

Fields Waves In Communication Electronics Solutions

This book provides a comprehensive treatment of electromagnetic waves. The author's approach is thoroughly modern, and unlike many others, this text offers a unified view of electromagnetic waves and their applications in telecommunications, radar, and photonics. The extensive coverage of Electromagnetic Waves begins with Maxwell's equations and takes students on the journey from the wave and Helmholtz equations through polarization, plane waves, and wave beams and packets, to antennas, transmission lines, and waveguides. Completing the treatment are chapters devoted to diffraction and an introduction to the theory of coherence. The author strikes an effective balance of the teach-through-concepts and teach-by-example approaches. The book is filled with exercises, current applications, and exercises that solidify students' understanding and bring relevance to the material. It forms an outstanding text for senior undergraduates and graduate-level students in electrical engineering and physics.

The millimeter-wave frequency band (30–300 GHz) is considered a potential candidate to host very high data rate communications. First used for high capacity radio links and then for broadband indoor wireless networks, the interest in this frequency band has increased as it is proposed to accommodate future 5G mobile communication systems. The large bandwidth available

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will enable a number of new uses for 5G. In addition, due to the large propagation attenuation, this frequency band may provide some additional advantages regarding frequency reuse and communication security. However, a number of issues have to be addressed to make mm-wave communications viable. This book collects a number of contributions that present solutions to these challenges.

The development of efficient techniques for the rigorous modelling of electromagnetic phenomena is a key factor in determining the progress in many technical area from microwave engineering to X-Ray technology. This book presents a class of numerical techniques for the analysis of discrete spectra of electrodynamic operators, highlights their advantages and drawbacks, and discusses their potential for solving practical problems. Examples of the application of some of the methods to solve both field theory and engineering problems are included.

The book is a comprehensive treatment of the field, covering fundamental theoretical principles and new technological advancements, state-of-the-art device design, and reviewing examples encompassing a wide range of related sub-areas. In particular, the first area focuses on the recent development of novel wearable and implantable antenna concepts and designs including metamaterial-based wearable antennas, microwave circuit integrated wearable filtering antennas, and textile and/or fabric material enabled wearable antennas. The second set of topics covers advanced wireless propagation and the associated statistical models for on-

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body, in-body, and off-body modes. Other sub-areas such as efficient numerical human body modeling techniques, artificial phantom synthesis and fabrication, as well as low-power RF integrated circuits and related sensor technology are also discussed. These topics have been carefully selected for their transformational impact on the next generation of body-area network systems and beyond.

Get up-to-speed on the theory, principles and design of vacuum electron devices.

One of us (FAB) published a book Problems in Electronics with Solutions in 1957 which became well established and ran to five editions, the last revised and enlarged edition appearing in 1976. When the first edition was written it covered almost the complete undergraduate electronics courses in engineering at universities. One book, at a price students can afford, can no longer cover an undergraduate course in electronics. It has therefore been decided to produce a book covering one important section of such a course using the experience gained and a few problems from previous editions of Problems in Electronics with Solutions. The book is based largely on problems collected by us over many years and given to undergraduate electronic and electrical engineers. Its purpose is to present the problems, together with a large number of their solutions, in the hope that it will prove valuable to undergraduates and other teachers. It should also be useful for Master's degree students in electronic and electrical engineering and physics, research workers, engineers and scientists in industry and as a

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reference source.

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

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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

Electromagnetism is the most pervasive force that exists in nature. Electromagnetic field theory is the study of characteristics of electric, magnetic and combined fields. The book is designed specifically to cater the needs of fourth semester students of B.Tech. in Electronics and Communications Engineering, JNTU. Simple, easy-to-understand and difficult-jargon-free text elucidates the fundamentals of the subject area and makes it a lasting resource for the students. Salient Features: ? Comprehensive coverage with lucid presentation style ? Rich exam-oriented pedagogy ? Unsolved review questions ? Objective-type questions

Antennas and Wave Propagation is written for the first course on the same. The book begins with an introduction that discusses the fundamental concepts, notations, representation and principles that govern the field of antennas. A separate chapter on mathematical preliminaries is discussed followed by chapters on every aspect of antennas from Maxwell's equations to antenna array analysis, antenna array synthesis, antenna measurements and wave propagation.

