Principles Of Electromagnetics Oup

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
Professor Jean Van Bladel, an eminent researcher
and educator in fundamental electromagnetic theory
and its application in electrical engineering, has
updated and expanded his definitive text and
reference on electromagnetic fields to twice its
original content. This new edition incorporates the
latest methods, theory, formulations, and
applications that relate to today's technologies. With
an emphasis on basic principles and a focus on
electromagnetic formulation and analysis,
Electromagnetic Fields, Second Edition includes
detailed discussions of electrostatic fields, potential
theory, propagation in waveguides and unbounded
space, scattering by obstacles, penetration through
apertures, and field behavior at high and low
frequencies.
This is a book about ideas, patterns, and broad

unifying themes in physics. Through the author's perspective, based on decades in teaching and research, it provides a view of how physicists understand the physical world around us. Eight broad themes are grouped into chapters that start with simple examples accessible to non-physics readers. Each chapter then proceeds to further and deeper sophistication, these more advanced topics also connected to the openingillustrations on the basis of the same patterns and principles. Together they provide a unified view of the subject to supplement what students learn in undergraduate and graduate courses.

International humanitarian law is the law that governs the conduct of participants during armed conflict. This branch of law aims to regulate the means and methods of warfare as well as to provide protections to those who do not, or who no longer, take part in the hostilities. It is one of the oldest branches of international law and one of enduring relevance today. The Oxford Guide to International Humanitarian Law provides a practical yet sophisticated overview of this important area of law. Written by a stellar line up of contributors, drawn from those who not only have extensive practical experience but who are also regarded as leading scholars of the subject, the text offers a comprehensive and authoritative exposition of the field. The Guide provides professionals and

advanced students with information and analysis of
sufficient depth to enable them to perform their tasks
with understanding and confidence. Each chapter
illuminates how the law applies in practice, but does
not shy away from the important conceptual issues
that underpin how the law has developed. It will
serve as a first port of call and a regular reference
work for those interested in international
humanitarian law.
This landmark monograph presents the most recent
mathematical developments in the analysis of
ionospheric distortions of SAR images and offers
innovative new strategies for their mitigation. As a
prerequisite to addressing these topics, the book
also discusses the radar ambiguity theory as it
applies to synthetic aperture imaging and the
propagation of radio waves through the ionospheric
plasma, including the anisotropic and turbulent
cases. In addition, it covers a host of related
subjects, such as the mathematical modeling of
extended radar targets (as opposed to point-wise
targets) and the scattering of radio waves off those
targets, as well as the theoretical analysis of the start-
stop approximation, which is used routinely in SAR
signal processing but often without proper
justification. The mathematics in this volume is clean
and rigorous – no assumptions are hidden or
ambiguously stated. The resulting work is truly
interdisciplinary, providing both a comprehensive

and thorough exposition of the field, as well as an accurate account of a range of relevant physical processes and phenomena. The book is intended for applied mathematicians interested in the area of radar imaging or, more generally, remote sensing, as well as physicists and electrical/electronic engineers who develop/operate spaceborne SAR sensors and perform the data processing. The methods in the book are also useful for researchers and practitioners working on other types of imaging. Moreover, the book is accessible to graduate students in applied mathematics, physics, engineering, and related disciplines. Praise for Transionospheric Synthetic Aperture Imaging: "I perceive that this text will mark a turning point in the field of synthetic aperture radar research and practice. I believe this text will instigate a new era of more rigorous image formation relieving the research, development and practitioner communities of inconsistent physical assumptions and numerical approaches." – Richard Albanese, Senior Scientist, Albanese Defense and Energy Development LLC Thoroughly updated and revised, this third edition of Sadiku's Elements of Electromagnetics is designed for the standard sophomore/junior level electromagnetics course taught in departments of electrical engineering. It takes a two-semester approach to fundamental concepts and applications in electromagnetics beginning with vecotr analysis-

