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An Introduction to Transport Phenomena in Materials Engineering *Prentice Hall* This introduction to transport phenomena in materials engineering balances an explanation of the fundamentals governing fluid flow and the transport of heat and mass with their common applications to specific systems in materials engineering. It introduces the influences of properties and geometry on fluid flow using familiar fluids such as air and water. Covers topics such as engineering units and pressure in static fluids; momentum transport and laminar flow of Newtonian fluids; equations of continuity and conservation of momentum and fluid flow past submerged objects; turbulent flow; mechanical energy balance and its application to fluid flow; transport of heat by conduction; transport of heat by convection; transient heat flow; heat transport by thermal radiation; mass transport in the solid state by diffusion; mass transport in fluids. Includes extensive appendices. **An Introduction to Transport Phenomena In Materials Engineering, 2nd edition** *Momentum Press* This classic text on fluid flow, heat transfer, and mass transport has been brought up to date in this second edition. The author has added a chapter on "Boiling and Condensation" that expands and rounds out the book's comprehensive coverage on transport phenomena. These new topics are particularly important to current research in renewable energy resources involving technologies such as windmills and solar panels. The book provides you and other materials science and engineering students and professionals with a clear yet thorough introduction to these important concepts. It balances the explanation of the fundamentals governing fluid flow and the transport of heat and mass with common applications of these fundamentals to specific systems existing in materials engineering. You will benefit from: • The use of familiar examples such as air and water to introduce the influences of properties and geometry on fluid flow. • An organization with sections dealing separately with fluid flow, heat transfer, and mass transport. This sequential structure allows the development of heat transport concepts to employ analogies of heat flow with fluid flow and the development of mass transport concepts to employ analogies with heat transport. • Ample high-quality graphs and figures throughout. • Key points presented in chapter summaries. • End of chapter exercises and solutions to selected problems. • An all new and improved comprehensive index. **Transport Phenomena in Materials Processing** *Springer* This text provides a teachable and readable approach to transport phenomena (momentum, heat, and mass transport) by providing numerous examples and applications, which are particularly important to metallurgical, ceramic, and materials engineers. Because the authors feel that it is important for students and practicing engineers to visualize the physical situations, they have attempted to lead the reader through the development and solution of the relevant differential equations by applying the familiar principles of conservation to numerous situations and by including many worked examples in each chapter. The book is organized in a manner characteristic of other texts in transport phenomena. Section I deals with the properties and mechanics of fluid motion; Section II with thermal properties and heat transfer; and Section III with diffusion and mass transfer. The authors depart from tradition by building on a presumed understanding of the relationships between the structure and properties of matter, particularly in the chapters devoted to the transport properties (viscosity, thermal conductivity, and the diffusion coefficients). In addition, generous portions of the text, numerous examples, and many problems at the ends of the chapters apply transport phenomena to materials processing. **Materials Processing A Unified Approach to Processing of Metals, Ceramics and Polymers** *Academic Press* **Materials Processing** is the first textbook to bring the fundamental concepts of materials processing together in a unified approach that highlights the overlap in scientific and engineering principles. It teaches students the key principles involved in the processing of engineering materials, specifically metals, ceramics and polymers, from starting or raw materials through to the final functional forms. Its self-contained approach is based on the state of matter most central to the shaping of the material: melt, solid, powder, dispersion and solution, and vapor. With this approach, students learn processing fundamentals and appreciate the similarities and differences between the materials classes. The book uses a consistent nomenclature that allow for easier comparisons between various materials and processes. Emphasis is on fundamental principles that gives students a strong foundation for understanding processing and manufacturing methods. Development of connections between processing and structure builds on students' existing knowledge of structure-property relationships. Examples of both standard and newer additive manufacturing methods throughout provide students with an overview of the methods that they will likely encounter in their careers. This book is intended primarily for upper-level undergraduates and beginning graduate students in Materials Science and Engineering who are already schooled in the structure and properties of metals, ceramics and polymers, and are ready to apply their knowledge to materials processing. It will also appeal to students from other engineering disciplines who have completed an introductory materials science and engineering course. Coverage of metal, ceramic and polymer processing in a single text provides a self-contained approach and consistent nomenclature that allow for easier comparisons between various materials and processes Emphasis on fundamental principles gives students a strong foundation for understanding processing and manufacturing methods Development of connections between processing and structure builds on students' existing knowledge of structure - property relationships Examples of both standard and newer additive manufacturing methods throughout provide students with an overview of the methods that they will likely encounter in their careers **Phase Transformation in Metals Mathematics, Theory and Practice** *Springer Nature* This textbook explains the physics of phase transformation and associated constraints from a metallurgical or materials science point of view, based on many topics including crystallography, mass transport by diffusion, thermodynamics, heat transfer and related temperature gradients, thermal deformation, and even fracture mechanics. The work presented emphasizes solidification and related analytical models based on heat transfer. This corresponds with the most fundamental physical event of continuous evolution of latent heat of fusion for directional or non-directional liquid-to-solid phase transformation at a specific interface with a certain geometrical shape, such as planar or curved front. Dr. Perez introduces mathematical and engineering approximation schemes for describing the phase transformation, mainly during solidification of pure metals and alloys. Giving clear definitions and explanations of theoretical concepts and full detail of derivation of formulae, this interdisciplinary volume is ideal for graduate and upper-level undergraduate students in applied science, and professionals in the metal making and surface reconstruction industries. **Electrochemistry and Corrosion Science** *Springer Science & Business Media* **Electrochemistry and Corrosion Science** is a graduate level text/professional reference that describes the types of corrosion on metallic materials. The focus will be on modeling and engineering approximation schemes that describe the thermodynamics and kinetics of electrochemical systems. The principles of corrosion behavior and metal recovery are succinctly described with the aid of pictures, figures, graphs and schematic models, followed by derivation of equations to quantify relevant parameters. Example problems are included to illustrate the application of electrochemical concepts and mathematics for solving complex corrosion problems. This book differs from others in that the subject matter is organized around the modeling and predicating approaches that are used to determine detrimental and beneficial electrochemical events. Thus, this book will take a more practical approach and make it especially useful as a basic text and reference for professional engineers. **Introduction to the Thermodynamics of Materials, Fifth Edition** *CRC Press* **Kinetics of Materials** *John Wiley & Sons* A classroom-tested textbook providing a fundamental understanding of basic kinetic processes in materials This textbook, reflecting the hands-on teaching experience of its three authors, evolved from Massachusetts Institute of Technology's first-year graduate curriculum in the Department of Materials Science and Engineering. It discusses key topics collectively representing the basic kinetic processes that cause changes in the size, shape, composition, and atomistic structure of materials. Readers gain a deeper understanding of these kinetic processes and of the properties and applications of materials. Topics are introduced in a logical order, enabling students to develop a solid foundation before advancing to more sophisticated topics. Kinetics of Materials begins with diffusion, offering a description of the elementary manner in which atoms and molecules move around in solids and liquids. Next, the more complex motion of dislocations and interfaces is addressed. Finally, still more complex kinetic phenomena, such as morphological evolution and phase transformations, are treated. Throughout the textbook, readers are instilled with an appreciation of the subject's analytic foundations and, in many cases, the approximations commonly used in the field. The authors offer many extensive derivations of important results to help illuminate their origins. While the principal focus is on kinetic phenomena in crystalline materials, select phenomena in noncrystalline materials are also discussed. In many cases, the principles involved apply to all materials. Exercises with accompanying solutions are provided throughout Kinetics of Materials, enabling readers to put their newfound knowledge into practice. In addition, bibliographies are offered with each chapter, helping readers to investigate specialized topics in greater detail. Several appendices presenting important background material are also included. With its unique range of topics, progressive structure, and extensive exercises, this classroom-tested textbook provides an enriching learning experience for first-year graduate students. **Materials Kinetics Transport and Rate Phenomena** *Elsevier* **Materials Kinetics: Transport and Rate Phenomena** provides readers with a clear understanding of how physical-chemical principles are applied to fundamental kinetic processes. The book integrates advanced concepts with foundational knowledge and cutting-edge computational approaches, demonstrating how diffusion, morphological evolution, viscosity, relaxation and other kinetic phenomena can be applied to practical materials design problems across all classes of materials. The book starts with an overview of thermodynamics, discussing equilibrium, entropy, and irreversible processes. Subsequent chapters focus on analytical and numerical solutions of the diffusion equation, covering Fick's laws, multicomponent diffusion, numerical solutions, atomic models, and diffusion in crystals, polymers, glasses, and polycrystalline materials. Dislocation and interfacial motion, kinetics of phase separation, viscosity, and advanced nucleation theories are examined next, followed by detailed analyses of glass transition and relaxation behavior. The book concludes with a series of chapters covering molecular dynamics, energy landscapes, broken ergodicity, chemical reaction kinetics, thermal and electrical conductivities, Monte Carlo simulation techniques, and master equations. Covers the full breadth of materials kinetics, including organic and inorganic materials, solids and liquids, theory and experiments, macroscopic and microscopic interpretations, and analytical and computational approaches Demonstrates how diffusion, viscosity microstructural evolution, relaxation, and other kinetic phenomena can be leveraged in the practical design of new materials Provides a seamless connection between thermodynamics and kinetics Includes practical

