

Revised Edition

A Textbook of

# Engineering Physics

For the Students of B.E.,  
B.Tech., B.Arch. and B.Sc. (Engg.)



Dr. M.N. AVADHANULU  
Dr. P.G. KSHIRSAGAR

**S. CHAND**

# A TEXTBOOK OF **ENGINEERING PHYSICS**

[For the Students of B.E., B.Tech., B.Arch., B.Sc., (Engg.)]

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# Preface to the Revised Edition

A **Textbook of Engineering Physics** is originally designed to serve as a textbook as well as reference book for two semester course in Engineering Physics. The book is written with two distinct objectives: First to provide a single source of information and the second to present the principles of Physics as relevant to the B.E./B.Tech. students in an easy-to-understand style. In this edition, a new chapter number 40 namely “Geometrical Optics” has been added to make the book still more useful to the students. The requirements of the students are given priority and the material is moulded in a more student-friendly style. However, the spirit of Physics is not sacrificed at any stage and the expectations of teachers are held high at every step. It is generally felt that Physics is one more body of facts thrust on engineering students who are already burdened with a heavy syllabus and evolved through the efforts of rational thinkers who have been interested to know; why, what and how of natural phenomena.

Engineering has emerged as the application of their understanding for the benefit of human society at large. Thus Physics is the foundation on which stands the elaborate structure of technology. The main purpose of teaching Physics to Engineering undergraduates is to acquaint the budding engineers with the thread of development and the urge that underlies the presentation of the material in this book, so that they can apply this knowledge beneficially in their later pursuits.

The authors sincerely hope that this book will assist the students in learning the principles of Physics more effectively.

Enough care is taken to eliminate printing mistakes. However, some mistakes might have crept in inadvertently. The authors appeal to the readers to point out such left-out mistakes. The authors are also highly indebted to the teachers in various engineering institutions who have been extending unstinted support to this book.

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# Preface to the Ninth Revised Edition

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“A Textbook of Engineering Physics” is written with two distinct objectives : to provide a single source of information for engineering undergraduates of different specializations and provide them a solid base in physics. Successive editions of the book incorporated topics as required by students pursuing their studies in various universities. In this new edition the contents are fine-tuned, modernized and updated at various stages.

Physics is not an isolated body of theories which merely serve vocational usefulness. What has been achieved in physics has sooner or later made tremendous impact on the technological growth of our society. To become active participants in the technological revolution, one has to necessarily acquaint himself with the methods of science. Mechanical memorizing of certain definitions and derivations does not belong to the method of science and as such is of little value to the student. The main purpose of teaching physics to engineering undergraduates is to equip them with an understanding of the “scientific method”, so that they may use the training beneficially in their higher pursuits. An earnest attempt is made in this direction right from the first edition of this book by blending careful presentation of fundamental concepts and methods of physics.

This edition retains the original theme of emphasis on concepts with less mathematical formalism. The practical applications are discussed at each stage. The question bank given at the end of each chapter is updated. At a number of places, points for refinement are noticed and those have been incorporated. We have gladly received and carefully considered suggestions from professors and students who have used earlier editions. Further suggestions for improvement of the quality and quantity of the content are most welcome.

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Dedicated to  
*My Mother,*  
*Maternal Uncles*  
*Shri Mullapudi Suryanarayana,*  
*Dr. Mullapudi Subba Rao and*  
*Shri Mullapudi Satyanarayana,*  
*and to*  
*My Wife Swarchala*

*Books are not paper and words but interaction with  
thinkers on a one-to-one basis, not of one generation but  
separated by hundreds and thousands of years*

**—Thomas Carlyle**

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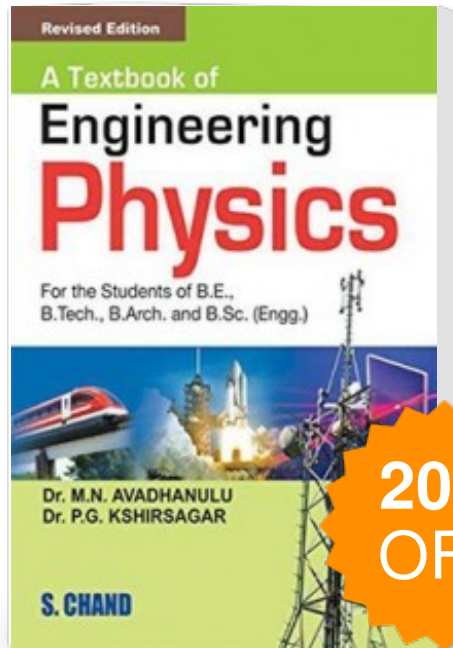
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