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This new edition has been extensively updated to match current BTEC National and Higher National syllabus specifications. It puts a greater focus on materials selection, outlining their properties and relevance to a variety of uses.

This book has been designed as a full programme of study for the most popular mechanical engineering option units followed by students on Mechanical Engineering, Manufacturing Engineering and Operations & Maintenance BTEC National Certificate and National Diploma courses. The author has structured the material so that manageable sections of text are complemented by in-text questions and features such as Test Your Knowledge, Activity and Maths in Action panels, making this an ideal book for student-centred classroom learning and independent study. Written for the new (2002) BTEC National specifications, this book will also be useful as an option unit resource for AVCE.

A broad ranging, low level text for engineering students. Written in Ray Higgins' entertaining style, this new edition has been extensively updated, and the sec-

tions on polymers, ceramics and composites re-written in expanded form.

A comprehensive reference on the properties, selection, processing, and applications of the most widely used nonmetallic engineering materials. Section 1, General Information and Data, contains information applicable both to polymers and to ceramics and glasses. It includes an illustrated glossary, a collection of engineering tables and data, and a guide to materials selection. Sections 2 through 7 focus on polymeric materials--plastics, elastomers, polymer-matrix composites, adhesives, and sealants--with the information largely updated and expanded from the first three volumes of the Engineered Materials Handbook. Ceramics and glasses are covered in Sections 8 through 12, also with updated and expanded information. Annotation copyright by Book News, Inc., Portland, OR

This is a comprehensive practical course in translation for advanced students of German, which focuses on improving translation quality whilst clarifying the theoretical issues involved. This second edition brings the course up-to-date, and has been fully reworked to give clearer explanations of key terms and include re-

vised chapters on genre, compensation and revision and editing. Based on detailed analysis of translation problems, Thinking German Translation features new material taken from a wide range of sources, including: business and politics press and publicity engineering tourism literary and consumer-oriented texts. Addressing a variety of translation issues such as cultural difference, register and dialect, Thinking German Translation is essential reading for all students wishing to perfect their translation skills. It is also an excellent foundation for those considering a career in translation. Further resources, including a free teacher's handbook for the course, are available on the companion website at <http://cw.routledge.com/textbooks/0415341469/resources/default.asp>

Stay Up to Date on the Latest Issues in Maintenance Engineering The most comprehensive resource of its kind, Maintenance Engineering Handbook has long been a staple for engineers, managers, and technicians seeking current advice on everything from tools and techniques to planning and scheduling. This brand-new edition brings you up to date on the most pertinent aspects of identifying and repairing faulty equipment; such dated subjects as sanitation and housekeeping have been removed. Maintenance Engineering Handbook has been advising plant and facility professionals for more than 50 years. Whether you're new to the profession or a practiced veteran, this updated edition is an absolute necessity. New and updated sections include: Belt Drives, provided by the Gates Corporation Repair and Maintenance Cost Estimation Ventilation Fans and Exhaust Systems 10 New Chapters on Maintenance of Mechanical Equipment Inside: • Organization and Management of the Maintenance Function • Maintenance Prac-

tices • Engineering and Analysis Tools • Maintenance of Facilities and Equipment • Maintenance of Mechanical Equipment • Maintenance of Electrical Equipment • Instrumentation and Reliability Tools • Lubrication • Maintenance Welding • Chemical Corrosion Control and Cleaning

This proceedings volume of the ISEA 2006 examines sports engineering, an interdisciplinary subject which encompasses and integrates not only sports science and engineering but also biomechanics, physiology and anatomy, and motion physics. This is the first title of its kind in the emerging field of sports technology.