exercises that reinforce key concepts at the end of each chapter **Transport Phenomena Equations and Numerical Solutions** *Wiley-Blackwell* This invaluable text, provides a much-needed overview of both the theoretical development, as well as appropriate numerical solutions, for all aspects of transport phenomena. It contains a basic introduction to many aspects of fluid mechanics, heat transfer and mass transfer, and the conservation equations for mass, energy and momentum are discussed with reference to engineering applications. Heat transfer by conduction, radiation, natural and forced convection is studied, as well as mass transfer and incompressible fluid mechanics. The second part of the book deals with numerical methods used to solve the problems encountered earlier. The basic concepts of finite difference and finite volume methods are presented. Other subjects usually covered in mathematical textbooks such as vector and tensor analysis, Laplace transforms, and Runge-Kutta methods are discussed in the Appendices. * Offers comprehensive coverage of both transport phenomena and numerical and analytical solutions to the problems. * Includes comprehensive coverage of numerical techniques. * Provides real-life problems and solutions, which are vital to the understanding and implementation of applications. This work will be welcomed not only by senior and graduate students in mechanical, aeronautical and chemical engineering, but also for engineers practising in these fields. **Transport Phenomena in Materials Processing and Manufacturing Introduction to Metallurgical Thermodynamics** *Chem/Mats-Sci/E* **Problems in Metallurgical Thermodynamics and Kinetics** *International Series on Materials Science and Technology Elsevier* **Problems in Metallurgical Thermodynamics and Kinetics** provides an illustration of the calculations encountered in the study of metallurgical thermodynamics and kinetics, focusing on theoretical concepts and practical applications. The chapters of this book provide comprehensive account of the theories, including basic and applied numerical examples with solutions. Unsolved numerical examples drawn from a wide range of metallurgical processes are also provided at the end of each chapter. The topics discussed include the three laws of thermodynamics; Clausius-Clapeyron equation; fugacity, activity, and equilibrium constant; thermodynamics of electrochemical cells; and kinetics. This book is beneficial to undergraduate and postgraduate students in universities, polytechnics, and technical colleges. **Mechanical Behavior of Materials** *John Wiley & Sons* *Incorporated* An understanding of mechanisms for mechanical behavior is essential to applications of new materials and new designs using established materials. Focusing on the similarities and differences in mechanical response within and between the material classes, this book provides a balanced approach between practical engineering applications and the science behind mechanical behavior of materials. Covering the three main material classes: metals, ceramics and polymers, topics covered include stress, strain, tensors, elasticity, dislocations, strengthening mechanisms, high temperature deformation, fracture, fatigue, wear and deformation processing. Designed to provide a bridge between introductory coverage of materials science and strength of materials books and specialized treatments on elasticity, deformation and mechanical processing, this title: * Successfully employs the principles of physics and mathematics to the materials science topics covered. * Provides short biographical or historical background on key contributors to the field of materials science. * Includes over one hundred new figures and mechanical test data that illustrate the subjects covered. * Features numerous examples and more than 150 homework problems, with problems pitched at three levels. **Optical Engineering The Journal of the Society of Photo-optical Instrumentation Engineers Gas Transport in Porous Media** *Springer Science & Business Media* **CLIFFORD K. HOAND STEPHEN W. WEBB** Sandia National Laboratories, P. O. Box 5800, Albuquerque, NM 87185, USA Gas and vapor transport in porous media occur in a number of important applications including drying of industrial and food products, oil and gas exploration, environmental remediation of contaminated sites, and carbon sequestration. Understanding the fundamental mechanisms and processes of gas and vapor transport in porous media allows models to be used to evaluate and optimize the performance and design of these systems. In this book, gas and vapor are distinguished by their available states at standard temperature and pressure (20 C, 101 kPa). If the gas-phase constituent can also exist as a liquid phase at standard temperature and pressure (e. g. , water, ethanol, toluene, trichloroethylene), it is considered a vapor. If the gas-phase constituent is non-condensable at standard temperature and pressure (e. g. , oxygen, carbon dioxide, helium, hydrogen, propane), it is considered a gas. The distinction is important because different processes affect the transport and behavior of gases and vapors in porous media. For example, mechanisms specific to vapors include vapor-pressure lowering and enhanced vapor diffusion, which are caused by the presence of a gas-phase constituent interacting with its liquid phase in an unsaturated porous media. In addition, the "heat-pipe" exploits isothermal latent heat exchange during evaporation and condensation to effectively transfer heat in designed and natural systems. **Polymer Science A Textbook for Engineers and Technologists** *Carl Hanser Verlag GmbH Co KG* This is an introductory textbook on polymer science aimed at lecturers/professors, undergraduate and graduate students of polymer science and technology courses as well as engineering (materials, chemical, civil, food, etc.), chemistry, and physics. It is also aimed at engineers and technologists. Each chapter is written starting from simple concepts and progressively getting more complex towards its end, to help the reader decide how deep to go into each topic. Each chapter also presents the solution of many proposed problems, guiding the reader to solve numerically the everyday problems polymer technologists face, by applying theoretical concepts. Additionally, at every chapter's end there is a list of problems for the reader to check his/her understanding of the topics. The book contains a list of more than 10 experiments to perform in the laboratory, linked to some of the concepts discussed in the book. It also serves as a long-term reference with many figures, diagrams, tables, chemical equations containing frequently needed information. It contains as well an appendix with a long list of chemical structures of the main commercially available polymers. **Materials Engineering Bonding, Structure, and Structure-Property Relationships** *Cambridge University Press* An easy-to-read textbook linking together bond strength and the arrangement of atoms in space with the properties that they control. **An Introduction to Materials Engineering and Science for Chemical and Materials Engineers** *John Wiley & Sons* **An Introduction to Materials Engineering and Science for Chemical and Materials Engineers** provides a solid background in materials engineering and science for chemical and materials engineering students. This book: Organizes topics on two levels; by engineering subject area and by materials class. Incorporates instructional objectives, active-learning principles, design-oriented problems, and web-based information and visualization to provide a unique educational