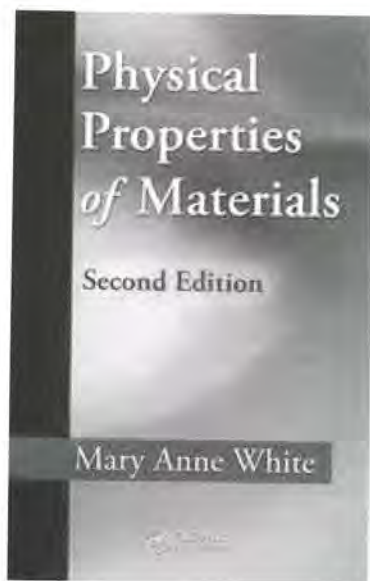


BOOK REVIEW



“Physical Properties of Materials”

Second Edition

by

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This book is a newly published resource for the teaching of materials behavior and properties. The focus, according to the author's preface and the Table of Contents is on the realm of physical properties, i.e., optical, thermal, electrical, magnetic and mechanical behavior, which represents the order of topics presented following an introductory chapter with an overall view of the field of Materials Science.

It should be noted that this book has been used by the author as the text in an introductory Materials Science and Engineering (MSE) course populated by students from a variety of disciplines aside from engineering, i.e., chemistry, physics (the course is cross-listed as a chemistry/physics course), earth science and biochemistry, as well as engineering.

In that regard this book might be considered to offer instructors an alternative approach to the

typical introductory MSE text used in service courses for engineers. Specifically, this book provides the reader with a description of the physical basis of the behavior of materials as exemplified in terms of a range of materials' physical properties which include, in order of emphasis, thermal behavior (including stability/phase diagrams), optical behavior (with an interesting focus on the physics of color), electrical/magnetic (with interesting examples of the newer concepts such as spintronics and materials such as carbon nanotubes which illustrate the fundamental concepts of structure vs. properties), mechanical behavior (the area of materials behavior most often emphasized in introductory MSE texts).

The book is well written and comprehensive in its presentation, as noted above. Furthermore, the text is well illustrated and contains an ample

supply of challenging, but useful problems. The contents include all of the historically basic concepts and the analytical relations used to describe and predict behavior. Additionally, the author has provided a number of illustrations of the most recent developments in materials that extend materials' applications into new areas, e.g., graphene, spintronics and nano-science/technology.

In addition to the content of the text itself there is an especially welcome text related web site from the publisher CRC Press. That web site links to a number of valuable materials science information and teaching resources such as the pod casts aligned with each chapter and external sites such as the fascinating general level PBS Nova materials series "Making Stuff", as well as more specific course related

demonstrations such as negative thermal expansion materials and supercritical CO₂. For instructors the related resource sites offer opportunities to incorporate some simple demonstrations that can be used to test student knowledge as well as illustrate the behaviors described in the text, e.g., from an historical GE Research movie clip of Dr. Irving Langmuir demonstrating interfacial behavior, to a Tokyo University video clip on spintronics / quantum dots. PowerPoint slides of figures from the book are also available to instructors.

Reviewer:

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