

## Engineering Physics 1 Senthil Kumar

This volume gathers selected, peer-reviewed original contributions presented at the International Conference on Computational Vision and Bio-inspired Computing (ICCVBIC) conference which was held in Coimbatore, India, on November 29-30, 2018. The works included here offer a rich and diverse sampling of recent developments in the fields of Computational Vision, Fuzzy, Image Processing and Bio-inspired Computing. The topics covered include computer vision; cryptography and digital privacy; machine learning and artificial neural networks; genetic algorithms and computational intelligence; the Internet of Things; and biometric systems, to name but a few. The applications discussed range from security, healthcare and epidemic control to urban computing, agriculture and robotics. In this book, researchers, graduate students and professionals will find innovative solutions to real-world problems in industry and society as a whole, together with inspirations for further research.

The development of fuzzy expert systems has provided new opportunities for problem solving amidst uncertainties. The medical field, in particular, has benefitted tremendously from advancing fuzzy system technologies. Fuzzy Expert Systems for Disease Diagnosis highlights the latest research and developments in fuzzy rule-based methods used in the detection of medical complications and illness. Offering emerging solutions and practical applications, this timely publication is designed for use by researchers, academicians, and students, as well as practitioners in the medical field.

Real-Time Data Analytics for Large-Scale Sensor Data covers the theory and applications of hardware platforms and architectures, the development of software methods, techniques and tools, applications, governance and adoption strategies for the use of massive sensor data in real-time data analytics. It presents the leading-edge research in the field and identifies future challenges in this fledging research area. The book captures the essence of real-time IoT based solutions that require a multidisciplinary approach for catering to on-the-fly processing, including methods for high performance stream processing, adaptively streaming adjustment, uncertainty handling, latency handling, and more. Examines IoT applications, the design of real-time intelligent systems, and how to manage the rapid growth of the large volume of sensor data Discusses intelligent management systems for applications such as healthcare, robotics and environment modeling Provides a focused approach towards the design and implementation of real-time intelligent systems for the management of sensor data in large-scale environments

Brydson's Plastics Materials, Eighth Edition, provides a comprehensive overview of the commercially available plastics materials that bridge the gap between theory and practice. The book enables scientists to understand the commercial implications of their work and provides engineers with essential theory. Since the previous edition, many developments have taken place in plastics materials, such as the growth in the commercial use of sustainable bioplastics, so this book brings the user fully up-to-date with the latest materials, references, units, and figures that have all been thoroughly updated. The book remains the authoritative resource for engineers, suppliers, researchers, materials scientists, and academics in the field of polymers, including current best practice, processing, and material selection information and health and safety guidance, along with discussions of sustainability and the commercial

importance of various plastics and additives, including nanofillers and graphene as property modifiers. With a 50 year history as the principal reference in the field of plastics material, and fully updated by an expert team of polymer scientists and engineers, this book is essential reading for researchers and practitioners in this field. Presents a one-stop-shop for easily accessible information on plastics materials, now updated to include the latest biopolymers, high temperature engineering plastics, thermoplastic elastomers, and more Includes thoroughly revised and reorganised material as contributed by an expert team who make the book relevant to all plastics engineers, materials scientists, and students of polymers Includes the latest guidance on health, safety, and sustainability, including materials safety data sheets, local regulations, and a discussion of recycling issues

The use of synthetic chemical dyes in various industrial processes, including paper and pulp manufacturing, plastics, dyeing of cloth, leather treatment and printing, has increased considerably over the last few years, resulting in the release of dye-containing industrial effluents into the soil and aquatic ecosystems. The textile industry generates high-polluting wastewaters and their treatment is a very serious problem due to high total dissolved solids (TDS), presence of toxic heavy metals, and the non-biodegradable nature of the dyestuffs in the effluent. The chapters in this book provide an overview of the problem and its solution from different angles. These problems and solutions are presented in a genuinely holistic way by world-renowned researchers. Discussed are various promising techniques to remove dyes, including the use of nanotechnology, ultrasound, microwave, catalysts, biosorption, enzymatic treatments, advanced oxidation processes, etc., all of which are "green." Green Chemistry for Dyes Removal from Wastewater comprehensively discusses: Different types of dyes, their working and methodologies and various physical, chemical and biological treatment methods employed Application of advanced oxidation processes (AOPs) in dye removal whereby highly reactive hydroxyl radicals are generated chemically, photochemically and/or by radiolytic/ sonolytic means. The potential of ultrasound as an AOP is discussed as well. Nanotechnology in the treatment of dye removal types of adsorbents for removal of toxic pollutants from aquatic systems Photocatalytic oxidation process for dye degradation under both UV and visible light, application of solar light and solar photoreactor in dye degradation

