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includes details of the fundamental phenomenological theories of solar cells li ion li air li s batteries fuel cells and their energy storage mechanisms discusses properties of various energy materials in addition to their device operation and evaluation includes details of the fundamental phenomenological theories of solar cells li ion li air li s batteries fuel cells and their energy storage mechanisms discusses properties of various energy materials in addition to their device operation and evaluation this concise sourcebook of the electrochemical engineering and economic principles involved in the development and commercialization of fuel cells offers a thorough review of applications and techno economic assessment of fuel cell technologies plus in depth discussion of conventional and novel approaches for generating energy parts i and ii explain basic and applied electrochemistry relevant to an understanding of fuel cells part iii covers engineering and technology aspects the book is useful for undergraduate and graduate students and scientists interested in fuel cells unlike any other current book on fuel cells each chapter includes problems based on the discussions in the text a thorough introduction to the fundamentals and applications of microscopic and macroscopic mass transfer this book highlights the potential and scope of green chemistry for clean and sustainable development covering the basics the book introduces readers to the need and the many applications and benefits and advantages of environmentally friendly chemical practice and application in industry the book addresses such topics as ecologically safe products catalysts and solvents conditions needed to produce such products types of chemical processes that are conducive to green chemistry and much more based on the author s lectures to graduate students of geosciences physics chemistry and materials science this didactic handbook covers basic aspects of ceramics such as composition and structure as well as such advanced topics as achieving specific functionalities by choosing the right materials the focus lies on the thermal transformation processes of natural raw materials to arrive at traditional structural ceramics and on the general physical principles of advanced functional ceramics the book thus provides practice oriented information to readers in research development and engineering on how to understand make and improve ceramics and derived products while also serving as a rapid reference for the practitioner the choice of topics and style of presentation make it equally useful for chemists materials scientists engineers and mineralogists fluid mechanics fundamentals and applications communicates directly with tomorrow s engineers in a simple yet precise manner the text covers the basic principles and equations of fluid mechanics in the context of numerous and diverse real world engineering examples the text helps students develop an intuitive understanding of fluid mechanics by emphasizing the physics and by supplying attractive figures numerous photographs and visual aids to reinforce the physics until now colloid science books have either been theoretical or focused on specific types of dispersion or on specific applications this then is the first book to provide an integrated introduction to the nature formation and occurrence stability propagation and uses of the most common types of colloidal dispersion in the process related industries the primary focus is on the applications of the principles paying attention to practical processes and problems this is done both as part of the treatment of the fundamentals where appropriate and also in the separate sections devoted to specific kinds of industries throughout the treatment is integrated with the principles of colloid and interface science common to each dispersion type presented for each major physical property class followed by separate treatments of features unique to emulsions foams or suspensions the first half of the book introduces the fundamental principles introducing readers to suspension formation and stability characterization and flow properties emphasizing practical aspects throughout the following chapters discuss a wide range of industrial applications and examples serving to emphasize the different methodologies that have been successfully applied overall the book shows how to approach making emulsions foams and suspensions with different useful properties how to propagate them and how to prevent their formation or destabilize them if necessary the author assumes no prior knowledge of colloid chemistry and with its glossary of key terms complete cross referencing and indexing this is a must have for graduate and professional scientists and engineers who may encounter or use emulsions foams or

suspensions or combinations thereof whether in process design industrial production or in related r d fields clear evidence of increasing demands in the processing industry prompted the editors and authors to publish a new book about high pressure process technology fundamentals and applications this book presents the latest knowledge regarding the high pressure processing aspects combined with that about the modeling the design and the operation of safe and reliable high pressure plants and equipment this treatment and selection of the subjects is stimulating and unique consisting of nine chapters each subdivided into several sections the book addresses the high pressure aspects providing well selected correlated information connected with a comprehensive overview together with a large number of references the main body of the first eight chapters refers to subjects like high pressure in general the thermodynamics and kinetics of the fluids involved the design of high pressure equipment the modeling and design of reactors separation and fractionation units the safety aspects the control and economics in the extended last chapter examples of promising high pressure applications are explained such as chemical and enzymatic reactions in supercritical solvents hydrogenation under supercritical conditions supercritical water oxidation polymerization with metallocene catalysts supercritical extraction fractionation and precipitation supercritical pharma processing ultra high pressure sterilization and supercritical dry cleaning this book provides a systematic and comprehensive description of high entropy alloys heas the authors summarize key properties of heas from the perspective of both fundamental understanding and applications which are supported by in depth analyses the book also contains computational modeling in tackling heas which help elucidate the formation mechanisms and properties of heas from various length and time scales metamaterials artificially structured materials with engineered electromagnetic properties have enabled unprecedented flexibility in manipulating electromagnetic waves and producing new functionalities this book details recent advances in the study of optical metamaterials ranging from fundamental aspects to up to date implementations in one unified treatment important recent developments and applications such as superlens and cloaking devices are also treated in detail and made understandable the planned monograph can serve as a very timely book for both newcomers and advanced researchers in this extremely rapid evolving field due to its unique properties graphene oxide has become one of the most studied materials of the last decade and a great variety of applications have been reported in areas such as sensors catalysis and biomedical applications this comprehensive volume systematically describes the fundamental aspects and applications of graphene oxide the book is designed as an introduction to the topic so each chapter begins with a discussion on fundamental concepts then proceeds to review and summarize recent advances in the field divided into two parts the first part covers fundamental aspects of graphene oxide and includes chapters on formation and chemical structure characterization methods reduction methods rheology and optical properties of graphene oxide solutions part two covers numerous graphene oxide applications including field effect transistors transparent conductive films sensors energy harvesting and storage membranes composite materials catalysis and biomedical applications in each case the differences and advantages of graphene oxide over its non oxidised counterpart are discussed the book concludes with a chapter on the challenges of industrial scale graphene oxide production graphene oxide fundamentals and applications is a valuable reference for academic researchers and industry scientists interested in graphene oxide graphene and other carbon materials superalloys are unique high temperature materials used in gas turbine engines which display excellent resistance to mechanical and chemical degradation this book introduces the metallurgical principles which have guided their development suitable for graduate students and researchers it includes exercises and additional resources at cambridge org 9780521859042 this book approaches the subject from a mechanistic perspective that pitches the language at a level that is understandable to those entering the field and who are not familiar with its common phrases or complex terms it provides a simple encapsulation of concepts and expands on them in each chapter the basic concept is explained as simply and clearly as possible without a great deal of detail then in subsequent sections additional material exceptions to the general rule examples etc is introduced and built up such material was generously supplemented with diagrams conceptually elegant line diagrams in two or three colors the artwork was well thought out and able to condense the scientific principles into a novel and visually exciting form the diagrams encourage browsing or draw the reader to salient points in addition the technique of highlighting

