Electromagnetics 5th Edition Kraus

In many schools this course has gone from a two-semester course to a one-semester course. In the fifth edition, transmission lines and other practical applications are addressed early in the text and the coverage of electrostatics is reduced to make this book suitable for a one-semester course. This text provides flexibility in that the core material is provided in the first five chapters with supplementary material that may be used as desired in the remaining chapters.This text is unique in having hundreds of real-world examples accompanied by problems of varying difficulty. Additionally, this book covers numerical techniques and contains useful computer programs and projects to afford students the opportunity to gain direct experience in the use of electromagnetic software and hardware. This text is accompanied by a website containing projects, recent developments in the field, and demonstrations of electromagnetic principles.

Here's an authoritative resource that offers you valuable assistance with your work involving microwave circuit analysis and design. This practical book provides a thorough understanding of the properties of planar transmission lines for integrated circuits. It presents matrix and computer-aided methods for analysis and design of circuit components. You find in-depth details on input, output, and interstage networks, as well as coverage of stability, noise, and signal distortion. Moreover, this unique book is the first to explore and develop the interface between lumped-element circuits and distributed element circuits. Supported with over 580 equations and 100 illustrations, this volume presents the necessary technological underpinnings and all the practical details you need to fully comprehend and work with the material.

This work treats the essential elements of radio wave propagation without requiring recourse to advanced electromagnetic concepts and equations. However, it provides sufficient detail to allow those concerned with wireless systems to acquire quickly a practical working knowledge of the important concepts. Radio wave propagation is placed in a practical context by considering the design aspects of communications systems at microwave frequencies. A fuller consideration of the electromagnetic properties of materials is given late in the book rather than as an introductory chapter.

Balanis’ second edition of Advanced Engineering Electromagnetics – a global best-seller for over 20 years – covers the advanced knowledge engineers involved in electromagnetic need to know, particularly as the topic relates to the fast-moving, continually evolving, and rapidly expanding field of wireless communications. The immense interest in wireless communications and the expected increase in wireless communications systems projects (antenna, microwave and wireless communication) points to an increase in the number of engineers needed to specialize in this field. In addition, the Instructor Book Companion Site contains a rich collection of multimedia resources for use with this text. Resources include: Ready-made lecture notes in Power Point format for all the chapters. Forty-nine MATLAB® programs to compute, plot and animate some of the wave phenomena Nearly 600 end-of-chapter problems, that's an average of 40 problems per chapter (200 new problems; 50% more than in the first edition) A thoroughly updated Solutions Manual 2500 slides for Instructors are included.

This Book Is Designed To Present The Fundamental Concepts Of Electromagnetic Field Theory As They Relate To Modern Engineering Applications. As An Up-To-Date Reference It Can Be Used By Practicing Engineers, Or As A Text/Supplement In Standard University Courses In Electromagnetics Or Electromagnetic Fields Theory. The Book Has Been Designed For Self-Study With A Problem-Solving Approach. Numerous Examples With Complete, Worked-Out Solutions Guide The Reader Through The Concepts Under Discussion. Beginning With A Review On Vectors And Coordinate Systems, The Book Covers Basic Coulomb's Law In Vector Form Up Through The Propagation Of The Electromagnetic Wave In Wave Guides. Maxwell's Equations Which Form The Central Theme Are Developed From The Historical Approach Wherein Relevant Experimental Laws Are Gradually Introduced And Manipulated With The Help Of Steadily Increasing Knowledge Of Vector Calculus. These Equations Are Identified As And When They Occur For Static And Time Varying Fields. In The Last Two Chapters These Equations Are Then Explored In A Collective Way.

This book is a classic and has been one of the traditional market leaders since its first publication in 1953. In this revision, the authors have made some drastic changes to keep pace with the transformation that has been going on in the curriculum over the past few years. In many schools this course has gone from a two-semester course to a one-semester course. In the fifth edition, transmission lines and other practical applications are addressed early in the text and the coverage of electrostatics is reduced to make this book suitable for a one-semester course. This text provides flexibility in that the core material is provided in the first five chapters with supplementary material that may be used as desired in the remaining chapters. This text is unique in having hundreds of real-world examples accompanied by problems of varying difficulty. Additionally, this book covers numerical techniques and contains useful computer programs and projects to afford students the opportunity to gain direct experience in the use of electromagnetic software and hardware. This text is accompanied by a website containing projects, recent developments in the field, and demonstrations of electromagnetic principles.