Safety at Work is widely accepted as the authoritative guide to safety and health in the workplace and covers all aspects of safety management. The sixth edition has been revised to cover recent changes to UK practice and standards in health, safety, employment and environmental legislation. It also incorporates EU directives and references to harmonised and international standards. Reflecting the importance of the roles of directors and managers in health and safety, new chapters cover the management of risk, emphasising the need for a sound organisational structure to achieve effective risk management. Developments in the behavioural approach to risk management and current thinking on the development of an international standard on safety management are also covered. Quality of the environment is rapidly becoming part of the safety manager's responsibilities both in the workplace and in the context of global pollution. A completely new part consisting of five chapters has been added dealing solely with environmental issues (including ISO 14001). The increasingly important role of ergonomics in health and safety is reflected in a new chapter on

Applied Ergonomics, dealing with the subject pragmatically, that will allow the manager and practitioner to design process and operations that are within the limits of the human body. The effects of stress, an emerging concern in health and safety, are covered in various chapters.

This 2nd Edition of Coulson & Richardson's classic Chemical Engineering text provides a complete update and revision of Volume 6: An Introduction to Design. It provides a revised and updated introduction to the methodology and procedures for process design and process equipment selection and design for the chemical process and allied industries. It includes material on flow sheeting, piping and instrumentation, mechanical design of equipment, costing and project evaluation, safety and loss prevention. The material on safety and loss prevention and environmental protection has been revised to cover current procedures and legislation. Process integration and the use of heat pumps has been included in the chapter on energy utilisation. Additional material has been added on heat transfer equipment; agitated vessels are now covered and the discussion of fired heaters and plate heat exchangers extended. The appendices have been extended to include a computer program for energy balances, illustrations of equipment specification sheets and heat exchanger tube layout diagrams. This 2nd Edition will continue to provide undergraduate students of chemical engineering, chemical engineers in industry and chemists and mechanical engineers, who have to tackle problems arising in the process industries, with a valuable text on how a complete process is designed and how it must be fitted into the environment.

Over the past three decades, the termi-

nology of composite materials has been well acknowledged by the technical community, and composite materials have been gaining exponential acceptance in a diversity of industries, serving as competitive candidates for traditional structural and functional materials to realise current and future trends imposed on high performance structures. Striking examples of breakthroughs based on utilisation of composite materials are increasingly found nowadays in transportation vehicles (aircraft, space shuttle and automobile), civil infrastructure (buildings, bridge and highway barriers), and sporting goods (F1, golf club, sailboat) etc., owing to an improved understanding of their performance characteristics and application potentials, especially innovative, cost-effective manufacturing processes. As the equivalent of ICCM in the Asian-Australasian regions, the Asian-Australasian Association for Composite Materials (AACM) has been playing a vital leading role in the field of composites science and technology since its inception in 1997 in Australia. Following the excellent reputations and traditions of previous ACCMs, ACCM-4 is held in scenic Sydney, Australia, 6-9 July 2004. The theme of ACCM-4, Composites Technologies for 2020, provides a forum to present state-of-the-art achievements and recent advances in composites sciences & technologies, and discuss and identify key and emerging issues for future pursuits. By bringing together leading experts and promising innovators from the research institutions, end-use industries and academia, ACCM-4 intends to facilitate broadband knowledge sharing and identify opportunities for long-term cooperative research and development ventures. The scope of ACCM-4 is broad. It includes, but not limited to, the following areas: Bi- composites Ceramic

matrix composites Durability and aging, NDE and SHM Eco-composites Manufacturing and processing technologies Industrial applications Interphases and interfaces Impact and dynamic response Matrices (polymers, ceramics, and metals) Mechanical and physical properties (fatigue, fracture, micromechanics, viscoelastic behavior, buckling and failure, etc.) Metal matrix composites Multi-functional composites Nano-composites Reinforcements (textiles, strand, and mat) Smart materials and structures Technology transfer (education, training, etc.)

An insight into the use of the finite method in geotechnical engineering. The first volume covers the theory and the second volume covers the applications of the subject. The work examines popular constitutive models, numerical techniques and case studies.

This practical reference provides thorough and systematic coverage on both basic metallurgy and the practical engineering aspects of metallic material selection and application.

Issues for 1929- include section Contents noted (1929-1939 called Metallurgical abstracts; Jan. 1940- Sept. 1945 called Engineering digest; Oct. 1945- called Materials & methods digest) Annual indexes of the abstracts and digest were prepared 1929-1941; beginning in 1942, included in the complete index to the periodical.