key concepts in a separate box is used throughout each chapter this book describes novel microtechnologies and integration strategies for developing a new class of assay systems to retrieve desired health information from patients in real time the selection and integration of sensor components and operational parameters for developing point of care poc are also described in detail the basics that govern the microfluidic regimen and the techniques and methods currently employed for fabricating microfluidic systems and integrating biosensors are thoroughly covered this book also describes the application of microfluidics in the field of cell and molecular biology single cell biology disease diagnostics as well as the commercially available systems that have been either introduced or have the potential of being used in research and development this is an ideal book for aiding biologists in understanding the fundamentals and applications of microfluidics this book also describes the preparatory methods for developing 3 dimensional microfluidic structures and their use for lab on a chip design explains the significance of miniaturization and integration of sensing components to develop wearable sensors for point of care poc demonstrates the application of microfluidics to life sciences and analytical chemistry including disease diagnostics and separations motivates new ideas related to novel platforms valving technology miniaturized transduction methods and device integration to develop next generation sequencing discusses future prospects and challenges of the field of microfluidics in the areas of life sciences in general and diagnostics in particular engineering solid mechanics bridges the gap between elementary approaches to strength of materials and more advanced specialized versions on the subject the book provides a basic understanding of the fundamentals of elasticity and plasticity applies these fundamentals to solve analytically a spectrum of engineering problems and introduces advanced topics of mechanics of materials including fracture mechanics creep superplasticity fiber reinforced composites powder compacts and porous solids text includes stress and strain equilibrium and compatibility elastic stress strain relations the elastic problem and the stress function approach to solving plane elastic problems applications of the stress function solution in cartesian and polar coordinates problems of elastic rods plates and shells through formulating a strain compatibility function as well as applying energy methods elastic and elastic plastic fracture mechanics plastic and creep deformation inelastic deformation and its applications this book presents the material in an instructive manner suitable for individual self study it emphasizes analytical treatment of the subject which is essential for handling modern numerical methods as well as assessing and creating software packages the authors provide generous explanations systematic derivations and detailed discussions supplemented by a vast variety of problems and solved examples primarily written for professionals and students in mechanical engineering engineering solid mechanics also serves persons in other fields of engineering such as aerospace civil and material engineering designed as a text for the senior undergraduate and postgraduate students in computer science this compact and comprehensive book provides a clear insight into object oriented programming oop and delineates the major areas where oop principles can be profitably applied the fundamental tenets of oop viz encapsulation inheritance and abstraction syndrome are skillfully analyzed what s more the book blends theory and applications in the most adept fashion to make it extremely handy for the students the text takes c as an example it is not just another book on c by any means and details some of the fundamental requirements from the oop angle in addition it discusses the various aspects of software development using oop an indepth coverage is given to the design usage and re usage of containers besides the book covers such topics and guis particularly ms windows and advanced gui programming concepts designed as a text for the senior undergraduate and postgraduate students in computer science this compact and comprehensive book provides a clear insight into object oriented programming oop and delineates the major areas where oop principles can be profitably applied the fundamental tenets of oop viz encapsulation inheritance and abstraction syndrome are skillfully analyzed what s more the book blends theory and applications in the most adept fashion to make it extremely handy for the students the text takes c as an example it is not just another book on c by any means and details some of the fundamental requirements from the oop angle in addition it discusses the various aspects of software development using oop an indepth coverage is given to the design usage and re usage of containers besides the book covers such topics and guis particularly ms windows and advanced gui programming concepts the book contains 11 chapters written by relevant scientists in the field of particle based methods and their applications in engineering and applied