This graduate-level physics textbook provides a comprehensive treatment of the basic principles and phenomena of classical electromagnetism. While many electromagnetism texts use the subject to teach mathematical methods of physics, here the emphasis is on the physical ideas themselves. Anupam Garg distinguishes between electromagnetism in vacuum and that in material media, stressing that the core physical questions are different for each. In vacuum, the focus is on the fundamental content of electromagnetic laws, symmetries, conservation laws, and the implications for phenomena such as radiation and light. In material media, the focus is on understanding the response of the media to imposed fields, the attendant constitutive relations, and the phenomena encountered in different types of media such as dielectrics, ferromagnets, and conductors. The text includes applications to many topical subjects, such as magnetic levitation, plasmas, laser beams, and synchrotrons. Classical Electromagnetism in a Nutshell is ideal for a yearlong graduate course and features more than 300 problems, with solutions to many of the advanced ones. Key formulas are given in both SI and Gaussian units; the book includes a discussion of how to convert between them, making it accessible to adherents of both systems. Offers a complete treatment of classical electromagnetism Emphasizes physical ideas Separates the treatment of electromagnetism in vacuum and material media Presents key formulas in both SI and Gaussian units Covers applications to other areas of physics Includes more than 300 problems

Wireless Power Transfer is the second edition of a well received first book, which published in 2012. It represents the state-of-the-art at the time of writing, and addresses a unique subject of great international interest in terms of research. Most of the chapters are contributed by the main author, though as in the first edition several chapters are contributed by other authors. The authors of the various chapters are experts in their own right on the specific topics within wireless energy transfer. Compared to the first edition, this new edition is more comprehensive in terms of the concepts discussed, and the range of current industrial applications which are presented, such as those of magnetic induction. From the eleven chapters of the first edtion, this second edition has expanded to twenty chapters. More chapters on the theoretical foundations and applications have been included. This new edition also contains chapters which deal with techniques for reducing power losses in wireless power transfer systems. In this regard, specific chapters discuss impedance matching methods, frequency splitting and how to deploy systems based on frequency splitting. A new chapter on multi-dimensional wireless power transfer has also been added. The design of wireless power transfer systems based on bandpass filtering approach has been included, in addition to the two techniques using couple mode theory and electronic circuits. The book has retained chapters on how to increase efficiency of power conversion and induction, and also how to control the power systems. Furthermore, detailed techniques for power relay, including applications, which were also discussed in the first edition, have been updated and kept. The book is written in a progressive manner, with a knowledge of the first chapters

making it easier to understand the later chapters. Most of the underlying theories covered in the book are clearly relevant to inductive near field communications, robotic control, robotic propulsion techniques, induction heating and cooking and a range of mechatronic systems.

This book presents a comprehensive treatment of electromagnetic analysis and design of three critical devices for an MRI system - the magnet, gradient coils, and radiofrequency (RF) coils. Electromagnetic Analysis and Design in Magnetic Resonance Imaging is unique in its detailed examination of the analysis and design of the hardware for an MRI system. It takes an engineering perspective to serve the many scientists and engineers in this rapidly expanding field. Chapters present: an introduction to MRI basic concepts of electromagnetics, including Helmholtz and Maxwell coils, inductance calculation, and magnetic fields produced by special cylindrical and spherical surface currents principles for the analysis and design of gradient coils, including discrete wires and the target field method analysis of RF coils based on the equivalent lumped-circuit model as well as an analysis based on the integral equation formulation survey of special purpose RF coils analytical and numerical methods for the analysis of electromagnetic fields in biological objects With the continued, active development of MRI instrumentation, Electromagnetic Analysis and Design in Magnetic Resonance Imaging presents an excellent, logically organized text - an indispensable resource for engineers, physicists, and graduate students working in the field of MRI.

Indoor Wireless Communications: From Theory to Implementation provides an in-depth reference for design engineers, system planners and post graduate students interested in the vastly popular field of indoor wireless communications. It contains wireless applications and services for in-building scenarios and knowledge of key elements in the design and implementation of these systems. Technologies such as Wireless Local Area Networks, Bluetooth, ZigBee, Indoor Optical Communications, WiMAX, UMTS and GSM for indoor environments are fully explained and illustrated with examples. Antennas and propagation issues for in-building scenarios are also discussed, emphasizing models and antenna types specifically developed for indoor communications. An exhaustive survey on indoor wireless communication equipment is also presented, covering all available technologies including antennas, distribution systems, transceivers and base stations.

