



# Introduction to Mechanical Behavior of Materials

By Keith Bowman

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## Introduction to Mechanical Behavior of Materials By Keith Bowman

An understanding of mechanisms for mechanical behavior is essential to applications of new materials and new designs using established materials. Focusing on the similarities and differences in mechanical response within and between the material classes, this book provides a balanced approach between practical engineering applications and the science behind mechanical behavior of materials. Covering the three main material classes: metals, ceramics and polymers, topics covered include stress, strain, tensors, elasticity, dislocations, strengthening mechanisms, high temperature deformation, fracture, fatigue, wear and deformation processing.

Designed to provide a bridge between introductory coverage of materials science and strength of materials books and specialized treatments on elasticity, deformation and mechanical processing, this title:

- Successfully employs the principles of physics and mathematics to the materials science topics covered.
- Provides short biographical or historical background on key contributors to the field of materials science.
- Includes over one hundred new figures and mechanical test data that illustrate the subjects covered.
- Features numerous examples and more than 150 homework problems, with problems pitched at three levels.

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### Editorial Review

From the Back Cover

#### Explore Mechanical Behavior in a Rich Practical and Historical Context

With Keith Bowman's *An Introduction to Mechanical Behavior of Materials*, you can build a sound understanding of the mechanisms for mechanical behavior—essential knowledge that will help you successfully apply new materials and new designs using established materials.

Focusing on the similarities and differences in mechanical response within and between the material classes, the text provides a balanced approach between practical engineering applications and the science behind the mechanical behavior of materials. Coverage spans the three main material classes (metals, ceramics, and polymers), as well as a broad range of topics, including stress, strain, tensors, elasticity, dislocations, strengthening mechanisms, high-temperature deformation, fracture, fatigue, wear, and deformation processing.

### Features

- Examples of engineering applications provide a practical context for the material.
- Numerical solutions demonstrate the mathematics behind key concepts.
- Provides a bridge between introductory coverage of materials science and strength of materials books and specialized treatments on elasticity, deformation, and mechanical processing.
- Presents short biographical or historical background on key contributors to the field of materials science.
- Includes over 100 figures and mechanical test data specifically created for this new text.
- Contains numerous examples and more than 150 homework problems of varying complexity.
- Appendices provide derivations and background tutorials.

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