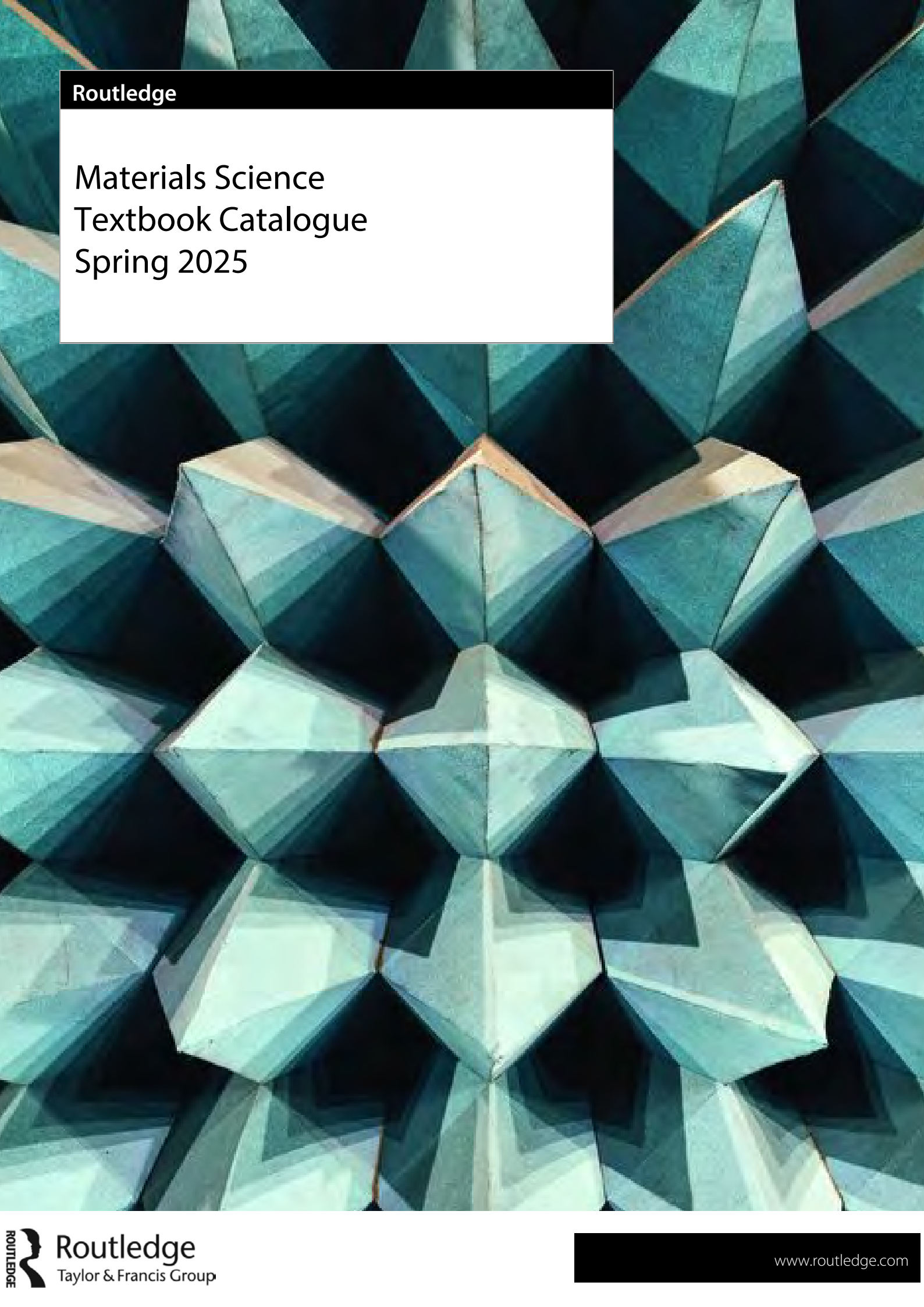




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Spring 2025



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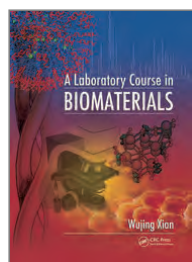
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A Laboratory Course in Biomaterials



Wujing Xian

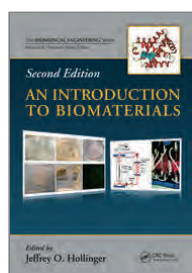
A new teaching tool for instructors in biomaterials and bioengineering, this volume is a comprehensive laboratory textbook. It trains students in laboratory skills, data analysis, problem solving, and scientific writing and integrates a variety of principles that include materials science, chemistry, biochemistry, molecular and cell biology, and engineering. Providing detailed descriptions, explanations, and illustrations of experiments, the text also includes a series of questions and answers at the end of each chapter to clarify concepts. Many of the experiments presented are adapted from research papers to reflect the recent progress in biomaterials and bioengineering.

CRC Press
June 2009 : 216pp
Pb: 978-1-420-07582-3 : **£71.99**
Hb: 978-1-138-40742-8 : **£180**
eBook: 978-0-429-13992-5

* For full contents and more information, visit: www.routledge.com/9781420075823

2ND EDITION

An Introduction to Biomaterials



Edited by **Jeffrey O. Hollinger** Carnegie Mellon University, Pittsburgh, Pennsylvania, USA

Series: Biomedical Engineering

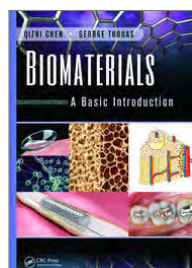
The second edition of this popular text includes nine new chapters that provide a comprehensive and up-to-date educational framework for biomaterials education. A new chapter on the biology of wound healing sets the stage for the basic requirements of standardized biomaterials testing and explains the reactions between biomaterials and the living system into which it is implanted. The book explains in vitro and in vivo testing paradigms and provides numerous examples in the chapters on experimental design, laboratory assays, and animal models. Emphasizing the importance of the regulatory process, it describes how innovation in the biomaterials process relates to patentability and inventorship.

CRC Press
November 2011 : 644pp
Hb: 978-1-439-81256-3 : **£145**
eBook: 978-0-429-14891-0

* For full contents and more information, visit: www.routledge.com/9781439812563

Biomaterials

A Basic Introduction



Qizhi Chen Monash University, Clayton, Victoria, Australia
, George Thouas Monash University, Australia

Biomaterials is a multidisciplinary subject involving materials science, engineering, cell biology, and medicine. This textbook provides an appropriate balance between depth and broadness of coverage, sufficient to enable understanding of the most important concepts and principles by students from a wide academic spectrum. The book presents the properties and principles of biomaterials from the point of view of clinical applications and includes learning objectives, laboratory practices, and problems. It was developed from extensive lecture notes created by Dr. Chen at Monash University.

