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Adaptive, tolerant and efficient composite structures - Martin Wiedemann 2012-08-01
Composite structures are most efficient in performance and production cost when combined with smart materials making them adaptable to changing operational conditions. The specific production processes of composites offer the possibility to integrate more functions thus making the structure more valuable. Active functions can be realized by smart materials, e.g. morphing, active vibration control, active structure acoustic control or structure health monitoring. The foundation is a sound understanding of materials, design methods, design principles, production technologies and adaptronics. Along the complete process chain this disciplines together deliver advanced lightweight solutions for applications ranging from mechanical engineering to vehicles, airframe and finally space structures. This book provides the scientific foundations as well as inspiring new ideas for engineers working in the field of composite lightweight structures.

Fit für die Prüfung - Elektrotechnik - Jan Luiken ter Haseborg 2014-11-06

Diese Aufgabensammlung zu den Grundlagen der Elektrotechnik richtet sich an Studierende der Elektrotechnik und Informationstechnik sowie der Regelungstechnik, Hochfrequenztechnik, Informationstechnik, Messtechnik und Automatisierungstechnik an Technischen Universitäten und Hochschulen im

Grundstudium. Sie enthält praxisnahe Rechenaufgaben mit didaktisch aufbereiteten, sehr ausführlichen Lösungen und ergänzt hervorragend die Übungen zur Vorlesung "Grundlagen der Elektrotechnik". Die Übungsaufgaben werden intensiv durchgerechnet. Dadurch wird das Basiswissen vertieft und ergänzt. Die Aufgabensammlung umfasst alle Themenschwerpunkte und ist sowohl für das Selbststudium als auch für die Prüfungsvorbereitung der ideale Begleiter.

Photovoltaics - Konrad Mertens 2018-07-23
A comprehensive tutorial on photovoltaic technology now fully updated to include solar storage and the latest methods for on-site plant measurements Starting with the basic principles of solar energy, this fully updated, practical text explains the fundamentals of semiconductor physics and the structure and functioning of the solar cell. It describes the latest measurement techniques for solar modules, and the planning and operation of grid-connected and off-grid PV systems. It also looks at other thin film cells, hybrid wafer cells, and concentrator systems. Additionally, this Second Edition covers solar modules and solar generators; system technology of grid connected plants; the storage of solar energy; photovoltaic measurement technology; the planning and operation of grid-connected systems; economic efficiency of PV systems; and the future development of PV. Presents the latest advances in PV R&D and

industry deployment Updated illustrations and tabular data reflect current state-of-the-art and PV technology efficiencies Offers expanded tutorial sections to aid teaching and self-study Includes a brand-new chapter on Solar Energy Storage Features two enlarged chapters—one on up-to-date photovoltaic metrology and the other on the future developments in photovoltaics Comes along with the accompanying website www.textbook-pv.org which offers free downloadable figures of the book, solutions of exercises, additional free PV software etc. Developed to prepare engineering students for the PV industry, this practical text is an essential PV primer.

High Voltage Engineering - Andreas Küchler
2017-05-16

This book is based on the leading German reference book on high voltage engineering. It includes innovative insulation concepts, new physical knowledge and new insulating materials, emerging techniques for testing, measuring and diagnosis, as well as new fields of application, such as high voltage direct current (HVDC) transmission. It provides an excellent access to high voltage engineering - for engineers, experts and scientists, as well as for students. High voltage engineering is not only a key technology for a safe, economic and sustainable electricity supply, which has become one of the most important challenges for modern society. Furthermore, a broad spectrum of industrial applications of high voltage technologies is used in most of the innovative fields of engineering and science. The book comprehensively covers the contents ranging from electrical field stresses and dielectric strengths through dielectrics, materials and technologies to typical insulation systems for AC, DC and impulse stresses. Thereby, the book provides a unique and successful combination of scientific foundations, modern technologies and practical applications, and it is clearly illustrated by many figures, examples and exercises. Therefore, it is an essential tool both for teaching at universities and for the users of high voltage technologies.