The purpose of this workshop is to spread the vast amount of information available on semiconductor physics to every possible field throughout the scientific community. As a result, the latest findings, research and discoveries can be quickly disseminated. This workshop provides all participating research groups with an excellent platform for interaction and collaboration with other members of their respective scientific community. This workshop's technical sessions include various current and significant topics for applications and scientific developments, including • Optoelectronics • VLSI & ULSI Technology • Photovoltaics • MEMS & Sensors • Device Modeling and Simulation • High Frequency/ Power Devices • Nanotechnology and Emerging Areas • Organic Electronics • Displays and Lighting Many eminent scientists from various national and international organizations are actively participating with their latest research works and also equally supporting this mega event by joining the various organizing committees.

Processing information and analyzing data efficiently and effectively is crucial for any

company that wishes to stay competitive in its respective market. Nonlinear data presents new challenges to organizations, however, due to its complexity and unpredictability. The only technology that can properly handle this form of data is artificial neural networks. These modeling systems present a high level of benefits in analyzing complex data in a proficient manner, yet considerable research on the specific applications of these intelligent components is significantly deficient. Applications of Artificial Neural Networks for Nonlinear Data is a collection of innovative research on the contemporary nature of artificial neural networks and their specific implementations within data analysis. While highlighting topics including propagation functions, optimization techniques, and learning methodologies, this book is ideally designed for researchers, statisticians, academicians, developers, scientists, practitioners, students, and educators seeking current research on the use of artificial neural networks in diagnosing and solving nonparametric problems.

This book contains cutting-edge research material presented by researchers, engineers, developers, and practitioners from academia and industry at the International Conference on Computational Intelligence, Cyber Security and Computational Models (ICC3) organized by PSG College of Technology, Coimbatore, India during December 19–21, 2013. The materials in the book include theory and applications to provide design, analysis, and modeling of the key areas. The book will be useful material for students, researchers, professionals, as well academicians in understanding current research trends and findings and future scope of research in computational intelligence, cyber security, and computational models.

This book features high-quality, peer-reviewed papers from the International Conference on Recent Advancement in Computer, Communication and Computational Sciences (RACCCS 2019), held at Aryabhata College of Engineering & Research Center, Ajmer, India, on August 16–17, 2019. Presenting the latest developments and technical solutions in computational sciences, it covers a variety of topics, such as intelligent hardware and software design, advanced communications, intelligent computing technologies, advanced software engineering, the web and informatics, and intelligent image processing. As such it helps those in the computer industry and academia to use the advances in next-generation communication and computational technology to shape real-world applications.

An evolution is currently underway in the textile industry and Textile for Industrial Applications is the guidebook for its growth. This industry can be classified into three categories—clothing, home textile, and industrial textile. Industrial textiles, also known as technical textiles, are a part of the industry that is thriving and showing great promise. Unlike conventional textiles traditionally used for clothing or furnishing by consumers, industrial textiles are used for manufacturing and functionality purposes, and generally by other industries. This book provides an encyclopedic review of industrial textiles, covering all of the latest trends in the development and application of these textiles with advice and suggestions on how to apply them in other industries. Discusses the latest technologies adopted in the industrial textile industry including nano finishing and plasma applications Covers the basic fundamentals about product characteristics and production techniques Caters to students and faculty involved in textile technology, composite technology, and other interdisciplinary courses as it relates to product engineering and product development Textiles for Industrial Applications details the

market potential and growth of industrial textiles and explains the steps involved in the product development of industrial textiles. It discusses property requirement, the basic textile manufacturing process, manufacturing techniques and fibers used, as well as application methods. The book highlights recent developments in terms of raw material usage, manufacturing technology, and value-added finishes in this sector. A separate chapter focuses on the testing procedures of various industrial textiles.

This book introduces readers to numerous multiplicative inverse functional equations and their stability results in various spaces. This type of functional equation can be of use in solving many physical problems and also has significant relevance in various scientific fields of research and study. In particular, multiplicative inverse functional equations have applications in electric circuit theory, physics, and relations connecting the harmonic mean and arithmetic mean of several values. Providing a wealth of essential insights and new concepts in the field of functional equations, the book is chiefly intended for researchers, graduate schools, graduate students, and educators, and can also be used for seminars in analysis covering topics of functional equations.