CRC Press
May 2018 : 736pp
Pb: 978-1-138-74966-5 : **£58.99**
Hb: 978-1-482-22769-7 : **£175**
eBook: 978-0-429-16141-4

* For full contents and more information, visit: www.routledge.com/9781138749665

Biomaterials Science and Technology

Fundamentals and Developments



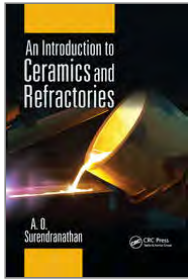
Yaser Dahman Ryerson University

This book presents a broad scope of the field, focusing on theory, advances, and applications of biomaterials. It reviews fabrication and properties of different classes of biomaterials and biocompatibility. It details methods used to characterize major properties of biomaterials and their modification to tailor properties for different applications. It discusses nanotechnology in biomaterials, reviews applications, and defines the set of tailored properties. Major applications are in the emerging fields of regenerative medicine as soft and hard tissues scaffolds, 3D printing as bioinks, and drug delivery.

CRC Press
February 2019 : 376pp
Hb: 978-1-138-61147-4 : **£145**
eBook: 978-0-429-46534-5

* For full contents and more information, visit: www.routledge.com/9781138611474

An Introduction to Ceramics and Refractories



A. O. Surendranathan

This book covers the fundamental aspects of ceramics and refractories. All refractories are ceramics, but all ceramics are not refractories. The book classifies and describes these materials, and examines their availability in nature. It examines the availability of these materials in nature, how they are extracted from nature, and how some of these materials are synthesized, and explains their structure–property correlation. It also addresses how they are designed for various applications and more.

CRC Press

December 2020 : 524pp

Pb: 978-0-367-73872-3 : **£45.99**

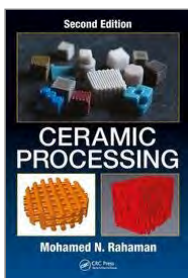
Hb: 978-1-482-22044-5 : **£120**

eBook: 978-0-429-06832-4

* For full contents and more information, visit: www.routledge.com/9780367738723

2ND EDITION

Ceramic Processing



Mohamed N. Rahaman University of Missouri-Rolla, USA

Ceramic Processing, Second Edition provides a comprehensive treatment of the principles and practical methods used in producing ceramics with controlled microstructure. While maintaining the objectives of the successful first edition, this new edition has been revised, updated, and expanded to include several new chapters, which should enhance it as an excellent textbook for use in the classroom and an indispensable reference text for researchers in industry.

CRC Press

June 2017 : 554pp

Hb: 978-1-498-71641-3 : **£145**

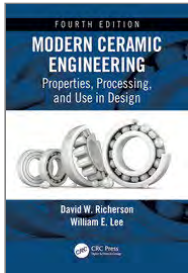
eBook: 978-1-315-15716-0

* For full contents and more information, visit: www.routledge.com/9781498716413

4TH EDITION

Modern Ceramic Engineering

Properties, Processing, and Use in Design, Fourth Edition



David W. Richerson Retired, University of Utah., **William E. Lee**

This edition includes new information in almost every chapter, as well as two new chapters that present a variety of relevant case studies. It includes updated content on nanotechnology, the use of ceramics in integrated circuits, flash drives, and digital cameras, and the role of miniaturization that has made our modern digital devices possible. It also highlights the increasing importance of modeling and simulation.

CRC Press

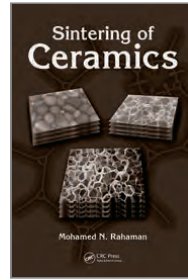
May 2018 : 836pp

Hb: 978-1-498-71691-8 : **£145**

eBook: 978-0-429-48824-5

* For full contents and more information, visit: www.routledge.com/9781498716918

Sintering of Ceramics



Mohamed N. Rahaman University of Missouri-Rolla, USA

Sintering of Ceramics provides the only comprehensive treatment of the theories and principles of sintering and their application to the production of advanced ceramics. It identifies and examines the variables that influence densification and microstructural evolution in order to design processing conditions for achieving the required target microstructure. Each chapter includes a set of exercise problems and numerous references for further study. The book also includes approximately 25 tables, 300 figures, and 5 appendices to provide comprehensive background knowledge and data in the field.

CRC Press

July 2007 : 404pp

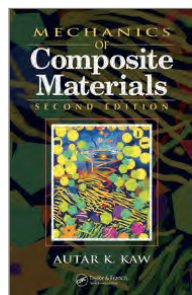
Hb: 978-0-849-37286-5 : **£115**

eBook: 978-0-429-12842-4

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2ND EDITION

Mechanics of Composite Materials



Autar K. Kaw University of South Florida, Tampa, USA

Series: Mechanical and Aerospace Engineering Series

This book provides a complete introduction to the mechanical behavior of composite materials. The second edition offers complete introductory treatment of polymer matrix, metal matrix, ceramic matrix, and carbon-carbon matrix composites. It details micromechanical analysis of a lamina, and macromechanical analysis of lamina and laminate. Included are Hooke's law, angle lamina, failure theories, hygrothermal response, laminate design, and beams. An updated version of PROMAL, the software package included in the first edition, is also included. PROMAL, available on a supported Web site, allows readers to conduct studies, compare theories, and quickly assess the information in tables and graphs.

CRC Press

November 2005 : 490pp

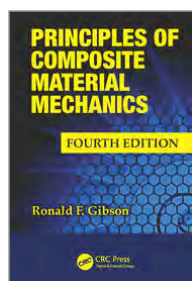
Hb: 978-0-849-31343-1 : £120

eBook: 978-0-429-12539-3

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Principles of Composite Material Mechanics



Ronald F. Gibson University of Nevada, Reno, USA

Series: Mechanical Engineering

This book covers a unique blend of classical and modern mechanics of composites technologies. The fourth edition reflects the current state of the art, fresh insight gleaned from the author's ongoing composites research, and pedagogical improvements based on feedback from students, colleagues, and the author's own course notes. New worked-out examples and homework problems are added in most chapters, example problems and homework problems are now integrated within the chapters, and answers to selected homework problems are featured in the back of the book.

CRC Press

February 2016 : 698pp

Hb: 978-1-498-72069-4 : £130

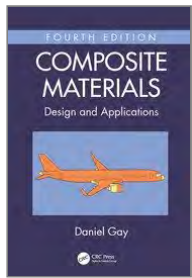
eBook: 978-0-429-19058-2

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4TH EDITION

Composite Materials

Design and Applications



Daniel Gay Institut Clément Ader, University of Toulouse, France

For decades, *Composite Materials: Design and Applications* has guided readers on the efficient design of structural composite parts and has illustrated challenges encountered in modern engineering practice. The Fourth Edition of this best-seller retains its pedagogical structure, featuring a technical level that rises in difficulty as the text progresses, while allowing each part to be explored independently, but has been updated to mirror recent advances and developments in manufacturing processes and applications. This book serves as a textbook for advanced students studying composite materials design, as well as a handy reference for industry professionals working with composite materials.