Handbook of Precision Engineering - A. Davidson 1977

Polymer Rheology - Tim A. Osswald 2015

Rheology unites the seemingly unrelated fields of plasticity and non-Newtonian fluids by recognizing that both these types of materials are unable to support a shear stress in static equilibrium. In this sense, a plastic solid is a fluid. Granular rheology refers to the continuum mechanical description of granular materials. In this book, rheology--the study of the deformation and flow of matter--is treated primarily in the context of the stresses generated during the flow of complex materials such as polymers, colloids, foams, and gels. A rapidly growing and industrially important field, it plays a significant role in polymer processing, food processing, coating and printing, and many other manufacturing processes.

Soft Matter Physics - Mohamed Daoud
2013-06-29

In a liquid crystal watch, the molecules contained within a thin film of the screen are reorientated each second by extremely weak electrical signals. Here is a fine example of soft matter: molecular systems giving a strong response to a very weak command signal. They can be found almost everywhere. Soft magnetic materials used in transformers exhibit a strong magnetic moment under the action of a weak magnetic field. Take a completely different domain: gelatin, formed from collagen fibres dissolved in hot water. When we cool below 37°C, gelation occurs, the chains joining up at various points to form a loose and highly deformable network. This is a natural example of soft matter. Going further, rather than consider a whole network, we could take a single chain of flexible polymer, such as polyoxyethylene [POE = (CH₂CH₂O)_N, 2 ≤ N ≤ 5 where N ≤ 10], for example, in water. Such a chain is fragile and may break under flow. Even though hydrodynamic forces are very weak on the molecular scale, their cumulated effect may be significant. Think of a rope pulled from both ends by two groups of children. Even if each girl and boy cannot pull very hard, the rope can be broken when there are enough children pulling.

Ammonothermal Synthesis and Crystal Growth of Nitrides - Elke Meissner 2021-02-07

This book provides a collection of contributed chapters, delivering a comprehensive overview of topics related to the synthesis and crystal growth of nitride compounds under supercritical

ammonia conditions. Focusing on key chemical and technological aspects of ammonothermal synthesis and growth of functional nitride compounds, the book also describes many innovative techniques for in-situ observation and presents new data fundamental for materials synthesis under ammonothermal conditions. With its detailed coverage of many thermodynamic and kinetics aspects, which are necessary for understanding and controlling crystal growth, this contributed volume is the ideal companion to materials chemists and engineers at any point in their journey in this rich and exciting field.

Machine Tools Production Systems 3 -

Christian Brecher 2021

The first part of this third volume focuses on the design of mechatronic components, in particular the feed drives of machine tools used to generate highly dynamic drive movements. Engineering guides for the selection and design of important machine components, the control technology of feed drives, and the measuring systems required for position capture are presented. Another focus is on process and diagnostic equipment for manufacturing machines and systems. The second part describes control concepts including programming methods for various applications of modern production systems. Programmable logic controllers (PLC), numerical controllers (NC) and robot controllers (RC) are part of these presentations. In the context of automated manufacturing systems, the various levels of the automation pyramid and the importance of control systems are also outlined. Finally, the volume deals with the engineering of machines and plants. The German Machine Tools and Production Systems Compendium has been completely revised. The previous five-volume series has been condensed into three volumes in the new ninth edition with colored technical illustrations throughout. This first English edition is a translation of the German ninth edition. Prof. Christian Brecher was elected as university professor for the Chair of Machine Tools at the Laboratory for Machine Tools and Production Engineering (WZL) of the RWTH Aachen University in 2004. He is also a member of the board of directors of the Laboratory for Machine Tools and Production Engineering

(WZL) and of the Fraunhofer Institute for Production Technology (IPT), Aachen. He focuses on machine, transmission and control technology. Since 2012, as a co-founding member together with Prof. Hopmann, Prof. Brecher is head of the Aachen Center for Integrative Lightweight Production (AZL) of the RWTH Aachen University. Since 2018, Prof. Brecher has been head of the Fraunhofer Institute for Production Technology (IPT). Since 2019, he has been the spokesperson for the "Internet of Production" Cluster of Excellence at the RWTH Aachen University. Prof. em. Dr.-Ing. Dr.-Ing. E. h. Dr.-Ing. E.h. Manfred Weck was head of the Chair of Machine Tools at the Laboratory for Machine Tools and Production Engineering (WZL) of the RWTH Aachen University from 1973 to 2004. Since its foundation in 1980 until 2004, he was also Director and Head of the Department for Production Machines of the Fraunhofer Institute for Production Technology (IPT), Aachen. He founded the AiF Research Community "Ultraprazisionstechnik e.V." (Ultraprecision technology) in 1988. Over the years, Prof. Weck received various honors and awards, amongst them the SME Frederick W. Taylor Research Medal in 2007 and the Acceptance into the Hall of Fame of the Manager Magazine in 2015. Furthermore, Prof. Weck received the Aachen Engineering Prize in 2017, honoring him for his life's work.