The aim of this book is to present the modern design and

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analysis principles of millimeter-wave communication system for wireless devices and to give postgraduates and system professionals the design insights and challenges when integrating millimeter wave personal communication system. Millimeter wave communication system are going to play key roles in modern gigabit wireless communication area as millimeter-wave industrial standards from IEEE, European Computer Manufacturing Association (ECMA) and Wireless High Definition (Wireless HD) Group, are on their way to the market. The book will review up-to-date research results and utilize numerous design and analysis for the whole system covering from Millimeter wave frontend to digital signal processing in order to address major topics in a high speed wireless system. This book emphasizes the importance and the requirements of high-gain antennas, low power transceiver, adaptive equalizer/modulation, channeling coding and adaptive multi-user detection for gigabit wireless communications. In addition, the book will include the updated research literature and patents in the topics of transceivers, antennas, MIMO, channel capacity, coding, equalizer, Modem and multi-user detection. Finally the application of these antennas will be discussed in light of different forthcoming wireless standards at V-band and E-band.

This text offers a practical, device-based approach to the study of microwave and wireless communications. Student objectives, questions and problems, and end-of-chapter summaries are used to reinforce the points made

This book provides a fundamental and practical introduction to radio frequency and microwave engineering and physical aspects of wireless communication. In this book, the author addresses a wide range of radio-frequency and microwave topics with emphasis on physical aspects including EM and voltage waves, transmission lines, passive circuits, antennas,

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radio wave propagation. Up-to-date RF design tools like RF circuit simulation, EM simulation and computerized Smith charts, are used in various examples to demonstrate how these methods can be applied effectively in RF engineering practice. Design rules and working examples illustrate the theoretical parts. The examples are close to real world problems, so the reader can directly transfer the methods within the context of their own work. At the end of each chapter a list of problems is given in order to deepen the reader's understanding of the chapter material and practice the new competences. Solutions are available on the author's website. Key Features: Presents a wide range of RF topics with emphasis on physical aspects e.g. EM and voltage waves, transmission lines, passive circuits, antennas Uses various examples of modern RF tools that show how the methods can be applied productively in RF engineering practice Incorporates various design examples using circuit and electromagnetic (EM) simulation software Discusses the propagation of waves: their representation, their effects, and their utilization in passive circuits and antenna structures Provides a list of problems at the end of each chapter Includes an accompanying website containing solutions to the problems (http://www.fh-dortmund.de/gustrau_rf_textbook) This will be an invaluable textbook for bachelor and masters students on electrical engineering courses (microwave engineering, basic circuit theory and electromagnetic fields, wireless communications). Early-stage RF practitioners, engineers (e.g. application engineer) working in this area will also find this book of interest.

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

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of the modern theory. The reader then gets acquainted with electrostatics 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 electrostatics 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.

Electronics and Communications for Scientists and Engineers, Second Edition, offers a valuable and unique overview on the basics of electronic technology and the internet. Class-tested over many years with students at Northwestern University, this useful text covers the essential electronics and communications topics for students and practitioners in engineering, physics, chemistry, and other applied sciences. It describes the electronic underpinnings of the World Wide Web and explains the basics of digital technology, including computing and communications, circuits, analog and digital electronics, as well as special topics such as operational amplifiers, data compression, ultra high definition TV, artificial intelligence, and quantum computers. Incorporates comprehensive updates and expanded material in all chapters where appropriate Includes new problems added throughout the text Features an updated section on RLC circuits Presents revised and new

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content in Chapters 7, 8, and 9 on digital systems, showing the many changes and rapid progress in these areas since 2000

In this brand new volume, Ian Poole begins with a fine introduction to radio, suitable for almost all readers. ...the book is an excellent way for neophytes to step into radio and learn something about it. It begins with the basics and gradually brings in more advanced concepts. We recommend it as an addition to the technical libraries of intermediate-level technical readers. It is an interesting read even for the advanced engineer. - QEX July/August 2004

