



# Mechanics of Materials

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## About the Book

The Mechanics of Materials is a discipline of mechanical engineering that studies deformable solids using numerical models. The resistance of an element is defined as its ability to resist efforts and forces applied without breaking, permanent deformation or acquiring deterioration. For mechanical design elements with complex geometries, the strength of materials is often insufficient and needs to use techniques based on the theory of elasticity or the mechanics of deformable solids. These problems in terms of stresses and strains can then be solved by using numerical methods such as finite element analysis.

This book thoroughly illustrates the cases of various problems of mechanics of materials. This book has 10 chapters covering Simple Stresses, Elastic Constants, Strain Energy and Impact loading, Shear Force and Bending Moments, Bending and Shear Stresses, Principal Stresses and Strains, Deflection of Beams, Torsion of Shafts, Columns and Cylinders and Spherical Shells.

Variety of problems both with practical relevance and various examinations are solved and presented in a simple and systematic way. This helps the students to understand and learn the subject with ease. Exercise problems and MCQs are added at the end of each chapter. This book is meant for engineering students.

## Salient Features

- Concepts of stress and strains
- Step-by-step procedure for solving problems
- Large number of solved problems
- Thought provoking exercise problems
- Problems and solution techniques spelled out in detail
- Balance between analysis and calculations
- Emphasis on the materials, properties and analysis
- All the illustrations are done with the help of suitable diagrams.

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Bending and Shear Stress in Beams	
Principal Stresses and Strains	

## About the Author

**Dr. T Krishna Rao** :- graduated in Mechanical Engineering in 1976. He obtained his Master's Degree from IIT-Madras in 1979 and Ph.D from JNTU, Hyderabad in 2008. He obtained his M.B.A., from Bangalore University in 1987. He has mixed experience of both industry and teaching. He had worked in Design Department of HMT Machine Tools Limited, Bangalore, for about 24 years before taking up teaching. He has 20 years of teaching experience in various positions as Professor, Professor and Head and Principal in engineering colleges. Presently he is working as Professor and Head, Department of Mechanical Engineering, Global Academy of Technology, Bangalore. He has authored textbooks - Design of Machine Elements (part-1 and Part-2) and co-authored- Management and Entrepreneurship and Operations Research.