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Introduction to Electromagnetic Theory **Foundations of Electromagnetic Theory Foundations of Electromagnetic Theory** Electromagnetic Theory Electromagnetic Theory FUNDAMENTALS OF ELECTROMAGNETIC THEORY, Second Edition **Understanding Geometric Algebra for Electromagnetic Theory** *Introduction to Electromagnetic Theory Electromagnetic Theory* **The Principles of Electromagnetic Theory Electromagnetic Theory** Electromagnetic Theory for Microwaves and Optoelectronics *An Introduction to Electromagnetic Theory* Electromagnetic Theory and Computation **Theory of Electromagnetic Wave Propagation** *Physics* **The Principles of Electromagnetic Theory and of Relativity Shielding of Electromagnetic Waves** Mathematical Methods of Electromagnetic Theory **Electromagnetic Waves** *Field Theory of Guided Waves* **Electromagnetic Theory Electromagnetic Theory** Theory of Reflection of Electromagnetic and Particle Waves **Electromagnetic Theory for Electromagnetic Compatibility Engineers** *Electromagnetic Wave Theory* Electromagnetic Theory *Electromagnetic Theory for Microwaves and Optoelectronics* **Electromagnetic Theory and Applications** *Electromagnetic Theory and Plasmonics for Engineers* **Lectures on Electromagnetic Theory Elements of Electromagnetic Theory Electromagnetic Theory of Gratings** *Principles of Optics* **Intermediate Electromagnetic Theory Electromagnetic Theory** Mathematical Foundations for Electromagnetic Theory *Electromagnetic Theory of Gratings* Principles of electromagnetics Electromagnetic Field Theory

Theory of Electromagnetic Wave Propagation Aug 20 2021 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.
Lectures on Electromagnetic Theory Apr 03 2020
Elements of Electromagnetic Theory Mar 03 2020
Electromagnetic Theory for Electromagnetic Compatibility Engineers Oct 10 2020 Engineers and scientists who develop and install electronic devices and circuits need to have a solid understanding of electromagnetic theory and the electromagnetic behavior of devices and circuits. In particular, they must be well-versed in electromagnetic compatibility, which minimizes and controls the side effects of interconnected electric devices. Designed to entice the practical engineer to explore some worthwhile mathematical methods, and to reorient the theoretical scientist to industrial applications, Electromagnetic Theory for Electromagnetic Compatibility Engineers is based on the author’s courses taught in industrial settings. The book is a mathematically rigorous exposition of electromagnetic theory with applications in electromagnetic compatibility and high-speed digital design. The topics—ranging from Maxwell's theory and multi-conductor transmission line theory to S-matrix, antenna theory, and dielectric breakdown—were chosen because they have direct relevance to current

electromagnetic compatibility problems encountered in the real world. With many worked examples and problem sets, the book relates the theory to practical experiences faced by practitioners. It is written both for physicists and mathematicians new to the field of electromagnetic compatibility and high-speed digital design, as well as established researchers in the field. It is also designed as an advanced undergraduate textbook for a course in electromagnetic theory.

Electromagnetic Theory of Gratings Jan 31 2020 When I was a student, in the early fifties, the properties of gratings were generally explained according to the scalar theory of optics. The grating formula (which pre dicts the diffraction angles for a given angle of incidence) was established, exper imentally verified, and intensively used as a source for textbook problems. Indeed those grating properties, we can call optical properties, were taught'in a satisfac tory manner and the students were able to clearly understand the diffraction and dispersion of light by gratings. On the other hand, little was said about the "energy properties", i. e. , about the prediction of efficiencies. Of course, the existence of the blaze effect was pointed out, but very frequently nothing else was taught about the efficiency curves. At most a good student had to know that, for an eche lette grating, the efficiency in a given order can approach unity insofar as the diffracted wave vector can be deduced from the incident one by a specular reflexion on the large facet. Actually this rule of thumb was generally sufficient to make good use of the optical gratings available about thirty years ago. Thanks to the spectacular improvements in grating manufacture after the end of the second world war, it became possible to obtain very good gratings with more and more lines per mm. Nowadays, in gratings used in the visible region, a spacing small er than half a micron is common.