Ian Poole has written a fascinating guide to the technology and applications of modern radio and communications equipment. His approach provides a useful foundation for college students and technicians seeking an update on the latest technology, but each topic is introduced from the basics, ensuring that the book is equally rewarding for managers in the communications industry, sales staff, and anyone seeking to update their knowledge of this exciting and rapidly expanding area of technology. The key areas covered by this book are: Radio principles Broadcasting, including Digital Radio Private mobile radio, (PMR) including trunking and TETRA Cellular telecommunications, including GSM and 3G Data communications, including Bluetooth and 802.11 As well as a survey of established and cutting-edge technologies the underpinning science and electronics is introduced.

*Includes a survey of established and cutting-edge communication technologies *Introduces the underpinning science and electronics of the subject

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*Provides an emphasis on circuits and how they work
The aim of this book is to present the modern design principles and analysis of lens antennas. It gives graduates and RF/Microwave professionals the design insights in order to make full use of lens antennas. Why do we want to write a book in lens antennas? Because this topic has not been thoroughly publicized, its importance is underestimated. As antennas play a key role in communication systems, recent development in wireless communications would indeed benefit from the characteristics of lens antennas: low profile, and low cost etc. The major advantages of lens antennas are narrow beamwidth, high gain, low sidelobes and low noise temperature. Their structures can be more compact and weigh less than horn antennas and parabolic antennas. Lens antennas with their quasi-optical characteristics, also have low loss, particularly at near millimeter and submillimeter wavelengths where they have particular advantages. This book systematically conducts advanced and up-to-date treatment of lens antennas.

Maxwell's equations of isotropic media and some important identities. Reflection of plane waves from interfaces. Mirrors and interferometers. Fresnel diffraction in paraxial limit. Hermit-Gaussian beams and their transformations. Optical fibers and guiding layers. Coupling of modes - resonators and couplers. Distributed feedback structures. Acousto-optic modulators. Some nonlinear systems. Wave propagation in anisotropic media. Electro-optic modulators. Nonlinear optics. Optical detection.

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This book is a first-year graduate text on electromagnetic fields and waves. It is the translated and revised edition of the Chinese version with the same title published by the Publishing House of Electronic Industry (PHEI) of China in 1994. The text is based on the graduate course lectures on "Advanced Electrodynamics" given by the authors at Tsinghua University. More than 300 students from the Department of Electronic Engineering and the Department of Applied Physics have taken this course during the last decade. Their particular fields are microwave and millimeterwave theory and technology, physical electronics, optoelectronics and engineering physics. As the title of the book shows, the texts and examples in the book concentrate mainly on electromagnetic theory related to microwaves and optoelectronics, or light wave technology. However, the book can also be used as an intermediate-level text or reference book on electromagnetic fields and waves for students and scientists engaged in research in neighboring fields.

This book is divided into two parts. The first part deals with basic electromagnetic and the second part with beam-wave electronics related to growing-wave devices including 'slow-wave' travelling-wave tubes and 'fast-wave' gyro-travelling-wave tubes. The first part is a prerequisite for the second part, while the second part covers the applications of the topics discussed in the first part. These two parts put together make the volume a self-contained treatise. In the specific applications considered, time-independent field concepts are exemplified in the problems related to the formation of an

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electron beam by an electron gun, the confinement of an electron beam by a magnetic focusing structure, etc. Similarly, time-dependent field concepts are exemplified in problems related to propagation through a slow-wave structure and amplification in growing-wave electron beam devices, such as travelling-wave tubes, double-stream amplifiers, beam-plasma amplifiers and gyro-travelling-wave tubes. All throughout the text, stress is given to provide complete analytical deductions with full mathematical details and present the state-of-the-art concepts.