In the automotive industry, the need to reduce vehicle weight has given rise to extensive research efforts to develop aluminum and magnesium alloys for structural car body parts. In aerospace, the move toward composite airframe structures urged an increased use of formable titanium alloys. In steel research, there are ongoing efforts to design novel damage-controlled forming processes for a new generation of efficient and reliable lightweight steel components. All these materials, and more, constitute today's research mission for lightweight structures. They provide a fertile materials science research field aiming to achieve a better understanding of the interplay between industrial processing, microstructure development, and the resulting material properties. *Advancements in the Processing, Characterization, and Application of Lightweight Materials* provides the recent advancements in the lightweight materials processing, manufacturing, and characterization. This book identifies the need for modern tools and techniques for designing lightweight materials and addresses multidisciplinary approaches for applying their use. Covering topics such as numerical optimization, fatigue characterization, and process evaluation, this text is an essential resource for materials engineers, manufacturers, practitioners, engineers, academicians, chief research officers, researchers, students, and vice presidents of research in government, industry, and academia.

This conference proceedings summarizes invited publications from the two IDES (Institute of Doctors Engineers and Scientists) International conferences, both held in Bangalore/ India.

This book covers the state-of-art image classification methods for discrimination of earth objects from remote sensing satellite data with an emphasis on fuzzy machine learning and deep learning algorithms. Both types of algorithms are described in such details that these can be implemented directly for thematic mapping of multiple-class or specific-class landcover from multispectral optical remote sensing data. These algorithms along with multi-date, multi-sensor remote sensing are capable to monitor specific stage (for e.g., phenology of growing crop) of a particular class also included. With these capabilities fuzzy machine learning algorithms have strong applications in areas like crop insurance, forest fire mapping, stubble burning, post disaster damage mapping etc. It also provides details about the temporal indices database using



proposed Class Based Sensor Independent (CBSI) approach supported by practical examples. As well, this book addresses other related algorithms based on distance, kernel based as well as spatial information through Markov Random Field (MRF)/Local convolution methods to handle mixed pixels, non-linearity and noisy pixels. Further, this book covers about techniques for quantitative assessment of soft classified fraction outputs from soft classification and supported by in-house developed tool called sub-pixel multi-spectral image classifier (SMIC). It is aimed at graduate, postgraduate, research scholars and working professionals of different branches such as Geoinformation sciences, Geography, Electrical, Electronics and Computer Sciences etc., working in the fields of earth observation and satellite image processing. Learning algorithms discussed in this book may also be useful in other related fields, for example, in medical imaging. Overall, this book aims to: exclusive focus on using large range of fuzzy classification algorithms for remote sensing images; discuss ANN, CNN, RNN, and hybrid learning classifiers application on remote sensing images; describe sub-pixel multi-spectral image classifier tool (SMIC) to support discussed fuzzy and learning algorithms; explain how to assess soft classified outputs as fraction images using fuzzy error matrix (FERM) and its advance versions with FERM tool, Entropy, Correlation Coefficient, Root Mean Square Error and Receiver Operating Characteristic (ROC) methods and; combines explanation of the algorithms with case studies and practical applications.

Incremental Sheet Forming Technologies Principles, Merits, Limitations, and Applications CRC Press

This is a compilation of papers presented at the 6th International Conference on Asian and Pacific Coasts (APAC2011) held on December 14-16, 2011 in Hong Kong, China. It contains more than 200 articles addressing a wide spectrum of issues, ranging from conventional coastal engineering problems (such as wave hydrodynamics and sediment transport) to issues of contemporary interest (such as tsunami, coastal development, climate change and seawater level rise, shoreline protection, marine energy, nearshore ecology, oil spill, etc.). Authors present their experiences in tackling these problems, by means of theoretical modeling, numerical simulation, laboratory and field observations, with an aim to advance fundamental understanding of the controlling mechanisms, as well as to develop solutions for practical designs. This volume serves to promote technological progress and activities, technical knowledge transfer and cooperation on an international scale."