CRC Press
September 2022 : 640pp
Hb: 978-1-032-04308-1 : £120
eBook: 978-1-003-19578-8

* For full contents and more information, visit: www.routledge.com/9781032043081

3RD EDITION

Fiber-Reinforced Composites

Materials, Manufacturing, and Design, Third Edition



P.K. Mallick University of Michigan, Dearborn, USA

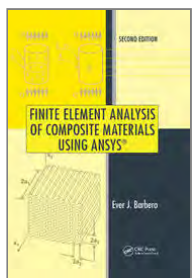
Series: Mechanical Engineering

This third edition of a bestseller offers a current perspective on the mechanics, characteristics, test methods, applications, manufacturing processes, and design aspects of composites. Highlighting materials such as nanocomposites and smart materials, the book contains new information on material substitution, cost analysis, nano- and natural fibers, fiber architecture, carbon-carbon composites, thermoplastics matrix composites, resin transfer molding, and test methods such as fiber bundle tests and interlaminar fracture measurements. It presents a new chapter on polymer-based nanocomposites. New examples and additional problems emphasize problem-solving skills used in real-world applications.

CRC Press
November 2007 : 638pp
Hb: 978-0-849-34205-9 : £145
eBook: 978-0-429-12206-4

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2ND EDITION

Finite Element Analysis of Composite Materials Using ANSYS®

Ever J. Barbero West Virginia University, Morgantown, USA

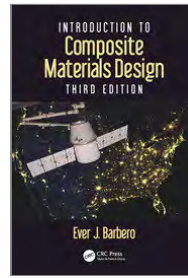
Series: Composite Materials

This is the only finite element analysis book on the market using ANSYS® to analyze composite materials. Combining theory of advanced mechanics of composites with implementation, the text covers major aspects of advanced analysis, including three-dimensional effects, viscoelasticity, edge effects, elastic instability, damage, and delamination. This second edition of a bestseller has been completely revised to incorporate advances in the state of the art in such areas as modeling of damage in composites. In addition, all 50+ examples have been updated for the newest ANSYS version.

CRC Press
December 2013 : 366pp
Hb: 978-1-466-51689-2 : £130
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3RD EDITION

Introduction to Composite Materials Design

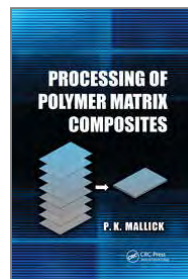
Ever J. Barbero West Virginia University, Morgantown, USA

Series: Composite Materials

This Third Edition includes the latest analysis techniques for the preliminary design of composite materials, including universal carpet plots and temperature dependent properties. The book features a practical, design-oriented presentation aimed at students and practicing engineers learning analysis and design of composite materials and structures. Expanding the coverage of previous editions, the text provides the main tools on design for reliability and an expanded material property database. Readers will find this edition highly streamlined for teaching, with new comprehensive examples and exercises emphasizing design as well as practical content pertinent to current industry needs.

CRC Press
October 2017 : 570pp
Hb: 978-1-138-19680-3 : £130
eBook: 978-1-315-29649-4

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Processing of Polymer Matrix Composites

P.K. Mallick

The book focuses on the major manufacturing processes used for polymer matrix composites and describes process details, process parameters and their effects on properties and process-induced defects, and analytical and experimental methods used for understanding process conditions. The book describes fibers, thermosetting and thermoplastic polymers, and interface characteristics important for design and processing. It emphasizes applications of process fundamentals for both continuous fiber and short fiber polymer matrix composites. The book considers quality inspection methods, tooling, and manufacturing costs and environmental and safety issues.

CRC Press
September 2021 : 356pp
Pb: 978-1-032-17894-3 : £45.99
Hb: 978-1-466-57822-7 : £135
eBook: 978-1-315-15725-2

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2ND EDITION

Computational Materials Science

An Introduction, Second Edition



June Gunn Lee Korea Institute of Science and Technology, Seoul, South Korea

The book covers the essentials of Computational Science and gives tools and techniques to solve materials science problems using molecular dynamics and first-principles methods. The new edition expands upon the density functional theory (DFT) and how the original DFT has advanced to a more accurate level by GGA+U and hybrid-functional methods. It offers 14 new worked examples in the LAMMPS, Quantum Espresso, VASP and MedeA-VASP programs, including computation of stress-strain behavior of Si-CNT composite, mean-squared displacement (MSD) of ZrO₂-Y₂O₃, band structure and phonon spectra of silicon, and Mo-S battery system. It discusses methods once considered too expensive but that are now cost-effective. New examples also include various post-processed results using VESTA, VMD, VTST, and MedeA.

CRC Press

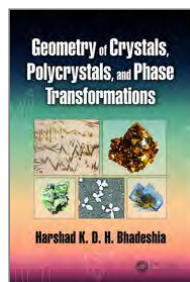
December 2016 : 376pp

Hb: 978-1-498-74973-2 : £115

eBook: 978-1-315-36842-9

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Geometry of Crystals, Polycrystals, and Phase Transformations



Harshad K. D. H. Bhadeshia University of Cambridge,
Cambridge, England

The first of this textbook covers what any reader in the material sciences, physics, chemistry, earth sciences and natural sciences in general should know about crystallography. It is intentionally concise and covers sufficient material to form a firm foundation. The second part is aimed at researchers and discusses phase transformations, deformations and interface crystallography in depth. The phase transformations are limited to those dominated by crystallography. The entire book contains worked examples and uniquely deals not just with crystals but aggregates of crystals and solid-state transformations between crystals.

CRC Press

August 2017 : 268pp

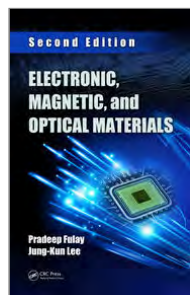
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Electronic, Magnetic, and Optical Materials



Pradeep Fulay University of West Virginia, Morgantown, USA, **Jung-Kun Lee** University of Pittsburgh, Pennsylvania, USA

This book integrates materials science with other engineering subjects such as physics, chemistry and electrical engineering. The authors discuss devices and technologies used by the electronics, magnetics and photonics industries and offer a perspective on the manufacturing technologies used in device fabrication. The new addition includes chapters on optical properties and devices and addresses nanoscale phenomena and nanoscience, a subject that has made significant progress in the past decade regarding the fabrication of various materials and devices with nanometer-scale features.

CRC Press

November 2016 : 554pp

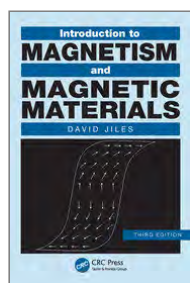
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3RD EDITION

Introduction to Magnetism and Magnetic Materials



David Jiles Iowa State University, Ames, USA

The third edition of Introduction to Magnetism and Magnetic Materials is a complete revision of its predecessor, introducing you to key and current theories, practices, and applications in magnetism and magnetic materials. It includes new information on soft magnetic materials, hard magnetic materials, magnetic data storage, and magnetic evaluation of materials, magneto-transport, small particles, nanomagnetism, magnetic semiconductors, spintronics, and high-frequency magnetism. Each chapter also features updated and new exercise problems, accompanied by answers at the back of the book.