Teaching Electromagnetics: Innovative Approaches and Pedagogical Strategies is a guide for educators addressing course content and pedagogical methods primarily at the undergraduate level in electromagnetic theory and its applications. Topics include teaching methods, lab experiences and hands-on learning, and course structures that help teachers respond effectively to trends in learning styles and evolving engineering curricula. The book grapples with issues related to the recent worldwide shift to remote teaching. Each chapter begins with a high-level consideration of the topic, reviews previous work and publications, and gives the reader a broad picture of the topic before delving into details. Chapters include specific guidance for those who want to implement the methods and assessment results and evaluation of the effectiveness of the methods. Respecting the limited time available to the average teacher to try new methods, the chapters focus on why an instructor should adopt the methods proposed in it. Topics include virtual laboratories, computer-assisted

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learning, and MATLAB® tools. The authors also review flipped classrooms and online teaching methods that support remote teaching and learning. The end result should be an impact on the reader represented by improvements to his or her practical teaching methods and curricular approach to electromagnetics education. The book is intended for electrical engineering professors, students, lab instructors, and practicing engineers with an interest in teaching and learning. In summary, this book: Surveys methods and tools for teaching the foundations of wireless communications and electromagnetic theory Presents practical experience and best practices for topical coverage, course sequencing, and content Covers virtual laboratories, computer-assisted learning, and MATLAB tools Reviews flipped classroom and online teaching methods that support remote teaching and learning Helps instructors in RF systems, field theory, and wireless communications bring their teaching practice up to date

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Clear, coherent work for graduate-level study discusses the Maxwell field equations, radiation from wire antennas, wave aspects of radio-astronomical antenna theory, the Doppler effect, and more.

In this book, a variety of topics related to electromagnetic fields and waves are extensively discussed. The topics encompass the physics of electromagnetic waves, their

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interactions with different kinds of media, and their applications and effects.

Adapted from a successful and thoroughly field-tested Italian text, the first edition of *Electromagnetic Waves* was very well received. Its broad, integrated coverage of electromagnetic waves and their applications forms the cornerstone on which the author based this second edition. Working from Maxwell's equations to applications in optical communications and photonics, *Electromagnetic Waves, Second Edition* forges a link between basic physics and real-life problems in wave propagation and radiation. Accomplished researcher and educator Carlo G. Someda uses a modern approach to the subject. Unlike other books in the field, it surveys all major areas of electromagnetic waves in a single treatment. The book begins with a detailed treatment of the mathematics of Maxwell's equations. It follows with a discussion of polarization, delves into propagation in various media, devotes four chapters to guided propagation, links the concepts to practical applications, and concludes with radiation, diffraction, coherence, and radiation statistics. This edition features many new and reworked problems, updated references and suggestions for further reading, a completely revised appendix on Bessel functions, and new definitions such as antenna effective height. Illustrating the concepts with examples in every chapter, *Electromagnetic Waves, Second Edition* is an ideal introduction for those new to the field as well as a convenient reference for seasoned professionals.

An introduction to RF propagation that spans all

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wireless applications This book provides readers with a solid understanding of the concepts involved in the propagation of electromagnetic waves and of the commonly used modeling techniques. While many books cover RF propagation, most are geared to cellular telephone systems and, therefore, are limited in scope. This title is comprehensive—it treats the growing number of wireless applications that range well beyond the mobile telecommunications industry, including radar and satellite communications. The author's straightforward, clear style makes it easy for readers to gain the necessary background in electromagnetics, communication theory, and probability, so they can advance to propagation models for near-earth, indoor, and earth-space propagation. Critical topics that readers would otherwise have to search a number of resources to find are included:

- * RF safety chapter provides a concise presentation of FCC recommendations, including application examples, and prepares readers to work with real-world propagating systems
- * Antenna chapter provides an introduction to a wide variety of antennas and techniques for antenna analysis, including a detailed treatment of antenna polarization and axial ratio; the chapter contains a set of curves that permit readers to estimate polarization loss due to axial ratio mismatch between transmitting and receiving antennas without performing detailed calculations
- * Atmospheric effects chapter provides curves of typical atmospheric loss, so that expected loss can be determined easily
- * Rain attenuation chapter features a summary of how to apply the ITU and Crane rain models
- * Satellite communication

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chapter provides the details of earth-space propagation analysis including rain attenuation, atmospheric absorption, path length determination and noise temperature determination. Examples of widely used models provide all the details and information needed to allow readers to apply the models with confidence. References, provided throughout the book, enable readers to explore particular topics in greater depth. Additionally, an accompanying Wiley ftp site provides supporting MathCad files for select figures in the book. With its emphasis on fundamentals, detailed examples, and comprehensive coverage of models and applications, this is an excellent text for upper-level undergraduate or graduate students, or for the practicing engineer who needs to develop an understanding of propagation phenomena.