sciences the chapters cover most particle based techniques used in practice including the discrete element method the smooth particle hydrodynamic method and the particle finite element method the book will be of interest to researchers and engineers interested in the fundamentals of particle based methods and their applications fundamentals of astrodynamics and applications is rapidly becoming the standard astrodynamics reference for those involved in the business of spaceflight what sets this book apart is that nearly all of the theoretical mathematics is followed by discussions of practical applications implemented in tested software routines for example the book includes a compendium of algorithms that allow students and professionals to determine orbits with high precision using a pc without a doubt when an astrodynamics problem arises in the future it will become standard practice for engineers to keep this volume close at hand and look it up in vallado while the first edition was an exceptionally useful and popular book throughout the community there are a number of reasons why the second edition will be even more so there are many reworked examples and derivations newly introduced topics include ground illumination calculations moon rise and set and a listing of relevant internet sites there is an improved and expanded discussion of coordinate systems orbit determination and differential correction perhaps most important is that all of the software routines described in the book are now available for free in fortran pascal and c this makes the second edition an even more valuable text and superb reference explore the relationship between quantum mechanics and information age applications this volume takes an altogether unique approach to quantum mechanics providing an in depth exposition of quantum mechanics fundamentals it shows how these concepts are applied to most of today s information technologies whether they are electronic devices or materials no other text makes this critical essential leap from theory to real world applications the book s lively discussion of the mathematics involved fits right in with contemporary multidisciplinary trends in education once the basic formulation has been derived in a given chapter the connection to important technological problems is summarily described a book for the information age quantum mechanics fundamentals and applications to technology promises to become a standard in departments of electrical engineering applied physics and materials science as well as physics it is an excellent text for senior undergraduate and graduate students and a helpful reference for practicing scientists engineers and chemists in the semiconductor and electronic industries covering principles and applications of analog and digital electronics this volume is an ideal pre degree text covering major areas of 21st century electronics geographic information systems or popularly known as gis has been developing it s roots since the role of remote sensing has increased it spreads it s branches to civil engineering geosciences forestry disaster mitigation ecology and environment and various other fields the book explains the concepts of gis in a simple language topics like development of gis data structures database concepts map projections requirement of hardware and software for implementing gis errors and removing errors advanced analysis are a few chapters to be named which find place in this book the fundamentals and applications of magnetic sensors are encompassed in this book it presents an overview on the research conducted in recent years in the field of magnetic sensors the topics covered in this book vary from underlying theories and properties of magnets to their sensing applications in areas such as biomedicine microelectromechanical systems nano satellites and pedestrian tracking this book has been compiled for readers who wish to gain a basic understanding of the research domain as well as explore potential areas of applications for magnetic sensors it also presents novel developments in this field in an efficient and legible manner the origin of the development of integrated circuits up to vlsi is found in the invention of the transistor which made it possible to achieve the action of a vacuum tube in a semiconducting solid the structure of the transistor can be constructed by a manufacturing technique such as the introduction of a small amount of an impurity into a semiconductor and in addition most transistor characteristics can be improved by a reduction of dimensions these are all important factors in the development actually the microfabrication of the integrated circuit can be used for two purposes namely to increase the integration density and to obtain an improved performance e g a high speed when one of these two aims is pursued the result generally satisfies both we use the english translation very large scale integration vlsi for cho lsi in japanese in the united states of america however similar technology is being developed under the name very high speed integrated circuits vhsil this also originated from the nature of the integrated circuit which satisfies both purposes fortunately the japanese word cho lsi has a

wider meaning than vlsi so it can be used in a broader area however vlsi has a larger industrial effect than vlsi electroless nickel plating fundamentals to applications provides a complete and actualized view of electroless nickel plating thus greatly improving the accessibility of knowledge on the subject it touches upon all aspects of electroless nickel from the fundamentals including thermodynamics of electroless plating bath chemistry and substrate preparation to more applied areas of the field such as bath replenishment composite coatings post treatments polyalloys graded and multilayer coatings ultrasound assistance applications and properties contributed to by a variety of international authors to ensure different points of view and interests are addressed this book stands as the first complete and updated state of the art text on electroless nickel in the twenty first century it also serves as the first technical book with a strong emphasis on nickel boron it also focuses on environmental aspects including cutting edge content presented sufficiently extensive to be directly useful to the practitioner this book is aimed at materials scientists metallurgists and other professionals working with electroless nickel plating this book provides a comprehensive and thorough treatment on fundamentals and applications of light propagation through inhomogeneous media the authors present a description of the phenomena components and technology used in grin optics and analyze various applications provides an introduction to the nature formation and occurrence stability propagation and uses of suspensions in the petroleum industry it focuses on the applications of the principles of particle dispersions with attention given to practical processes and problems among the topics discussed are suspensions in porous media near well and oilwell applications and suspensions in surface operations the book also illustrates how to understand make and use desirable suspensions and how to approach destabilizing or preventing the occurrence of undesirable suspensions radically enhance your progress in organic synthesis radical chemistry has undergone a renaissance in recent years these two volumes will make the key developments accessible to a broad range of organic chemists they cover both the generation of radicals and their use the editors prof louis fensterbank and dr cyril ollivier are experts in radical chemistry and its application to organic synthesis find out all about the generation and use of radicals the two volume set describes the fundamentals of radical chemistry and its application in organic synthesis it includes practical examples of the generation of a variety of organic radicals you will find critically reviewed reliable and ready to use information on the use of radicals in single electron transfer hydrogen atom transfer radical functionalization and cross coupling processes by understanding the fundamental reactivities of radicals they can be harnessed for atom efficient and green reactions lower level but with the same traditional every day examples that students identify with and that makes cimbalá cengel's approach unique essentials of fluid mechanics fundamentals and applications is an abridged version of a more comprehensive text by the same authors fluid mechanics fundamentals and applications mcgraw hill 2006 the text covers the basic principles and equations of fluid mechanics in the context of numerous and diverse real world engineering applications the whole range of biocatalysis from a firm grounding in theoretical concepts to in depth coverage of practical applications and future perspectives the book not only covers reactions products and processes with and from biological catalysts but also the process of designing and improving such biocatalysts one unique feature is that the fields of chemistry biology and bioengineering receive equal attention thus addressing practitioners and students from all three areas the fundamentals and applications of light emitting diodes the revolution in the lighting industry examines the evolution of leds including a review of the luminescence process and background on solid state lighting the book emphasizes phosphor converted leds that are based on inorganic phosphors but explores different types of leds based on inorganic organic quantum dots perovskite structured materials and biomaterials a detailed description is included about the diverse applications of leds in fields such as lighting displays horticulture biomedicine and digital communication as well as challenges that must be solved before using leds in commercial applications traditional light sources are fast being replaced by light emitting diodes leds the fourth generation of lighting is completely dominated by led luminaires apart from lighting leds have extended their hold on other fields such as digital communications horticulture medicine space research art and culture display devices and entertainment the technological promises offered by leds have elevated them as front runners in the lighting industry presents a concise overview of different types of light emitting diodes leds based on inorganic phosphors organic materials quantum dots perovskite structured materials and biomaterials includes a discussion