Incremental Sheet Forming (ISF) exempts use of dies and reduces cost for manufacturing complex parts. Sheet metal forming is used for producing high-quality components in automotive, aerospace, and medical industries. This book covers the benefits of this new technology, including the process parameters along with various techniques. Each variant of this novel process is discussed along with the requirements of machinery and hardware. In addition, appropriate guidelines are also suggested regarding the relationship between process parameters and aspects of ISF process in order to ensure the applicability of the process on the industrial scale. This book will be a useful asset for researchers,

engineers in manufacturing industries, and postgraduate level courses. Machinability of Advanced Materials addresses the level of difficulty involved in machining a material, or multiple materials, with the appropriate tooling and cutting parameters. A variety of factors determine a material's machinability, including tool life rate, cutting forces and power consumption, surface integrity, limiting rate of metal removal, and chip shape. These topics, among others, and multiple examples comprise this research resource for engineering students, academics, and practitioners.

The increasing use of composite materials over conventional materials has been a continual trend for over a decade. While the fundamental understanding of fiber reinforcement has not changed, many new material advancements have occurred, especially in manufacturing methods, and there is an ever-growing number of composite material applications across various industries. *Polymer-Based Composites: Design, Manufacturing, and Applications* presents the concepts and methods involved in the development of various fiber-reinforced composite materials. Features: Offers a comprehensive view of materials, mechanics, processing, design, and applications Bridges the gap between research, manufacturing science, and analysis and design Discusses composite materials composed of continuous synthetic fibers and matrices for use in engineering structures Presents codes and standards related to fiber-reinforced polymer composites Includes case studies and examples based on industrial, automotive, aerospace, and household applications This book is a valuable resource for advanced students, researchers, and industry personnel to understand recent advances in the field and achieve practical results in the development, manufacture, and application of advanced composite materials. The disciplines of science and engineering rely heavily on the forecasting of prospective constraints for concepts that have not yet been proven to exist, especially in areas such as artificial intelligence. Obtaining quality solutions to the problems presented becomes increasingly difficult due to the number of steps required to sift through the possible solutions, and the ability to solve such problems relies on the recognition of patterns and the categorization of data into specific sets. Predictive modeling and optimization methods allow unknown events to be categorized based on statistics and classifiers input by researchers. *The Handbook of Research on Predictive Modeling and Optimization Methods in Science and Engineering* is a critical reference source that provides comprehensive information on the use of optimization techniques and predictive models to solve real-life engineering and science problems. Through discussions on techniques such as robust design optimization, water level prediction, and the prediction of human actions, this publication identifies solutions to developing problems and new solutions for existing problems, making this publication a valuable resource for engineers, researchers, graduate students, and other professionals.

All papers have been peer-reviewed. The Cryogenic Engineering Conference

covers applications and systems at temperatures where ordinary gases are liquids or solids, generally less than 150 K (-120°C or 185°F). It covers the newest approaches to producing low temperatures and to the use of systems at low temperatures, such as new superconducting magnets, high temperature superconducting electrical power applications, space applications and the properties of fluids and materials at these temperatures. Design, construction, testing, and characterization of cryogenic systems are presented. Topics include: Hydrogen: Past, Present, and Future; Liquefied Natural Gas; Liquid Helium: Refrigeration and Supply; Large Scale Cryogenic Systems; Large Scale Cryogenic Test Facilities; Expanders, Pumps, and Compressors; Large Cryosystem Components and Issues; Cryogenic Instrumentation, Controls, and Measurements; Cryostats: Design and Performance; Cryostates and Cryogenics for Herschel-Planck Mission; Superconducting RF Systems; Thermal Insulation; Material, Property Measurements; Low Temperature Superconducting Magnet Systems; High Temperature Superconducting Magnet Systems; High Temperature Superconducting Cables; High Current Leads; Helium II Phenomena; Fluid Dynamics, Heat Transfer, and Thermodynamics; Cryogenics at Zero G; Cryocooler Programs Overviews; Cryocooler Reliability; Stirling Cryocoolers; Pulse Tube - G-M Type; Pulse Tube JT and Heat Exchanger Modeling and Performance Issues; Brayton, Collins, Sorption Cryocoolers; JT and Thermoacoustic Cryocoolers; Magnetic Refrigeration; Hybrid Cycle Cryocoolers; Terrestrial Applications of Cryocoolers; and Novel Concepts or Devices.