CRC Press

September 2015 : 626pp

Pb: 978-1-482-23887-7 : £105

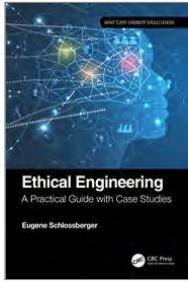
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eBook: 978-0-429-16009-7

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Ethical Engineering

A Practical Guide with Case Studies



Eugene Schlossberger Purdue University Northwest
(Hammond campus), USA

Series: What Every Engineer Should Know

Ethical Engineering provides detailed and practical guidance in making decisions about the many ethical issues practicing engineers may face in their professional lives. It outlines a decision-making procedure and helps engineers construct an ethics toolkit consisting of professional models, a comprehensive set of ethical considerations and factors that help in weighing those considerations, and analyses of particular issues. Illustrating case studies are provided. This book helps readers navigate a variety of real-world ethical issues they are likely to face in this increasingly interdisciplinary, global, and diverse profession.

CRC Press

March 2023 : 422pp

Pb: 978-1-032-15112-0 : **£49.99**

Hb: 978-1-032-15113-7 : **£125**

eBook: 978-1-003-24257-4

* For full contents and more information, visit: www.routledge.com/9781032151120

2ND EDITION

Introduction to Materials Science and Engineering



Yip-Wah Chung Northwestern University, Evanston, Illinois, USA, **Monica Kapoor**

Updated to reflect the many societal and technological changes in the field since publication of the first edition, Introduction to Materials Science and Engineering, Second Edition offers an interdisciplinary view, emphasizing the importance of materials to engineering applications, and builds the basis needed to select, modify, and create materials to meet specific criteria. Written for advanced undergraduate students and readers interested in introductory materials science and engineering concepts, this concise textbook provides a strong foundation in MSE and its applications. The textbook offers a solutions manual and PowerPoint lecture slides for adopting professors.

CRC Press

April 2022 : 386pp

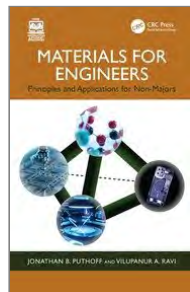
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eBook: 978-1-003-22344-3 : **£84.99**

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Materials for Engineers

Principles and Applications for Non-Majors



Jonathan B. Puthoff, **Vilupannur A. Ravi**

Designed with the needs of non-Materials Science and Engineering students in mind, this textbook covers the major categories of materials and their defining properties, but with an emphasis on applications related to materials properties measurement, materials selection, and design as opposed to an accent on fundamental physical and chemical topics. This textbook is aimed at undergraduate engineering students taking materials science courses. It can also be used by professional engineers interested in a ready reference.

CRC Press

August 2024 : 366pp

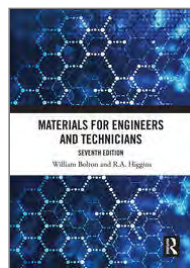
Hb: 978-1-032-10253-5 : **£91.99**

eBook: 978-1-003-21440-3

* For full contents and more information, visit: www.routledge.com/9781032102535

7TH EDITION

Materials for Engineers and Technicians



William Bolton, **R.A. Higgins**

This comprehensive introduction to materials engineering and manufacturing processes for BTEC Level 2 students and beginning level 3 students remains straightforward and readable. The references to specifications for materials and materials testing have been updated to include current European-wide standards. The chapter on selection of materials provides more cases, and the sections on new developments in materials and recycling of materials have been extended. Sustainability and 3D printing are now included, more applications have been indicated, and a number of case studies of materials and associated problems have been added.

Routledge

October 2020 : 460pp

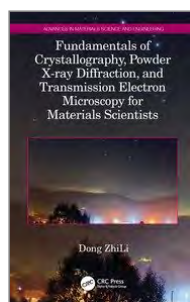
Pb: 978-0-367-53550-6 : **£41.99**

Hb: 978-0-367-53549-0 : **£165**

eBook: 978-1-003-08244-6

* For full contents and more information, visit: www.routledge.com/9780367535506

Fundamentals of Crystallography, Powder X-ray Diffraction, and Transmission Electron Microscopy for Materials Scientists



Dong ZhiLi Nanyang Technological University, Singapore

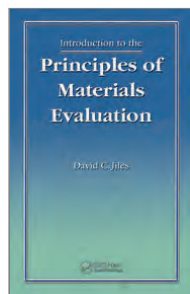
Series: Advances in Materials Science and Engineering

The goal of this textbook is to effectively equip readers with an in-depth understanding of crystallography, x-ray diffraction, and transmission electron microscopy theories as well as applications. Written as an introduction to the topic with minimal reliance on advanced mathematics, the book will appeal to a broad spectrum of readers, including students, engineers, and researchers in materials science and engineering, applied physics, and chemical engineering. It can be used in XRD and TEM lab training.

CRC Press
May 2022 : 272pp
Hb: 978-0-367-35794-8 : £105
eBook: 978-0-429-35166-2

* For full contents and more information, visit: www.routledge.com/9780367357948

Introduction to the Principles of Materials Evaluation



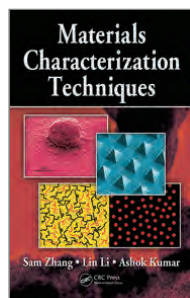
David C. Jiles Wolfson Centre for Magnetism Technology, Cardiff University, UK

Developing an understanding of the way different types of energy interact with materials, this text presents a thorough examination of all types of destructive and nondestructive testing methods, focusing on each one's strengths and utility. The author first discusses relevant physical properties and how to determine them using mechanical, acoustic, thermal, optical, electrical, magnetic, and radiative energy. For the remainder of the book, he systematically examines the testing methods derived from these types of energy, how the methods work, how to identify defects and potential problems, and how to make decisions based on the results. Numerous illustrations, examples, and exercises help demonstrate the concepts and reinforce understanding.

CRC Press
November 2007 : 298pp
Hb: 978-0-849-37392-3 : £145
eBook: 978-0-429-12300-9

* For full contents and more information, visit: www.routledge.com/9780849373923

Materials Characterization Techniques



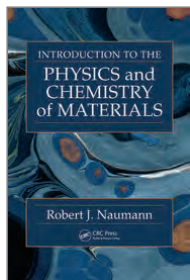
Sam Zhang Southwest University, Chongqing, China, **Lin Li** Nanyang Technological University, Singapore, **Ashok Kumar** University of South Florida, Tampa, USA

With an emphasis on practical applications and real-world case studies, Materials Characterization Techniques presents the principles of widely used advanced surface and structural characterization techniques for quality assurance, contamination control, and process improvement. The book reviews the most popular and powerful analysis and quality control tools, explaining the appropriate uses and related technical requirements. The text features coverage of a wide range of topics, including Auger electron spectroscopy, atomic force microscopy, transmission electron microscopy, gel electrophoresis chromatography, laser confocal scanning fluorescent microscopy, and UV spectroscopy.