Kautschuktechnologie - Röthemeyer 2013

Kautschuktechnologie umfasst die Herstellung, Verarbeitung und Anwendung von Kautschuk und Elastomeren sowie die Beschreibung des Verhaltens viskoelastischer Materialien. Die einzigartigen Eigenschaften der Kautschuke und Elastomere erfordern für die Beherrschung der Technologie das kombinierte Wissen von Chemikern, Physikern und Ingenieuren. Das nun in seiner dritten Auflage aktualisierte und erweiterte Standardwerk ist eine zusammenfassende Darstellung, die alle Aspekte dieses vielseitigen fachübergreifenden Wissensgebiets in ihren Abhängigkeiten verbindet. Das Handbuch ist mit Beiträgen von Fachautoren aus der Praxis sowohl für die Aus- und Weiterbildung als auch bei der täglichen Arbeit als Nachschlagewerk geeignet.

Advances in Polymer Processing 2020 -

Christian Hopmann 2020-03-10

This book gathers the proceedings of the International Symposium on Plastics Technology, which was held on March 10, 2020 in Aachen, Germany, and was organised by the Institute for Plastics Processing (IKV) in Industry and Craft at RWTH Aachen University. Peer-reviewed by an international scientific committee, the conference proceedings comprise the papers presented by the international speakers. Topics covered include - circular economy- extrusion- lightweight technologies- simulation and digitisation - injection moulding- hybrid materials and additive manufacturing. In these fields, key themes for plastics technologies have been identified that will shape the face of research and industry for the next decade. In their contributions, the authors present the latest scientific findings, and discuss topical issues in plastics technologies. The symposium offered an inspiring forum for the exchange on research and innovation, for discussing urgent questions and providing impulses for the future of plastics technology.

The First Snap-fit Handbook - Paul R. Bonenberger 2005-01-01

Engineering Design - Gerhard Pahl 2013-11-11
The aim of the first two German editions of our book Kon struktionslehre (Engineering Design) was to present a comprehensive, consistent and clear approach to systematic engineering design. The book has been translated into five languages, making it a standard international reference of equal importance for improving the design methods of practising designers in industry and for educating students of mechanical engineering design. Although the third German edition conveys essentially the same message, it contains additional knowledge based on further findings from design research and from the application of systematic design methods in practice. The latest references have also been included. With these additions the book achieves all our aims and represents the state of the art. Substantial sections remain identical to the previous editions. The main extensions include: - a discussion of cognitive psychology, which enhances the creativity of design work; - enhanced methods for product

planning; - principles of design for recycling; - examples of well-known machine elements*; - special methods for quality assurance; and - an up-to-date treatment of CAD*.

Injection Moulding of Elastomers - W. S. Penn 1969

A record of the proceedings of the Conference on Injection Moulding of Elastomers held at the Borough Polytechnic, London, March 12-14, 1968.

Nonlinear Model Predictive Control - Lars Grüne 2016-11-09

This book offers readers a thorough and rigorous introduction to nonlinear model predictive control (NMPC) for discrete-time and sampled-data systems. NMPC schemes with and without stabilizing terminal constraints are detailed, and intuitive examples illustrate the performance of different NMPC variants. NMPC is interpreted as an approximation of infinite-horizon optimal control so that important properties like closed-loop stability, inverse optimality and suboptimality can be derived in a uniform manner. These results are complemented by discussions of feasibility and robustness. An introduction to nonlinear optimal control algorithms yields essential insights into how the nonlinear optimization routine—the core of any nonlinear model predictive controller—works. Accompanying software in MATLAB® and C++ (downloadable from extras.springer.com/), together with an explanatory appendix in the book itself, enables readers to perform computer experiments exploring the possibilities and limitations of NMPC. The second edition has been substantially rewritten, edited and updated to reflect the significant advances that have been made since the publication of its predecessor, including: • a new chapter on economic NMPC relaxing the assumption that the running cost penalizes the distance to a pre-defined equilibrium; • a new chapter on distributed NMPC discussing methods which facilitate the control of large-scale systems by splitting up the optimization into smaller subproblems; • an extended discussion of stability and performance using approximate updates rather than full optimization; • replacement of the pivotal sufficient condition for stability without stabilizing terminal conditions with a weaker alternative and