FUNDAMENTALS OF ELECTROMAGNETIC THEORY, Second Edition May 29 2022 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

Electromagnetic Theory Oct 29 2019 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.

Electromagnetic Theory for Microwaves and Optoelectronics Jul 07 2020 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 Elec trodynamics" given by the authors at Tsinghua University. More than 300 students from the Department of Electronic Engineering and the Depart ment 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.

Electromagnetic Theory for Microwaves and Optoelectronics Nov 22 2021 This book is a first year graduate text on electromagnetic fields and waves. At the same time it serves as a useful reference for researchers and engineers in the areas of microwaves and optoelectronics. Following the presentation of the physical and mathematical foundations of electromagnetic theory, the book discusses the field analysis of electromagnetic waves confined in material boundaries, or so-called guided waves, electromagnetic waves in the dispersive media and anisotropic media, Gaussian beams and scalar diffraction theory. The theories and methods presented in the book are foundations of wireless engineering, microwave and millimeter wave techniques, optoelectronics and optical fiber communication.

Electromagnetic Theory Jul 31 2022 This book is an electromagnetics classic. Originally published in 1941, it has been used by many generations of students, teachers, and researchers ever since. Since it is classic electromagnetics, every chapter continues to be referenced to this day. This classic reissue contains the entire, original edition first published in 1941. Additionally, two new forewords by Dr. Paul E. Gray (former MIT President and colleague of Dr. Stratton) and another by Dr. Donald G. Dudley, Editor of the IEEE Press Series on E/M Waves on the significance of the book's contribution to the field of Electromagnetics.

Electromagnetic Theory Feb 23 2022

Theory of Reflection of Electromagnetic and Particle Waves Nov 10 2020 This book is written for scientists and engineers whose work involves wave reflec tion or transmission. Most of the book is written in the language of electromagnetic theory, but, as the title suggests, many of the results can be applied to particle waves, specifically to those satisfying the Schr6dinger equation. The mathematical connection between electromagnetic s (or TE) waves and quantum particle waves is established in Chapter 1. The main results for s waves are translated into quantum mechanical language in the Appendix. There is also a close analogy between acoustic waves and electromagnetic p (or TM) waves, as shown in Section 1-4. Thus the book, though primarily intended for those working in optics, microwaves and radio, will be of use to physicists, chemists and electrical engineers studying reflection and transmission of particles at potential barriers. The tech niques developed here can also be used by those working in acoustics, ocean ography and seismology. Chapter 1 is recommended for all readers: it introduces reflection phenomena, defines the notation, and previews (in Section 1-6) the contents of the rest of the book. This preview will not be duplicated here. We note only that applied topics do appear: two examples are the important phenomenon of attenuated total reflection in Chapter 8, and the reflectivity of multilayer dielectric mirrors in Chapter 12. The subject matter is restricted to linear classical electrodynamics in non-magnetic media, and the corresponding particle analogues.

Field Theory of Guided Waves Feb 11 2021 "Co-published with Oxford University Press Long considered the most comprehensive account of electromagnetic theory and analytical methods for solving waveguide and cavity problems, this new Second Edition has been completely revised and thoroughly updated -- approximately 40% new material!Packed with examples and

applications FIELD THEORY OF GUIDED WAVES provides solutions to a large number of practical structures of current interest. The book includes an exceptionally complete discussion of scalar and Dyadic Green functions. Both a valuable review and source of basic information on applied mathematical topics and a hands-on source for solution methods and techniques, this book belongs on the desk of all engineers working in microwave and antenna systems!" Sponsored by: IEEE Antennas and Propagation Society