Nanoarchitectures Built with Carbon Nanotubes and Magnetic Nanoparticles, Volume 630, the latest volume in the Methods in Enzymology series, continues the legacy of this premier serial with quality chapters authored by leaders in the field. New chapters in this volume include updates from well-known, established leaders. Contains the authority of authors who are leaders in their field Provides a comprehensive source on new methods and research in enzymology

This volume presents select papers presented at the 7th International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics. The papers discuss advances in the fields of soil dynamics and geotechnical earthquake engineering. Some of the themes include seismic risk assessment, engineering seismology, wave propagation, remote sensing applications for geohazards, engineering vibrations, etc. A strong emphasis is placed on connecting academic research and field practice, with many examples, case studies, best practices, and discussions on performance based design. This volume will be of interest to researchers and practicing engineers alike.

An in-depth exploration of natural fiber-reinforced composites and their applications In Natural Fiber-Reinforced Composites: Thermal Properties and Applications, a team of distinguished researchers delivers a comprehensive overview of the thermal properties of natural fiber-reinforced polymer composites ideal for readers seeking to make an informed decision regarding materials

selection for the development of automotive and aerospace products. The book brings together information currently dispersed throughout the scientific literature and offers viable and environmentally friendly alternatives to conventional composites. It also reviews the potential for using natural fiber-reinforced composites in the automotive, mechanical, and civil engineering sectors. Included case studies highlight and illustrate the applications of natural fiber-reinforced composites, and the included mathematical models predict the improvement of relevant properties of the materials. This book also provides: A thorough overview of the thermal characterization of natural fiber-based hybrid composites Comprehensive explorations of the thermal properties of hybrid natural fiber reinforced thermoplastic composites Practical discussions of the thermal properties of sugar palm fiber and sisal fiber-based hybrid composites In-depth examinations of the thermal properties of flax fiber, pineapple leaf fiber, and grass and cane fiber hybrid composites Natural Fiber-Reinforced Composites: Thermal Properties and Applications is a must-read for materials scientists and polymer chemists, as well as chemists and engineering scientists working in industry.

The book presents the best articles presented by researchers, academicians and industrial experts in the International Conference on “Innovative Design, Analysis and Development Practices in Aerospace and Automotive Engineering”. The book discusses new concept designs, analysis and manufacturing technologies, where more swing is for improved performance through specific and/or multifunctional linguistic design aspects to downsize the system, improve weight to strength ratio, fuel efficiency, better operational capability at room and elevated temperatures, reduced wear and tear, NVH aspects while balancing the challenges of beyond Euro IV/Barat Stage IV emission norms, Greenhouse effects and recyclable materials. The innovative methods discussed in the book will serve as a reference material for educational and research organizations, as well as industry, to take up challenging projects of mutual interest.

Biological Synthesis of Nanoparticles and Their Applications gives insight into the synthesis of nanoparticles utilizing the natural routes. It demonstrates various strategies for the synthesis of nanoparticles utilizing plants, microscopic organisms like bacteria, fungi, algae and so forth. It orchestrates interdisciplinary hypothesis, ideas, definitions, models and discoveries associated with complex cell of the prokaryotes and eukaryotes. Highlights: Discusses biological approach towards the nanoparticle synthesis Describes the role of nanotechnology in the field of medicine and its medical devices Covers application and usage of the chemicals at the molecular level to act as catalysts and binding products for both organic and inorganic Chemical Reactions Reviews application in physics such as solar cells, photovoltaics and other usage Microorganisms can aggregate and detoxify substantial metals because of different reductase enzymes, which can diminish metal salts to metal nanoparticles. The readers after going through this book will have detailed account of mechanism of bio-synthesis of nanoparticles.



The congress's unique structure represents the two dimensions of technology and medicine: 13 themes on science and medical technologies intersect with five challenging main topics of medicine to create a maximum of synergy and integration of aspects on research, development and application. Each of the congress themes was chaired by two leading experts. The themes address specific topics of medicine and technology that provide multiple and excellent opportunities for exchanges.