In the offered book the fundamentals of electromagnetic fields and waves are discussed based on the great Maxwell equations. The book is conceived as a textbook for serious technical and classical universities in the considered themes. Nevertheless, it can be used, of course, as the reference book for wide group of engineers, researchers and practical experts. Material of this book is divided into four main parts connected between them. The first part (Fundamental of Electrodynamics) is devoted to explanation of Maxwell equations and methods of its solutions. Besides classical interpretation the generalized equations are discussed, which take into consideration the scalar magnetic fields. New approaches allow description of so-called longitudinal electromagnetic waves, which have the

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absolutely non-standard propagation properties, and permit to explain various electrodynamics paradoxes, which cannot be explained in another way. The main characteristics of wave processes in the free space and in transmission lines (feeders) are described. The second part (Radio Wave Propagation) investigates the obvious patterns of diffraction and interference phenomena at radio wave propagation for the obstacle presence in the propagation track, which is typical for all practical situations. Radio wave propagation of various frequency ranges is fulfilled separately taking into consideration the specific features of reflections from the atmosphere parts, attenuation in different media, types of propagating waves, multipath effects, diffraction and non-standard conditions of obstacle overcoming including non-usual ways of atmosphere ducts. The third part is devoted to description of various types and antennas, beginning from simplest (vibrators) and ending by complicate adaptive antenna arrays. Description is fulfilled on the reviewing level with many obvious figures, not to rely on strict mathematical methods, but rather on the concept level. Fourth part includes description of UHF devices, which are the elements' base of UHF devices including surface and bulk integrated UHF circuits. These results have in many aspects the pioneer character and they are not widely known to experts. Distinctive feature of the offered book is sufficiently simplifies description of the very complicated electrodynamics problems available for the modern students and for young engineers. Of course, it is impossible to deal without mathematics in these areas

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but required mathematics can be replaced by the many patterns, which give the chance to understand problems and to determine the complex questions. Sample

Chapter(s) Chapter1: GENERAL DEFINITIONS AND RELATIONS OF ELECTRODYNAMICS (498 KB)Contents:FRONT MATTERCHAPTER 1. GENERAL DEFINITIONS AND RELATIONS OF ELECTRODYNAMICSCHAPTER 2. ELECTROMAGNETIC FIELDS AND WAVESCHAPTER 3. MAIN PHYSICAL PHENOMENA AT RADIO WAVES PROPAGATIONCHAPTER 4. PROPAGATION OF RADIO WAVES OF DIFFERENT RANGES AND ITS APPLICATION AREASCHAPTER 5. PRINCIPAL CHARACTERISTICS OF ANTENNASCHAPTER 6. ANTENNAS OF DECIMILLIMETER, MILLIMETER AND CENTIMETER WAVESCHAPTER 7. ANTENNAS OD DECIMETER, METER AND DECAMETER WAVESCHAPTER 8. ANTENNAS OF HECTOMETER, KILOMETER MYRIAMETER WAVESCHAPTER 9. ANTENNAS FOR TV, RADIO RELAY AND SPACE COMMUNICATION LINESCHAPTER 10. ELECTROMAGNETIC COMPATIBILITY OF RADIO ENGINEERING SYSTEMS. ANTENNAS AND THE PROBLEM OF ITS MINIATURIZATIONCHAPTER 11. MAIN COMPONENTS OF THE ELEMENT BASE OF ANTENNA-FEEDER ENGINEERINGCHAPTER 12. BASE ELEMENTS AND FUNCTIONAL UNITS OF ANTENNA- FEEDER ENGINEERINGBACK MATTER

Readership: The book is conceived as a textbook for serious technical and classical universities in the considered themes. Nevertheless, it can be used, of

