

<<材料力学>>

图书基本信息

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## 前言

This textbook is intended for use in a first course in mechanics of materials. Programs of instruction relating to the mechanical sciences, such as mechanical, civil, and aerospace engineering, often require that students take this course in the second or third year of studies. Because of the fundamental nature of the subject matter, mechanics of materials is often a required course, or an acceptable technical elective in many other curricula. Students must have completed courses in statics of rigid bodies and mathematics through integral calculus as prerequisites to the study of mechanics of materials. To place this book in context for engineering education, the user should know that it is an extensive revision of the fourth edition of *Strength of Materials* by Pytel and Singer. The contents have been thoroughly modernized to reflect the realities and trends in contemporary engineering education. In addition to eliminating a few of the specialized topics normally taught in more advanced civil engineering courses, the coverage of fundamental topics has been expanded. All of the illustrations have been redrawn and improved, with the addition of a second color for clarity and as an aid to understanding complex structures. Many new diagrams aid the visualization of concepts and improve the comprehension of derivations. Fully 60% of the homework problems are new or modified versions of previous problems. A new feature is the computer problems found at the end of each chapter. Every effort has been made to maintain the conciseness and organization that were the hallmarks of the earlier editions of Pytel and Singer. In the first eight chapters, emphasis is placed exclusively on elastic analysis through the presentation of stress, strain, torsion, bending, and combined loading. An instructor can easily teach these topics within the time constraints of a two- or three-credit course. The remaining five chapters of the text cover material that can be omitted from an introductory course. Because these more advanced topics are not interwoven in the early chapters on the basic theory, the core material can efficiently be taught without skipping over topics within chapters. Once the instructor has covered the material on elastic analysis, he or she can freely choose topics from the more advanced later chapters, as time permits. Organizing the material in this manner has created a significant savings in the number of pages without sacrificing topics that are usually found in an introductory text.

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### 内容概要

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## 章节摘录

If two bodies are pressed against each other, compressive forces are developed on the area of contact. The pressure caused by these surface loads is called bearing stress. Examples of bearing stress are the soil pressure beneath a pier and the contact pressure between a rivet and the side of its hole. If the bearing stress is large enough, it can locally crush the material, which in turn can lead to more serious problems. In order to reduce bearing stresses, engineers sometimes employ bearing plates, the purpose of which is to distribute the contact forces over a larger area. As an illustration of bearing stress, consider the lap joint formed by the two plates that are riveted together as shown in Fig. 1.12 ( a ) . The bearing stress caused by the rivet is not constant; it actually varies from zero at the sides of the hole to a maximum behind the rivet as illustrated in Fig. 1.12 ( b ) . The difficulty inherent in such a complicated stress distribution is avoided by the common practice of assuming that the bearing stress  $\sigma_b$  is uniformly distributed over a reduced area. ....

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