of current and emerging applications in lighting horticulture and medical fields addresses fundamentals luminescence mechanisms and key optical materials including synthesis methods often described as a miracle material graphene's potential applications are extraordinary ranging from nanoscale green technologies to sensors and future conductive coatings this book covers the topic of graphene the history fundamental properties methods of production and applications of this exciting new material the style of the book is both scientific and technical it is accessible to an audience that has a general undergraduate level background in the sciences or engineering and is aimed at industries considering graphene applications as the graphene topic is a broad reaching and rapidly moving field of research the aim of this book is therefore to provide information about graphene and its current and future applications that are immediately implementable relevant and concise after reading this book the reader will have sufficient knowledge and background to move forward independently into graphene research and to apply the knowledge therein although the book will be self contained each chapter has copious references to enable further reading research and exploration of the chapter topics the book divided in ten chapters deals with algebra of complex numbers and its various geometrical properties properties of polar form of complex numbers and regions in the complex plane limit continuity differentiability different kinds of complex valued functions different types of transformations conformal mappings of different functions properties of bilinear and special bilinear transformation line integrals their properties and different theorems sequences and series power series zeros of functions residues and residue theorem meromorphic functions different kinds of singularities evaluation of real integrals analytic continuation construction of harmonic functions infinite product their properties and gamma function schwarz christoffel transformations mapping by multi valued functions entire functions jenson's theorem and poisson jenson theorem the book is designed as a textbook for ug and pg students of science as well as engineering an accessible and clear introduction to linear algebra with a focus on matrices and engineering applications providing comprehensive coverage of matrix theory from a geometric and physical perspective fundamentals of matrix analysis with applications describes the functionality of matrices and their ability to quantify and analyze many practical applications written by a highly qualified author team the book presents tools for matrix analysis and is illustrated with extensive examples and software implementations beginning with a detailed exposition and review of the gauss elimination method the authors maintain readers interest with refreshing discussions regarding the issues of operation counts computer speed and precision complex arithmetic formulations parameterization of solutions and the logical traps that dictate strict adherence to gauss's instructions the book heralds matrix formulation both as notational shorthand and as a quantifier of physical operations such as rotations projections reflections and the gauss reductions inverses and eigenvectors are visualized first in an operator context before being addressed computationally least squares theory is expounded in all its manifestations including optimization orthogonality computational accuracy and even function theory fundamentals of matrix analysis with applications also features novel approaches employed to explicate the qr singular value schur and jordan decompositions and their applications coverage of the role of the matrix exponential in the solution of linear systems of differential equations with constant coefficients chapter by chapter summaries review problems technical writing exercises select solutions and group projects to aid comprehension of the presented concepts fundamentals of matrix analysis with applications is an excellent textbook for undergraduate courses in linear algebra and matrix theory for students majoring in mathematics engineering and science the book is also an accessible go to reference for readers seeking clarification of the fine points of kinematics circuit theory control theory computational statistics and numerical algorithms

Energy Materials

2021-08-15

includes details of the fundamental phenomenological theories of solar cells li ion li air li s batteries fuel cells and their energy storage mechanisms discusses properties of various energy materials in addition to their device operation and evaluation includes details of the fundamental phenomenological theories of solar cells li ion li air li s batteries fuel cells and their energy storage mechanisms discusses properties of various energy materials in addition to their device operation and evaluation

Fuel Cells

2006-05-05

this concise sourcebook of the electrochemical engineering and economic principles involved in the development and commercialization of fuel cells offers a thorough review of applications and techno economic assessment of fuel cell technologies plus in depth discussion of conventional and novel approaches for generating energy parts i and ii explain basic and applied electrochemistry relevant to an understanding of fuel cells part iii covers engineering and technology aspects the book is useful for undergraduate and graduate students and scientists interested in fuel cells unlike any other current book on fuel cells each chapter includes problems based on the discussions in the text

Mass Transfer

1985

a thorough introduction to the fundamentals and applications of microscopic and macroscopic mass transfer

