



Essentials of Materials Science & Engineering - SI Version

By Donald R. Askeland, Pradeep P. Fulay

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This text provides students with a solid understanding of the relationship between the structure, processing, and properties of materials. Authors Donald Askeland and Pradeep Fulay teach the fundamental concepts of atomic structure and materials behaviors and clearly link them to the "materials" issues that students will have to deal with when they enter the industry or graduate school (e.g. design of structures, selection of materials, or materials failures). While presenting fundamental concepts and linking them to practical applications, the authors emphasize the necessary basics without overwhelming the students with too much of the underlying chemistry or physics. The book covers fundamentals in an integrated approach that emphasizes applications of new technologies that engineered materials enable. New and interdisciplinary developments in materials field such as nanomaterials, smart materials, micro-electro-mechanical (MEMS) systems, and biomaterials are also discussed.

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Editorial Review

About the Author

Donald R. Askeland joined the University of Missouri-Rolla in 1970 after obtaining his doctorate in Metallurgical Engineering from the University of Michigan. His primary interest has been in teaching, resulting in a variety of campus, university, and industry awards and the preparation of a materials engineering textbook. Dr. Askeland has also been active in research involving metals casting and metals joining, particularly in the production, treatment, and joining of cast irons, gating and fluidity of aluminum alloys, and optimization of casting processes. Additional work has concentrated on lost foam casting, permanent mold casting, and investment casting; much of this work has been interdisciplinary, providing data for creating computer models and validation of such models.

Pradeep P. Fulay received his Ph.D. from the University of Arizona and teaches at the University of Pittsburgh. His research is primarily concerned with the synthesis and processing of ceramic powders and thin films, consisting of nano-sized primary particles/grains. His current research involves development of novel synthesis and processing protocols for electro-optic and ferroelectric ceramics and studies related to the relationships between their microstructure and dielectric/optical properties. Dr. Fulay is also researching fundamental of magnetorheological (MR) fluids. He is a Fellow to the American Ceramic Society.

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