Science is a broad, interdisciplinary subject comprising physics, chemistry, and biology. Physics deals with atomic matter and energy, while biology or health sciences deals with much larger molecular systems. Chemistry is perhaps the most essential science, as it serves as a bridge between these two fields. With this in mind, Chemistry for Engineers is a one-of-a-kind, well-written book that fo-

cuses on chemistry as applicable to engineers. It provides a comprehensive review of the basic branches and principles of chemistry, and also discusses the applications of chemistry in fields such as cement chemistry, asphalt chemistry, and polymer chemistry, among others. Readers interested in chemical engineering will find this volume invaluable as a reference book.

Employing a technological approach, this text provides a descriptive and qualitative treatment of materials science for engineering and metallurgy students. The author's accessible style, along with the inclusion of carefully presented worked examples, makes this an ideal guide to all types of engineering materials, their properties and applications.

This volume has been prepared as a reference guide for all engineering, industrial and technical management personnel who are in any way involved in the manufacturing process, in product design, or in converting of raw materials to finished products. This Encyclopedic Dictionary covers a wide range of subjects from industrial materials, minerals, metals, plastics and synthetic fibers to machine tools, computers, lasers, robots and other production equipment as well as manufacturing processes. Some of the materials reviewed are brass, steel, nickel, copper, bronze, cast iron, cements, clay, coal, coke, petroleum and petrochemicals, glass, limestone, rubber, paper, metal alloys, chemicals, synthetic fibers, textiles, plastics, resins, lubricants, and thermoplastics. Various processes are reviewed such as metal casting, forming, machining, annealing, extrusion, heat treating, injection molding, papermaking and steel processing. In heat treating such areas as martempering, annealing, spheroidizing, tempering

and austempering are included. Different types of equipment related to the products are defined. In plastics such products are covered as nylons, polyesters, rayons, Teflon, Vinyon, Saran, acetates and acrylics. Many of the manufacturing processes and equipment involved in the conversion of material to finished products are described along with products and their ultimate uses. Also, important associated manufacturing activities such as inspection, handling, and control are included to make the references as complete as is practicable.

The first reference on this emerging interdisciplinary research area at the interface between materials science and biomedicine is written by pioneers in the field, who address the requirements, current status and future challenges. Focusing on inherently conducting polymers, carbon nanotubes and graphene, they adopt a systematic approach, covering all relevant aspects and concepts: synthesis and fabrication, properties, introduction of biological function, components of bionic devices and materials requirements. Established bionic devices, such as the bionic ear are examined, as are emerging areas of application, including use of organic bionic materials as conduits for bone re-growth, spinal cord injury repair and muscle regeneration. The whole is rounded off with a look at future prospects in sustainable energy generation and storage. Invaluable reading for materials scientists, polymer chemists, electrotechnicians, chemists, biologists, and bioengineers.

Thoroughly revised and updated, this third edition of Ian Polmear's *Light Alloys* provides the definitive overview of the metallurgy of aluminum, magnesium and titanium alloys. The emphasis remains on manufacturing processes and application areas, in which there have been sig-

nificant advances in recent years. The extraction of each metal is considered briefly, followed by its casting characteristics and alloying behavior. Sections on heat treatment properties, fabrication and major applications have been expanded to give more comprehensive coverage of the subjects. Particular attention has been paid to microstructure/property relationships as well as to the role of the individual alloying elements, and new materials and novel processes are reviewed in an additional chapter. This succinct and informative introduction to the physical metallurgy of the light alloys will be essential reading for advanced undergraduates in metallurgy, materials science, manufacturing and mechanical engineering. It will also prove invaluable to metallurgists and engineers in industry seeking to expand on their knowledge. Other Titles of Interest
 Steels: Microstructure and Properties Second Edition R W K Honeycombe and H K D H Bhadeshia ISBN 0340589469
 Properties of Engineering Materials Second Edition R A Higgins ISBN 0 340 60033 0
 Engineering Metallurgy: Applied Physical Metallurgy Sixth Edition R H Higgins ISBN 0 340 56830 5