Green Chemistry

2013-09-11

this book highlights the potential and scope of green chemistry for clean and sustainable development covering the basics the book introduces readers to the need and the many applications and benefits and advantages of environmentally friendly chemical practice and application in industry the book addresses such topics as ecologically safe products catalysts and solvents conditions needed to produce such products types of chemical processes that are conducive to green chemistry and much more

Electronic Fundamentals and Applications

1977-01-01

based on the author s lectures to graduate students of geosciences physics chemistry and materials science this didactic handbook covers basic aspects of ceramics such as composition and structure as well as such advanced topics as achieving specific functionalities by choosing the right materials the focus lies on the thermal transformation processes of natural raw materials to arrive at traditional structural ceramics and on the general physical principles of advanced functional ceramics the book thus provides practice oriented information to readers in research development and engineering on how to understand make and improve ceramics and derived products while also serving as a rapid reference for the practitioner the choice of topics and style of presentation make it equally useful for chemists materials scientists engineers and mineralogists

E-commerce

2010-04-16

fluid mechanics fundamentals and applications communicates directly with tomorrow's engineers in a simple yet precise manner the text covers the basic principles and equations of fluid mechanics in the context of numerous and diverse real world engineering examples the text helps students develop an intuitive understanding of fluid mechanics by emphasizing the physics and by supplying attractive figures numerous photographs and visual aids to reinforce the physics

Classic and Advanced Ceramics

2006

until now colloid science books have either been theoretical or focused on specific types of dispersion or on specific applications this then is the first book to provide an integrated introduction to the nature formation and occurrence stability propagation and uses of the most common types of colloidal dispersion in the process related industries the primary focus is on the applications of the principles paying attention to practical processes and problems this is done both as part of the treatment of the fundamentals where appropriate and also in the separate sections devoted to specific kinds of industries throughout the treatment is integrated with the principles of colloid and interface science common to each dispersion type presented for each major physical property class followed by separate treatments of features unique to emulsions foams or suspensions the first half of the book introduces the fundamental principles introducing readers to suspension formation and stability characterization and flow properties emphasizing practical aspects throughout the following chapters discuss a wide range of industrial applications and examples serving to emphasize the different methodologies that have been successfully applied overall the book shows how to approach making emulsions foams and suspensions with different useful properties how to propagate them and how to prevent their formation or destabilize them if necessary the author assumes no prior knowledge of colloid chemistry and with its glossary of key terms complete cross referencing and indexing this is a must have for graduate and professional scientists and engineers who may encounter or use emulsions foams or suspensions or combinations thereof whether in process design industrial production or in related r d fields

Fluid Mechanics

2006-05-12

clear evidence of increasing demands in the processing industry prompted the editors and authors to publish a new book about high pressure process technology fundamentals and applications this book presents the latest knowledge regarding the high pressure processing aspects combined with that about the modeling the design and the operation of safe and reliable high pressure plants and equipment this treatment and selection of the subjects is stimulating and unique consisting of nine chapters each subdivided into several sections the book addresses the high pressure aspects providing well selected correlated information connected with a comprehensive overview together with a large number of references the main body of the first eight chapters refers to subjects like high pressure in general the thermodynamics and kinetics of the fluids involved the design of high pressure equipment the modeling and design of reactors separation and fractionation units the safety aspects the control and economics in the extended last chapter examples of promising high pressure applications are explained such as chemical and enzymatic reactions in supercritical solvents hydrogenation under supercritical conditions supercritical water oxidation polymerization with metallocene catalysts supercritical extraction fractionation and precipitation supercritical pharma processing ultra high pressure sterilization and supercritical dry cleaning

Emulsions, Foams, and Suspensions

2001-10-15

this book provides a systematic and comprehensive description of high entropy alloys heas the authors summarize key properties of heas from the perspective of both fundamental understanding and applications which are supported by in depth analyses the book also contains computational modeling in tackling heas which help elucidate the formation mechanisms and properties of heas from various length and time scales

High Pressure Process Technology: Fundamentals and Applications

2016-05-09

metamaterials artificially structured materials with engineered electromagnetic properties have enabled unprecedented flexibility in manipulating electromagnetic waves and producing new functionalities this book details recent advances in the study of optical metamaterials ranging from fundamental aspects to up to date implementations in one unified treatment important recent developments and applications such as superlens and cloaking devices are also treated in detail and made understandable the planned monograph can serve as a very timely book for both newcomers and advanced researchers in this extremely rapid evolving field

High-Entropy Alloys

2009-12-01

due to its unique properties graphene oxide has become one of the most studied materials of the last decade and a great variety of applications have been reported in areas such as sensors catalysis and biomedical applications this comprehensive volume systematically describes the fundamental aspects and applications of graphene oxide the book is designed as an introduction to the topic so each chapter begins with a discussion on fundamental concepts then proceeds to review and summarize recent advances in the field divided into two parts the first part covers fundamental aspects of graphene oxide and includes chapters on formation and chemical structure characterization methods reduction methods rheology and optical properties of graphene oxide solutions part two covers numerous graphene oxide applications including field effect transistors transparent conductive films sensors energy harvesting and storage membranes composite materials catalysis and biomedical applications in each case the differences and advantages of graphene oxide over its non oxidised counterpart are discussed the book concludes with a chapter on the challenges of industrial scale graphene oxide production graphene oxide fundamentals and applications is a valuable reference for academic researchers and industry scientists interested in graphene oxide graphene and other carbon materials