CRC Press
December 2008 : 342pp
Hb: 978-1-420-04294-8 : £120
eBook: 978-0-429-14390-8

* For full contents and more information, visit: www.routledge.com/9781420042948

Introduction to the Physics and Chemistry of Materials



Robert J. Naumann University of Alabama, Huntsville, USA

Preparing students for graduate work in materials science and engineering, this applications-oriented text emphasizes cutting-edge technology to provide a clear picture of how the principles of materials apply to exciting breakthroughs and promising new fields. It covers the discovery of spectra, the Bohr theory of the atom, the Schrödinger wave equation, wave functions, energy states of electrons in a crystal and in the hydrogen atom, and the development of the periodic system. The book also derives the Bose–Einstein, Maxwell–Boltzmann, Planck, and Fermi–Dirac distribution functions. A solutions manual is available for qualifying instructors.

CRC Press

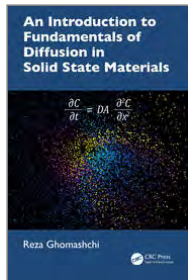
December 2008 : 533pp

Hb: 978-1-420-06133-8 : £175

eBook: 978-0-429-14879-8

* For full contents and more information, visit: www.routledge.com/9781420061338

An Introduction to Fundamentals of Diffusion in Solid State Materials



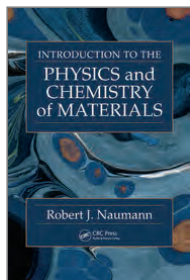
Reza Ghomashchi

Diffusion, the movement of atoms in a material, is an integral part of many metallurgical and materials treatment processes. Understanding diffusion mechanisms helps to control and improve materials properties. This book offers a comprehensive overview of diffusion in synthesis and analysis of materials from the fundamentals through applications. Written with less emphasis on complex mathematical equations, this text is accessible to researchers and students in materials, mechanical, and related engineering disciplines studying the phenomenon of diffusion in materials and its application in the engineering of materials.

CRC Press
December 2024 : 252pp
Hb: 978-1-032-74020-1 : **£99.99**
eBook: 978-1-003-46725-0

* For full contents and more information, visit: www.routledge.com/9781032740201

Introduction to the Physics and Chemistry of Materials



Robert J. Naumann University of Alabama, Huntsville, USA

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CRC Press

December 2008 : 533pp

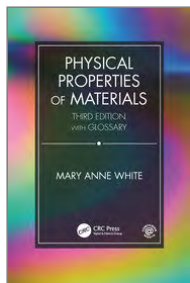
Hb: 978-1-420-06133-8 : £175

eBook: 978-0-429-14879-8

* For full contents and more information, visit: www.routledge.com/9781420061338

3RD EDITION

Physical Properties of Materials, Third Edition



Mary Anne White Dalhousie University, Halifax, Nova Scotia, Canada

The book focuses on the optical, thermal, electrical, magnetic and mechanical properties of materials. It introduces various materials via their properties and application of materials through tutorials via a companion website. In comparison with other textbooks it has broader coverage of physical properties and deep connections concerning the relationship between structure and origins of the properties. New topics include reference to the latest research topics in materials science and engineering, including boron nitride nanotubes, new cloaking technologies, new energy storage materials, and materials for renewable energy capture. It now features a glossary at the end of the book.

CRC Press

October 2018 : 518pp

Pb: 978-1-138-60510-7 : £61.99

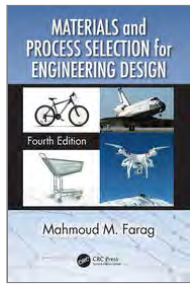
Hb: 978-1-138-56917-1 : £145

eBook: 978-0-429-46826-1

* For full contents and more information, visit: www.routledge.com/9781138605107

4TH EDITION

Materials and Process Selection for Engineering Design



Mahmoud M. Farag The American University in Cairo, Egypt

The Fourth Edition of this best-selling text helps readers develop designs, reach economic decisions, select materials, choose manufacturing processes, and assess environmental impact. It has been comprehensively revised to reflect the many advances in the fields of materials and manufacturing over the past decade. Aimed at students in mechanical, manufacturing, and materials engineering, as well as professionals in these fields, this book provides the practical know-how in order to choose the right materials and processes for development of new or enhanced products.

CRC Press

December 2020 : 562pp

Pb: 978-0-367-41947-9 : **£84.99**

Hb: 978-0-367-43834-0 : **£215**

eBook: 978-1-003-00609-1

* For full contents and more information, visit: www.routledge.com/9780367419479

A Mathematics Boot Camp for Science and Engineering Students



Ying Ma

Many students have difficulty applying mathematical techniques to solve problems in science and engineering, even after completing Calculus I and II. Students who are beginning core coursework in their field of study often need additional guidance on practicing, learning, and improving their problem-solving skills for application. This book offers a solution to this issue and is specifically designed to address common errors in mathematical problem-solving for undergraduate science and engineering students. This concise and practical text offers "basic training" in mathematical problem-solving skills for undergraduate students in science and engineering disciplines.

CRC Press

March 2025 : 323pp

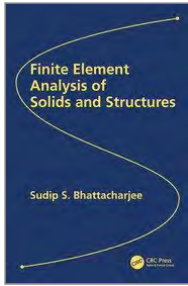
Pb: 978-1-032-44294-5 : **£53.99**

Hb: 978-1-032-44295-2 : **£120**

eBook: 978-1-003-37148-9

* For full contents and more information, visit: www.routledge.com/9781032442945

Finite Element Analysis of Solids and Structures



Sudip S. Bhattacharjee

This textbook combines the theory of elasticity (advanced analytical treatment of stress analysis problems) and finite element methods (numerical details of finite element formulations) into one academic course derived from author's teaching, research, and applied work in automotive product development as well as in civil structural analysis. This work contains 12 discrete chapters that can be covered in a single semester university graduate course on linear elastic finite element analysis methods. The book also serves as a reference for practicing engineers working on design assessment and analysis of solids and structures.

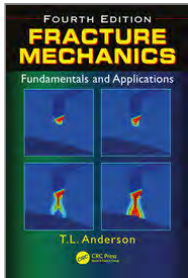
CRC Press
October 2024 : 340pp
Pb: 978-1-032-04158-2 : **£45.99**
Hb: 978-0-367-43705-3 : **£110**
eBook: 978-1-003-02784-3

* For full contents and more information, visit: www.routledge.com/9781032041582

4TH EDITION

Fracture Mechanics

Fundamentals and Applications, Fourth Edition



Ted L. Anderson Quest Integrity Group, Boulder USA

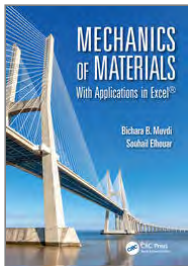
Fracture Mechanics: Fundamentals and Applications, Fourth Edition is the most useful and comprehensive guide to fracture mechanics available. It has been adopted by more than 150 universities worldwide and used by thousands of engineers and researchers. This new edition reflects the latest research, industry practices, applications, and computational analysis and modeling. It encompasses theory and applications, linear and nonlinear fracture mechanics, solid mechanics, and materials science with a unified, balanced, and in-depth approach. Numerous chapter problems have been added or revised, and additional resources are available for those teaching college courses or training sessions.

