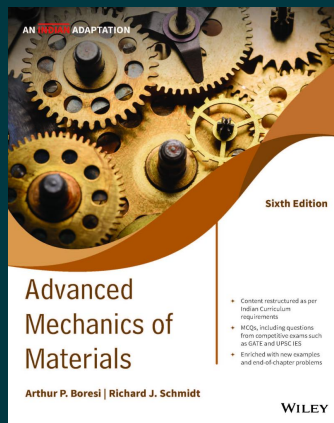




Advanced Mechanics of Materials, 6ed, An Indian Adaptation

By [Arthur P. Boresi](#), [Richard J. Schmidt](#)

Paperback

9788194726395

₹1,035.00

Pages: 584

Description

Advanced Mechanics of Materials is a well-established and comprehensive textbook written for the undergraduate and graduate students of aerospace, civil, and mechanical engineering and applied mechanics. The book presents a unified approach to the study of the behavior of structural members and the development of design and failure criteria. It explores analytical methods for determining the strength, stiffness (deformation characteristics), and stability of the various members in a structural system.

About the Author

Arthur P. Boresi, Richard J. Schmidt

Arthur P. Boresi is Professor Emeritus in the Department of Civil and Architectural Engineering at the University of Wyoming in Laramie. He is the coauthor of a number of books

Table of Contents

Chapter 1: Introduction

1.1 Review of Elementary Mechanics of Materials

1.2 Methods of Analysis

1.3 Stress–Strain Relations

1.4 Failure and Limits on Design

Chapter 2: Theories of Stress and Strain

2.1 Definition of Stress at a Point

2.2 Stress Notation

2.3 Symmetry of the Stress Array and Stress on an Arbitrarily Oriented Plane

2.4 Transformation of Stress, Principal Stresses, and Other Properties

2.5 Differential Equations of Motion of a Deformable Body

2.6 Deformation of a Deformable Body

2.7 Strain Theory, Transformation of Strain, and Principal Strains

2.8 Small-Displacement Theory

2.9 Strain Measurement and Strain Rosettes

Chapter 3: Linear Stress–Strain–Temperature Relations

3.1 First Law of Thermodynamics, Internal-Energy Density, and Complementary Internal-Energy Density

3.2 Hooke's Law: Isotropic Elasticity

3.3 Hooke's Law: Anisotropic Elasticity

3.4 Equations of Thermo elasticity for Isotropic Materials

3.5 Hooke's Law: Orthotropic Materials

Chapter 4: Applications of Energy Methods

4.1 Principle of Stationary Potential Energy

4.2 Castigliano's Theorem on Deflections

4.3 Castigliano's Theorem on Deflections for Linear Load-Deflection Relations

4.4 Deflections of Statically Determinate Structures

4.5 Statically Indeterminate Structures

Chapter 5: Torsion

5.1 Torsion of a Prismatic Bar of Circular Cross Section

5.2 Saint-Venant's Semiinverse Method

5.3 Linear Elastic Solution

5.4 The Prandtl Elastic-Membrane (Soap-Film) Analogy

5.5 Narrow Rectangular Cross Section

5.6 Torsion of Rectangular Cross Section Members

5.7 Hollow Thin-Wall Torsion Members and Multiply Connected Cross Sections

5.8 Thin-Wall Torsion Members with Restrained Ends

5.9 Fully Plastic Torsion: General Cross Sections

Chapter 6: Bending of Straight Beams

6.1 Fundamentals of Beam Bending

6.2 Bending Stresses in Beams Subjected to Nonsymmetrical Bending

6.3 Deflections of Straight Beams Subjected to Nonsymmetrical Bending

6.4 Effect of Inclined Loads

6.5 Fully Plastic Load for Nonsymmetrical Bending

Chapter 7: Shear Center for Thin-Wall Beam Cross Sections

7.1 Approximations for Shear in Thin-Wall Beam Cross Sections

7.2 Shear Flow in Thin-Wall Beam Cross Sections

7.3 Shear Center for a Channel Section

7.4 Shear Center of Composite Beams Formed from Stringers and Thin Webs

7.5 Shear Center of Box Beams

Chapter 8: Curved Beams

8.1 Introduction

8.2 Circumferential Stresses in a Curved Beam

8.3 Radial Stresses in Curved Beams

8.4 Correction of Circumferential Stresses in Curved Beams Having I, T, or Similar Cross Sections

8.5 Deflections of Curved Beams

8.6 Statically Indeterminate Curved Beams: Closed Ring Subjected to a Concentrated Load

8.7 Fully Plastic Loads for Curved Beams

Chapter 9: Beams on Elastic Foundations

9.1 General Theory

9.2 Infinite Beam Subjected to a Concentrated Load: Boundary Conditions

9.3 Infinite Beam Subjected to a Distributed Load Segment

9.4 Semi-infinite Beam Subjected to Loads at Its End

9.5 Semi-infinite Beam with Concentrated Load Near Its End

9.6 Short Beams

9.7 Thin-Wall Circular Cylinders

Chapter 10: The Thick-Wall Cylinder

10.1 Basic Relations

10.2 Stress Components at Sections Far from Ends for a Cylinder with Closed Ends

10.3 Stress Components and Radial Displacement for Constant Temperature Cylinder

10.4 Criteria of Failure

10.5 Fully Plastic Pressure and Autofrettage

Chapter 11: Elastic and Inelastic Stability of Columns

11.1 Introduction to the Concept of Column Buckling

11.2 Deflection Response of Columns to Compressive Loads

11.3 The Euler Formula for Columns with Pinned Ends

11.4 Euler Buckling of Columns with Linearly Elastic End Constraints

11.5 Local Buckling of Columns

Chapter 12: Flat Plates

12.1 Introduction

12.2 Stress Resultants in a Flat Plate

12.3 Kinematics: Strain-Displacement Relations for Plates

12.4 Equilibrium Equations for Small-Displacement Theory of Flat Plates

12.5 Stress-Strain-Temperature Relations for Isotropic Elastic Plates

12.6 Strain Energy of a Plate

12.7 Boundary Conditions for Plates

12.8 Solution of Rectangular Plate Problems

12.9 Solution of Circular Plate Problems

Chapter 13: Stress Concentrations

13.1 Nature of a Stress Concentration Problem and the Stress Concentration Factor

13.2 Stress Concentration Factors: Theory of Elasticity

13.3 Stress Concentration Factors: Combined Loads

13.4 Stress Concentration Factors: Experimental Techniques

13.5 Effective Stress Concentration Factors

13.6 Effective Stress Concentration Factors: Inelastic Strains

Chapter 14: Contact Stresses

14.1 Introduction

14.2 The Problem of Determining Contact Stresses

14.3 Geometry of the Contact Surface

14.4 Notation and Meaning of Terms

14.5 Expressions for Principal Stresses

14.6 Method of Computing Contact Stresses

14.7 Deflection of Bodies in Point Contact

14.8 Stress for Two Bodies in Line Contact: Loads Normal to Contact Area

14.9 Stresses for Two Bodies in Line Contact: Loads Normal and Tangent to Contact Area

Problems

References

Multiple Choice Questions

Appendix A Average Mechanical Properties of Selected Materials

Appendix B Second Moment (Moment of Inertia) of a Plane Area

Appendix C Properties of Steel Cross Sections

Author Index

Subject Index

To purchase this product, please visit:

<https://www.wileyindia.com/advanced-mechanics-of-materials-6ed-an-indian-adaptaion.html>



Scan to buy