Optical Metamaterials

2016-11-14

superalloys are unique high temperature materials used in gas turbine engines which display excellent resistance to mechanical and chemical degradation this book introduces the metallurgical principles which have guided their development suitable for graduate students and researchers it includes exercises and additional resources at cambridge org 9780521859042

Graphene Oxide

2006

this book approaches the subject from a mechanistic perspective that pitches the language at a level that is understandable to those entering the field and who are not familiar with its common phrases or complex terms it provides a simple encapsulation of concepts and expands on them in each chapter the basic concept is explained as simply and clearly as possible without a great deal of detail then in subsequent sections additional material exceptions to the general rule examples etc is introduced and built up such material was generously supplemented with diagrams conceptually elegant line diagrams in two or three colors the artwork was well thought out and able to condense the scientific principles into a novel and visually exciting form the diagrams encourage browsing or draw the reader to salient points in addition the technique of highlighting key concepts in a separate box is used throughout each chapter

The Superalloys

2011-12-15

this book describes novel microtechnologies and integration strategies for developing a new class of assay systems to retrieve desired health information from patients in real time the selection and integration of sensor components and operational parameters for developing point of care poc are also described in detail the basics that govern the microfluidic regimen and the techniques and methods currently employed for fabricating microfluidic systems and integrating biosensors are thoroughly covered this book also describes the application of microfluidics in the field of cell and molecular biology single cell biology disease diagnostics as well as the commercially available systems that have been either introduced or have the potential of being used in research and development this is an ideal book for aiding biologists in understanding the fundamentals and applications of microfluidics this book also describes the preparatory methods for developing 3 dimensional microfluidic structures and their use for lab on a chip design explains the significance of miniaturization and integration of sensing components to develop wearable sensors for point of care poc demonstrates the application of microfluidics to life sciences and analytical chemistry including disease diagnostics and separations motivates new ideas related to novel platforms valving technology miniaturized transduction methods and device integration to develop next generation sequencing discusses future prospects and challenges of the field of microfluidics in the areas of life sciences in general and diagnostics in particular

Fundamentals and Applications of Controlled Release Drug Delivery

2016-10-13

engineering solid mechanics bridges the gap between elementary approaches to strength of materials and more advanced specialized versions on the subject the book provides a basic understanding of the fundamentals of elasticity and plasticity applies these fundamentals to solve analytically a spectrum of engineering problems and introduces advanced topics of mechanics of materials including fracture mechanics creep superplasticity fiber reinforced composites powder compacts and porous solids text includes stress and strain equilibrium and compatibility elastic stress strain relations the elastic problem and the stress function approach to solving plane elastic problems applications of the stress function solution in cartesian and polar coordinates problems of elastic rods plates and shells through formulating a strain compatibility function as well as applying energy methods elastic and elastic plastic fracture mechanics plastic and creep deformation inelastic deformation and its applications this book presents the material in an instructive manner suitable for individual self study it emphasizes analytical treatment of the subject which is essential for handling modern numerical methods as well as assessing and creating software packages the authors provide generous explanations systematic derivations and detailed discussions supplemented by a vast variety of problems and solved examples primarily written for professionals and students in mechanical engineering engineering solid mechanics also serves persons in other fields of engineering such as aerospace civil and material engineering

Microfluidics for Biologists

1998-12-22

designed as a text for the senior undergraduate and postgraduate students in computer science this compact and comprehensive book provides a clear insight into object oriented programming oop and delineates the major areas where oop principles can be profitably applied the fundamental tenets of oop viz encapsulation inheritance and abstraction syndrome are skillfully analyzed what s more the book blends theory and applications in the most adept fashion to make it extremely handy for the students the text takes c as an example it is not just another book on c by any means and details some of the fundamental requirements from the oop angle in addition it discusses the various aspects of software development using oop an indepth coverage is given to the design usage and re usage of containers besides the book covers such topics and guis particularly ms windows and advanced gui programming concepts designed as a text for the senior undergraduate and postgraduate students in computer science this compact and comprehensive book provides a clear insight into object oriented programming oop and delineates the major areas where oop principles can be profitably applied the fundamental tenets of oop viz encapsulation inheritance and abstraction syndrome are skillfully analyzed what s more the book blends theory and applications in the most adept fashion to make it extremely handy for the students the text takes c as an example it is not just another book on c by any means and details some of the fundamental requirements from the oop angle in addition it discusses the various aspects of software development using oop an indepth coverage is given to the design usage and re usage of containers besides the book covers such topics and guis particularly ms windows and advanced gui programming concepts

Engineering Solid Mechanics

2004-08

the book contains 11 chapters written by relevant scientists in the field of particle based methods and their applications in engineering and applied sciences the chapters cover most particle based techniques used in practice including the discrete element method the smooth particle hydrodynamic method and the particle finite element method the book will be of interest to researchers and engineers interested in the fundamentals of particle based methods and their applications