Contributors to current issue (listed in papers' order): Ibrahim Yasser, Abeer Twakol, A. A. Abd El-Khalek, A. A. Salama, Ahmed Sharaf Al-Din, Issam Abu Al-Qasim, Rafif Alhabib, Magdy Badran, Remya P. B, Francina Shalini, Masoud Ghods, Zahra Rostami, A. Sahaya Sudha, Luiz Flavio Autran Monteiro Gomes, K.R. Vijayalakshmi, Prakasam Muralikrishna, Surya Manokaran, Nidhi Singh, Avishek Chakraborty, Soma Bose Biswas, Malini Majumdar, Rakhal Das, Binod Chandra Tripathy, Nidhi Singh, Avishek Chakraborty, Nilabhra Paul, Deepshikha Sarma, Akash Singh, Uttam Kumar Bera, Fatimah M. Mohammed, Sarah W. Raheem, Muhammad Riaz, Florentin Smarandache, Faruk Karaaslan, Masooma Raza Hashmi, Iqra Nawaz, Kousik Das, Sovan Samanta, Kajal De, Xavier Encarnacion, Nivetha Martin, I. Pradeepa, N. Ramila Gandhi, P. Pandiammal, Aiman Muzaffar, Md Tabrez Nafis, Shahab Saquib Sohail, Abhijit Saha, Jhulaneswar Baidya, Debjit Dutta, Irfan Deli, Said Broumi, Mohsin Khalid, Neha Andaleeb Khalid, Md. Hanif Page, Qays Hatem Imran, Shilpi Pal, S. Satham Hussain, Saeid Jafari, N. Durga, Hanieh Shambayati, Mohsen Shafiei Nikabadi, Seyed Mohammad, Ali Khatami Firouzabadi, Mohammad Rahmanimanesh, Mujahid Abbas, Ghulam Murtaza, K. Porselvi, B. Elavarasan, Y. B. Jun, Chinnadurai V, Sindhu M P, K.Radhika, K. Arun Prakash, Malayalan Lathamaheswari, Ruipu Tan, Deivanayagampillai Nagarajan, Talea Mohamed, Assia Bakali, Nivetha Martin, R. Dhavaseelan, Ali Hussein Mahmood Al-Obaidi, Suman Das, Surapati Pramanik, Madad Khan, Muhammad Zeeshan, Saima Anis, Abdul Sami Awan, M. Sarwar Sindhu, Tabasam Rashid, Agha Kashif, Rajesh Kumar Saini, Atul Sangal, Manisha.

This book presents recent developments in the coating processes, sub processes and emphasizes on processes with the potential to improve performance quality and reproducibility. The book demonstrates how application methods, environmental factors, and chemical interactions affect each surface coating's performance. In addition, it provides analysis of latest polymers, carbon resins, high-temperature materials used for coatings and describes the development, chemical and physical properties, synthesis, polymerization, commercial uses and characteristics for each raw material and coating. Characterization techniques to solve the coating problems are also presented, as well as optimization studies to identify the critical coating parameters to ensure a robust process.

Inorganic Anticorrosive Materials. Past, Present and Future Perspectives covers the anticorrosive effect of inorganic materials, in particular metal oxides. The book wraps up the latest developments in the area of corrosion inhibition and discusses future opportunities. It addresses the fundamental characteristics, synthesis, inhibition mechanisms and applications of metal oxides as corrosion inhibitors in industry and provides a chronological overview of growth. The book concludes with discussions about commercialization and economics. This is

an indispensable reference for scholars, chemical engineers, chemists and materials scientists working in R&D and academia who need to know the in and outs of corrosion inhibition mechanisms. Utilizes metal oxides as corrosion inhibitors for usage in modern industrial platforms Evaluates corrosion inhibitors as prime options for sustainable and transformational opportunities Provides up-to-date reference materials, including websites of interest and information about ongoing research

Oxynitride thin film technology is rapidly impacting a broad spectrum of applications, ranging from decorative functions (through optoelectronics) to corrosion resistance. Developing a better understanding of the relationships between deposition processes, structure and composition of the deposited films is critical to the continued evolution of these applications. This e-book provides valuable information about the process modeling, fabrication and characterization of metallic oxynitride-based thin films produced by reactive sputtering and some related deposition processes. Its contents are spread in twelve main and concise chapters through which the book thoroughly reviews the bases of oxynitride thin film technology and deposition processes, sputtering processes and the resulting behaviors of these oxynitride thin films. More importantly, the solutions for the growth of oxynitride technology are given in detail with an emphasis on some particular compounds. This is a valuable resource for academic learners studying materials science and industrial coaters, who are concerned not only about fundamental aspects of oxynitride synthesis, but also by their innate material characteristics.