An Introduction to Electromagnetic Theory Oct 22 2021 First published in 1973, Dr Clemmow's Introduction to Electromagnetic Theory provides a crisp and selective account of the subject. It concentrates on field theory (with the early development of Maxwell's equations) and omits extended descriptions of experimental phenomena and technical applications, though without losing sight of the practical nature of the subject. Rationalized mks units are used and an awareness of orders of magnitude is fostered. Fields in media are discussed from both the macroscopic and microscopic points of view. As befits a mainly theoretical treatment, a knowledge of vector algebra and vector calculus is assumed, the standard results required being summarized in an appendix. Other comparatively advanced mathematical techniques, such as tensors anf those involving Legendre or Bessel functions, are avoided. Problems for solution, some 180 in all, are given at the end of each chapter.

Foundations of Electromagnetic Theory Oct 02 2022 This revision is an update of a classic text that has been the standard electricity and magnetism text for close to 40 years. The fourth edition contains more worked examples, a new design and new problems.Vector Analysis, Electrostatistics, Solution of Electrostatic Problems, The Electrostatic Field in Dielectric Media, Microscopic Theory of Dielectrics, Electrostatic Energy, Electric Current, The Magnetic Field of Steady Currents, Magnetic Properties of Matter, Microscopic Theory of Magnetism, Electromagnetic Induction, Magnetic Energy, Slowly Varying Currents, Physics of Plasmas, Electromagnetic Properties of Superconductors, Maxwell's Equations, Propagation of Monochromatic, Monochromatic Waves in Bounded Regions, Dispersion and Oscillating Fields in Dispersive Media, The Emission of Radiation, Electrodynamics, The Special Theory of Relativity.Intended for those interested in learning the basics of standard electricity and magnetism.

Physics Jul 19 2021 Physics: Introduction to Electromagnetic Theory has been written for the first-year students of B. Tech Engineering Degree Courses of all Indian Universities following the guideline and syllabus as recommended by AICTE. The book, written in a very simple and lucid way, will be very much helpful to reinforce understanding of different aspects to meet the engineering student’s needs. Writing a text-cum manual of this category poses several challenges providing enough content without sacrificing the essentials, highlighting the key features, presenting in a novel format and building informative assessment. This book on engineering physics will prepare students to apply the knowledge of Electromagnetic Theory to tackle 21st century and onward engineering challenges and address the related questions. Some salient features of the book: · Expose basic science to the engineering students to the fundamentals of physics and to enable them to get an insight of the subject · To develop knowledge on critical questions solved and supplementary problems covering all types of medium and advanced level problems in a very logical and systematic manner · Some essential information for the users under the heading “Know more” for clarifying some basic information as well as comprehensive synopsis of formulae for a quick revision of the basic principles · Constructive manner of presentation so that an Engineering degree students can prepare to work in different sectors or in national laboratories at the very forefront of technology

Electromagnetic Theory Dec 24 2021 V. 1. I. Introduction. II. Outline of the electromagnetic connections. Appendix A. The rotational ether in its application to electromagnetism. III. The

elements of vectorial algebra and analysis. IV. Theory of plane electromagnetic waves. Appendix B. A gravitational and electromagnetic analogy -- v. 2. V. Mathematics and the age of the earth. VI. Pure diffusion of electric displacement. Appendix C. Rational units. VII. Electromagnetic waves and generalised differentiation. VIII. Generalised differentiation and divergent series. Appendix. D. On compressional electric or magnetic waves. Appendix E. Dispersion. Appendix F. On the transformation of optical wave surfaces by homogeneous strain. Appendix G. Note of the motion of a charged body at a speed equal to or greater than that of light. Appendix H. Note on electrical waves in sea water. Appendix I. Note on the attenuation of Hertzian waves along wires -- v. 3. IX. Waves from moving sources. Appendix J. Note on the size and inertia of electrons. Appendix K. Vector analysis. X. Waves in the ether.