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course, as the reference book for wide group of engineers, researches and practical experts. Electromagnetic (EM) waves carry energy through propagation in space. This radiation associates with entangled electric and magnetic fields which must exist simultaneously. Although all EM waves travel at the speed of light in vacuum, they cover a wide range of frequencies called the EM spectrum. The various portions of the EM spectrum are referred to by various names based on their different attributes in the emission, transmission, and absorption of the corresponding waves and also based on their different practical applications. There are no certain boundaries separating these various portions, and the ranges tend to overlap. Overall, the EM spectrum, from the lowest to the highest frequency (longest to shortest wavelength) contains the following waves: radio frequency (RF), microwaves, millimeter waves, terahertz, infrared, visible light, ultraviolet, X-rays, and gamma rays. This Special Issue consists of sixteen papers covering a broad range of topics related to the applications of EM waves, from the design of filters and antennas for wireless communications to biomedical imaging and sensing and beyond.

This Second Edition offers material on solid-state electromagnetics and optics to reflect the new technology. Features new examples.

Introduction and Survey of the Electromagnetic Spectrum; Fundamentals of Electric Fields; Fundamentals of Magnetic Fields; Electrodynamics; Radiation; Relativity and Quantum Physics; The Hidden

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Schematic; Transmission Lines; Waveguides and Shields; Circuits as Guides for Waves and S-Parameters; Antennas: How to Make Circuits That Radiate; EMC (Part I: Basics, Part II: PCB Techniques, Part III: Cabling); Lenses, Dishes, and Antenna Arrays; Diffraction; Frequency Dependence of Materials, Thermal Radiation, and Noise; Electrical Engineering Book Recommendations; Index.

Why yet another book on antennas ? The aim of the authors was to offer a didactic text appropriate for advanced graduate students, as well as a practical work for practicing engineers; to combine a solid theoretical treatment with a practical development which should allow the serious reader to undertake antenna design from first principles. To accomplish these goals, the authors bring together their contributions from both industry and the academic environment. The developments of the various topics start at a level which is accessible to a novice in the speciality, but give a treatment which culminates at an advanced level. Another important feature of the book is its use of practical examples illustrating real engineering problems and designs. In most cases, the explanation is sufficient to grasp the principles of operation of the related equipment, and, where appropriate, the reader is referred to a relevant bibliography for more complete and hence more sophisticated methodologies of design. Of particular note are the chapters on specialist subjects such as

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antennas and signal theory, and signal processing antennas, showing how the antenna may be combined with signal processing techniques in imaging applications, in angular superresolution, and in adaptive arrays to suppress interference and jamming. Another example is the chapter on the use of polarimetry to enhance the wealth of information which may be extracted, for example, from radar signals.

“A helpful read not just for corporate strategists but for almost anyone looking ahead.” Los Angeles Times What's Your Next Big Move? At the turn of the century, Western Union passed on the chance to dominate the telephone industry. Later, General Electric concluded that a new invention called television was doomed to fail. And very recently, decision makers at the highest level were taken off-guard when the global economy dropped from under their feet--and took their companies with it. Today, only those business leaders with the power of long-term foresight will seize and hold true competitive advantage. But can managers really predict the future? Yes, to a greater extent than one might expect. Strategic Business Forecasting shows how to identify and quantify possible events that may affect your business. Applying creativity, personal experience, and the lessons of history, you can use such forecasting to develop plans that will help your organization compete. Drs. Simon Ramo and Ronald

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Sugar, two giants of the aerospace industry, share their Four-Measures Rating system to help you explore the world of possibilities--thoroughly and systematically. Under their tutelage, you will be equipped to: Create a comprehensive list of possible scenarios concerning your business Utilize a scoring system to rate each scenario's merit as a serious and useful prediction Develop an effective plan that strategically shapes the future of your organization The authors provide vivid illustrations of the Four-Measures system at work with real-world examples of both forecasting failures and successes. No one can predict perfectly, and the authors don't promise magic. With the approach described in Strategic Business Forecasting, however, you can ensure your organization is better poised to seize future opportunities, avoid pitfalls, and handle anything the increasingly volatile global economy throws your way.

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

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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

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