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Nanoparticles have a smaller size as compared to their micro, macro, or bulk counterparts. Reduction in size of these particles provides them with some unique characteristics, such as surface-to-volume ratio, quantum confinement effect, surface plasmon response, widening of band gap, etc. These nanoparticles have attracted attention of scientists all over the globe in last few decades. Written in a convenient and easy-to-read style, this book covers the important aspects of nanomaterials by focusing on the many issues related to the food and textile industries, treatment of polluted water, health, energy crises, targeted drug delivery, etc. The editors take an interdisciplinary approach to discussing how the scenario will change on a global level in the future and explore when these nanomaterials will replace almost all micro- and macromaterials. The Science of Nanomaterials is a ready-at-hand guide to the many issues related to the use of nanomaterials in drug and gene delivery, sensors, photosplitting of water, wastewater treatment, microbial diagnosis, textile industries, nanocomposites, food industries (safety, security, packaging and preservation), etc.

This book presents the current state of knowledge on nanomaterials and their use in buildings, ranging from glazing and vacuum insulation to PCM composites. It also discusses recent applications in organic photovoltaics, photo-bioreactors, bioplastics and foams, making it an exciting read while also providing copious references to current research and applications for those wanting to pursue possible future research directions. Derek Clements-Croome, Emeritus Professor in Architectural Engineering, University of Reading (From the Foreword) Demonstrating how higher energy efficiency in new and existing buildings can help reduce global greenhouse gas emissions, this book details the way in which new technologies, manufacturing processes and products can serve to abate emissions from the energy sector and offer a cost-effective means of improving competitiveness and drive employment. Maximizing reader insights into how nano and biotech materials – such as aerogel based plasters, thermochromic glazings and thermal energy adsorbing glass, amongst others – can provide high energy efficiency performance in buildings, it provides practitioners in the field with an important high-tech tool to tackle key challenges and is essential reading for civil engineers, architects, materials scientists and researchers in the area of the sustainability of the built environment.

The Handbook of Composites From Renewable Materials comprises a set of 8 individual volumes that brings an interdisciplinary perspective to accomplish a more detailed understanding of the interplay between the synthesis, structure, characterization, processing, applications and performance of these advanced materials. The handbook covers a multitude of natural polymers/ reinforcement/ fillers

and biodegradable materials. Together, the 8 volumes total at least 5000 pages and offers a unique publication. This 4th volume of the Handbook is solely focused on the Functionalization of renewable materials. Some of the important topics include but not limited to: Chitosan-based bio sorbents: oil spill clean-up by textiles; pyridine and bipyridine end-functionalized polylactide; functional separation membranes from chitin and chitosan derivatives; acrylated epoxidized flaxseed oil bio-resin and its biocomposites; encapsulation of inorganic renewable nanofiller; chitosan coating on textile fibers for functional properties; surface functionalization of cellulose whiskers for nonpolar composites; impact of chemical treatment and the manufacturing process on mechanical, thermal and rheological properties of natural fibers based composites; bio-polymers modification; review on fibers from natural resources; strategies to improve the functionality of starch based films; the effect of gamma-radiation on biodegradability of natural fibers; surface functionalization through vapor-phase assisted surface polymerization (VASP) on natural materials from agricultural by-products; okra bast fiber as potential reinforcement element of biocomposites; silane coupling agent used in natural fiber/plastic composites; composites of olefin polymer /natural fibers: the surface modifications on natural fibers; surface functionalization of biomaterials; thermal and mechanical behaviors of bio-renewable fibres based polymer composites; natural and artificial diversification of starch; role of radiation and surface modification on bio-fiber for reinforced polymer composites.

This handbook summarizes the current advancements and growth in sustainable carbonaceous porous materials for fabrication and revival of energy devices, fuel cells, sensors technology, solar cell technology, stealth technology in addition to biomedical applications. It also covers the potential applications of carbon materials in various fields such as chemical, engineering, biomedical and environmental sciences. It also confers the prospective utilization of 2D and 3D hierarchical porous carbon in different interdisciplinary engineering applications. The book discusses major challenges faced in the development of cost-effective future energy storage strategies and provides effective solutions for improvement in the performance of carbon-based materials. Given the content, this handbook will be useful for students, researchers and professionals working in the area of material chemistry and allied fields.