Object-Oriented Programming: Fundamentals And Applications

2011-02-17

fundamentals of astrodynamics and applications is rapidly becoming the standard astrodynamics reference for those involved in the business of spaceflight what sets this book apart is that nearly all of the theoretical mathematics is followed by discussions of practical applications implemented in tested software routines for example the book includes a compendium of algorithms that allow students and professionals to determine orbits with high precision using a pc without a doubt when an astrodynamics problem arises in the future it will become standard practice for engineers to keep this volume close at hand and look it up in vallado while the first edition was an exceptionally useful and popular book throughout the community there are a number of reasons why the second edition will be even more so there are many reworked examples and derivations newly introduced topics include ground illumination calculations moon rise and set and a listing of relevant internet sites there is an improved and expanded discussion of coordinate systems orbit determination and differential correction perhaps most important is that all of the software routines described in the book are now available for free in fortran pascal and c this makes the second edition an even more valuable text and superb reference

Particle-Based Methods

2010

explore the relationship between quantum mechanics and information age applications this volume takes an altogether unique approach to quantum mechanics providing an in depth exposition of quantum mechanics fundamentals it shows how these concepts are applied to most of today s information technologies whether they are electronic devices or materials no other text makes this critical essential leap from theory to real world applications the book s lively discussion of the mathematics involved fits right in with contemporary multidisciplinary trends in education once the basic formulation has been derived in a given chapter the connection to important technological problems is summarily described a book for the information age quantum mechanics fundamentals and applications to technology promises to become a standard in departments of electrical engineering applied physics and materials science as well as physics it is an excellent text for senior undergraduate and graduate students and a helpful reference for practicing scientists engineers and chemists in the semiconductor and electronic industries

Fluid Mechanics

2001-06-30

covering principles and applications of analog and digital electronics this volume is an ideal pre degree text covering major areas of 21st century electronics

Fundamentals of Astrodynamics and Applications

2008-11-20

geographic information systems or popularly known as gis has been developing it s roots since the role of remote sensing has increased it spreads it s branches to civil engineering geosciences forestry disaster mitigation ecology and environment and various other fields the book explains the concepts of gis in a simple language topics like development of gis data structures database concepts map projections requirement of hardware and software for implementing gis errors and removing errors advanced analysis are a few chapters to be named which find place in this book

Quantum Mechanics

2005

the fundamentals and applications of magnetic sensors are encompassed in this book it presents an overview on the research conducted in recent years in the field of magnetic sensors the topics covered in this book vary from underlying theories and properties of magnets to their sensing applications in areas such as biomedicine microelectromechanical systems nano satellites and pedestrian tracking this book has been compiled for readers who wish to gain a basic understanding of the research domain as well as explore potential areas of applications for magnetic sensors it also presents novel developments in this field in an efficient and legible manner

Electronics: Fundamentals And Applications

2006

the origin of the development of integrated circuits up to vlsi is found in the invention of the transistor which made it possible to achieve the ac tion of a vacuum tube in a semiconducting solid the structure of the tran sistor can be constructed by a manufacturing technique such as

the introduction of a small amount of an impurity into a semiconductor and in addition most transistor characteristics can be improved by a reduction of dimensions these are all important factors in the development actually the microfabrication of the integrated circuit can be used for two purposes namely to increase the integration density and to obtain an improved performance e.g. a high speed when one of these two aims is pursued the result generally satisfies both we use the english translation very large scale integration vlsi for cho lsi in japanese in the united states of america however similar technology is being developed under the name very high speed integrated circuits vhsil this also originated from the nature of the integrated circuit which satisfies both purposes fortunately the japanese word cho lsi has a wider meaning than vlsi so it can be used in a broader area however vlsi has a larger industrial effect than vhsil

Electronic Circuits

2006

electroless nickel plating fundamentals to applications provides a complete and actualized view of electroless nickel plating thus greatly improving the accessibility of knowledge on the subject it touches upon all aspects of electroless nickel from the fundamentals including thermodynamics of electroless plating bath chemistry and substrate preparation to more applied areas of the field such as bath replenishment composite coatings post treatments polyalloys graded and multilayer coatings ultrasound assistance applications and properties contributed to by a variety of international authors to ensure different points of view and interests are addressed this book stands as the first complete and updated state of the art text on electroless nickel in the twenty first century it also serves as the first technical book with a strong emphasis on nickel boron it also focuses on environmental aspects including cutting edge content presented sufficiently extensive to be directly useful to the practitioner this book is aimed at materials scientists metallurgists and other professionals working with electroless nickel plating

GIS

2006

this book provides a comprehensive and thorough treatment on fundamentals and applications of light propagation through inhomogeneous media the authors present a description of the phenomena components and technology used in grin optics and analyze various applications

Colloidal Silica

2015-01-29

provides an introduction to the nature formation and occurrence stability propagation and uses of suspensions in the petroleum industry it focuses on the applications of the principles of particle dispersions with attention given to practical processes and problems among the topics discussed are suspensions in porous media near well and oilwell applications and suspensions in surface operations the book also illustrates how to understand make and use desirable suspensions and how to approach destabilizing or preventing the occurrence of undesirable suspensions

Magnetic Sensors: Fundamentals and Applications

2013-03-12

radically enhance your progress in organic synthesis radical chemistry has undergone a renaissance in recent years these two volumes will make the key developments accessible to a broad range of organic chemists they cover both the generation of radicals and their use the editors prof louis fensterbank and dr cyril ollivier are experts in radical chemistry and its application to organic synthesis find out all about the generation and use of radicals the two

volume set describes the fundamentals of radical chemistry and its application in organic synthesis it includes practical examples of the generation of a variety of organic radicals you will find critically reviewed reliable and ready to use information on the use of radicals in single electron transfer hydrogen atom transfer radical functionalization and cross coupling processes by understanding the fundamental reactivities of radicals they can be harnessed for atom efficient and green reactions