Detailed descriptions of detection, direction-finding, and signal-estimation methods, using consistent formalisms and notation, emphasizing HF antenna array sensing applications. Adaptive antenna array technology encompasses many powerful interference suppression approaches that exploit spatial differences among signals reaching a radio receiver system. Today, worldwide propagation phenomenology occurring in the High Frequency (HF) radio regime has made such interference common. In this book, Jay Sklar, a longtime researcher at MIT Lincoln Laboratory, presents detailed descriptions of detection, direction-finding, and signal-estimation methods applicable at HF, using consistent formalisms and notation. Modern electronic system technology has made many of these techniques affordable and practical; the goal of the book is to offer practicing engineers a comprehensive and self-contained reference that will encourage more widespread application of these approaches. The book is based on the author's thirty years of managing MIT Lincoln Laboratory work on the application of adaptive antenna array technologies to the sensing of HF communication signals. After an overview of HF propagation phenomenology, communication signal formats, and HF receiver architectural approaches, Sklar describes the HF propagation environment in more detail; introduces important modulation approaches and signaling protocols used at HF; discusses HF receiver system architectural features; and addresses signal processor architecture and its implementation. He then presents the technical foundation for the book: the vector model for a signal received at an adaptive array antenna. He follows this with discussions of actual signal processing techniques for detection and direction finding, including specific direction-finding algorithms; geolocation techniques; and signal estimation.

Principles of Electromagnetic Waves and Materials is a condensed version of the author's previously published textbook, Electromagnetic Waves, Materials, and Computation with MATLAB. This book focuses on lower-level courses, primarily senior undergraduate and graduate students in electromagnetic waves and materials courses. It takes an integrative

Covering a wide range of application areas, from wireless communications and navigation, to sensors and radar, this practical resource offers you the first comprehensive, multidisciplinary overview of radio engineering. You learn important techniques to help you with the generation, control, detection and utilization of radio waves, and find detailed guidance in radio link, amplifier, and antenna design. The book approaches relevant problems from both electromagnetic theory based on MaxwellOCOs equations and circuit theory based on KirchoffOCOs and OhmOCOs laws, including brief introductions to each theory."

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

This book is aimed to provide the basic preparatory material to the students who wish to study the electromagnetism as part of their course study. In the discussion of different concepts of electromagnetism, use of vectors and coordinates systems are unavoidable. Most of the books avoid details of these topics due to scope of the book or the syllabus. Most of the students take it for granted the formulae stated in the book. Some students when try to understand the three dimensional aspects of the coordinate systems they find some confusion. To help student clear their concepts on these aspects and to answer how different readily given expressions are derived we have come forward to write this book. The book starts discussion from very basic definitions of vector terminology and then relates this with the coordinate systems. Most needed coordinate systems are Cartesian, cylindrical and spherical coordinate systems. These systems are discussed from the basic level and culminate into the derivations of the longer expressions. As problems are already available in the books of similar nature authors have not included them in this book. It is hoped that this book would clear most of the concepts needed to study the electromagnetism.

This second edition comes from your suggestions for a more lively format, self-learning aids for students, and the need for applications and projects without being distracted from EM Principles. Flexibility Choose the order, depth, and method of reinforcing EM Principles—the PDF files on CD provide Optional Topics, Applications, and Projects.Affordability Not only is this text priced below competing texts, but also the topics on CD (and downloadable to registered users) provide material sufficient for a second term of study with no additional book for students to buy.MATLAB This book takes full

advantage of MATLAB's power to motivate and reinforce EM Principles. No other EM books is better integrated with MATLAB. The second edition is even richer and easier to incorporate into course use with the new, self-paced MATLAB tutorials on the CD and available to registered users.

Readily available commercial software enables engineers and students to perform routine calculations and design without necessarily having a sufficient conceptual understanding of the anticipated solution. The software is so user-friendly that it usually produces a beautiful colored visualization of that solution, often camouflaging the fact that t

Applied Electromagnetics and Electromagnetic Compatibility deals with Radio Frequency Interference (RFI), which is the reception of undesired radio signals originating from digital electronics and electronic equipment. With today's rapid development of radio communication, these undesired signals as well as signals due to natural phenomena such as lightning, sparking, and others are becoming increasingly important in the general area of Electro Magnetic Compatibility (EMC). EMC can be defined as the capability of some electronic equipment or system to be operated at desired levels of performance in a given electromagnetic environment without generating EM emissions unacceptable to other systems operating in the vicinity.