Milton Ohring's *Engineering Materials Science* integrates the scientific nature and modern applications of all classes of engineering materials. This comprehensive, introductory textbook will provide undergraduate engineering students with the fundamental background needed to understand the science of structure-property relationships, as well as address the engineering concerns of materials selection in design, processing materials into useful products, and how material degrade and fail in service. Specific topics include: physical and electronic structure; thermodynamics and kinetics; pro-

cessing; mechanical, electrical, magnetic, and optical properties; degradation; and failure and reliability. The book offers superior coverage of electrical, optical, and magnetic materials than competing text. The author has taught introductory courses in material science and engineering both in academia and industry (AT&T Bell Laboratories) and has also written the well-received book, *The Material Science of Thin Films* (Academic Press).

John Maynard Keynes is credited with the aphorism that the long-term view in economics must be taken in the light that "in the long-term we are all dead". It is not in any spirit of gloom however that we invite our readers of the sixteenth volume in the review series, *Advances in Nuclear Science and Technology*, to take a long view. The two principal roles of nuclear energy lie in the military sphere - not addressed as such in this series - in the sphere of the centralised production of power, and chiefly electricity generation. The immediate need for this latter has receded in the current era of restricted economies, vanishing growth rates and occasional surpluses of oil on the spot markets of the world. Nuclear energy has its most important role as an insurance against the hard times to come. But will the demand come at a time when the current reactors with their heavy use of natural uranium feed stocks are to be used or in an era where other aspects of the fuel supply must be exploited? The time scale is sufficiently uncertain and the duration of the demand so unascertainable that a sensible forward policy must anticipate that by the time the major demand comes, the reasonably available natural uranium may have been largely consumed in the poor convertors of the current thermal fission programme.

Ten grids that changed the world: the emergence and evolution of the most prominent visual structure in Western culture. Emblematic of modernity, the grid is the underlying form of everything from skyscrapers and office cubicles to paintings by Mondrian and a piece of computer code. And yet, as Hannah Higgins makes clear in this engaging and evocative book, the grid has a history that long predates modernity; it is the most prominent visual structure in Western culture. In *The Grid Book*, Higgins examines the history of ten grids that changed the world: the brick, the tablet, the gridiron city plan, the map, musical notation, the ledger, the screen, moveable type, the manufactured box, and the net. Charting the evolution of each grid, from the Paleolithic brick of ancient Mesopotamia through the virtual connections of the Internet, Higgins demonstrates that once a grid is invented, it may bend, crumble, or shatter, but its organizing principle never disappears. The appearance of each grid was a watershed event. Brick, tablet, and city gridiron made possible sturdy housing, the standardization of language, and urban development. Maps, musical notation, financial ledgers, and moveable type promoted the organization of space, music, and time, international trade, and mass literacy. The screen of perspective painting heralded the science of the modern period, classical mechanics, and the screen arts, while the standardization of space made possible by the manufactured box suggested the purified box forms of industrial architecture and visual art. The net, the most ancient grid, made its first appearance in Stone Age Finland; today, the loose but clearly articulated networks of the World Wide Web suggest that we are in the middle of an emergent grid that is reshaping the

world, as grids do, in its image.

Engineering Materials 2 is an introduction to the properties and structures of engineering materials such as metals, polymers, ceramics, and composites. The fracture, fatigue, creep, and environmental stability of materials are discussed, along with the results of impact tests, tensile tests, bend tests, and hardness measurements. Comprised of 13 chapters, this volume begins by considering the factors that determine the selection of a material from which a component is to be made, as well as the main properties required of engineering materials. The reader is then introduced to the main methods used for tensile testing, impact testing, bend tests, and hardness measurements, and how to interpret the results of such tests together with thermal conductivity and electrical conductivity data. Subsequent chapters focus on the basic structure of materials including metals, polymers, and composites; the shaping of metals and non-metallic materials; and the fracture, fatigue, creep, and environmental stability of materials. This book is intended for engineering students and technicians who want to gain a basic understanding of the properties and structures of engineering materials.

