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Sommario/riassunto

The book is essential for anyone looking to deepen their understanding of advanced composite materials and their intricate behaviors, offering comprehensive insights into the mechanics, design, and innovative applications of functional composites in today's engineering landscape. Understanding the complicated vibration behavior of composite beams, plates, shells, curved membranes, rings, and other complex structures is crucial for modern-day engineering. Functional Composites: Role in Modern Engineering addresses current progress in the mechanics and design of functional composites and structures. It covers the characterization of properties, analyses, and design of various advanced composite material systems with an emphasis on coupled mechanical and non-mechanical behaviors. The book comprehensively covers analyses of functional materials related to piezoelectric and magnetostrictive nanocomposites, as well as the design of active fiber composites. Techniques and challenges in producing functional composites and identifying their coupled properties are also discussed. The book culminates in a discussion on more advanced uses of functional composites and how these smart structures can be analyzed on a larger scale. The book's comprehensive coverage of the innovative potential of these composites makes it an essential resource for industry professionals and students alike. Readers will find that the book: Explores technologies for improvement in advanced processes and the application of functional composites; Introduces both recently developed and emerging functional composites; Provides comprehensive insight into concepts such as the successful fabrication of multipurpose functional composites, sustainability of functional composites, and future scopes and challenges of functional composites; Serves as a valuable reference for students and researchers working with functional composites. Audience Materials scientists, mechanical, manufacturing, biomedical, and industrial engineers in industry and academia, as well as students, who are working with functional composites.