

# Table of Contents

## Preface

## Chapter 1: Fiber Reinforced Composite Materials and Laminates

<b>The Use of Viscoelastic Layers in GFRP, a New Vision of Planning Hull</b> P. Townsend, J.C. Suárez, N. Muñoz and J. Rodríguez	3
<b>Stress Analysis of a Flange Stiffened FRP Composite Panel with Varying Stacking Sequence</b> N. Teyi and S.K. Tamang	9
<b>Determination of Interlaminar Fracture Toughness of CFRP Composite in Mode I Using Numerical Simulation with Cohesive Elements</b> F. Sedlacek, T. Kalina and K. Raz	15
<b>Fabrication of Fibre Metal Laminates with Multiscale Toughening Mechanisms</b> G. Mahendrarajah, E. Kandare and A.A. Khatibi	22
<b>The Effect of Alkalization Treatment on Fiber-Matrix Compatibility in Natural Fiber Reinforced Composite</b> E. Yuanita, Y.A. Husnil, M.A. Mochtar, R. Lailani and M. Chalid	28
<b>Design and Build of a Remote Control Concrete Boat</b> M.G. Lee, Y.C. Kan, Y.F. Shih, Y.X. Wang and M.J. Lee	34
<b>Inverse Hybrid Laminate for Lightweight Applications</b> T. Osiecki, C. Gerstenberger, T. Timmel, M. Frankiewicz, R. Dziedzic, P. Scholz and L. Kroll	40
<b>Effect of Ply Drop in Aerospace Composite Structures</b> P. Jadhav	46

## Chapter 2: Polymer Matrix Composite Materials

<b>Development of Eco-Friendly Flame-Retarded High Density Polyethylene Composites</b> Y.F. Shih, W.L. Tsai and V.K. Kotharangannagari	55
<b>Two Experimental Approaches for Investigation of Nonlinear Elastic Properties of Polymers and Polymer-Based Composites</b> A.V. Belashov, A.A. Zhikhoreva, I.V. Semenova and Y.M. Beltukov	61

## Chapter 3: Manufacturing Technology

<b>Compressive Strength Prediction of Quad-Diametral Lattice Structures</b> K. Raz, Z. Chval and F. Sedlacek	69
<b>Design of Injection Mold from Plastic Material</b> Z. Chval, K. Raz and F. Sedlacek	75
<b>Relaxation-Compression Resin Transfer Molding under Magnetic Field</b> A. Ouezgan, S. Adima, A. Maziri, E.H. Mallil and J. Echaabi	81
<b>Effect of Shear Stress on Viscosity and Crystallization Behavior of CaO-SiO<sub>2</sub>-Al<sub>2</sub>O<sub>3</sub> Based Mold Fluxes</b> S.P. Gu, G.H. Wen, J.L. Guo and P. Tang	87

## Chapter 4: Nanomaterials and Technology

<b>Iron/Sulfur Co-Doped Titanium Dioxide Nanotubes: Optimization of the Photoelectrocatalytic Degradation of Phenol Red under Visible Light</b> E.C.R. Lopez, N.E.B. Saputil, L.A. Loza, F.F.G. Camiguing, M.L. Mopon Jr. and J.V.D. Perez	95
<b>Development of Copper Loaded Nanoparticles Hydrogel Made from Waste Biomass (Sugarcane Bagasse) for Special Medical Application</b> H. Kumar, A.K. Gehlaut, H. Gupta, A. Gaur and J.W. Park	102

<b>Effect of Surface Modification on Multi-Walled Carbon Nanotubes and their Reinforced Nylon Composites</b> Y.F. Shih, V.K. Kotharangannagari and Y.T. Lin	108
<b>Natural Convection in a Nano-Fluid Filled Square Enclosure</b> B.L. Barhoi, R.C. Borah and S. Singh	114
<b>A Study on Phonon-Mediated Thermal Transport and Lattice Thermal Conductivity Prediction Using First-Principles Calculations</b> A.P. Maung and C.H. Hsu	120

## **Chapter 5: Functional and Special Materials**

<b>Fabrication of Solid Oxide Electrolysis Single Cell Using NiO-YSZ/YSZ/LSM-YSZ via Drop-Coating Method</b> J.R. Rabo and R.B.M. Cervera	129
<b>A Novel Full Stressed Energy Harvester with Varied Thickness</b> G.H. Zhu and Y.B. Liu	135
<b>Development of Rice Straw Paper Coated with Pomelo Peel Extract for Bio-Based and Antibacterial Packaging</b> R. Chollakup, W. Kongtud, U. Sukatta, K. Piriyaatits, M. Premchookiat and A. Jarerat	141

## **Chapter 6: Building Materials**

<b>Biochar as a Conducting Filler to Enhance Electrical Conduction Monitoring for Concrete Structures</b> S. Kamaluddin, D. Kurniawan, M.S. Abu Bakar and Z. Abu Samah	149
<b>Lightweight Concrete Manufacturing Technology Based on Waste Energy Raw Materials Alkaline-Activated</b> M. Nalewajko	155
<b>Effects of the Usage of Wasted Diatomite and Phase Change Materials as Partial Replacement of Cement on the Mechanical Properties of Concrete</b> Y.F. Shih, W.C. Hou, V.K. Kotharangannagari and M.G. Lee	161
<b>Analytical Methods for the Synthesis of Composites</b> I. Garkina and A. Danilov	167