which is then applied throughout the text. A balanced presentation of time-varying fields and static fields prepares students for employment in today's industrial and manufacturing sectors. Mathematical theorems are treated separately from physical concepts. Students, therefore, do not need to review any more mathematics than their level of proficiency requires. Sadiku is well-known for his excellent pedagogy, and this edition refines his approach even further. Student-oriented pedagogy comprises: chapter introductions showing how the forthcoming material relates to the previous chapter, summaries, boxed formulas, and multiple choice review questions with answers allowing students to gauge their comprehension. Many new problems have been added throughout the text, as well as a new chapter on "Modern Topics" covering microwaves, electromagnetic interference and compatability, and optical fibers. This book is appropriate for sophomore/junior level students in electrical engineering. It will also be accompanied by a Solutions Manual, available free to adopters of the main text.

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.

Quantum Field Theory has become the universal language of most modern theoretical physics. This introductory textbook shows how this beautiful theory offers the correct mathematical framework to describe and understand the fundamental interactions of elementary particles. The book begins with a brief reminder of basic classical field theories, electrodynamics and general relativity, as well as their symmetry properties, and proceeds with the principles of quantisation following Feynman's path integral approach. Special care is used at every step to illustrate the correct mathematical formulation of the underlying assumptions. Gauge theories and the problems encountered in their quantisation are discussed in detail. The last chapters contain a full description of the Standard Model of particle physics and the attempts to go beyond it, such as grand unified theories and supersymmetry. Written for advanced undergraduate and beginning graduate students in physics and mathematics, the book could also serve as a reference for active researchers in the field.

It is with great pleasure that we present to you a collection of over 200 high quality technical papers from more than 10 countries that were presented at the Biomed 2008. The papers cover almost every aspect of Biomedical Engineering, from artificial intelligence to biomechanics, from medical informatics to tissue engineering. They also come from almost all parts of the globe, from America to Europe, from

the Middle East to the Asia-Pacific. This set of papers presents to you the current research work being carried out in various disciplines of Biomedical En- neering, including new and innovative researches in emerging areas. As the organizers of Biomed 2008, we are very proud to be able to come-up with this publication. We owe the success to many individuals who worked very hard to achieve this: members of the Technical Committee, the Editors, and the Inter- tional Advisory Committee. We would like to take this opportunity to record our thanks and appreciation to each and every one of them. We are pretty sure that you will find many of the papers illuminating and useful for your own research and study. We hope that you will enjoy yourselves going through them as much as we had enjoyed compiling them into the proceedings. Assoc. Prof. Dr. Noor Azuan Abu Osman Chairperson, Organising Committee, Biomed 2008
This book develops the theory of electromagnetic (EM) precursors to seaquakes (i.e. underwater earthquakes) and tsunamis, including the sequential stages of the transformation of a weak seismic mechanical excitation of the sea bottom into EM signals in the atmosphere. It further examines the relationship between geophysics and biophysics, using appropriate mathematical support, and a new model of the magnetic location of the epicenter of a possible land earthquake is described, as well as a block- scheme of the multidisciplinary multilevel seaquake monitoring complex. Also discussed are measured changes of brain bioelectric activity and heart functioning under the influence of moderate geomagnetic storms. Written for researchers and specialists (e.g. upper level undergraduates, postgraduates, scientists) in mathematical, computational, geophysical, biophysical, geodynamical, seismological and prognostic disciplines, this book provides multidisciplinary data and analytical tools supporting the theory and practice of

seismic prognosis, promoting further understanding of novel marine and land monitoring systems.

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

Taking a vector-first approach, this text provides a balanced presentation of a host of topics including electrostatics, magnetostatics, fields, waves, and applications like transmission lines, waveguides, and antennas. The new edition includes new Application Notes detailing real-worldconnections, a revised math pre-test for professors to assess students' mathematical skills, and new and updated problems.

This textbook is intended for undergraduate and graduate students taking an intermediate or advanced course in electromagnetism. It methodically develops the theory of electromagnetism, paying special attention to its links with mechanics and thermodynamics, and contains 50 example problems, together with fully solved 225 exercises, on all aspects of electromagnetism and its various applications.