Green Sustainable Process for Chemical and Environmental Engineering and Science: Solid State Synthetic Methods cover recent advances made in the field of solid-state materials synthesis and its various applications. The book provides a brief introduction to the topic and the fundamental principles governing the various methods. Sustainable techniques and green processes development in solid-state chemistry are also highlighted. This book also provides a comprehensive literature on the industrial application using solid-state materials and solid-state devices. Overall, this book is intended to explore green solid-state techniques, eco-friendly materials involved in organic synthesis and real-time applications. Provides a broad overview of solid-state chemistry Outlines an eco-friendly solid-state synthesis of modern nanomaterials, organometallic, coordination compounds and pure organic Gives a detailed account of solid-state chemistry, fundamentals, concepts, techniques and applications Deliberates cutting-edge recent advances in industrial technologies involved in energy, environmental, medicinal and organic chemistry fields

Fundamentals of Environmental and Toxicological Chemistry: Sustainable Science, Fourth Edition covers university-level environmental chemistry, with toxicological chemistry integrated throughout the book. This new edition of a bestseller provides an updated text with an increased emphasis on sustainability and green chemistry. It is organized based on the five spheres of Earth's environment: (1) the hydrosphere (water), (2) the atmosphere (air), (3) the geosphere (solid Earth), (4) the biosphere (life), and (5) the anthrosphere (the part of the environment made and used by humans). The first chapter defines environmental chemistry and each of the five environmental spheres. The second chapter presents the basics of toxicological chemistry and its relationship to environmental chemistry. Subsequent chapters are grouped by sphere, beginning with the hydrosphere and its environmental chemistry, water pollution, sustainability, and water as nature's most renewable resource. Chapters then describe the atmosphere, its structure and importance for protecting life on Earth, air pollutants, and the sustainability of atmospheric quality. The author explains the nature of the geosphere and discusses soil for growing food as well as geosphere sustainability. He also describes the biosphere and its sustainability. The final sphere described is the anthrosphere. The text explains human influence on the environment, including climate, pollution in and by the anthrosphere, and means of sustaining this sphere. It also discusses renewable,

nonpolluting energy and introduces workplace monitoring. For readers needing additional basic chemistry background, the book includes two chapters on general chemistry and organic chemistry. This updated edition includes three new chapters, new examples and figures, and many new homework problems.

Himalaya, one of the global biodiversity hotspots, is the abode of a variety of flora and fauna. The Himalayan ecosystems have immense ecological, socioeconomic, and aesthetic significance as they provide a wide range of ecosystem services. The northwest Himalaya (NWH), covering three states of India viz., Uttarakhand, Himachal Pradesh, and Jammu and Kashmir, starts from the foothills of Shivaliks in the south and extends to the greater Himalaya in the north. This region is also the source of some of the major rivers of India. With the increase in population, the NWH ecosystems have been under threat due to deforestation, loss of biodiversity, expansion of agriculture and settlement, overexploitation of natural resources, habitat loss and fragmentation, poaching, mining, construction of roads and large dams, and unplanned tourism. The Himalaya being young and geotectonically active, remains inherently unstable, fragile, and prone to natural disasters. Climate change is also likely to impact the Himalayan cryosphere drastically. Recognizing the importance of the Himalaya, a National Mission for Sustaining the Himalayan Ecosystem, one of the eight missions under the National Action Plan on Climate Change (NAPCC) of Govt. of India, to conserve biodiversity, forest cover and other ecological values in the Himalayan region has been taken up. Spaceborne remote sensing with its ability to provide synoptic and repetitive coverage has emerged as a powerful tool for assessment and monitoring of the Himalayan resources and phenomena. Indian Institute of Remote Sensing, Dehradun has taken up a number of studies in the fields of geology, water resources, forestry, agriculture, urban settlement, etc., over the last decade. The book summarises the work carried out in different disciplines, illustrated with tables and figures and a host of relevant references. It is hoped that the book serves as an excellent reference of immense value to the students, researchers, professors, scientists, professionals, and decision makers working in the NWH region.

Electrochemical Impedance Spectroscopy is a compendium of contributions from experts in the field of electrochemical impedance spectroscopy (EIS). This compilation of investigations and reviews addresses the groundbreaking applications of EIS in different fields. An array of exploitations are revealed throughout this book such as the use of EIS in monitoring and controlling of corrosion, in medicine where accurate information on fluid distribution is needed as well as environmental applications in food, water, and drug analyses. Competency of EIS as an approach compared to the traditional electrochemical techniques is assessed in almost every application. This book, therefore, is a valuable reference for students, researchers, and anyone interested in electrochemical impedance spectroscopy.

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