inclusion of an alternative and much simpler proof in the analysis; and • further variations and extensions in response to suggestions from readers of the first edition. Though primarily aimed at academic researchers and practitioners working in control and optimization, the text is self-contained, featuring background material on infinite-horizon optimal control and Lyapunov stability theory that also makes it accessible for graduate students in control engineering and applied mathematics.

Handbook of Adhesion - D. E. Packham
2006-02-08

This second edition of the successful Handbook of Adhesion provides concise and authoritative articles covering many aspects of the science and technology associated with adhesion and adhesives. It is intended to fill a gap between the necessarily simplified treatment of the student textbook and the full and thorough treatment of the research monograph and review article. The articles are structured in such a way, with internal cross-referencing and external literature references, that the reader can build up a broader and deeper understanding, as their needs require. This second edition includes many new articles covering developments which have risen in prominence in the intervening years, such as scanning probe techniques, the surface forces apparatus and the relation between adhesion and fractal surfaces. Advances in understanding polymer - polymer interdiffusion are reflected in articles drawing out the implications for adhesive bonding. In addition, articles derived from the earlier edition have been revised and updated where needed. Throughout the book there is a renewed emphasis on environmental implications of the use of adhesives and sealants. The scope of the Handbook, which features nearly 250 articles from over 60 authors, includes the background science - physics, chemistry and material science - and engineering, and also aspects of adhesion relevant to the use of adhesives, including topics such as: Sealants and mastics Paints and coatings Printing and composite materials Welding and autohesion Engineering design The Handbook of Adhesion is intended for scientists and engineers in both academia and industry, requiring an understanding of the various facets of adhesion.

Polymer Blends - Lloyd M. Robeson 2007

It has been well-recognized that polymer blends offer a key option in solving emerging application requirements. The ability to combine existing polymers into new compositions with commercializable properties offers the advantage of reduced research and development expense compared to the development of new monomers and polymers to yield a similar property profile. An additional advantage is the much lower capital expense involved with scale-up and commercialization. Another specific advantage of polymer blends versus new monomer/polymer compositions is that blends often offer property profile combinations not easily obtained with new polymeric structures. In the rapidly emerging technology landscape, polymer blend technology can quickly respond to developing needs. This book offers a comprehensive overview of this important field, in particular a unique and extensive literature research on all aspects of this technology. It can be utilized as a reference text as well as a textbook for a graduate level course on polymer blends.

Statistical Procedures for Machine and Process Qualification - Edgar Dietrich 2010

This book has established itself as a standard reference for everyone dealing with statistical problems in industrial production. The focus is put on the application of the procedures required for machine acceptance and process qualification as well as interpretation of the calculated results. Great value is also set on the visualization of results in many different variations. This helps the practitioner to quickly gain insight into the situations he has to evaluate. Especially the included company guidelines are proof of the practical application and the benefit of the discussed topics in daily practice. This book takes the latest developments in international and national standards (i.e., DIN ISO 21747) into account. The company guidelines of Daimler AG, General Motors Powertrain, Robert Bosch GmbH, Volkswagen AG as well as the Ford Test Examples of the Evaluation of SPC Systems are included. The case examples included in the book as well as most of the charts and tables can be recreated using the qs-STAT(R) demo version. You can download this qs-STAT(R) demo version

either from the Q-DAS(R) website (www.q-das.de) or order it directly from Q-DAS(R). The data necessary for handling the case examples are also included in the demo version.