Principles of Optics: Electromagnetic Theory of Propagation, Interference and Diffraction of Light, Sixth Edition covers optical phenomenon that can be treated with Maxwell's phenomenological theory. The book is comprised of 14 chapters that discuss various topics about optics, such as geometrical theories, image forming instruments, and optics

of metals and crystals. The text covers the elements of the theories of interference, interferometers, and diffraction. The book tackles several behaviors of light, including its diffraction when exposed to ultrasonic waves. The selection will be most useful to researchers whose work involves understanding the behavior of light.

The basic objective of this highly successful text--to present the concepts of electromagnetics in a style that is clear and interesting to read--is more fully-realized in this Second Edition than ever before.Thoroughly updated and revised, this two-semester approach to fundamental concepts and applications in electromagnetics begins with vector analysis--which is then applied throughout the text. A balanced presentation of time-varying fields and static fields prepares students for employment in today's industrial and manufacturing sectors.Mathematical theorems are treated separately from physical concepts.Students, therefore, do not need to review any more mathematics than their level of proficiency requires. Sadiku is well-known for his excellent pedagogy, and this edition refines his approach even further. Student-oriented pedagogy comprises: chapter introductions showing how the forthcoming material relates to the previous chapter, summaries, boxed formulas, and multiple choice review questions with answers allowing students to gauge their comprehension. Many new problems have been added throughout the text.

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

A spherical actuator is a novel electric device that can achieve 2/3-DOF rotational motions in a single joint with electric power input. It has advantages

such as compact structure, low mass/moment of inertia, fast response and non-singularities within the workspace. It has promising applications in robotics, automobile, manufacturing, medicine and aerospace industry. This is the first monograph that introduces the research on spherical actuators systematically. It broadens the scope of actuators from conventional single-axis to multi-axis, which will help both beginners and researchers to enhance their knowledge on electromagnetic actuators. Generic analytic modeling methods for magnetic field and torque output are developed, which can be applied to the development of other electromagnetic actuators. A parametric design methodology that allows fast analysis and design of spherical actuators for various applications is proposed. A novel non-contact high-precision 3-DOF spherical motion sensing methodology is developed and evaluated with experiments, which shows that it can achieve one order of magnitude higher precision than conventional methods. The technologies of nondimensionalization and normalization are introduced into magnetic field analysis the first time, and a benchmark database is established for the reference of other researches on spherical actuators. In this book, Dr. Matthew N. O. Sadiku has shared the amazing story of how he rose from his humble beginnings in Nigeria. He described how he was raised in a Muslim home. After his conversion to

Christianity, his drive led him to relocate to the
United States for advanced degrees. He has
provided a text that is lively from beginning to the
end. The book provides a good understanding of his
life, thought, and work. You will learn about what it
takes to be a mover and shaker for God as you see
Sadiku traverse the nation, rising to success in the
academic and publishing worlds. The book is an
essential reading for those interested in the genesis
of greatness.

Electromagnetic complex media are artificial
materials that affect the propagation of
electromagnetic waves in surprising ways not usually
seen in nature. Because of their wide range of
important applications, these materials have been
intensely studied over the past twenty-five years,
mainly from the perspectives of physics and
engineering. But a body of rigorous mathematical
theory has also gradually developed, and this is the
first book to present that theory. Designed for
researchers and advanced graduate students in
applied mathematics, electrical engineering, and
physics, this book introduces the electromagnetics of
complex media through a systematic, state-of-the-art
account of their mathematical theory. The book
combines the study of well posedness,
homogenization, and controllability of Maxwell
equations complemented with constitutive relations
describing complex media. The book treats