This book presents concepts, methods and applications of inorganic nanomaterials for energy applications such as fuel cells and batteries, for environmental applications such as water purification, and for medicinal applications such as cancer treatments. The founding father of nanotechnology, Eric Drexler, always communicated a unique vision in exploring new materials and creating advancements in molecular nanotechnology. He emphasized the potential advantages of smaller size, higher

efficiency and less needed resources for applications in energy, environment and medicine. A higher surface to volume ratio of inorganic nanomaterials is a key property.

Issues in Electronic Circuits, Devices, and Materials: 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Electronic Circuits, Devices, and Materials. The editors have built Issues in Electronic Circuits, Devices, and Materials: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Electronic Circuits, Devices, and Materials in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Electronic Circuits, Devices, and Materials: 2011 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

The textile industry is focused in its search for alternative green fibres with the aim of providing high-quality products which are fully recyclable and biodegradable. Natural textile materials from renewable sources play an increasingly important role in the industry due to their unique properties and functionality over synthetic fibres, as well as their sustainability. Fundamentals of Natural Fibres and Textiles covers all the fundamental and basic information about natural fibres and textiles. Many different fibres are covered from their origin, through processing, properties, and applications. The latest methods for characterisation and testing of natural fibres are all addressed with reference to cutting-edge industry trends. This uniquely comprehensive approach to the topic provides the ideal entry point to natural fibres for textile and clothing scientists, engineers, designers, researchers, students, and manufacturers of such products. Explains the characteristics of natural fibres to show how they compare to synthetic fibres for a range of purposes Provides an overview of the environmental impact of the processing of fibres and how this creates industrial waste Covers a wide range of natural fibres in detail, from traditional silk and wool to electrospun biopolymers Provides the latest updates on technologies for designing natural fibres and applying them to the development of new products

Issues in Structural and Materials Engineering: 2013 Edition is a ScholarlyEditions™ book that delivers timely, authoritative, and comprehensive information about Computer Engineering. The editors have built Issues in Structural and Materials Engineering: 2013 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Computer Engineering in this book to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Structural and Materials Engineering: 2013 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

Issues in Materials and Manufacturing Research: 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Materials and Manufacturing Re-

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This book provides the fundamental aspects of the diverse ranges of nanostructured materials (0D, 1D, 2D and 3D) for energy and environmental applications in a comprehensive manner written by specialists who are at the forefront of research in the field of energy and environmental science. Experimental studies of nanomaterials for aforementioned applications are discussed along with their design, fabrication and their applications, with a specific focus on catalysis, energy storage and conversion systems. This work also emphasizes the challenges of past developments and directions for further research. It also looks at details pertaining to the current ground – breaking of nanotechnology and future perspectives with a multidisciplinary approach to energy and environmental science and informs readers about an efficient utilization of nanomaterials to deliver solutions for the public.

This new volume, Microscopy Applied to Materials Sciences and Life Sciences, focuses on recent theoretical and practical advances in polymers and their blends, composites, and nanocomposites related to their microscopic characterization. It highlights recent accomplishments and trends in the field of polymer nanocomposites and filled polymers related to microstructural characterization. This book gives an insight and better understanding into the development in microscopy as a tool for characterization. The book emphasizes recent research work in the field of microscopy in life sciences and materials sciences mainly related to its synthesis, characterizations, and applications. The book explains the application of microscopic techniques in life sciences and materials sciences, and their applications and state of current research carried out. The book aims to foster a better understanding of the properties of polymer composites by describing new techniques to measure microstructure property relationships and by utilizing techniques and expertise developed in the conventional filled polymer composites. Characterization techniques, particularly microstructural characterization, have proven to be extremely difficult because of the range of length-scales associated with these materials. Topics include: •Instrumentation and Techniques: advances in scanning probe microscopy, SEM, TEM, OM. 3D imaging and tomography, electron diffraction techniques and analytical microscopy, advances in sample preparation techniques in-situ microscopy, correlative microscopy in life and material sciences, low voltage electron microscopy. •Life Sciences: Structure and imaging of biomolecules, live cell imaging, neurobiology, organelles and cellular dynamics, multi-disciplinary approaches for medical and biological sciences, microscopic application in plants, microorganism and environmental science, super resolution microscopy in biological sciences. •Materials Sciences: materials for nanotechnology, metals alloys and inter-metallic, ceramics, composites, minerals and microscopy in cultural heritage, thin films, coatings, surfaces and interfaces, carbon based materials, polymers and soft materials and self-assembled materials, semiconductors and magnetic

