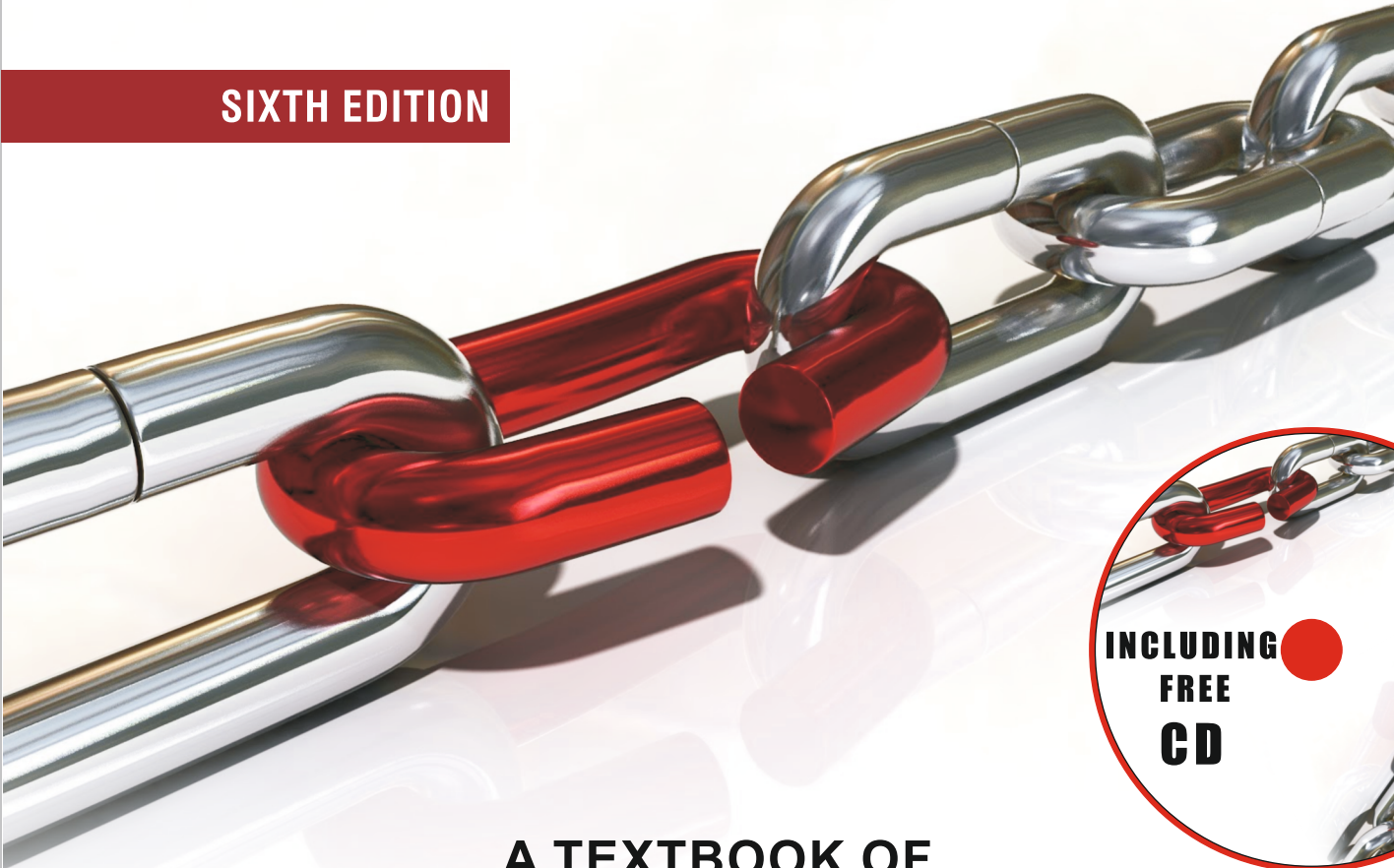


SIXTH EDITION



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A TEXTBOOK OF
STRENGTH
OF
MATERIALS

(Mechanics of Solids)
S.I. Units



Dr. R.K. Bansal

**A TEXTBOOK OF
STRENGTH OF MATERIALS
[MECHANICS OF SOLIDS]**



A TEXTBOOK OF
STRENGTH OF MATERIALS
[Mechanics of Solids]

(In S.I. Units)

**[For Degree, U.P.S.C. (Engg. Services), GATE and
Other Competitive Examinations]**

By

Dr. R.K. BANSAL

B.Sc. Engg. (Mech.), M. Tech., Hons. (I.I.T., Delhi)
Ph.D., M.I.E. (India)
Formerly Professor and Head
Department of Mechanical Engineering,
(University of Delhi)
Delhi College of Engineering, Delhi

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A TEXTBOOK OF STRENGTH OF MATERIALS

Compiled by : **Smt. Nirmal Bansal**

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





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*Dedicated
to
The loving memory
of
my daughter, Babli*



PREFACE TO THE SIXTH EDITION

The popularity of the fifth edition and reprints of the book **A Textbook of Strength of Materials** amongst the students and the teachers of the various Indian universities, has prompted the bringing out of the sixth edition of the book so soon. The sixth edition has been thoroughly revised and brought up-to-date. A large number of problems from different B.E. degree examinations of Indian universities and other examining bodies, such as Institution of Engineers, U.P.S.C. (Engineering Services) and GATE have been selected and have been solved at proper places in this edition in S.I. Units.