Electromagnetic Theory and Computation Sep 20 2021 This book explores the connection between algebraic structures in topology and computational methods for 3-dimensional electric and magnetic field computation. The connection between topology and electromagnetism has been known since the 19th century, but there has been little exposition of its relevance to computational methods in modern topological language. This book is an effort to close that gap. It will be of interest to people working in finite element methods for electromagnetic computation and those who have an interest in numerical and industrial applications of algebraic topology.

Electromagnetic Wave Theory Sep 08 2020 This is a first year graduate text on electromagnetic field theory emphasizing mathematical approaches, problem solving and physical interpretation. Examples deal with guidance, propagation, radiation and scattering of electromagnetic waves, metallic and dielectric wave guides, resonators, antennas and radiating structures, Cerenkov radiation, moving media, plasmas, crystals, integrated optics, lasers and fibers, remote sensing, geophysical probing, dipole antennas and stratified media.

Intermediate Electromagnetic Theory Nov 30 2019 This invaluable text has been developed to provide students with more background on the applications of electricity and magnetism, particularly with those topics which relate to current research. For example, waveguides (both metal and dielectric) are discussed more thoroughly than in most texts because they are an important laboratory tool and important components of modern communications. In a sense, this book modernizes the topics covered in the typical course on electricity and magnetism. It provides not only solid background for the student who chooses a field which uses techniques requiring knowledge of electricity and magnetism, but also general background for the physics major.

Electromagnetic Waves Mar 15 2021 Electromagnetism began in the nineteenth century when Faraday showed electricity and magnetism were not distinct, separate phenomena, but interacted when there were time-varying electric or magnetic fields. In Electricity and Magnetism I have shown from first principles how Faraday's experiments led finally to Maxwell's four equations, which with the electromagnetic-force law summarise the whole of classical electromagnetism. This book therefore begins with Maxwell's equations and then uses them to study the propagation and generation of electromagnetic waves. Physics is a subject in which the more advanced the treatment of a topic, the deeper the understanding of common occurrences that is revealed. In studying the solutions of Maxwell's equations you will find answers to such questions as: What is an electro magnetic wave? Why does a radio wave travel through space at the speed of light? How is a radio wave generated? Why does light pass through a straight tunnel when a radio wave does not? How does light travel down a curved glass fibre? It is a remarkable fact that the classical laws of electromagnetism are fully consistent with Einstein's special theory of relativity and this is discussed in Chapter 2. The following four chapters provide solutions of Maxwell's equations for the propagation of electro magnetic waves in free space, in dielectrics,

across interfaces and in conductors respectively.

The Principles of Electromagnetic Theory and of Relativity Jun 17 2021 The aim of this work is to study the principles upon which the classical and relativistic theories of the electromagnetic and gravitational fields are based. Thus, the primary object of the book is to present a simple exposition of Maxwell's theory, of General Relativity and of the link between those two concepts, namely, Special Relativity. In the nineteenth century the notion of a continuous field gradually replaced the idea of action at a distance. The electromagnetic theory that was elaborated at that time covers a very large area of Physics, since it makes possible the description of permanent phenomena, electrostatics and magnetostatics, as well as of variable phenomena. It anticipates the existence of waves, and thereby the theory of light is annexed to this vast domain. It was discovered that Maxwell's equations changed their form when they were related to reference systems associated with two observers in rectilinear uniform motion with respect to each other and each endowed with the absolute time required by classical mechanics. This was a most remarkable fact. Indeed, as soon as attempts were made to verify the results of classical kinematics by means of experiments with the propa gation of light, there arose a whole series of contradictions.

The Principles of Electromagnetic Theory Jan 25 2022

Introduction to Electromagnetic Theory Mar 27 2022 Direct approach covers electrostatics of point charges, distributions of charge, conductors and dielectrics, currents and circuits, Lorentz force and magnetic field, magnetic media, Maxwell equations, more. 228 illustrations. 1963 edition.