materials. Polymers and inorganic nanoparticles. The volume will be of significant interest to scientists working on the basic issues surrounding polymers, nanocomposites, and nanoparticulate-filled polymers, as well as those working in industry on applied problems, such as processing. Because of the multidisciplinary nature of this research, the book will be valuable to chemists, materials scientists, physicists, chemical engineers, and processing specialists who are involved and interested in the future frontiers of blends.

This book focuses on functional aspects of nanostructured materials that have a high relevance to immediate applications, such as catalysis, energy harvesting, energy storage, optical properties and surface functionalization via self-assembly. Additionally, there are chapters devoted to massive nanostructured materials and composites and covering basic properties and requirements of this new class of engineering materials. Especially the issues concerning stability, reliability and mechanical performance are mandatory aspects that need to be regarded carefully for any nanostructured engineering material.

This book discusses how nanostructured materials play a key role in helping address environmental challenges. Employing nanostructured materials in catalysis can increase the efficient decomposition of toxic pollutants in air, water, and soil. This multidisciplinary book discusses the most promising nanostructured materials made-up of metals, metal oxides, metal chalcogenides, multi-metal oxides, carbon nanostructures, and hybrid materials that can address environmental remediation. It provides a well-referenced introduction to newcomers from allied disciplines and will be valuable to researchers in academia, industry, and government working on solutions to environmental problems.

This book covers the recent advances in solar photovoltaic materials and their innovative applications. Many problems in material science are explored for enhancing the understanding of solar cells and the development of more efficient, less costly, and more stable cells. This book is crucial and relevant at this juncture and provides a historical overview focusing primarily on the exciting developments in the last decade. This book primarily covers the different Maximum Power Point Tracking control techniques that have led to the improved speed of response of solar photovoltaics, augmented search accuracy, and superior control in the presence of perturbations such as sudden variations in illumination and temperature. Furthermore, the optimal design of a photovoltaic system based on two different approaches such as consumed power and economics is discussed.

Applied Geology is a multidisciplinary subject that interacts with other disciplines, such as mineralogy, petrology, structural geology, hydrogeology, seismic engineering, rock engineering, soil mechanics, geophysics, remote sensing (RS-GIS-GPS), environmental geology, etc. This book, entitled Applied Geology, is the only one of its kind in the Indian market that caters to the needs of all these subjects. This book covers all aspects of Applied Geology and is intended to serve B.Tech students. A plethora of examples and case studies relevant to the Indian context have been included for better understanding of the geological challenges faced by engineers.

With the advent of digital computers and rapidly developing computational techniques, computer simulations are widely used as predictive tools to supplement experimental techniques in engineering and technology. Computational biomechanics is a field where the movements of biological systems are assessed in the light of computer algorithms describing solid and fluid mechanical principles.

This rapidly developing field must be constantly studied and updated as it continues to expand. Advances in Computational Approaches in Biomechanics examines the current trends and applications of intelligent computational techniques used to analyze a multitude of phenomena in the field of biomechanics and elaborates a series of sophisticated techniques used for computer simulation in solid mechanics, fluid mechanics, and fluid-solid interface. Covering a range of topics such as injury prevention, element analysis, and soft tissues, this publication is ideal for industry professionals, practitioners, researchers, academicians, instructors, and students.

