engineering it covers the subject of electromagnetism with a clear exposition of the theory in association with the practical applications the text explains the physical and mathematical aspects of the highly complicated electromagnetic theory in a very simple manner the book begins with a introductory chapter on vector theory and then moves on to explain the effectiveness of ampere s circuital law and biot savart s law in dealing with magnetostatic problems derivation of maxwell s field equations from the fundamental laws of faraday and ampere free space solutions of wave equations and the theory of skin effect finally it concludes with the applications of smith chart in solving transmission line problems and the theory of rectangular and circular waveguides key features large number of solved examples and chapter end problems appendices to give the solutions of wave equations in waveguides three dimensional

figures to illustrate theories generalized solution of maxwell s equations besides undergraduate students of engineering it would be useful for the postgraduate students of physics

From ER to E.T.

2017-01-04

periodic structures mode matching approach and applications in electromagnetic engineering in periodic structures hwang gives readers a comprehensive understanding of the underlying physics in meta materials made of periodic structures providing a rigorous and firm mathematical framework for analyzing their electromagnetic properties the book presents scattering and guiding characteristics of periodic structures using the mode matching approach and their applications in electromagnetic engineering provides an analytic approach to describing the wave propagation phenomena in photonic crystals and related periodic structures covers guided and leaky mode propagation in periodic surroundings from fundamentals to practical device applications demonstrates formulation of the periodic system and applications to practical electromagnetic optical devices even further to artificial dielectrics introduces the evolution of periodic structures and their applications in microwave millimeter wave and thz written by a high impact author in electromagnetics and optics contains mathematical derivations which can be applied directly to matlab programs solution manual and matlab computer codes available on wiley companion website the book is primarily intended for graduate students in electronic engineering optics physics and applied physics or researchers working with periodic structures advanced undergraduates in ee optics applied physics applied math and materials science who are interested in the underlying physics of meta materials will also be interested in this text

Fundamentals of Electromagnetics with MATLAB

2007

this book is a sequel to electromagnetism theory volume i it has been updated to cover some additional aspects of theory and nearly all modern applications the semi historical approach is unchanged but further historical comments have been introduced at various places in the book to give a better insight into the development of the subject as well as to make the study more interesting and palatable to the students emphasis on practical aspects of wave guidance and radiation sections on analysis of cylindrical dielectric waveguide e g of optical fibres in chapters 18 and 22 tensor formulation of maxwell s stresses extension of principle of duality to time varying field problems as well as to non electrical systems extrapolation of the method of images from partially embedded conduction current elements to discontinuous current elements with displacement currents in antennae problems explanation of the physical basis of the mechanism of electromagnetic radiation analysis of wave polarization including complete and partial polarization effects of finite geometrical dimensions of the conducting media on the skin effect phenomenon types of apertures in receiving antennae the book is designed to serve as a core text for students of electrical engineering besides it will be useful to postgraduate physics students as well as research engineers and design and development engineers in industries

APPLIED ELECTROMAGNETIC THEORY

2008-07-11

this book earlier titled as electromagnetism theory and applications which is bifurcated into two volumes electromagnetism theory and electromagnetism applications magnetic diffusion and electromagnetic waves has been updated to cover some additional aspects of theory and nearly all modern applications the semi historical approach is unchanged but further historical comments have been introduced at various places in the book to give a better insight into the development of the subject as well as to make the study more interesting and palatable to the students key features physical explanations of different types of currents concepts of complex permittivity and complex permeability and anisotropic behaviour of constitute parameters in different media and different conditions vector co ordinate system transformation equations halbach magnets and the theory of one sided flux discussion on physical aspects of demagnetization curve of b h loop for ferromagnetic materials extrapolation of frohlich kennely equation used for the design and analysis of permanent magnet applications physical aspects of faraday s law of electromagnetic induction i e fourth maxwell s field equation through the approach of special relativity extrapolation and elaboration of the concept of electromechanical energy conversion to both magnetic as well as electric field systems appendices contain in depth analysis of self inductance and non conservative fields appendix 6 proof regarding the boundary conditions appendix 8 theory of bicylindrical co ordinate system to provide the physical basis of the circuit approach to the cylindrical transmission line systems appendix 10 and properties of useful functions like bessel and legendre functions appendix 9 the book is designed to serve as a core text for students of electrical engineering besides it will be useful to postgraduate physics students as well as research engineers and design and development engineers in industries

Periodic Structures

2012-12-11

electromagnetics is too important in too many fields for knowledge to be gathered on the fly knowing how to apply theoretical principles to the solutions of real engineering problems and the development of new technologies and solutions is critical engineering electromagnetics applications provides such an understanding demonstrating how to apply the underlying physical concepts within the particular context of the problem at hand comprising chapters drawn from the critically acclaimed handbook of engineering electromagnetics this book supplies a focused treatment covering radar wireless satellite and optical communication technologies it also introduces various numerical techniques for computer aided solutions to complex problems emerging problems in biomedical applications and techniques for measuring the biological properties of materials engineering electromagnetics applications shares the broad experiences of leading experts regarding modern problems in electromagnetics

Introduction to Electromagnetic Fields

1982

this volume presents a detailed rigorous treatment of the fundamental theory of electromagnetic pulse propagation in causally dispersive media that is applicable to dielectric conducting and semiconducting media asymptotic methods of approximation based upon saddle point methods are presented in detail

ELECTROMAGNETISM Volume 2 —Applications

2014-01-16

the applications of electromagnetic phenomena within electrical engineering have been evolving and progressing at a fast pace in contrast the underlying principles have been stable for a long time and are not expected to undergo any changes it is these electromagnetic field fundamentals that are the subject of discussion in this book with an emphasis on basic principles concepts and governing laws that apply across the electrical engineering discipline electromagnetic foundations of electrical engineering begins with an explanation of maxwell s equations from which the fundamental laws and principles governing the static and time varying electric and magnetic fields are derived results for both slowly and rapidly varying electromagnetic field problems are discussed in detail key aspects offers a project portfolio with detailed solutions included on the companion website which draws together aspects from various chapters so as to ensure comprehensive understanding of the fundamentals provides end of chapter homework problems with a focus on engineering applications progresses chapter by chapter to increasingly more challenging topics allowing the reader to grasp the more simple phenomena and build upon these foundations enables the reader to attain a level of competence to subsequently progress to more advanced topics such as electrical machines power system analysis electromagnetic compatibility microwaves and radiation this book is aimed at electrical engineering students and faculty staff in sub disciplines as diverse as power and energy systems circuit theory and telecommunications it will also appeal to existing electrical engineering professionals with a need for a refresher course in electromagnetic foundations

ELECTROMAGNETISM Volume I (Theory)

2014-01-01

Engineering Electromagnetics

2018-10-08

Electromagnetic and Optical Pulse Propagation

2019-07-17

Electromagnetic Foundations of Electrical Engineering

2008-09-09