CRC Press
February 2017 : 684pp
Hb: 978-1-498-72813-3 : **£145**
eBook: 978-1-315-37029-3

* For full contents and more information, visit: www.routledge.com/9781498728133

Mechanics of Materials

With Applications in Excel



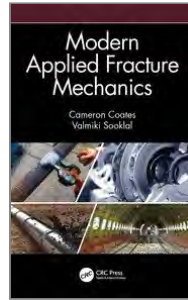
Bichara B. Muvdi Bradley University, Peoria, Illinois, USA,
Souhail Elhouar Bradley University, Peoria, Illinois, USA

This text covers the fundamentals of the mechanics of materials—or strength of materials—in a clear and easily understandable way, incorporating numerous examples, homework problems, and review problems to ensure comprehension. It also instills practical skills for developing Microsoft® Excel® applications to solve mechanics of materials problems using numerical techniques. The book includes editable Excel spreadsheets representing all the examples featured in the text, PowerPoint® lecture slides, multimedia simulations, graphics files, and a solutions manual with qualifying course adoption.

CRC Press
June 2016 : 723pp
Hb: 978-1-466-57071-9 : **£125**
eBook: 978-1-315-37431-4

* For full contents and more information, visit: www.routledge.com/9781466570719

Modern Applied Fracture Mechanics



Cameron Coates Kennesaw State University, USA,
Valmiki Sooklal Kennesaw State University, USA

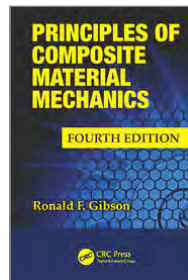
Modern Applied Fracture Mechanics presents a practical, accessible guide to understanding and applying basic linear elastic fracture mechanics (LEFM) techniques to problems commonly seen in industry, including fatigue analysis, failure analysis, and damage tolerance. The textbook is appropriate for undergraduate students, preparing them for the industry, and for advanced studies in fracture mechanics at the graduate level. Industry professionals and researchers will find this book a valuable resource for understanding basic fracture mechanics principles and methods.

CRC Press
August 2022 : 242pp
Hb: 978-0-367-50125-9 : **£110**
eBook: 978-1-003-05205-0

* For full contents and more information, visit: www.routledge.com/9780367501259

4TH EDITION

Principles of Composite Material Mechanics



Ronald F. Gibson University of Nevada, Reno, USA

Series: Mechanical Engineering

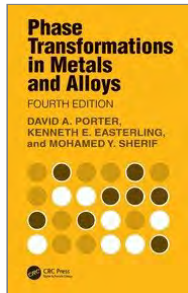
This book covers a unique blend of classical and modern mechanics of composites technologies. The fourth edition reflects the current state of the art, fresh insight gleaned from the author's ongoing composites research, and pedagogical improvements based on feedback from students, colleagues, and the author's own course notes. New worked-out examples and homework problems are added in most chapters, example problems and homework problems are now integrated within the chapters, and answers to selected homework problems are featured in the back of the book.

CRC Press
February 2016 : 698pp
Hb: 978-1-498-72069-4 : **£130**
eBook: 978-0-429-19058-2

* For full contents and more information, visit: www.routledge.com/9781498720694

4TH EDITION

Phase Transformations in Metals and Alloys



David A. Porter , **Kenneth E. Easterling** University of Exeter, UK, **Mohamed Y. Sherif**

Revised to cover developments in the field over the past decade, the Fourth Edition provides information and examples that better illustrate the engineering relevance of this topic. It supplies a comprehensive overview of specific types of phase transformations, supplemented by practical case studies of engineering alloys. With case studies, detailed examples, and exercises drawn from relevant applications, the Fourth Edition keeps the previous editions' popular easy-to-follow style and excellent mix of basic and advanced information, making it ideal for those new to the field. The unique presentation links basic understanding of theory with application in a gradually progressive manner.

CRC Press

November 2021 : 578pp

Pb: 978-0-367-43034-4 : **£58.99**

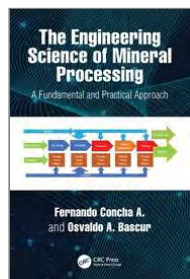
Hb: 978-0-367-82077-0 : **£155**

eBook: 978-1-003-01180-4

* For full contents and more information, visit: www.routledge.com/9780367430344

The Engineering Science of Mineral Processing

A Fundamental and Practical Approach



Fernando Concha A , Osvaldo A. Bascur OSIssoft LLC,
California

This book emphasizes the fundamentals of mineral processing to provide readers with a deep understanding of the science and phenomena that occur during the processing of ores. It also offers guidance on contemporary process implementation through practical industry applications. It includes examples of dynamic simulations and practical execution of advanced software to guide operating plans to ensure optimal conditions that predict process constraints. Offering a balance between fundamentals and applications, this book will interest researchers and industry professionals working to optimize mineral processing.

CRC Press

April 2024 : 546pp

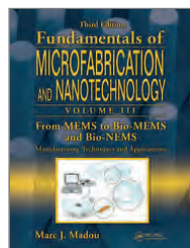
Hb: 978-1-032-61419-9 : £120

eBook: 978-1-032-61421-2

* For full contents and more information, visit: www.routledge.com/9781032614199

From MEMS to Bio-MEMS and Bio-NEMS

Manufacturing Techniques and Applications



Marc J. Madou University of California, Irvine, USA

This text details manufacturing techniques applicable to bio-nanotechnology. After reviewing MEMS techniques, materials, and modeling, the author covers nanofabrication, genetically engineered proteins, artificial cells, nanotechnology, and self-assembly. He also discusses scaling laws in MEMS and NEMS, actuators, fluidics, and power and brains in miniature devices. He concludes with coverage of various MEMS and NEMS applications.

CRC Press

June 2011 : 654pp

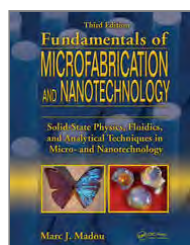
Hb: 978-1-420-05516-0 : £110

eBook: 978-0-429-10921-8

* For full contents and more information, visit: www.routledge.com/9781420055160

3RD EDITION

Fundamentals of Microfabrication and Nanotechnology, Three-Volume Set



Marc J. Madou University of California, Irvine, USA

The first volume in this set offers a rigorous theoretical treatment of micro- and nanosciences and includes sections on solid-state physics, quantum mechanics, crystallography, and fluidics. The second volume presents a very large set of manufacturing techniques for micro- and nanofabrication and covers different forms of lithography, material removal processes, and additive technologies. The third volume focuses on manufacturing techniques and applications of Bio-MEMS and Bio-NEMS. The text is illustrated in color throughout and contains worked-out examples and end-of-chapter problems. Ancillaries are available with qualifying course adoption.