experience for the student. Provides a foundation for understanding the structure and properties of materials such as ceramics/glass, polymers, composites, bio-materials, as well as metals and alloys. Takes an integrated approach to the subject, rather than a "metals first" approach. **Transport Phenomena High-Entropy Alloys Fundamentals and Applications** *Springer* This book provides a systematic and comprehensive description of high-entropy alloys (HEAs). The authors summarize key properties of HEAs from the perspective of both fundamental understanding and applications, which are supported by in-depth analyses. The book also contains computational modeling in tackling HEAs, which help elucidate the formation mechanisms and properties of HEAs from various length and time scales. **Electronic Properties of Materials** *Springer* It is quite satisfying for an author to learn that his brainchild has been favorably accepted by students as well as by professors and thus seems to serve some useful purpose. This horizontally integrated text on the electronic properties of metals, alloys, semiconductors, insulators, ceramics, and polymeric materials has been adopted by many universities in the United States as well as abroad, probably because of the relative ease with which the material can be understood. The book has now gone through several reprinting cycles (among them a few pirate prints in Asian countries). I am grateful to all readers for their acceptance and for the many encouraging comments which have been received. I have thought very carefully about possible changes for the second edition. There is, of course, always room for improvement. Thus, some rewording, deletions, and additions have been made here and there. I withstood, however, the temptation to expand considerably the book by adding completely new subjects. Nevertheless, a few pages on recent developments needed to be inserted. Among them are, naturally, the discussion of ceramic (high-temperature) superconductors, and certain elements of the rapidly expanding field of optoelectronics. Further, I felt that the readers might be interested in learning some more practical applications which result from the physical concepts which have been treated here. **Physics of Functional Materials** *John Wiley & Sons* Written by academics with more than 30 years experience teaching physics and material science, this book will act as a one-stop reference on functional materials. Offering a complete coverage of functional materials, this unique book deals with all three states of the material, providing an insightful overview of this subject not before seen in other texts. Includes solved examples, a number of exercises and answers to the exercises. Aims to promote understanding of the subject as a basis for higher studies. The use of mathematically complicated quantum mechanical equations will be minimized to aid understanding. **For Instructors & Students: Visit Wiley's Higher Education Site for: Supplements Online Resources** **Technology Solutions** Instructors may request an evaluation copy for this title. **Transport Phenomena and Unit Operations A Combined Approach** *John Wiley & Sons* The subject of transport phenomena has long been thoroughly and expertly addressed on the graduate and theoretical levels. Now **Transport Phenomena and Unit Operations: A Combined Approach** endeavors not only to introduce the fundamentals of the discipline to a broader, undergraduate-level audience but also to apply itself to the concerns of practicing engineers as they design, analyze, and construct industrial equipment. Richard Griskey's innovative text combines the often separated but intimately related disciplines of transport phenomena and unit operations into one cohesive treatment. While the latter was an academic precursor to the former, undergraduate students are often exposed to one at the expense of the other. **Transport Phenomena and Unit Operations** bridges the gap between theory and practice, with a focus on advancing the concept of the engineer as practitioner. Chapters in this comprehensive volume include: **Transport Processes and Coefficients** **Frictional Flow in Conduits** **Free and Forced Convective Heat Transfer** **Heat Exchangers** **Mass Transfer; Molecular Diffusion** **Equilibrium Staged Operations** **Mechanical Separations** Each chapter contains a set of comprehensive problem sets with real-world quantitative data, affording students the opportunity to test their knowledge in practical situations. **Transport Phenomena and Unit Operations** is an ideal text for undergraduate engineering students as well as for engineering professionals. **The Science and Design of Engineering Materials** *McGraw-Hill Science Engineering* **CD-ROM** contains: **Dynamic phase diagram tool** -- Over 30 animations of concepts from the text -- **Photomicrographs** from the text. **Corrosion and Surface Chemistry of Metals** *EPFL Press* **Textbook; grad.** **Thermodynamics, Diffusion and the Kirkendall Effect in Solids** *Springer* In this book basic and some more advanced thermodynamics and phase as well as stability diagrams relevant for diffusion studies are introduced. Following, Fick's laws of diffusion, atomic mechanisms, interdiffusion, intrinsic diffusion, tracer diffusion and the Kirkendall effect are discussed. Short circuit diffusion is explained in detail with an emphasis on grain boundary diffusion. Recent advances in the area of interdiffusion will be introduced. Interdiffusion in multi-component systems is also explained. Many practical examples will be given, such that researchers working in this area can learn the practical evaluation of various diffusion parameters from experimental results. Large number of illustrations and experimental results are used to explain the subject. This book will be appealing for students, academicians, engineers and researchers in academic institutions, industry research and development laboratories. **Physical Metallurgy** *Newnes* This fifth edition of the highly regarded family of titles that first published in 1965 is now a three-volume set and over 3,000 pages. All chapters have been revised and expanded, either by the fourth edition authors alone or jointly with new co-authors. Chapters have been added on the physical metallurgy of light alloys, the physical metallurgy of titanium alloys, atom probe field ion microscopy, computational metallurgy, and orientational imaging microscopy. The books incorporate the latest experimental research results and theoretical insights. Several thousand citations to the research and review literature are included. Exhaustively synthesizes the pertinent, contemporary developments within physical metallurgy so scientists have authoritative information at their fingertips Replaces existing articles and monographs with a single, complete solution Enables metallurgists to predict changes and create novel alloys and processes **The Publishers' Trade List Annual Intercorporeality Emerging Socialities in Interaction** *Oxford University Press* This book draws inspiration from Maurice Merleau-Ponty's concept of intercorporeality to offer a new, multidisciplinary perspective on the body. By drawing attention to the body's ability to simultaneously sense and be sensed, Merleau-Ponty transcends the object-subject divide and describes how bodies are about, into, and within other bodies. Such inherent relationality constitutes the essence of intercorporeality, and the chapters in this book examine such relationality from a host of diverse perspectives. The book begins with an introductory chapter in which the editors review the current research

