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Titolo	Fiber reinforced polymeric materials and sustainable structures // edited by Shamsheer Bahadur Singh [and three others]
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Descrizione fisica	1 online resource (372 pages)
Collana	Composites Science and Technology Series
Disciplina	620.118
Soggetti	Fibrous composites
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Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Methodology for Evaluating FRP-Concrete Interfacial Bond Strength at Elevated Temperatures -- Durability of FRP Composites for Use in Civil Infrastructure - From Materials to Application -- Stochastic Multiscale Analysis for Incorporating Micro-Scale Spatial Randomness in Multi-Directional Composite Laminates -- Circular Economy: New Opportunities in Sustainable Nano Materials and Polymer Bio-Nanocomposites -- Rehabilitation and Retrofitting of Reinforced Concrete Structures using Fiber Reinforced Polymers- Experiments -- Construction Technology for Integral Bridges with Basalt Fiber-Reinforced Polymer Prestressing Tendons -- Experimental Investigation on Flexural behaviour of Large Scale RC Beams Strengthened with Various FRP Configurations -- Elasticity Solution of FG Shell under Unidirectional Bending by Mixed Semi-Analytical -- Effect of Prestressing on CFRP Laminate for Flexural Enhancement -- Cocos Nucifera Sheath based Hybrid Composites as Alternative Materials for Body Armour Applications -- Transformation of Natural Fiber Reinforced Composites on the Structural Properties to the Large Scale Application -- Role of FRP Composites in Aeroelastic Modeling used in Wind Tunnels -- Comparative Study of Long-Term Monitoring Systems and Introduction to Emerging Smart FRP Technology -- A Potential Bio-Reinforcement in Polymers for Fiber Reinforced Plastic (FRP) Structures- An Overview -- Hydration and Microstructure Characteristics of Nano Silica Admixed Sustainable Cementitious Mortar -- Nanoparticle

Reinforced Natural Nanofibers -- Fabrication and Mechanical Characterization of Glass/Epoxy and Carbon/Epoxy Fiber-Reinforced Composite Laminates -- Evaluating Accuracy of Correlation Expressions from Literature for Estimation of Concrete Strength from Ultrasonic Pulse Velocity -- Experimental Investigation on Durability Properties of Hybrid Fibers Concrete -- Evaluating the Synergic Effect of Sugarcane Bagasse Ash and Rice Husk Ash on the Mechanical Properties of Reinforced Cement Concrete -- Effect of Polypropylene Fiber on the properties of Self- Compacting Concrete with M-Sand -- Numerical Investigation of Nonlinear Guided Wave Propagation in a Functionally Graded Material -- Effect of High Temperatures on Stiffness of Water Quenched Reinforced Concrete Columns Supplemented with Steel Fibers -- Performance Characteristics and Economical Evaluation of Various Types of Nanomaterial Concrete -- Bending Analysis of Laminated Composite Cylindrical Shell using Fifth Order Shear Deformation Theory -- Performance of GGBS and SBA in Compressed Stabilized Earth Blocks -- Tailoring Properties of Electric Arc Furnace Slag based Geopolymer through Fly Ash Incorporation -- Impact of Clay and Non-Clay Microfines on Various Concrete Properties -- Experimental Evaluation of GRFP Rebars in Concrete Beams -- Coal Ash: A Non-Virgin Material Sustained for Cement Concrete -- Composite action of Fibers and Ferrocement Laminate on Flexural behavior of Self Compacting Concrete -- Effect of Layer Thickness and FRP Reinforcement Ratio on the Load Carrying Capacity of ECC Composite Beams -- Influence of Fire on Steel Reinforcement of RCC Elements -- Static and Dynamic Mechanical Properties of Graphene Oxide and Fly Ash based Concrete -- Evaluation of Properties of Glass Fiber Reinforced Concrete through Laboratory Investigation -- An Experimental and Analytical Assessment of the Opportunities for Incorporating Cinder as Binary Blended Concrete.

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### Sommario/riassunto

This book deals with the introduction of various kinds of advanced composite materials such as carbon fiber-reinforced polymer (CFRP), glass fiber-reinforced polymer (GFRP), aramid fiber-reinforced polymer (AFRP), and basalt fiber-reinforced polymer (BFRP). This book covers the advantages and disadvantages of these advanced composite materials. The primary advantages, such as high specific strength and stiffness, of advanced composite materials result in lighter and durable structures. On the other hand, its linear elastic behavior till failure has been highlighted as the main disadvantage for their structural applications. This book also highlights the various forms in which the FRP components are tailored and stacked up to optimize its strength and stiffness to deliver the high-performance structural as well as non-structural components in its real-life application. The various forms in which FRP materials are developed are described such as uni-directional, cross-ply, angle-ply, hybrid, and functionally graded composites. In addition, various forms in which these materials stacked and/ bonded to fabricate the various structural and non-structural components are described. Most importantly, techniques to extract plant-based cellulosic fibers and its application to fabricate the various forms of sustainable composite products are described. In addition, development of nano-particle-enforced cellulosic fibers for sustainable industrial products has also been presented. Furthermore, the use of advanced composites and natural fiber-based composites has been demonstrated for repair, rehabilitation, and retrofitting of deficient structural systems. Moreover, the comprehensive overview of the state-of-the-art research on the test methods for material characterization at room and elevated temperature is presented which will be of high interest to scientists, researchers, students, and engineers working in

the fields of composite materials such as FRPs and other forms of composites such as fiber-reinforced concrete (FRC). This book is also helpful for undergraduate, masters, and most importantly Ph.D. research scholars for developing their fundamental understanding on advanced composite materials and their applications in construction as well as industrial sectors.

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