deterministic and stochastic problems both in the frequency and time domains. It also covers computational aspects and scattering problems, among other important topics. Detailed appendices make the book self-contained in terms of mathematical prerequisites, and accessible to engineers and physicists as well as mathematicians. 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. Introduces CEM methods, applying the codes that implement them to real-world engineering problems. Effective medium theory dates back to the early days of the theory of electricity. Faraday 1837 proposed one of the earliest models for a composite metal-insulator dielectric, and around 1870 Maxwell and later Garnett (1904) developed models to describe a composite or mixed material medium. The subject has been developed considerably since and while the results are useful for predicting materials performance, the theory can also be used in a wide range of problems in physics and materials engineering. This book develops the topic of effective medium theory by bringing together the essentials of both the static and the dynamical theory. Electromagnetic systems are thoroughly dealt with, as well as related areas such as the CPA theory of alloys, liquids, the density functional theory etc, with applications to ultrasonics, hydrodynamics, superconductors, porous media and others, where the unifying aspects of the effective medium concept

are emphasized. In this new second edition two further chapters have been added to deal with the theory of electrolytes and the exciting frontiers in electromagnetic and related areas of cloaking research all from the perspective of effective medium theory. In addition, a new appendix with notes on the example problems makes this an ideal graduate level text book and research reference source.

This text applies engineering science and technology to biological cells and tissues that are electrically conducting and excitable. It describes the theory and a wide range of applications in both electric and magnetic fields.

This textbook is intended for undergraduate and graduate students taking an intermediate or advanced course in electromagnetism. It presents electromagnetism as a classical theory, based, like mechanics, on principles that are independent of the atomic constitution of matter. This book isunique amongst electrodynamics texts in its treatment of the precise manner in which electromagnetism is linked to mechanics and thermodynamics. Thus a clear distinction is maintained between such concepts as field and force, or radiation and heat. Applications include radiation from chargedparticles, electromagnetic wave propagation and guided waves, thermoelectricity, magnetohydrodynamics, piezoelectricity, ferroelectricity, paramagnetic cooling, ferromagnetism and superconductivity.

There are 225 worked examples of dynamical and thermal effects of electromagnetic fields, and ofeffects resulting from the motion of bodies. The concise, methodological approach of this book will be valuable to students and will make it of special interest to tutors and lecturers.

Electromagnetics for Electrical Machines offers a comprehensive yet accessible treatment of the linear theory of electromagnetics and its application to the design of electrical machines. Leveraging valuable classroom insight gained by the authors during their impressive and ongoing teaching careers, this text emphasizes concepts rather than numerical methods, providing presentation/project problems at the end of each chapter to enhance subject knowledge. Highlighting the essence of electromagnetic field (EMF) theory and its correlation with electrical machines, this book: Reviews Maxwell's equations and scalar and vector potentials Describes the special cases leading to the Laplace, Poisson's, eddy current, and wave equations Explores the utility of the uniqueness, generalized Poynting, Helmholtz, and approximation theorems Discusses the Schwarz–Christoffel transformation, as well as the determination of airgap permeance Addresses the skin effects in circular conductors and eddy currents in solid and laminated iron cores Contains examples relating to the slot leakage inductance of rotating electrical

machines, transformer leakage inductance, and
theory of hysteresis machines Presents analyses of
EMFs in laminated-rotor induction machines, three-
dimensional field analyses for three-phase solid rotor
induction machines, and more Electromagnetics for
Electrical Machines makes an ideal text for
postgraduate-level students of electrical engineering,
as well as of physics and electronics and
communication engineering. It is also a useful
reference for research scholars concerned with
problems involving electromagnetics.
Elements of Electromagnetics is designed for a first
course in Electromagnetics for students towards an
electrical engineering degree. This core course is
usually required of all ECE majors. A split occurs in
the market between professors who present vectors
first and professors who present transmission lines
first, Sadiku's text takes the vectors-first approach.
The 5th edition is primarily focused on adding new
and revised homework problems, particularly
problems that focus on real-world practical
examples. MATLAB exercises have been
incorporated into each chapter for extended practice.
Theintensive review and accuracy checking process
conductedin the 4th edition will be highlighted in the
preface.
"Electromagnetics" (ISSN: 0272-6343) is a journal
published eight times a year by Taylor and Francis
Group, an international academic publisher. A

sample copy, instructions for authors, subscription details, and the tables of contents of previous issues are available online. The journal publishes research on electromagnetics. Topics include developments in electromagnetic theory, high frequency techniques, and scattering and diffraction. Taylor and Francis Group provides the information.