on bodily interaction, and introduce the notion of intercorporeality as a potentially integrative framework. The first section then offers four chapters devoted to clarifying theoretical and developmental perspectives on intercorporeality. Section 2 contains three chapters that provide insight on intercorporeality from evolutionary, historical, and cross-sectional perspectives. In Section 3, four chapters examine the intercorporeal nature of meaning-making during human interaction. Section 4 then presents three chapters that explore the intercorporeal nature of multi-agent interactions and the role that non-animate bodies (i.e., objects) play in such interaction. Throughout all the chapters, the authors work to integrate research in their specific discipline into the larger, transdisciplinary notion of intercorporeality. This collection provides an indisputably unique perspective on bodies-in-interaction, while simultaneously offering an interdisciplinary way forward in contemporary scholarship on bodies, meaning, and interaction.

Fundamentals of Metallurgy *Elsevier* As product specifications become more demanding, manufacturers require steel with ever more specific functional properties. As a result, there has been a wealth of research on how those properties emerge during steelmaking. **Fundamentals of metallurgy** summarises this research and its implications for manufacturers. The first part of the book reviews the effects of processing on the properties of metals with a range of chapters on such phenomena as phase transformations, types of kinetic reaction, transport and interfacial phenomena. Authors discuss how these processes and the resulting properties of metals can be modelled and predicted. Part two discusses the implications of this research for improving steelmaking and steel properties. With its distinguished editor and international team of contributors, **Fundamentals of metallurgy** is an invaluable reference for steelmakers and manufacturers requiring high-performance steels in such areas as automotive and aerospace engineering. It will also be useful for those dealing with non-ferrous metals and alloys, material designers for functional materials, environmentalists and above all, high technology industries designing processes towards materials with tailored properties. Summarises key research and its implications for manufacturers