The unprecedented expansion of higher education in India and the proliferation of providers in turn have posed enormous challenges to equity, quality and financing of the sector. The India Higher Education Report 2015 traces the evolution of higher education and discusses the key role of committees and commissions whose reports and recommendations form the backdrop of contemporary developments. Authoritative and comprehensive, the volume examines a range of themes including equity, financing, employment, quality, and governance. It also engages with new and recent data as well as current issues and debates. The volume will be an important resource for academics, policy makers, civil society organisations, media and those concerned with higher education. It will also be useful to scholars and researchers of public policy, sociology and economics.

Research in the area of nanoindentation has gained significant momentum in recent years, but there are very few books currently available which can educate researchers on the application aspects of this technique in various areas of materials science. Applied Nanoindentation in Advanced Materials addresses this need and is a comprehensive, self-contained reference covering applied aspects of nanoindentation in advanced materials. With contributions from leading researchers in the field, this book is divided into three parts. Part one covers innovations and analysis, and parts two and three examine the application and evaluation of soft and ceramic-like materials respectively. Key features: A one stop solution for scholars and researchers to learn applied aspects of nanoindentation Contains contributions from leading researchers in the field Includes the analysis of key properties that can be studied using the nanoindentation technique Covers recent innovations Includes worked examples Applied Nanoindentation in Advanced Materials is an ideal reference for researchers and practitioners working in the areas of nanotechnology and nanomechanics, and is also a useful source of information for graduate students in mechanical and materials engineering, and chemistry. This book also contains a wealth of information for scientists and engineers interested in mathematical modelling and simulations related to nanoindentation testing and analysis.

COMPOSITES : Materials, Processes, Structures And Applications - discusses Stress-Strain Relation, Method of Analysis, Laminated Plates, Sandwich Constructions and Fabrication Processes, as applied to Composite Materials and Structures. Solved problems and questions with answers are special features in this book. It is developed based on ten years of teaching experience and corresponding lecture notes in Composite Materials and Structures (Aeronautical Engineering) and Composite Materials (Mechanical Engineering) and under Anna University Chennai Curriculum. It is a textbook for B.E. and M.E. (Aeronautical & Aerospace Engineering) and a reference book for mechanical engineering, manufacturing engineering, and metallurgical and materials engineering (MME). It shall serve as a handbook for engineering industrialists and research scientists working with Engineering Materials and Manufacturing Processes.

This edited volume is an introduction to diverse methods and applications in operations research focused on local populations and community-based organizations that have the potential to improve the lives of individuals and communities in tangible ways. The book's themes include: space, place and community; disadvantaged, underrepresented or underserved populations; international and transnational applications; multimethod, cross-disciplinary and comparative approaches and appropriate technology; and analytics. The book is comprised of eleven original submissions, a re-print of a 2007 article by Johnson and Smilowitz that introduces CBOR, and an introductory chapter that provides policy motivation, antecedents to CBOR in OR/MS, a theory of CBOR and a comprehensive review of the chapters. It is hoped that this book will provide a resource to academics and practitioners who seek to develop methods and applications that bridge the divide between traditional OR/MS rooted in mathematical models and newer streams in 'soft OR' that emphasize problem structuring methods, critical approaches to OR/MS and community engagement and capacity-building.

Biomimetic Nanoengineered Materials for Advanced Drug Delivery is an indispensable guide for new developments in biomimetic nanoengineering for advanced drug delivery applications. Focusing on the fundamentals of a new type of nanocarriers for drug delivery in the most recent miRNA therapeutics, the book provides readers with detailed knowledge from the basics, to the most recent innovations. Early chapters of the book discuss a range of drug delivery techniques, including nanofibers, biomimetic polymers, 3D bioprinting, nanotechnology and radiofrequency sensitive nanocarriers. Later chapters explore miRNA therapeutics, magnetic nanoparticles, nanogel-based and ROS-mediated drug delivery systems. The book is a vital reference for biomaterials and nanomedicine researchers and clinicians with an interest in advanced drug delivery. Analyzes nanoparticle-plasma protein interactions, making it one of the first books on this topic Includes the latest trends in nanotherapeutic drug delivery Presents comprehensive chapters that cover a specific drug delivery carrier and its mode of operation, stimuli and the target site of action Provides an essential tool for researchers in nanomedicine and nanobiomaterials

This volume was collected by results of the International Conference on Recent Advances in Materials, Mechanical and Civil Engineering (ICRAMMCE-2017, 1-2nd June, 2017, Hyderabad, India) and presents readers with the results of recent researches and achievements in the fields of the structural materials, technologies of materials processing, building materials and technologies in the construction, applied mechanics and practice of design in the mechanical engineering. We hope that this collection will be useful for many specialists from area of mechanical engineering and construction.