Electromagnetic Theory Aug 08 2020 A treatise on the subject of electromagnetic theory. Includes the properties of matter, units, dimensions, field tensors and more.

Mathematical Foundations for Electromagnetic Theory Sep 28 2019 Co-published with Oxford University Press. This highly technical and thought-provoking book stresses the development of mathematical foundations for the application of the electromagnetic model to problems of research and technology. Features include in-depth coverage of linear spaces, Green's functions, spectral expansions, electromagnetic source representations, and electromagnetic boundary value problems. This book will be of interest graduate-level students in engineering, electromagnetics, physics, and applied mathematics as well as to research engineers, physicists, and scientists.

Shielding of Electromagnetic Waves May 17 2021 This book provides a new, more accurate and efficient way for design engineers to understand electromagnetic theory and practice as it relates to the shielding of electrical and electronic equipment. The author starts by defining an electromagnetic wave, and goes on to explain the shielding of electromagnetic waves using the basic laws of physics. This is a new approach for the understanding of EMI shielding of barriers, apertures and seams. It provides a reliable, systematic approach that is easily understood by design engineers for the purpose of packaging the electrical and electronic systems of the future. This book covers both theory and practical application, emphasizing the use of transfer impedance to explain fully the penetration of an electromagnetic wave through an EMI gasketed seam. Accurate methods of testing shielding components such as EMI gaskets, shielded cables and connectors, shielded air vent materials, conductive glass and conductive paint are also covered. Describes in detail why the currently accepted theory of shielding needs improvement. Discusses the penetration of an electromagnetic wave through shielding barrier materials and electromagnetic interference (EMI) gasketed seams. Emphasizes the use of transfer impedance to explain the penetration of an electromagnetic wave through an EMI gasketed seam. The definition of an electromagnetic wave and how it is generated is included. Chapter in the book are included that reinforce the presented theory.

Electromagnetic Theory and Applications Jun 05 2020 Electromagnetic Theory and

Applications aims to serve as a textbook for Physics and Engineering Students. The book covers vector algebra, electrostatics, electric field in dielectrics, boundary value problems, magnetostatics, maxwell equations and wave propagation, waves at an interface, transmission lines and wave guides, retarded potentials and radiating systems.

Electromagnetic Theory Jun 29 2022 The pattern set nearly 70 years ago by Maxwell's Treatise on Electricity and Magnetism has had a dominant influence on almost every subsequent English and American text, persisting to the present day. The Treatise was undertaken with the intention of presenting a connected account of the entire known body of electric and magnetic phenomena from the single point of view of Faraday. Thus, it contained little or no mention of the hypotheses put forward on the Continent in earlier years by Riemann, Weber, Kirchhoff, Helmholtz, and others. It is by no means clear that the complete abandonment of these older theories was fortunate for the later development of physics. So far as the purpose of the Treatise was to disseminate the ideas of Faraday, it was undoubtedly fulfilled; as an exposition of the author's own contributions, it proved less successful. By and large, the theories and doctrines peculiar to Maxwell the concept of displacement current, the identity of light and electromagnetic vibrations appeared there in scarcely greater completeness and perhaps in a less attractive form than in the original memoirs. We find that all the first volume and a large part of the second deal with the stationary state. In fact, only a dozen pages are devoted to the general equations of the electromagnetic field, 18 to the propagation of plane waves and the electromagnetic theory of light, and a score more to magneto-optics, all out of a total of 1,000. The mathematical completeness of potential theory and the practical utility of circuit theory have influenced English and American writers in very nearly the same proportion since that day. Only the original and solitary genius of Heaviside succeeded in breaking away from this course. For an exploration of the fundamental content of Maxwell's equations one must turn again to the Continent. There the work of Hertz, Lorentz, Abraham, and Sommerfeld, together with their associates and successors, has led to a vastly deeper understanding of physical phenomena and to industrial developments of tremendous proportions. The present volume attempts a more adequate treatment of variable electromagnetic fields and the theory of wave propagation. Some attention is given to the stationary state, but for the purpose of introducing fundamental concepts under simple conditions, and always with a view to later application in the general case.