This comprehensive text on antenna theory explains the origin of radiation and discusses antenna parameters in-depth

This book offers an in-depth coverage of fundamental antenna theory, and shows how to apply this in practice. The author discusses electromagnetic radiation and antenna characteristics such as impedance, radiation pattern, polarization, gain and efficiency. In addition, the book provides readers with the necessary tools for analyzing complex antennas and for designing new ones. Furthermore, a refresher chapter on vector algebra, including gradient, divergence and curl operation is included. Throughout the book ample examples of employing the derived theory are given and all chapters are concluded with problems, giving the reader the opportunity to test his/her acquired knowledge. Key Features: Covers the mathematical and physical background that is needed to understand electromagnetic radiation and antennas Discusses the origin of radiation and provides an in-depth explanation of antenna parameters Explores all the necessary steps in antenna analysis allowing the reader to understand and analyze new antenna structures Contains a chapter on vector algebra, which is often a stumbling block for learners in this field Includes examples and a list of problems at the end of each chapter Accompanied by a website containing solutions to the problems (for instructors) and CST modeling files (www.wiley.com/go/visser_antennas This book will serve as an invaluable reference for advanced (last year Bsc, Msc) students in antenna and RF engineering, wireless communications, electrical engineering, radio engineers and other professionals needing a reference on antenna theory. It will also be of interest to advanced/senior radio engineers, designers and developers.

Practical, concise and complete reference for the basics of modern antenna design Antennas: from Theory to Practice discusses the basics of modern antenna design and theory. Developed specifically for engineers and designers who work with radio communications, radar and RF engineering, this book offers practical and hands-on treatment of antenna theory and techniques, and provides its readers the skills to analyse, design and measure various antennas. Key features: Provides thorough coverage on the basics of transmission lines, radio waves and propagation, and antenna analysis and design Discusses industrial standard design software tools, and antenna measurement equipment, facilities and techniques Covers electrically small antennas, mobile antennas, UWB antennas and new materials for antennas Also discusses reconfigurable antennas, RFID antennas, Wide-band and multi-band antennas, radar antennas, and MIMO antennas Design examples of various antennas are provided Written in a practical and concise manner by authors who are experts in antenna design, with experience from both academia and industry This book will be an invaluable resource for engineers and designers working in RF engineering, radar and radio communications, seeking a comprehensive and practical introduction to the basics of antenna design. The book can also be used as a textbook for advanced students entering a profession in this field.

"...Ben has been the world-wide guru of this technology, providingsupport to applications of all types. His genius lies in handlingthe extremely complex mathematics, while at the same time seeingthe practical matters involved in applying the results. As thisbook clearly shows, Ben is able to relate to novices interested inusing frequency selective surfaces and to explain technical detailsin an understandable way, liberally spiced with his special brandof humor... Ben Munk has written a book that represents the epitomeof practical understanding of Frequency Selective Surfaces. Hedeserves all honors that might befall him for this achievement."-William F. Bahret. Mr. W. Bahret was with the United States Air Force but is nowretired. From the early 50s he sponsored numerous projectsconcerning Radar Cross Section of airborne platforms in particularantennas and absorbers. Under his leadership grew many of theconcepts used extensively today, as for example the metallicradome. In fact, he is by many considered to be the father ofstealth technology. "This book compiles under one cover most of Munk's research overthe past three decades. It is woven with the physical insight thathe has gained and further developed as his career has grown. Benuses mathematics to whatever extent is needed, and only as needed.This material is written so that it should be useful to engineerswith a background in electromagnetics. I strongly recommend thisbook to any engineer with any interest in phased arrays and/orfrequency selective surfaces. The physical insight that may begained from this book will enhance their ability to treatadditional array problems of their own." -Leon Peters, Jr. Professor Leon Peters, Jr., was a professor at the Ohio StateUniversity but is now retired. From the early sixties he worked on,among many other things, RCS problems involving antennas andabsorbers. This book presents the complete derivation of the Periodic Methodof Moments, which enables the reader to calculate quickly andefficiently the transmission and reflection properties ofmulti-layered Frequency Selective Surfaces comprised of either wireand/or slot elements of arbitrary shape and located in a stratifiedmedium. However, it also gives the reader the tools to analyzemulti-layered FSS's leading to specific designs of the veryimportant Hybrid Radome, which is characterized by constant bandwidth with angle of incidence and polarization. Further, itinvestigates in great detail bandstop filters with large as well