For graduate students and researchers, this self contained text provides a carefully structured, coherent, and comprehensive treatment of the mathematical modelling in electromagnetism of continuous media. The authors provide a systematic review of known subjects along with many original results. Part I reviews basic notions and approaches in electromagnetism (Maxwell's equations, Green's functions, harmonic fields, dispersive effects) and emphasizes the physical motivation for the modelling of non-conventional materials. The frequency-dependent properties (such as conductivity, polarizability, and magnetizability), which enter wave diffraction and dispersion, are shown, and these lead to a discussion of models of materials with fading memory in the time domain. Part II develops the thermodynamics of electromagnetic and thermoelectromagnetic materials with memory and provides a systematic account of thermodynamic restrictions. Existence, uniqueness and stability problems are investigated. Also, variational formulations and wave propagation solution are

established. Part III is devoted to more involved models which are motivated by the interest in materials and structures with non-conventional properties. The mathematical modelling deals with non-linearity, non-locality and hysteresis. In non-linear materials attention is focussed on the generation of harmonics and in discontinuity waves. Non-locality is examined in a general way and hence is applied to superconductivity. Hysteresis is developed for magnetism. A review of known schemes is given along with new results about the modelling of hysteresis loops. The wide application of technologies in new mechanical, electronic and biomedical systems calls for materials and structures with non-conventional properties (e.g materials with 'memory'). Of equal importance is the understanding of the physical behaviour of these materials and consequently developing mathematical modelling techniques for prediction. Includes appendices that include some properties of Bessel functions, Fourier transforms and Sobolev spaces, compact operators and eigenfunctions, differential operators in curvilinear coordinates, and finite formulation of electromagnetism.

"Quantum Theory for Chemical Applications (QTCA) Quantum theory, or more specifically, quantum mechanics is endlessly fascinating, curious & strange, and often considered to be difficult to learn. It is true that quantum mechanics is a mathematical

theory. Its scope, its predictions, the wisdom we gain from its results, all these become fully clear only in the context of the relevant equations and calculations. But the study of quantum mechanics is definitely worth the effort, and - as I like to tell my students- it is not rocket science"--
This book discusses many advances in optical physics and is intended mainly for experimentalists. The interaction of electromagnetic radiation with free atoms is introduced using classical or semi-classical calculations wherever possible. Topics discussed include the spontaneous emission of radiation, and atomic beam magnetic resonance experiments. Electricity, Magnetism and Electromagnetic Theory has been designed to meet the needs of BSc (Physics) students as per the UGC Choice Based Credit System. This textbook provides a thorough understanding of the fundamental concepts of electricity, magnetism and electromagnetic theory. Having a problem-solving approach, it covers the entire spectrum of the subject with discussion on topics such as electrostatics, magnetostatics, electromagnetic induction, Maxwell's equations and electromagnetic wave propagation. The concepts are exhaustively presented with numerous examples and figures/diagrams which would help the students in analysing and retaining the concepts in an effective manner.
The third edition of Fundamentals of Photonics

features alogical blend of theory and applications, coverage includesdetailed accounts of the primary theories of light, including rayoptics, wave optics, electromagnetic optics, and photon optics, aswell as the interaction of light with matter, and the theory ofsemiconductor materials and their optical properties. Photonics technology has been continuing to develop at a rapidpace since the publication of the second edition. In the new,full color ThirdEdition of this landmark book, two newchapters have been written to cover the advances in the field ofphotonics. All the chapters have been updated and many newsections have been added. References to book and articleshave been thoroughly updated, and much of the material hasbeen rewritten to improve readability. New problemsand exercises are provided and, once again, a solutions manualfor the exercises is available to instructors. New to this edition is an electronic version with animatedillustrations for better comprehension. MICROWAVE INTEGRATED CIRCUIT COMPONENTS DESIGN THROUGH MATLAB® This book teaches the student community microwave integrated circuit component design through MATLAB®, helping the reader to become conversant in using codes and, thereafter, commercial software for verification purposes only. Microwave circuit theory and its comparisons, transmission line networks, S-parameters, ABCD parameters, basic design parameters of planar transmission lines (striplines, microstrips, slot lines, coplanar waveguides, finlines), filter theory, Smith chart,