Principles of Optics Jan 01 2020 Revised and updated edition of one of the most famous science books of the twentieth century.

Foundations of Electromagnetic Theory Sep 01 2022

Principles of electromagnetics Jul 27 2019

Electromagnetic Theory Dec 12 2020 In 1865 James Clerk Maxwell (1831 - 1879) published this work, "A Dynamical Theory of the Electromagnetic Field" demonstrating that electric and magnetic fields travel through space as waves moving at the speed of light. He proposed that light is an undulation in the same medium that is the cause of electric and magnetic phenomena. The unification of light and electrical phenomena led him to predict the existence of radio waves. Maxwell is also regarded as the founding scientist of the modern field of electrical engineering. His discoveries helped usher in the era of modern physics, laying the foundation for such fields as special relativity and quantum mechanics. Many physicists regard Maxwell as the 19th-century scientist having the greatest influence on 20th-century physics. His contributions to physics are considered by many to be of the same magnitude as the ones of Isaac Newton and Albert Einstein. In this original treatise Maxwell introduces the best of his mind in seven parts, to include: Part i. introductory. Part ii. on electromagnetic induction. Part iii. general equations of the electromagnetic field. Part iv. mechanical actions in the field. Part v. theory of condensers. Part vi. electromagnetic theory of light. Part vii. calculation of the coefficients of electromagnetic

induction
Electromagnetic Theory of Gratings Aug 27 2019 When I was a student, in the early fifties, the properties of gratings were generally explained according to the scalar theory of optics. The grating formula (which pre dicts the diffraction angles for a given angle of incidence) was established, exper imentally verified, and intensively used as a source for textbook problems. Indeed those grating properties, we can call optical properties, were taught'in a satisfac tory manner and the students were able to clearly understand the diffraction and dispersion of light by gratings. On the other hand, little was said about the "energy properties", i. e. , about the prediction of efficiencies. Of course, the existence of the blaze effect was pointed out, but very frequently nothing else was taught about the efficiency curves. At most a good student had to know that, for an eche lette grating, the efficiency in a given order can approach unity insofar as the diffracted wave vector can be deduced from the incident one by a specular reflexion on the large facet. Actually this rule of thumb was generally sufficient to make good use of the optical gratings available about thirty years ago. Thanks to the spectacular improvements in grating manufacture after the end of the second world war, it became possible to obtain very good gratings with more and more lines per mm. Nowadays, in gratings used in the visible region, a spacing small er than half a micron is common.
Introduction to Electromagnetic Theory Nov 03 2022 Perfect for the upper-level undergraduate physics student, Introduction to Electromagnetic Theory presents a complete account of classical electromagnetism with a modern perspective. Its focused approach delivers numerous problems of varying degrees of difficulty for continued study. The text gives special attention to concepts that are important for the development of modern physics, and discusses applications to other areas of physics wherever possible. A generous amount of detail has been in given in mathematical manipulations, and vectors are employed right from the start.
Understanding Geometric Algebra for Electromagnetic Theory Apr 27 2022 This book aims to disseminate geometric algebra as a straightforward mathematical tool set for working with and understanding classical electromagnetic theory. It's target readership is anyone who has some knowledge of electromagnetic theory, predominantly ordinary scientists and engineers who use it in the course of their work, or postgraduate students and senior undergraduates who are seeking to broaden their knowledge and increase their understanding of the subject. It is assumed that the reader is not a mathematical specialist and is neither familiar with geometric algebra or its application to electromagnetic theory. The modern approach, geometric algebra, is the mathematical tool set we should all have started out with and once the reader has a grasp of the subject, he or she cannot fail to realize that traditional vector analysis is really awkward and even misleading by comparison. Professors can request a solutions manual by email: pressbooks@ieee.org
Mathematical Methods of Electromagnetic Theory Apr 15 2021 This text provides a mathematically precise but intuitive introduction to classical electromagnetic theory and wave propagation, with a brief introduction to special relativity. While written in a distinctive, modern style, Friedrichs manages to convey the physical intuition and 19th century basis of the equations, with an emphasis on conservation laws. Particularly striking features of the book include: (a) a mathematically rigorous derivation of the interaction of electromagnetic waves with matter, (b) a straightforward explanation of how to use variational principles to solve problems in electro- and magnetostatics, and (c) a thorough discussion of the central importance of the conservation of charge. It is suitable for advanced undergraduate students in mathematics and physics with a background in advanced calculus and linear algebra, as well as mechanics and electromagnetics at an undergraduate level. Apart from minor corrections to the text, the notation was updated in this edition to follow the conventions of modern vector calculus. Titles in this

