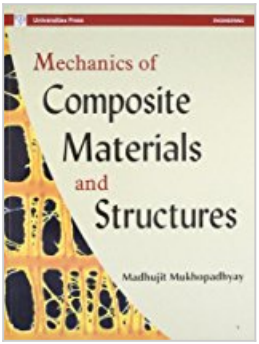

Mechanics of Composite Materials and Structures

By Madhujit Mukhopadhyay

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Fibre reinforced plastic (FRP) materials have a wide range of applications in various engineering structures - offshore, maritime, aerospace and civil engineering; machine components; chemical engineering applications and so on. The scope for intelligent exploitation of these composites is ample, though the actual use has been limited. This is mainly because of the paucity of adequate knowledge on FRP composite materials, its structural mechanics and structural analysis among practicing engineers. Mechanics of Composite Materials and Structures is an attempt to present an integrated and unified approach to the analysis of FRP composite materials. The micromechanics and lamination theory of composite structural elements are discussed in detail. Closed form analytical solutions as well as numerical techniques for solving problems in FRP analysis are presented. Applications of the finite element method for the analysis of FRP structural elements are given considerable emphasis.

Contents:
Preface / Introduction to Composite Materials / Processing of FRP Composites / Micromechanical Analysis of Composite Strength and Stiffness / Elastic Properties of the Unidirectional Lamina / Analysis of Laminated Composites / Analytical Methods of Laminated Plate / Analysis of Composite Beams / Finite Element Analysis of Composite Structures / Hydrothermal Effects in Laminates / Failure Theories and Strength of a Unidirectional Lamina / Analysis of Laminate Strength / Design of Fiber Reinforced Composite Structures / Composite Joints / Index

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Editorial Review

About the Author
Dr Madhujit Mukhopadhyay is a professor in the department of Ocean Engineering and Naval Architecture, IIT Kharagpur. His field of research is in the area of plates and shells (bare or stiffened). He has a large number of research publications in reputed international journals of civil, mechanical, aerospace, engineering, and naval architecture and is the author of two textbooks.

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