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# Design And Analysis Of Composite Structures: With Applications To Aerospace Structures



## Synopsis

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.

## Book Information

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## Customer Reviews

Nevertheless, this book is an important contribution to the field and will provide a useful aid to postgraduate aerostructural engineers. (The Aeronautical Journal, 1 June 2014)

Design and Analysis of Composite Structures: With Applications to Aerospace Structures, Second Edition provides a series of analysis and design methods for composite structures. It focuses on the development of analysis techniques that can be used in the context of preliminary design of composite structures. The methods provided can be used to perform trade studies to determine the effect of different design variables on the strength, stiffness, weight or cost of composite structures. The analysis methods are used to obtain design guidelines and to explain traditional design rules being used in the aerospace industry. The limitations and range of applicability of each method are also provided. Key features of this second edition: Enhanced with the addition of composite fittings with analysis and design methods for clips and lugs, and a detailed application of a composite skin designed using three different design concepts The weight and cost implications of the different geometries and various design decisions associated with how to stiffen the panel to be designed and which fabrication method(s) to use, are discussed in detail An App called CoDeAn (Composites Design and Analysis) has been created for this book. Most of the analysis methods and equations in the book are available to the App user in an efficient and user-friendly way ranging from material creation to analysis of different failure modes of a composite structure Discusses design guidelines in detail and provides methods to develop robust, accurate

preliminary designs Real life applications are explained and analyzed in detail. End of chapter exercises using these applications are also included Accompanied by a website hosting lecture slides and solutions for instructors

Design and Analysis of Composite Structures: With Applications to Aerospace Structures, Second Edition is a comprehensive reference for graduate students, researchers and practitioners in Aerospace Engineering and other engineering disciplines.

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