Includes entries for maps and atlases.

This renowned text has provided many thousands of students with an easily accessible introduction to the wide ranging subject area of materials engineering and manufacturing processes for over thirty years. Avoiding the excessive technical jargon and mathematical complexity so often found in textbooks for this subject, and retaining the practical down-to-earth approach for which this book is noted, *Materials for Engineers and Technicians* is now thoroughly updat-

ed and fully in line with current syllabus requirements. Offering a comprehensive guide to materials used by engineers, their applications and selection in a single volume, the fourth edition focuses on applications and selection - reflecting the increased emphasis on this aspect of materials engineering now seen within current vocational and university courses. Materials properties and relevance to particular uses are addressed in detail from the outset, with all subsequent chapters linking back to these essential concepts. Detailed discussion of examples of materials, and additional applications of processes have been incorporated throughout the text, with expanded sections addressing the causes of failure as this relates to material selection. Updated sections in the fourth edition provide a wider ranging discussion of titanium, printed-circuit-board materials and production, silicon chip production, and the applications and forms of modern composite materials. This new edition has been matched closely to the relevant units of the BTEC Higher National Engineering program, as well as catering fully for the requirements of a Level 3 audience. Students of BTEC Nationals will find that the new edition structure covers all the essential topics required for their courses in the early chapters (chapters 1 - 8). Those students following higher level qualifications (HNC / D Engineering, and first year undergraduate Engineering Materials modules within Mechanical, Manufacturing Systems and also Electrical & Electronic Engineering degree courses) will find additional more advanced topics are addressed in the second half of the book. In addition to meeting the requirements of vocational and undergraduate engineering syllabuses, this text will also prove a valuable desktop reference for

professional engineers working in product design, who require a quick source of information on materials and manufacturing processes.

A world list of books in the English language.

Storage and conversion are critical components of important energy-related technologies. "Advanced Batteries: Materials Science Aspects" employs materials science concepts and tools to describe the critical features that control the behavior of advanced electrochemical storage systems. This volume focuses on the basic phenomena that determine the properties of the components, i.e. electrodes and electrolytes, of advanced systems, as well as experimental methods used to study their critical parameters. This unique materials science approach utilizes concepts and methodologies different from those typical in electrochemical texts, offering a fresh, fundamental and tutorial perspective of advanced battery systems. Graduate students, scientists and engineers interested in electrochemical energy storage and conversion will find "Advanced Batteries: Materials Science Aspects" a valuable reference.

Engineering Materials Technology, Second Edition discusses the underlying principles of materials selection in mechanical and production engineering. The book is comprised of 20 chapters that are organized into five parts. The text first covers the structure of materials, such as metals, alloys, and non-metals. The second part deals with the properties of materials, which include fracture, fatigue, and creep. The third and

fourth parts discuss the characteristics of metals and non-metals, respectively. The last part deals with the selection process; this part takes into consideration the various properties of materials and the processes it goes through. The book will be of great use to students and practitioners of mechanical and production engineering.

Lea's Chemistry of Cement and Concrete deals with the chemical and physical properties of cements and concretes and their relation to the practical problems that arise in manufacture and use. As such it is addressed not only to the chemist and those concerned with the science and technology of silicate materials, but also to those interested in the use of concrete in building and civil engineering construction. Much attention is given to the suitability of materials, to the conditions under which concrete can excel and those where it may deteriorate and to the precautionary or remedial measures that can be adopted. First published in 1935, this is the fourth edition and the first to appear since the death of Sir Frederick Lea, the original author. Over the life of the first three editions, this book has become the authority on its subject. The fourth edition is edited by Professor Peter C. Hewlett, Director of the British Board of Agreement and visiting Industrial Professor in the Department of Civil Engineering at the University of Dundee. Professor Hewlett has brought together a distinguished body of international contributors to produce an edition which is a worthy successor to the previous editions.