series are co-published with the Courant Institute of Mathematical Sciences at New York University.

Electromagnetic Theory Jan 13 2021 V. 1. I. Introduction. II. Outline of the electromagnetic connections. Appendix A. The rotational ether in its application to electromagnetism. III. The elements of vectorial algebra and analysis. IV. Theory of plane electromagnetic waves. Appendix B. A gravitational and electromagnetic analogy -- v. 2. V. Mathematics and the age of the earth. VI. Pure diffusion of electric displacement. Appendix C. Rational units. VII. Electromagnetic waves and generalised differentiation. VIII. Generalised differentiation and divergent series. Appendix. D. On compressional electric or magnetic waves. Appendix E. Dispersion. Appendix F. On the transformation of optical wave surfaces by homogeneous strain. Appendix G. Note of the motion of a charged body at a speed equal to or greater than that of light. Appendix H. Note on electrical waves in sea water. Appendix I. Note on the attenuation of Hertzian waves along wires -- v. 3. IX. Waves from moving sources. Appendix J. Note on the size and inertia of electrons. Appendix K. Vector analysis. X. Waves in the ether.

Electromagnetic Field Theory Jun 25 2019 The book Electromagnetic Field Theory caters to the students of BE/BTech Electronics and Communication Engineering, Electrical and Electronics Engineering, and Electronic Instrumentation Engineering, as electromagnetics is an integral part of their curricula. It covers a wide range of topics that deal with various physical and mathematical concepts, including vector functions, coordinate systems, integration and differentiation, complex numbers, and phasors. The book helps in understanding the electric and magnetic fields on different charge and current distributions, such as line, surface, and volume. It also explains the electromagnetic behaviour of waves, fields in transmission lines, and radiation in antennas. A number of electromagnetic applications are also included to develop the interest of students. SALIENT FEATURES • Simple and easy-to-follow text • Complete coverage of the subject as per the syllabi of most universities • Lucid, well-explained concepts with clear examples • Relevant illustrations for better understanding and retention • Some of the illustrations provide three-dimensional view for in-depth knowledge • Numerous mathematical examples for full clarity of concepts • Chapter objectives at the beginning of each chapter for its overview • Chapter-end summary and exercises for quick review and to test your knowledge

Electromagnetic Theory and Plasmonics for Engineers May 05 2020 This book presents the theory of electromagnetic (EM) waves for upper undergraduate, graduate and PhD-level students in engineering. It focuses on physics and microwave theory based on Maxwell’s equations and the boundary conditions important for studying the operation of waveguides and resonators in a wide frequency range, namely, from approx. 10**9 to 10**16 hertz. The author also highlights various current topics in EM field theory, such as plasmonic (comprising a noble metal) waveguides and analyses of attenuations by filled waveguide dielectrics or semiconductors and also by conducting waveguide walls. Featuring a wide variety of illustrations, the book presents the calculated and schematic distributions of EM fields and currents in waveguides and resonators. Further, test questions are presented at the end of each chapter.