Four advanced topics of Strength of Materials such as stresses due to rotation in thin and thick cylinders, bending of curved bars, theories of failure of the material and unsymmetrical bending and shear centre have been added. These chapters have been written in such a simple and easy-to-follow language that even an average student can understand easily by self-study.

In the chapter of 'Columns and Struts', the advanced articles such as columns with eccentric load, with initial curvature and beam columns have been included. Also in the chapter of 'Principal Stresses and Strains', strain on an oblique plane and Mohr's strain circle have been added.

The notations in this edition have been used up-to-date by the use of sigma and tau for stresses.

The objective type multiple-choice questions are often asked in the various competitive examinations. Hence a large number of objective type questions with answers have been added at the end of the book.

Also a large number of objective type questions which have been asked in most of competitive examinations such as Engineering Services Examination and GATE with answers and explanation have been incorporated in this edition.

With these editions, it is hoped that the book will be quite useful for the students of different branches of Engineering at various Engineering Institutions.

I express my sincere thanks to my colleagues, friends, students and the teachers of different Indian universities for their valuable suggestions and recommending the book to their students.

Suggestions for the improvement of this book are most welcome and would be incorporated in the next edition with a view to make the book more useful.

—Author

PREFACE TO THE FIRST EDITION

I am glad to present the book entitled, **A Textbook of Strength of Materials** to the engineering students of mechanical, civil, electrical, aeronautical and chemical and also to the students of A.M.I.E. Examination of Institution of Engineers (India). The course-contents have been planned in such a way that the general requirements of all engineering students are fulfilled.

During my long experience of teaching to the engineering students for the past 20 years, I have observed that the students face difficulty in understanding clearly the basic principles, fundamental concepts and theory without adequate solved problems along with the text. To meet this very basic requirement to the students, a large number of the questions taken from the examinations of the various universities of India and from other professional and competitive examinations (such as Institution of Engineers, and U.P.S.C. Engineering Service Examinations) have been solved along with the text, in S.I. units.

This book is written in a simple and easy-to-follow language, so that even an average students can grasp the subject by self-study. At the end of each chapter, highlights, theoretical questions and many unsolved numerical problems with answers are given for the students to solve them.

I am thankful to my colleagues, friends and students who encouraged me to write this book. I am grateful to Institution of Engineers (India), various universities of India and those authorities whose work have been consulted and gave me a great help in preparing this book.

I express my appreciation and gratefulness to my publisher, Shri R.K. Gupta (a Mechanical Engineer) for his most co-operative, painstaking attitude and untiring efforts for bringing out the book in a short period.

Smt. Nirmal Bansal deserves special credit as she not only provided an ideal atmosphere at home for book writing but also gave inspiration and valuable suggestions.

Though every care has been taken in checking the manuscripts and proof reading, yet claiming perfection is very difficult. I shall be very grateful to the readers and users of this book for pointing any mistakes that might have crept in. Suggestions for improvement are most welcome and would be incorporated in the next edition with a view to make the book more useful.

—Author

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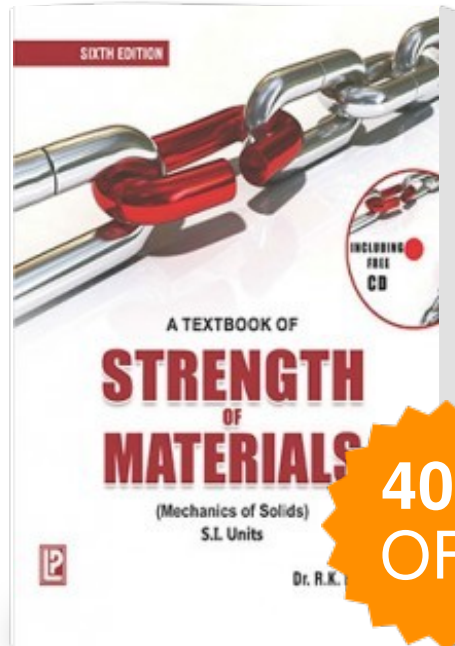
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