inverted Smith chart, stability circles, noise figure circles and microwave components, are thoroughly explained in the book. The chapters are planned in such a way that readers get a thorough understanding to ensure expertise in design. Aimed at senior undergraduates, graduates and researchers in electrical engineering, electromagnetics, microwave circuit design and communications engineering, this book: • Explains basic tools for design and analysis of microwave circuits such as the Smith chart and network parameters • Gives the advantage of realizing the output without wiring the circuit by simulating through MATLAB code • Compares distributed theory with network theory • Includes microwave components, filters and amplifiers S. Raghavan was a Senior Professor (HAG) in the Department of Electronics and Communication Engineering, National Institute of Technology (NIT), Trichy, India and has 39 years of teaching and research experience at the Institute. His interests include: microwave integrated circuits, RF MEMS, Bio MEMS, metamaterial, frequency selective surfaces (FSS), substrate integrated waveguides (SIW), biomedical engineering and microwave engineering. He has established state-of-the-art MICs and microwave research laboratories at NIT, Trichy with funding from the Indian government. He is a Fellow/Senior Member in more than 24 professional societies including: IEEE (MTT, EMBS, APS), IETE, IEI, CSI, TSI, ISSS, ILA and ISOI. He is twice a recipient of the Best Teacher Award, and has received the Life Time Achievement Award, Distinguished Professor of Microwave Integrated Circuit Award and Best Researcher Award.

This book deals with electromagnetic theory and its applications at the level of a senior-level undergraduate course for science and engineering. The basic concepts and mathematical analysis are clearly developed and the important applications are analyzed. Each chapter contains

numerous problems ranging in difficulty from simple applications to challenging. The answers for the problems are given at the end of the book. Some chapters which open doors to more advanced topics, such as wave theory, special relativity, emission of radiation by charges and antennas, are included. The material of this book allows flexibility in the choice of the topics covered. Knowledge of basic calculus (vectors, differential equations and integration) and general physics is assumed. The required mathematical techniques are gradually introduced. After a detailed revision of time-independent phenomena in electrostatics and magnetism in vacuum, the electric and magnetic properties of matter are discussed. Induction, Maxwell equations and electromagnetic waves, their reflection, refraction, interference and diffraction are also studied in some detail. Four additional topics are introduced: guided waves, relativistic electrodynamics, particles in an electromagnetic field and emission of radiation. A useful appendix on mathematics, units and physical constants is included. Contents 1. Prologue. 2. Electrostatics in Vacuum. 3. Conductors and Currents. 4. Dielectrics. 5. Special Techniques and Approximation Methods. 6. Magnetic Field in Vacuum. 7. Magnetism in Matter. 8. Induction. 9. Maxwell's Equations. 10. Electromagnetic Waves. 11. Reflection, Interference, Diffraction and Diffusion. 12. Guided Waves. 13. Special Relativity and Electrodynamics. 14. Motion of Charged Particles in an Electromagnetic Field. 15. Emission of Radiation.
Principles of electromagneticsPrinciples Of Electromagnetics, 4Th Edition, International VersionElements of ElectromagneticsOxford Series in Electrical an
This comprehensive account is the first book to cover the development of the Transmission-Line Modelling Method (TLM) since the early 1970's. It starts with basic transmission line theory and works through TLM discrete models of lumped

components, including one-, two-, and three-dimensional problems. The emphasis is on electromagnetics, but other applications such as in thermal and acoustic problems are also covered, making this a valuable resource for practicing engineers as well as students of electrical engineering.