asnarrow bandwidth (dichroic surfaces). It also discusses for thefirst time, lossy elements used in producing Circuit Analogabsorbers. Finally, the last chapter deals with power breakdown ofFSS's when exposed to pulsed signals with high peak power. The approach followed by most other presentations simply consistsof expanding the fields around the FSS, matching the boundaryconditions and writing a computer program. While this enables theuser to obtain calculated results, it gives very little physicalinsight and no help in how to design actual multi-layered FSS's. Incontrast, the approach used in this title analyzes all curves ofdesired shapes. In particular, it discusses in great detail how toproduce radomes made of FSS's located in a stratified medium(Hybrid Radomes), with constant band width for all angles ofincidence and polarizations. Numerous examples are given of greatpractical interest. More specifically, Chapter 7 deals with thetheory and design of bandpass radomes with constant bandwidth andflat tops. Examples are given for mono-, bi- and tri-planardesigns. Chapter 8 deals with bandstop filters with broad as wellas narrow bandwidth. Chapter 9 deals with multi-layered FSS oflossy elements, namely the so-called Circuit Analog Absorbers,designed to yield outstanding absorption with more than a decade ofbandwidth. Features material previously labeled as classified by the UnitedStates Air Force.

Transformer Engineering: Design, Technology, and Diagnostics, Second Edition helps you design better transformers, apply advanced numerical field computations more effectively, and tackle operational and maintenance issues. Building on the bestselling Transformer Engineering: Design and Practice, this greatly expanded second edition also emphasizes diagnostic aspects and transformer-system interactions. What’s New in This Edition Three new chapters on electromagnetic fields in transformers, transformer-system interactions and modeling, and monitoring and diagnostics An extensively revised chapter on recent trends in transformer technology An extensively updated chapter on short-circuit strength, including failure mechanisms and safety factors A step-by-step procedure for designing a transformer Updates throughout, reflecting advances in the field A blend of theory and practice, this comprehensive book examines aspects of transformer engineering, from design to diagnostics. It thoroughly explains electromagnetic fields and the finite element method to help you solve practical problems related to transformers. Coverage includes important design challenges, such as eddy and stray loss evaluation and control, transient response, short-circuit withstand and strength, and insulation design. The authors also give pointers for further research. Students and engineers starting their careers will appreciate the sample design of a typical power transformer. Presenting in-depth explanations, modern computational techniques, and emerging trends, this is a valuable reference for those working in the transformer industry, as well as for students and researchers. It offers guidance in optimizing and enhancing transformer design, manufacturing, and condition monitoring to meet the challenges of a highly competitive market.

This book introduces Radio Frequency Propagation to a broad audience. The author blends theory and practice to bring readers up-to-date in key concepts, underlying principles and practical applications of wireless communications. The presentation is designed to be easily accessible, minimizing mathematics and maximizing visuals.

This is an exciting revision of John Kraus' classic book Antennas, which has been long known as the "Antenna Bible". A new co-author, Ronald Marhefka has joined the author team for this revison. Many new, modern applications have been added-thus the title change to Antennas with All Applications. As well, the references have been updated to include recent additons to the literature. Additionally, the book has been reorganized to make it more user-friendly for both students and professionals. The book now covers the fundamentals of various antennas and concepts in the first half of the book and then gets into more details on those same topics later in the book. This allows a one-semester course to just cover the fundamentals if desired, and a professional to focus on advanced topics if he or she wants.

A clearly written introduction to the key physical and engineering principles of electromagnetics, first published in 2000. ElectromagneticsWith ApplicationsMcGraw-Hill Science, Engineering & Mathematics

Pozar's new edition of Microwave Engineering includes more material on active circuits, noise, nonlinear effects, and wireless systems. Chapters on noise and nonlinear distortion, and active devices have been added along with the coverage of noise and more material on intermodulation distortion and related nonlinear effects. On active devices, there's more updated material on bipolar junction and field effect transistors. New and updated material on wireless communications systems, including link budget, link margin, digital modulation methods, and bit error rates is also part of the new edition. Other new material includes a section on transients on transmission lines, the theory of power waves, a discussion of higher order modes and frequency effects for microstrip line, and a discussion of how to determine unloaded.