CRC Press

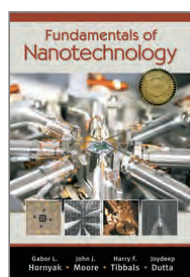
August 2011 : 1992pp

Hb: 978-0-849-33180-0 : £290

eBook: 978-1-315-27416-4

* For full contents and more information, visit: www.routledge.com/9780849331800

Fundamentals of Nanotechnology



Gabor L. Hornyak NanoThread, Inc., Golden, Colorado, USA, **John J. Moore** Colorado School of Mines, Golden, USA, **H.F. Tibbals** University of Texas Southwestern Medical Center, Dallas, USA, **Joydeep Dutta**

Nanotechnology is no longer a subdiscipline of chemistry, engineering, or any other field. It represents the convergence of many fields, and therefore demands a new paradigm for teaching. This textbook is for the next generation of nanotechnologists. It surveys the field's broad landscape, exploring the physical basics such as nanorheology, nanofluidics, and nanomechanics as well as industrial concerns such as manufacturing, reliability, and safety. The authors then explore the vast range of nanomaterials and systematically outline devices and applications in various industrial sectors. This color text is an ideal companion to Introduction to Nanoscience by the same group of esteemed authors.

CRC Press

December 2008 : 812pp

Hb: 978-1-420-04803-2 : £115

eBook: 978-1-315-22256-1

* For full contents and more information, visit: www.routledge.com/9781420048032

Introduction to Nanoscience



Gabor L. Hornyak NanoThread, Inc., Golden, Colorado, USA, **Joydeep Dutta**, **H.F. Tibbals** University of Texas Southwestern Medical Center, Dallas, USA, **Anil K. Rao** Metropolitan State College of Denver, Colorado, USA

Tomorrow's nanoscientist will have a truly interdisciplinary and nano-centric education, rather than, for example, a degree in chemistry with a specialization in nanoscience. For this to happen, the field needs a truly focused and dedicated textbook. This full-color masterwork is such a textbook. It introduces the nanoscale along with the societal impacts of nanoscience, then presents an overview of characterization and fabrication methods. The authors systematically discuss the chemistry, physics, and biology aspects of nanoscience, providing a complete picture of the challenges, opportunities, and inspirations posed by each facet before giving a brief glimpse at nanoscience in action: nanotechnology.

CRC Press

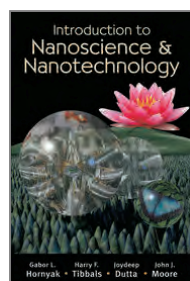
May 2008 : 856pp

Hb: 978-1-420-04805-6 : £115

eBook: 978-0-429-14489-9

* For full contents and more information, visit: www.routledge.com/9781420048056

Introduction to Nanoscience and Nanotechnology



Gabor L. Hornyak NanoThread, Inc., Golden, Colorado, USA, **H.F. Tibbals** University of Texas Southwestern Medical Center, Dallas, USA, **Joydeep Dutta**, **John J. Moore** Colorado School of Mines, Golden, USA

The maturation of nanotechnology has revealed it to be a unique and distinct discipline rather than a specialization within a larger field. Its textbook cannot afford to be a chemistry, physics, or engineering text focused on nano. It must be an integrated and multidisciplinary nano textbook. The archetype of the modern nano textbook, this text builds a solid background in characterization and fabrication methods while integrating the physics, chemistry, and biology facets. The remainder of this color text focuses on applications, examining engineering aspects as well as nanomaterials and industry-specific applications in such areas as energy, electronics, and biotechnology.

CRC Press

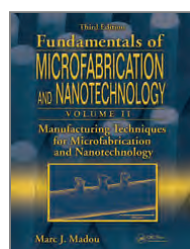
December 2008 : 1634pp

Hb: 978-1-420-04779-0 : £185

eBook: 978-0-429-14151-5

* For full contents and more information, visit: www.routledge.com/9781420047790

Manufacturing Techniques for Microfabrication and Nanotechnology



Marc J. Madou University of California, Irvine, USA

Designed for science and engineering students, this text focuses on emerging trends in processes for fabricating MEMS and NEMS devices. The book reviews different forms of lithography, subtractive material removal processes, and additive technologies. Both top-down and bottom-up fabrication processes are exhaustively covered and the merits of the different approaches are compared. Students can use this color volume as a guide to help establish the appropriate fabrication technique for any type of micro- or nano-machine.

CRC Press

June 2011 : 670pp

Hb: 978-1-420-05519-1 : £130

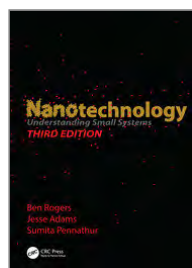
eBook: 978-0-429-11246-1

* For full contents and more information, visit: www.routledge.com/9781420055191

3RD EDITION

Nanotechnology

Understanding Small Systems, Third Edition



Ben Rogers NevadaNano, Sparks, USA, **Jesse Adams** NevadaNano, Sparks, USA, **Sumita Pennathur** University of California, Santa Barbara, USA

Series: Mechanical and Aerospace Engineering Series

This is a substantial revision of one of the first true primary texts in nanotechnology. The second edition was a CHOICE Award winner in 2011. Each chapter in the third edition has been thoroughly revised and updated. It adds a major new chapter on nanomedicine. It maintains the pedagogy along with the glossary. Vetted by a number of current and previous adopters, this text incorporates their comments in this new edition.

CRC Press

May 2017 : 432pp

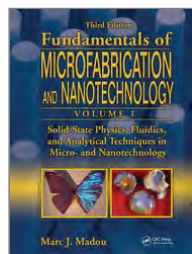
Pb: 978-1-138-07268-8 : £45.99

Hb: 978-1-482-21172-6 : £135

eBook: 978-0-429-18358-4

* For full contents and more information, visit: www.routledge.com/9781138072688

Solid-State Physics, Fluidics, and Analytical Techniques in Micro- and Nanotechnology



Marc J. Madou University of California, Irvine, USA

Providing a clear theoretical understanding of MEMS and NEMS, Solid-State Physics, Fluidics, and Analytical Techniques in Micro- and Nanotechnology covers all aspects of solid state physics behind nanotechnology and science. After exploring the rise of Si, MEMS, and NEMS in a historical context, the text discusses crystallography, quantum mechanics, the band theory of solids, and the silicon single crystal. It concludes with coverage of photonics, the quantum hall effect, and superconductivity. The text offers end-of-chapter problems, worked examples throughout, extensive references, and PowerPoint slides for download, along with a solutions manual for qualifying instructors.