Essential reading for steelmakers and manufacturers Written by leading experts from both industry and academia

Principles of Polymer Processing *John Wiley & Sons* Thoroughly revised edition of the classic text on polymer processing The Second Edition brings the classic text on polymer processing thoroughly up to date with the latest fundamental developments in polymer processing, while retaining the critically acclaimed approach of the First Edition. Readers are provided with the complete panorama of polymer processing, starting with fundamental concepts through the latest current industry practices and future directions. All the chapters have been revised and updated, and four new chapters have been added to introduce the latest developments. Readers familiar with the First Edition will discover a host of new material, including:

- * Blend and alloy microstructuring
- * Twin screw-based melting and chaotic mixing mechanisms
- * Reactive processing
- * Devolatilization--theory, mechanisms, and industrial practice
- * Compounding--theory and industrial practice
- * The increasingly important role of computational fluid mechanics
- * A systematic approach to machine configuration design

The Second Edition expands on the unique approach that distinguishes it from comparative texts. Rather than focus on specific processing methods, the authors assert that polymers have a similar experience in any processing machine and that these experiences can be described by a set of elementary processing steps that prepare the polymer for any of the shaping methods. On the other hand, the authors do emphasize the unique features of particular polymer processing methods and machines, including the particular elementary step and shaping mechanisms and geometrical solutions. Replete with problem sets and a solutions manual for instructors, this textbook is recommended for undergraduate and graduate students in chemical engineering and polymer and materials engineering and science. It will also prove invaluable for industry professionals as a fundamental polymer processing analysis and synthesis reference.

Fundamentals of Electrochemical Corrosion *ASM International* Covering the essential aspects of the corrosion behavior of metals in aqueous environments, this book is designed with the flexibility needed for use in courses for upper-level undergraduate and graduate students, for concentrated courses in industry, for individual study, and as a reference book.