A textbook for a senior undergraduate course. A comprehensive explanation of electromagnetic theory and its applications to engineering, focusing on communications system, the major uses of high frequency electrical signals, radio waves, and fiber optics. Annotation copyright by Book News, Inc., Portland, OR

Discover an innovative and fresh approach to teaching classical electromagnetics at a foundational level Introduction to Electromagnetic Waves with Maxwell’s Equations delivers an accessible and practical approach to teaching the wellknown topics all electromagnetics instructors must include in their syllabus. Based on the author’s decades of experience teaching the subject, the book is carefully tuned to be relevant to an audience of engineering students who have already been exposed to the basic curricula of linear algebra and multivariate calculus. Forming the backbone of the book, Maxwell’s equations are developed step-by-step in consecutive chapters, while related electromagnetic phenomena are discussed simultaneously. The author presents accompanying mathematical tools alongside the material provided in the book to assist students with retention and comprehension. The book contains over 100 solved problems and examples with stepwise solutions offered alongside them. An accompanying website provides readers with additional problems and solutions. Readers will also benefit from the inclusion of: A thorough introduction to preliminary concepts in the field, including scalar and vector fields, cartesian coordinate systems, basic vector operations, orthogonal coordinate systems, and electrostatics, magnetostatics, and electromagnetics An exploration of Gauss’ Law, including integral forms, differential forms, and boundary conditions A discussion of Ampere’s Law, including integral and differential forms and Stoke’s Theorem An examination of Faraday’s Law, including integral and differential forms and the Lorentz Force Law Perfect for third-and fourth-year undergraduate students in electrical engineering, mechanical engineering, applied maths,

physics, and computer science, Introduction to Electromagnetic Waves with Maxwell’s Equations will also earn a place in the libraries of graduate and postgraduate students in any STEM program with applications in electromagnetics.

Fundamentals of Optical Fibers, Second Edition offers readers a timely and consistent introduction to the fundamental principles of light propagation in fibers. In it, the author reviews, in depth, fundamental wave guiding concepts, the influence of various fiber structures and materials on light transmission, nonlinear light propagation effects occurring in fibers, and various measurement techniques. Since the chief application of optical fibers is in communication systems, throughout the book the focus is on topics, which pertain to that domain.

The Second Edition of this book, while retaining the contents and style of the first edition, continues to fulfil the require-ments of the course curriculum in Electromagnetic Theory for the undergraduate students of electrical engineering, electronics and telecommunication engineering, and electro-nics and communication engineering. The text covers the modules of the syllabus corresponding to vectors and fields, Maxwell’s equations in integral form and differential form, wave propagation in free space and material media, transmission line analysis and waveguide principles. It explains physical and mathematical aspects of the highly complicated electromagnetic theory in a very simple and lucid manner. This new edition includes : • Two separate chapters on Transmission Line and Waveguide • A thoroughly revised chapter on Plane Wave Propagation • Several new solved and unsolved numerical problems asked in various universities’ examinations

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.

Introductory Experiments; Mechanics; Molecular Physics; Electricity and Magnetism; Optics and Atomic Physics; Condensed Matter Physics; Semiconductor Physics; Applied Physics; Nobel Prize Experiments; Student Projects;

The Electrical Engineer's Handbook is an invaluable reference source for all practicing electrical engineers and students. Encompassing 79 chapters, this book is intended to enlighten and refresh knowledge of the practicing engineer or to help educate engineering students. This text will most likely be the engineer’s first choice in looking for a solution; extensive, complete references to other sources are provided throughout. No other book has the breadth and depth of coverage available here. This is a must-have for all practitioners and students! The Electrical Engineer's Handbook provides the most up-to-date information in: Circuits and Networks, Electric Power Systems, Electronics, Computer-Aided Design and Optimization, VLSI Systems, Signal Processing, Digital Systems and Computer Engineering, Digital Communication and Communication Networks, Electromagnetics and Control and Systems. About the Editor-in-Chief... Wai-Kai Chen is Professor and Head Emeritus of the Department of Electrical Engineering and Computer Science at the University of Illinois at Chicago. He has extensive experience in education and industry and is very active professionally in the fields of circuits and systems. He was Editor-in-Chief of the IEEE Transactions on Circuits and Systems, Series I and II, President of the IEEE Circuits and Systems Society and is the Founding Editor and Editor-in-Chief of the Journal of Circuits, Systems and Computers. He is the recipient of the Golden Jubilee Medal, the Education Award, and the Meritorious Service Award from the IEEE Circuits and Systems Society, and the Third Millennium Medal from the IEEE. Professor Chen is a fellow of the IEEE and the American Association for the Advancement of Science. * 77 chapters encompass the entire field of electrical engineering. * THOUSANDS of valuable figures, tables, formulas, and definitions. * Extensive bibliographic references.