Unsaturated Polyester Resins: Fundamentals, Design, Fabrication, and Applications explains the preparation, techniques and applications relating to the use of unsaturated polyester resin systems for blends, interpenetrating polymer networks (IPNs), gels, composites and nanocomposites, enabling readers to understand and utilize the improved material properties that UPRs facilitate. Chapters cover unsaturated polyester resins and their interaction at the macro, micro and nano levels, in-depth studies on the properties and analysis of UPR based materials, and the applications of UPR based composites, blends, IPNs and gels across a range of advanced commercial and industrial fields. This is a highly detailed source of information on unsaturated polyester resins, supporting academics, researchers and postgraduate students working with UPRs, polyesters, polymeric or composite mate-

rials, polymer chemistry, polymer physics, and materials science, as well as scientists, R&D professionals and engineers in industry. Covers the use of unsaturated polyester resin systems for blends, IPNs, gels, composites and nanocomposites Presents cutting-edge techniques for the analysis and improvement of properties of advanced UPR-based materials Unlocks the potential of unsaturated polyester resins in high-performance materials for a range of advanced applications

This book covers the topic of degradation phenomenon of natural fiber-based composites (NFC) under various aging conditions and proposes suitable solutions to improve the response of natural fiber-reinforced composite to aging conditions such as moisture, seawater, hygrothermal, and natural and accelerated weathering. The information provided by the book plays a vital role in the durability and shelf life of the composites as well as broadening the scope of outdoor application for natural fiber-based composites. The book will be appropriate for researchers and scientist who are interested in the application of natural fiber composites in various fields.

Collection of selected, peer reviewed papers from the 2014 2nd International Conference on Mechanical Structures and Smart Materials (2nd ICMSSM 2014), August 16-17, 2014, Kuala Lumpur, Malaysia. The 120 papers are grouped as follows: Chapter 1: Materials Science, Chapter 2: Material Properties and Processing Technologies, Chapter 3: Applied Mechanic and Engineering Design, Chapter 4: Mechanical Engineering and Control Systems, Chapter 5: Researches of Transmission Line Construction, Chapter 6: Civil Engineering and Information Technologies.

Issues in Industrial, Applied, and Environmental Chemistry: 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Industrial, Applied, and Environmental Chemistry. The editors have built Issues in Industrial, Applied, and Environmental Chemistry: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Industrial, Applied, and Environmental Chemistry in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Industrial, Applied, and Environmental Chemistry: 2011 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

As technology advances, it is imperative to stay current in the newest developments made within the engineering industry and within material sciences. Trends in manufacturing such as 3D printing, casting, welding, surface modification, computer numerical control (CNC), non-traditional, Industry 4.0 ergonomics, and hybrid machining methods must be closely examined to utilize these important resources for the betterment of society. Advanced Manufacturing Techniques for Engineering and Engineered Materials provides a unified and complete overview about the recent and emerging trends, developments, and associated technology with scope for the commercialization of techniques specific to manufacturing materials. This book also reviews the various machining methods for difficult-to-cut materials and novel materials including matrix composites. Covering topics such as agro-waste, conventional machining, and material performance, this book is an essential resource for researchers, engineers, technologists, students and professors of higher education, industry workers,

entrepreneurs, researchers, and academicians.

An Assessment of the National Institute of Standards and Technology Chemical Science and Technology Laboratory examines the operations of the Chemical Science and Technology Laboratory (CSTL) of the National Institute of Standards and Technology (NIST). This book assesses the CSTL, based on the following criteria: (1) the technical merit of the current laboratory programs relative to current state-of-the-art programs worldwide; (2) the adequacy of the laboratory budget, facilities, equipment, and human resources, as they affect the quality of the laboratory's technical programs; and (3) the degree to which laboratory programs in measurement science and standards achieve their stated objectives and desired impact."