Polymer Physics From Suspensions to Nanocomposites and Beyond *John Wiley & Sons* Providing a comprehensive review of the state-of-the-art advanced research in the field, **Polymer Physics** explores the interrelationships among polymer structure, morphology, and physical and mechanical behavior. Featuring contributions from renowned experts, the book covers the basics of important areas in polymer physics while projecting into the future, making it a valuable resource for students and chemists, chemical engineers, materials scientists, and polymer scientists as well as professionals in related industries.

Kinetics in Materials Science and Engineering *CRC Press* "A pedagogical gem.... Professor Readey replaces 'black-box' explanations with detailed, insightful derivations. A wealth of practical application examples and exercise problems complement the exhaustive coverage of kinetics for all material classes." --Prof. Rainer Hebert, University of Connecticut "Prof. Readey gives a grand tour of the kinetics of materials suitable for experimentalists and modellers.... In an easy-to-read and entertaining style, this book leads the reader to fundamental, model-based understanding of kinetic processes critical to development, fabrication and application of commercially-important soft (polymers, biomaterials), hard (ceramics, metals) and composite materials. It is a must-have for anyone who really wants to understand how to make materials and how they will behave in service." --Prof. Bill Lee, Imperial College London, Fellow of the Royal Academy of Engineering "A much needed text filling the gap between an introductory course in materials science and advanced materials-specific kinetics courses. Ideal for the undergraduate interested in an in-depth study of kinetics in materials." --Prof. Mark E. Eberhart, Colorado School of Mines

This book provides an in-depth introduction to the most important kinetic concepts in materials science, engineering, and processing. All types of materials are addressed, including metals, ceramics, polymers, electronic materials, biomaterials, and composites. The expert author with decades of teaching and practical experience gives a lively and accessible overview, explaining the principles that determine how long it takes to change material properties and make new and better materials. The chapters cover a broad range of topics extending from the heat treatment of steels, the processing of silicon integrated microchips, and the production of cement, to the movement of drugs through the human body. The author explicitly avoids "black box" equations, providing derivations with clear explanations.

Finite Volume Method Powerful Means of Engineering Design *BoD - Books on Demand* We hope that among these chapters you will find a topic which will raise your interest and engage you to further investigate a problem and build on the presented work. This book could serve either as a textbook or as a practical guide. It includes a wide variety of concepts in FVM, result of the efforts of scientists from all over the world. However, just to help you, all book chapters are systemized in three general groups: New techniques and algorithms in FVM; Solution of particular problems through FVM and Application of FVM in medicine and engineering. This book is for everyone who wants to grow, to improve and to investigate.

Introduction to Materials Science for Engineers *Pearson Education India* This Text Provides A Balanced And Current Treatment Of The Full Spectrum Of Engineering Materials, Covering All The Physical Properties, Applications And Relevant Properties Associated With The Subject. It Explores All The Major Categories Of Materials While Offering Detailed Examinations Of A Wide Range Of New Materials With High-Tech Applications.

Fluid Mechanics *Academic Press* Fluid mechanics, the study of how fluids behave and interact under various forces and in various applied situations-whether in the liquid or gaseous state or both-is introduced and comprehensively covered in this widely adopted text. Revised and updated by Dr. David Dowling, **Fluid Mechanics, Fifth Edition** is suitable for both a first or second course in fluid mechanics at the graduate or advanced undergraduate level. The leading advanced general text on fluid mechanics, **Fluid Mechanics, 5e** includes a free copy of the DVD "Multimedia Fluid Mechanics," second edition. With the inclusion of the DVD, students can gain additional insight about fluid flows through nearly 1,000 fluids video clips, can conduct flow simulations in any of more than 20 virtual labs and simulations, and can view dozens of other new interactive demonstrations and animations, thereby enhancing their fluid mechanics learning experience. Text has been reorganized to provide a better flow from topic to topic and to consolidate portions that belong together. Changes made to the book's pedagogy accommodate the needs of students who have completed minimal prior study of fluid mechanics. More than 200 new or revised end-of-chapter problems illustrate fluid mechanical principles and draw on phenomena that can be observed in everyday life. Includes free Multimedia Fluid Mechanics 2e DVD

Gender and Technology *Oxfam* This collection of articles from Gender and Development considers technologies of many kinds, including those intended to save womens labour, to enable them to control their fertility and to learn and communicate using computer technology.

Microgravity Science & Applications Program Tasks and Bibliography for FY1992