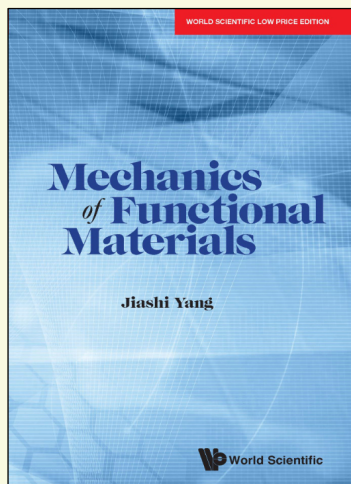


Mechanics of Functional Materials



By **Jiashi Yang**
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ABOUT THE BOOK

Conventional books on the mechanics of materials treat elastic deformations of solids through one-dimensional models for the extension of rods, torsion of shafts and bending of beams. In functional materials, mechanical, thermal, electric and magnetic fields interact among themselves, and therefore, need a more comprehensive model.

This book presents a systematic treatment of the three-dimensional theories for these coupled phenomena and the corresponding one-dimensional models for extension, torsion and bending. This book adopts a mixed approach by devoting the first half of the book to the development of the three-dimensional theories of elastic, thermal, electric and magnetic fields as well as their interactions in dielectrics, conductors and semiconductors. The remainder of the book presents the one-dimensional models for extension, torsion and bending systematically.

READERSHIP

University professors and graduate students, and research and development engineers in civil, mechanical and electrical engineering.

CONTENTS

- Mechanics of Materials and Elasticity
- Heat Conduction and Thermoelasticity
- Electricity and Magnetism
- Piezoelectric and Piezomagnetic Effects
- Extension of Rods

Contd.

- Torsion of Shafts
- Bending of Beams

ABOUT THE AUTHOR

Jiashi Yang is a Full Professor at the Department of Mechanical and Materials Engineering of University of Nebraska-Lincoln, USA. His research area is the mechanics of electromechanical structures and devices. He has coauthored over four hundred papers in refereed journals. His previous book publications include *An Introduction to the Theory of Piezoelectricity* with Springer and *Mechanics of Piezoelectric Structures* with World Scientific. He served as an Associate Editor for the *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control* from 2004–2020.

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