VLSI Technology

2019-10-30

lower level but with the same traditional every day examples that students identify with and that makes cimbala cengel's approach unique essentials of fluid mechanics fundamentals and applications is an abridged version of a more comprehensive text by the same authors fluid mechanics fundamentals and applications mcgraw hill 2006 the text covers the basic principles and equations of fluid mechanics in the context of numerous and diverse real world engineering applications

Electroless Nickel Plating: Fundamentals to Applications

2012-12-06

the whole range of biocatalysis from a firm grounding in theoretical concepts to in depth coverage of practical applications and future perspectives the book not only covers reactions products and processes with and from biological catalysts but also the process of designing and improving such biocatalysts one unique feature is that the fields of chemistry biology and bioengineering receive equal attention thus addressing practitioners and students from all three areas

Gradient-Index Optics

1995

the fundamentals and applications of light emitting diodes the revolution in the lighting industry examines the evolution of leds including a review of the luminescence process and background on solid state lighting the book emphasizes phosphor converted leds that are based on inorganic phosphors but explores different types of leds based on inorganic organic quantum dots perovskite structured materials and biomaterials a detailed description is included about the diverse applications of leds in fields such as lighting displays horticulture biomedicine and digital communication as well as challenges that must be solved before using leds in commercial applications traditional light sources are fast being replaced by light emitting diodes leds the fourth generation of lighting is completely dominated by led luminaires apart from lighting leds have extended their hold on other fields such as digital communications horticulture medicine space research art and culture display devices and entertainment the technological promises offered by leds have elevated them as front runners in the lighting industry presents a concise overview of different types of light emitting diodes leds based on inorganic phosphors organic materials quantum dots perovskite structured materials and biomaterials includes a discussion of current and emerging applications in lighting communications horticulture and medical fields addresses fundamentals luminescence mechanisms and key optical materials including synthesis methods

Suspensions

2021-07-09

often described as a miracle material graphene's potential applications are extraordinary ranging from nanoscale green technologies to sensors and future conductive coatings this book

covers the topic of graphene the history fundamental properties methods of production and applications of this exciting new material the style of the book is both scientific and technical it is accessible to an audience that has a general undergraduate level background in the sciences or engineering and is aimed at industries considering graphene applications as the graphene topic is a broad reaching and rapidly moving field of research the aim of this book is therefore to provide information about graphene and its current and future applications that are immediately implementable relevant and concise after reading this book the reader will have sufficient knowledge and background to move forward independently into graphene r d and to apply the knowledge therein although the book will be self contained each chapter has copious references to enable further reading research and exploration of the chapter topics

Science of Synthesis: Free Radicals: Fundamentals and Applications in Organic Synthesis 1

2008

the book divided in ten chapters deals with algebra of complex numbers and its various geometrical properties properties of polar form of complex numbers and regions in the complex plane limit continuity differentiability different kinds of complex valued functions different types of transformations conformal mappings of different functions properties of bilinear and special bilinear transformation line integrals their properties and different theorems sequences and series power series zero s of functions residues and residue theorem meromorphic functions different kinds of singularities evaluation of real integrals analytic continuation construction of harmonic functions infinite product their properties and gamma function schwarz christoffel transformations mapping by multi valued functions entire functions jenson s theorem and poisson jenson theorem the book is designed as a textbook for ug and pg students of science as well as engineering

Essentials of Fluid Mechanics

2004-03-12

an accessible and clear introduction to linear algebra with a focus on matrices and engineering applications providing comprehensive coverage of matrix theory from a geometric and physical perspective fundamentals of matrix analysis with applications describes the functionality of matrices and their ability to quantify and analyze many practical applications written by a highly qualified author team the book presents tools for matrix analysis and is illustrated with extensive examples and software implementations beginning with a detailed exposition and review of the gauss elimination method the authors maintain readers interest with refreshing discussions regarding the issues of operation counts computer speed and precision complex arithmetic formulations parameterization of solutions and the logical traps that dictate strict adherence to gauss s instructions the book heralds matrix formulation both as notational shorthand and as a quantifier of physical operations such as rotations projections reflections and the gauss reductions inverses and eigenvectors are visualized first in an operator context before being addressed computationally least squares theory is expounded in all its manifestations including optimization orthogonality computational accuracy and even function theory fundamentals of matrix analysis with applications also features novel approaches employed to explicate the qr singular value schur and jordan decompositions and their applications coverage of the role of the matrix exponential in the solution of linear systems of differential equations with constant coefficients chapter by chapter summaries review problems technical writing exercises select solutions and group projects to aid comprehension of the presented concepts fundamentals of matrix analysis with applications is an excellent textbook for undergraduate courses in linear algebra and matrix theory for students majoring in mathematics engineering and science the book is also an accessible go to reference for readers seeking clarification of the fine points of kinematics circuit theory control theory computational statistics and numerical algorithms

Biocatalysis

2020-07-09

The Fundamentals and Applications of Light-Emitting Diodes

1999

TiO₂ Photocatalysis

2015

Graphene

2005

Biotechnology

2013-12-30

Fundamentals of Complex Analysis

2015-10-12

Fundamentals of Matrix Analysis with Applications

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