This book reviews health hazards associated with wastewater use and water pollutants. Chapters present applications of green materials made of agricultural waste, activated carbon and magnetic materials for wastewater treatment. The removal of toxic metals using algal biomass and the removal of toxic dyes using chitosan composite materials are also discussed. The book includes reviews on the removal of phenols, pesticides, and on the use of ionic liquid-modified activated carbon for the treatment of textile wastewater.

The aim of these proceedings is to present and stimulate discussion on the many subjects related to ion implantation among a broad mix of specialists from areas as diverse as materials science, device production and advanced ion implanters. The contents open with a paper on the future developments of the microelectronics industry in Europe within the framework of the global competition. The subsequent invited and oral presentations cover in detail the following areas: trends in processing and devices, ion-solid interaction, materials science issues, advanced implanter systems, process control and yield, future trends and applications.

Natural Polymers, Biopolymers, Biomaterials, and Their Composites, Blends, and IPNs focuses on the recent advances in natural polymers, biopolymers, biomaterials, and their composites, blends, and IPNs. Biobased polymer blends and composites occupy a unique position in the dynamic world of new biomaterials. The growing need for lubricious coatings and surfaces in medical devices—an outcome of the move from invasive to noninvasive medicines/procedures—is playing a major role in the advancement of biomaterials technology. Natural polymers have attained their cutting-edge technology through various platforms, yet there is a lot of novel information about them that is discussed in the book. This important work covers topics such as chitosan composites for biomedical applications and wastewater treatment, coal biotechnology, biomedical and related applications of second generation polyamidoamines, silk fibers, PEG hydrogels, bamboo fiber reinforced PE composites, jute/polyester composites, magnetic biofoams, and many other interesting aspects of importance to polymer research today.

This book presents a unified approach to fracture behavior of natural and synthetic fiber-reinforced polymer composites on the basis of fiber orientation, the addition of fillers, characterization, properties and applications. In addition, the book contains an extensive survey of recent improvements in the research and development of fracture analysis of FRP composites that are used to make higher fracture toughness composites in various applications. The FRP composites are an emerging area in polymer science with many structural applications. The rise in materials failure by fracture has forced scientists and researchers to develop new higher strength materials for obtaining higher frac-

ture toughness. Therefore, further knowledge and insight into the different modes of fracture behavior of FRP composites are critical to expanding the range of their application.

This treatise on Engineering Materials and Metallurgy contains comprehensive treatment of the matter in simple, lucid and direct language and envelopes a large number of figures which reinforce the text in the most efficient and effective way. The book comprises five chapters (excluding basic concepts) in all and fully and exhaustively covers the syllabus in the above mentioned subject of 4th Semester Mechanical, Production, Automobile Engineering and 2nd semester Mechanical disciplines of Anna University.

FRP : Composite Materials and Structures - discusses Micromechanics, Macromechanics, Lamination Theory, Fabrication and Repair, and Sandwich Products, as applied to Composite Materials and Structures. Solved problems and questions with answers are special features in this book. It is developed based on twelve years of teaching experience and corresponding lecture notes in Composite Materials and Structures (Aeronautical Engineering) and Composite Materials (Mechanical Engineering) and under Anna University Chennai Curriculum. It is a textbook for B.E. and M.E. (Aeronautical & Aerospace Engineering) and a reference book for mechanical, manufacturing, and metallurgical and materials engineering. It shall serve as a handbook for engineering industrialists and research scientists working with Engineering Materials and Manufacturing Processes.

This book comprehensively covers the different topics of wood polymer composite materials mainly synthesis methods for the composite materials, various characterization techniques to study the superior properties and insights on potential advanced applications. It also discusses the chemistry, fabrication process, properties, applications, recycling and life cycle assessment of wood polymer composites. This is a useful reference source for both engineers and researchers working in composite materials science as well as the students attending materials science, physics, chemistry and engineering courses.