CRC Press

June 2011 : 656pp

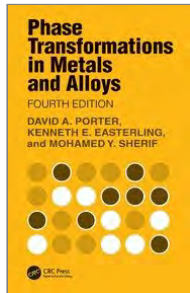
Hb: 978-1-420-05511-5 : £130

eBook: 978-0-429-11248-5

* For full contents and more information, visit: www.routledge.com/9781420055115

4TH EDITION

Phase Transformations in Metals and Alloys



David A. Porter , Kenneth E. Easterling University of Exeter, UK, **Mohamed Y. Sherif**

Revised to cover developments in the field over the past decade, the Fourth Edition provides information and examples that better illustrate the engineering relevance of this topic. It supplies a comprehensive overview of specific types of phase transformations, supplemented by practical case studies of engineering alloys. With case studies, detailed examples, and exercises drawn from relevant applications, the Fourth Edition keeps the previous editions' popular easy-to-follow style and excellent mix of basic and advanced information, making it ideal for those new to the field. The unique presentation links basic understanding of theory with application in a gradually progressive manner.

CRC Press

November 2021 : 578pp

Pb: 978-0-367-43034-4 : **£58.99**

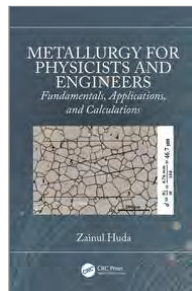
Hb: 978-0-367-82077-0 : **£155**

eBook: 978-1-003-01180-4

* For full contents and more information, visit: www.routledge.com/9780367430344

Metallurgy for Physicists and Engineers

Fundamentals, Applications, and Calculations



Zainul Huda Department of Mechanical Engineering,
King Abdulaziz University, Jeddah, Saudi Arabia

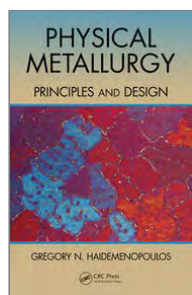
Relating theory with practice to provide a holistic understanding of the subject and enable critical thinking, this book covers fundamentals of materials technology, microstructural development engineering metallurgy, non-metallic materials, and applications. The book provides mathematical modeling for metals, polymers, ceramics, composites, and semiconductors. It features more than 250 solved problems and each chapter ends with exercise problems and answers to selected problems followed by references for additional reading. The text offers in-depth treatment of design against failure to help readers develop the skill of designing materials and components against failure.

CRC Press
February 2020 : 380pp
Hb: 978-0-367-19838-1 : £115
eBook: 978-0-429-26558-7

* For full contents and more information, visit: www.routledge.com/9780367198381

Physical Metallurgy

Principles and Design



Gregory N. Haidemenopoulos

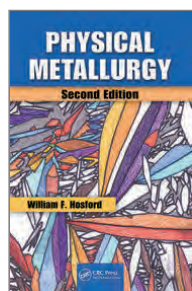
This book focuses on the processing–structure–properties triangle as it applies to metals and alloys. It introduces the fundamental principles of physical metallurgy and the design methodologies for alloys and processing. It discusses the structure and change of structure through phase transformations as well as strengthening mechanisms and mechanical properties as they relate to structure.

CRC Press
January 2018 : 490pp
Hb: 978-1-138-62768-0 : £145
eBook: 978-1-315-21122-0

* For full contents and more information, visit: www.routledge.com/9781138627680

2ND EDITION

Physical Metallurgy



William F. Hosford University of Michigan, Ann Arbor,
USA

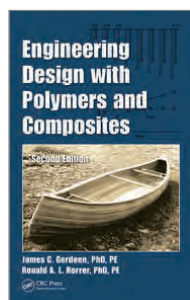
This book combines theoretical concepts, real alloy systems, processing procedures, and examples of real-world applications. It reviews properties common to all metals before discussing specific nonferrous alloy systems, iron-carbon alloys, special steels and low carbon sheet steel, and cast irons. Concluding chapters treat powder metallurgy, corrosion, welding, and magnetic alloys. There are appendices on microstructural analysis, stereographic projection, and the Miller–Bravais system for hexagonal crystals. Physical Metallurgy uses engaging historical and contemporary examples that relate to the applications of concepts in each chapter, ample references, and sample problems throughout.

CRC Press
April 2010 : 442pp
Hb: 978-1-439-81360-7 : £135
eBook: 978-0-429-19233-3

* For full contents and more information, visit: www.routledge.com/9781439813607

2ND EDITION

Engineering Design with Polymers and Composites



James C. Gerdeen, PhD, PE University of Colorado, Denver, USA, **Ronald A.L. Rorrer, PhD, PE** University of Colorado, Denver, USA

With new chapters on polymer fusing, rapid prototyping, and piezoelectric polymers, this second edition provides one of the only textbooks on the analysis and design of mechanical components made from polymer materials. It explains how to create polymer materials to meet design specifications. The authors describe modern design concepts for selecting polymers and composites for design applications. They also present computer methods for choosing polymer materials from a database, for optimal design, and for laminated plate design. A solutions manual is available for qualifying instructors.

CRC Press

December 2011 : 420pp

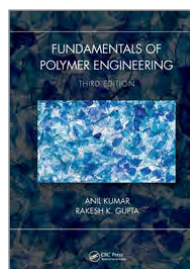
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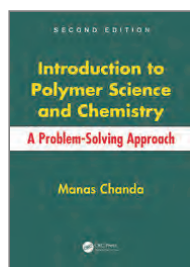
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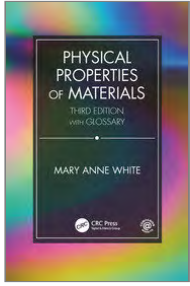
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CRC Press

October 2018 : 518pp

Pb: 978-1-138-60510-7 : **£61.99**

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Theory, Fundamentals, and Design



Hota V.S. GangaRao West Virginia University, USA,
Woraphot Prachasaree

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October 2024 : 534pp

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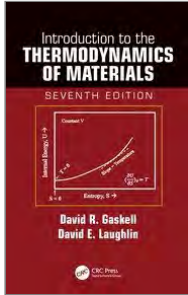
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CRC Press

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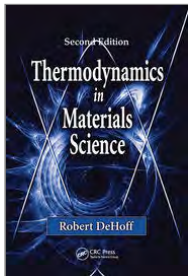
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Robert DeHoff University of Florida, Gainesville, USA

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CRC Press

March 2006 : 624pp

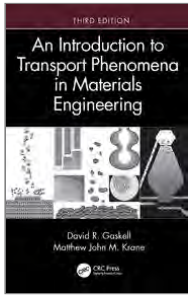
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CRC Press

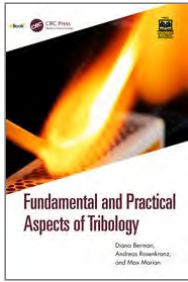
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Fundamental and Practical Aspects of Tribology



Diana Berman , Andreas Rosenkranz , Max Marian

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CRC Press

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