



Mechanics of Aircraft Structures

By C. T. Sun

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Designed to help students get a solid background in structural mechanics and extensively updated to help professionals get up to speed on recent advances

This Second Edition of the bestselling textbook *Mechanics of Aircraft Structures* combines fundamentals, an overview of new materials, and rigorous analysis tools into an excellent one-semester introductory course in structural mechanics and aerospace engineering. It's also extremely useful to practicing aerospace or mechanical engineers who want to keep abreast of new materials and recent advances. Updated and expanded, this hands-on reference covers:

- * Introduction to elasticity of anisotropic solids, including mechanics of composite materials and laminated structures
- * Stress analysis of thin-walled structures with end constraints
- * Elastic buckling of beam-column, plates, and thin-walled bars
- * Fracture mechanics as a tool in studying damage tolerance and durability

Designed and structured to provide a solid foundation in structural mechanics, *Mechanics of Aircraft Structures*, Second Edition includes more examples, more details on some of the derivations, and more sample problems to ensure that students develop a thorough understanding of the principles.

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Mechanics of Aircraft Structures By C. T. Sun Bibliography

- Sales Rank: #1636460 in eBooks
- Published on: 2008-05-02
- Released on: 2008-05-02
- Format: Kindle eBook

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Editorial Review

From the Publisher

Aircraft structures must be designed to ensure that every part of a given material is used to its full capacity; today's designs employ cutting-edge composite materials to meet those needs. This book focuses on the mechanics of the most recent developments in design and materials, and covers advanced composite materials and new computer-aided designs.

From the Back Cover

An accessible, state-of-the-art introduction to the most important topics in aerospace engineering today

This combined text and professional reference presents what every structural engineer needs to know about modern aircraft structures. Covering the latest developments in the field, it explores the role of commercial finite element codes in structural analysis, demonstrates the use of fracture mechanics to solve damage tolerance and durability problems in aircraft structures, and examines the penetration of composite materials into areas traditionally dominated by metals. Clear and accessible throughout, this book assumes only an introductory background in the mechanics of solids while explaining subjects typically found only in much more advanced texts. It offers ample examples, emphasizes concepts of mechanics rather than problem solving, and helps foster an in-depth understanding of the subject.

Mechanics of Aircraft Structures provides concise introductions to:

- Aerospace materials —advanced composites as well as metals
- The concept of anisotropy in material properties and properties of fiber composites
- A new approach for deriving the shear flow on thin-walled sections
- Methods for calculating strain energy release rates and stress intensity factors for simple structures
- Fracture mechanics topics —fatigue crack growth and fiber-reinforced composites
- The concept of postbuckling of thin rods
- Mechanics of composite materials and laminates.

Mechanics of Aircraft Structures combines classical and state-of-the-art topics into an excellent one-semester introductory course in structural mechanics and aerospace engineering at the undergraduate or graduate level. It is also an extremely useful resource for aerospace or mechanical engineers —especially in aerospace, automotive, and defense-related industries.

About the Author

C. T. SUN is the Neil Armstrong Distinguished Professor at Purdue University. His experience spans three decades, and he has received a number of teaching and research awards in aeronautics and composite materials.

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