This book provides a wide-range exploration on the ongoing research and developmental events in environmental nanotechnology. Emerging nanomaterials and its technology have been known to offer unique advantages and are continually showing promising potential attracting continuous global attention. This work thus discusses experimental studies of various nanomaterials along with their design and applications and with specific attention to chemical reactions and their challenges for catalytic systems. It will make a noteworthy appeal to scientists and researchers working in the field of nanotechnology for environmental sciences.

Cloud Enterprise Architecture examines enterprise architecture (EA) in the context of the surging popularity of Cloud computing. It explains the different kinds of desired transformations the architectural blocks of EA undergo in light of this strategically significant convergence. Chapters cover each of the contributing architectures of EA—business, information, application, integration, security, and technology—illustrating the current and impending implications of the Cloud on each. Discussing the implications of the Cloud paradigm on EA, the book details the perceptible and positive changes that will affect EA design, governance, strategy, management, and sustenance. The author ties these topics together with chapters on Cloud integration and composition architecture. He also examines the Enterprise Cloud, Federated Clouds, and the vision to establish the InterCloud. Laying out a compre-

hensive strategy for planning and executing Cloud-inspired transformations, the book: Explains how the Cloud changes and affects enterprise architecture design, governance, strategy, management, and sustenance Presents helpful information on next-generation Cloud computing Describes additional architectural types such as enterprise-scale integration, security, management, and governance architectures This book is an ideal resource for enterprise architects, Cloud evangelists and enthusiasts, and Cloud application and service architects. Cloud center administrators, Cloud business executives, managers, and analysts will also find the book helpful and inspirational while formulating appropriate mechanisms and schemes for sound modernization and migration of traditional applications to Cloud infrastructures and platforms.

This book presents recent research on sustainable building materials and their various applications. Topics include such items as fiber reinforced concrete, the use of mineral admixtures, self-sensing cement composites, the use of nanomaterials for structural health monitoring and the production of geopolymer mortar. Keywords: Light Transmitting Concrete, Self-Compacting Concrete, Light-Weight Concrete, Polymer Concrete, Porous Concrete, Eco-Friendly Building Material, Cement Composite, Geopolymer Composites, Sustainable Bricks, Cement, Sisal Fiber, Glass Fiber, Nanomaterials, Metakaoline, Fly Ash, Silica Fume, Rice Husk Ash, Oyster Shells, Bitumen, Sugarcane Bagasse Ash, Herbocrete, Waste Foundry Sand, Swell Pressure of Clay, Quarry Dust, Sensors, Topology Optimization, Soil Stabilization.

Materials Development and Processing for Biomedical Applications focuses on various methods of manufacturing, surface modifications, and advancements in biomedical applications. This book ex-

amines in detail about five different aspects including, materials properties, development, processing, surface coatings, future perspectives and fabrication of advanced biomedical devices. Fundamental aspects are discussed to better understand the processing of various biomedical materials such as metals, ceramics, polymers, composites, etc. A wide range of surface treatments are covered in this book that will be helpful for the readers to understand the importance of surface treatments and their future perspectives. Additional Features Include: Examines various properties of biomedical materials at the beginning in several chapters which will enrich the fundamental knowledge of the readers. Discusses advancements in various fields of biomedical applications. Provides a glimpse of characterization techniques for the evaluation of material properties. Addresses biocompatibility, biocorrosion, and tribocorrosion. This book explores new and novel strategies for the development of materials and their biomedical applications. It will serve as a comprehensive resource for both students and scientists working in materials and biomedical sciences.

This book presents select proceedings of the International Conference on Materials Processing and Characterization (ICMPC 2021). It particularly focuses on emerging trends related to advanced materials processing and characterization and current practices in industries. It discusses innovative manufacturing processes, standards and technologies used to broaden the knowledge of materials and also help to increase innovation and responsiveness to ever-increasing international needs, more in-depth studies of functionally graded materials/ tailor-made materials. This book will be a valuable resource for students, researchers, and professionals working in the various areas of materials science.