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Nota di contenuto	DESIGN AND ANALYSIS OF COMPOSITE STRUCTURES : WITH APPLICATIONS TO AEROSPACE STRUCTURES; Contents; About the Author; Series Preface; Preface to First Edition; Preface to Second Edition; 1 Applications of Advanced Composites in Aircraft Structures; References; 2 Cost of Composites: a Qualitative Discussion; 2.1 Recurring Cost; 2.2 Nonrecurring Cost; 2.3 Technology Selection; 2.4 Summary and Conclusions; Exercises; References; 3 Review of Classical Laminated Plate Theory; 3.1 Composite Materials: Definitions, Symbols and Terminology; 3.2 Constitutive Equations in Three Dimensions 3.2.1 Tensor Transformations3.3 Constitutive Equations in Two Dimensions: Plane Stress; Exercises; References; 4 Review of Laminate Strength and Failure Criteria; 4.1 Maximum Stress Failure Theory; 4.2 Maximum Strain Failure Theory; 4.3 Tsai-Hill Failure Theory; 4.4 Tsai-Wu Failure Theory; 4.5 Puck Failure Theory; 4.6 Other Failure Theories; References; 5 Composite Structural Components and Mathematical Formulation; 5.1 Overview of Composite Airframe; 5.1.1 The Structural

Design Process: The Analyst's Perspective

5.1.2 Basic Design Concept and Process/Material Considerations for Aircraft Parts

5.1.3 Sources of Uncertainty: Applied Loads, Usage and Material Scatter; 5.1.3.1 Knowledge of Applied Loads; 5.1.3.2 Variability in Usage; 5.1.3.3 Material Scatter; 5.1.4 Environmental Effects; 5.1.5 Effect of Damage; 5.1.6 Design Values and Allowables; 5.1.7 Additional Considerations of the Design Process; 5.2 Governing Equations; 5.2.1 Equilibrium Equations; 5.2.2 Stress-Strain Equations; 5.2.3 Strain-Displacement Equations; 5.2.4 von Karman Anisotropic Plate Equations for Large Deflections

5.3 Reductions of Governing Equations: Applications to Specific Problems

5.3.1 Composite Plate under Localized In-Plane Load; 5.3.2 Composite Plate under Out-of-Plane Point Load; 5.4 Energy Methods; 5.4.1 Energy Expressions for Composite Plates; 5.4.1.1 Internal Strain Energy U; 5.4.1.2 External Work W; Exercises; References; 6 Buckling of Composite Plates; 6.1 Buckling of Rectangular Composite Plate under Biaxial Loading; 6.2 Buckling of Rectangular Composite Plate under Uniaxial Compression; 6.2.1 Uniaxial Compression, Three Sides Simply Supported, One Side Free

6.3 Buckling of Rectangular Composite Plate under Shear

6.4 Buckling of Long Rectangular Composite Plates under Shear; 6.5 Buckling of Rectangular Composite Plates under Combined Loads; 6.6 Design Equations for Different Boundary Conditions and Load Combinations; Exercises; References; 7 Post-Buckling; 7.1 Post-Buckling Analysis of Composite Panels under Compression; 7.1.1 Application: Post-Buckled Panel under Compression; 7.2 Post-Buckling Analysis of Composite Plates under Shear; 7.2.1 Post-Buckling of Stiffened Composite Panels under Shear

7.2.1.1 Application: Post-Buckled Stiffened Fuselage Skin under Shear

Sommario/riassunto

"New edition updated with additional exercises and two new chapters. Design and Analysis of Composite Structures: With Applications to Aerospace Structures, 2nd Edition builds on the first edition and includes two new chapters on composite fittings and the design of a composite panel, as well additional exercises. The book enables graduate students and engineers to generate meaningful and robust designs of complex composite structures. A compilation of analysis and design methods for structural components made of advanced composites, it begins with simple parts such as skins and stiffeners and progresses through to applications such as entire components of fuselages and wings. It provides a link between theory and day-to-day design practice, using theory to derive solutions that are applicable to specific structures and structural details used in industry. Starting with the basic mathematical derivation followed by simplifications used in real-world design, Design and Analysis of Composite Structures: With Applications to Aerospace Structures, 2nd Edition presents the level of accuracy and range of applicability of each method along with design guidelines derived from experience combined with analysis. The author solves in detail examples taken from actual applications to show how the concepts can be applied, solving the same design problem with different methods based on different drivers (e.g. cost or weight) to show how the final configuration changes as the requirements and approach change. Each chapter is followed by exercises that represent specific design problems often encountered in the aerospace industry but which are also applicable in the automotive, marine, and construction industries. Updated to include additional exercises, that represent real design problems encountered in the aerospace industry, but which are also applicable in the automotive, marine, and construction industries. Includes two new chapters. One on composite

fittings and another on application and the design of a composite panel. Provides a toolkit of analysis and design methods that enable engineers and graduate students to generate meaningful and robust designs of complex composite structures. Provides solutions that can be used in optimization schemes without having to run finite element models at each iteration; thus speeding up the design process and allowing the examination of many more alternatives than traditional approaches. Supported by a complete set of lecture slides and solutions to the exercises hosted on a companion website for instructors. An invaluable resource for Engineers and graduate students in aerospace engineering as well as Graduate students and engineers in mechanical, civil and marine engineering"--