Finite Element Analysis for Engineers -

Frank Rieg 2014-10-01

The Finite Element Analysis today is the leading engineer's tool to analyze structures concerning engineering mechanics, i.e. statics, heat flows, eigenvalue problems and many more. Thus, this book wants to provide well-chosen aspects of this method for students of engineering sciences and engineers already established in the job in such a way, that they can apply this knowledge immediately to the solution of practical problems. Over 30 examples along with all input data files on DVD allow a comprehensive practical training of engineering mechanics. Two very powerful FEA programs are provided on DVD, too: Z88, the open source finite elements program for static calculations, as well as Z88Aurora, the very comfortable to use and much more powerful freeware finite elements program which can also be used for non-linear calculations, stationary heat flows and eigenproblems, i.e. natural frequencies. Both are full versions with which arbitrarily big structures can be computed - only limited by your computer memory and your imagination. For Z88 all sources are fully available, so that the reader can study the theoretical aspects in the program code and extend it if necessary. Z88 and Z88Aurora are ready-to-run for Windows and LINUX as well as for Mac OS X. For Android devices there also exists an app called Z88Tina which can be downloaded from Google Play Store.

Handbook of Technical Diagnostics - Horst Czichos 2013-01-11

This book presents concepts, methods and techniques to examine symptoms of faults and failures of structures, systems and components and to monitor functional performance and structural integrity. The book is organized in five parts. Part A introduces the scope and application of technical diagnostics and gives a comprehensive overview of the physics of failure. Part B presents all relevant methods and techniques for diagnostics and monitoring: from stress, strain, vibration analysis, nondestructive

evaluation, thermography and industrial radiology to computed tomography and subsurface microstructural analysis. Part C covers the principles and concepts of technical failure analysis, illustrates case studies, and outlines machinery diagnostics with an emphasis on tribological systems. Part D describes the application of structural health monitoring and performance control to plants and the technical infrastructure, including buildings, bridges, pipelines, electric power stations, offshore wind structures, and railway systems. And finally, Part E is an excursion on diagnostics in arts and culture. The book integrates knowledge of basic sciences and engineering disciplines with contributions from research institutions, academe, and industry, written by internationally known experts from various parts of the world, including Europe, Canada, India, Japan, and USA.

Polymer Testing - Wolfgang Grellmann 2013

The staggering growth rates in plastics production and applications increase the demand for meaningful measuring and analysis methods in polymer testing. The advances in electronic measuring techniques led to further developments in classic testing methods as well as to completely new methods. This book describes the significance of characteristic data for the quantification of the interrelationship between microstructure and macroscopic properties.

Manufacturing Processes 4 - Fritz Klocke 2014-07-08

This book provides essential information on metal forming, utilizing a practical distinction between bulk and sheet metal forming. In the field of bulk forming, it examines processes of cold, warm and hot bulk forming, as well as rolling and a new addition, the process of thixoforming. As for the field of sheet metal working, on the one hand it deals with sheet metal forming processes (deep drawing, flange forming, stretch drawing, metal spinning and bending). In terms of special processes, the chapters on internal high-pressure forming and high rate forming have been revised and refined. On the other, the book elucidates and presents the state of the art in sheet metal separation processes (shearing and fineblanking). Furthermore, joining by forming has been added

to the new edition as a new chapter describing mechanical methods for joining sheet metals. The new chapter "Basic Principles" addresses both sheet metal and bulk forming, in addition to metal physics, plastomechanics and computational basics; these points are complemented by the newly added topics of metallography and analysis, materials and processes for testing, and tribology and lubrication techniques. The chapters are supplemented by an in-depth description of modern numeric methods such as the finite element method. All chapters have been updated and revised for the new edition, and many practical examples from modern manufacturing processes have been added.

Fracture Mechanics - Dietmar Gross
2011-07-03

- self-contained and well illustrated - complete and comprehensive derivation of mechanical/mathematical results with emphasis on issues of practical importance - combines classical subjects of fracture mechanics with modern topics such as microheterogeneous materials, piezoelectric materials, thin films, damage - mechanically and mathematically clear and complete derivations of results

RFID Handbook - Klaus Finkenzeller
2000-01-05

A comprehensive and timely reference on RFID (Radio-Frequency Identification) technology covering the fundamental techniques and principles, and looking at current and potential applications. RFID is used in all areas of automatic data capture allowing contactless identification of objects using RF, from ticketing to industrial automation. This book brings together the disparate information on this fast-growing technology and features include: * Introduction to the essential operating criteria and physical principles of RFID systems * The latest information in the standards requirements, manufacture and applications of contactless smart cards * Coverage of the practical challenges to be considered in real-world applications of RFID from public transport to electronic immobilisation * Description of coding and modulation, the differentiation features of RFID systems and international standards * Examination of radio frequency ranges used and international licensing controls

including the US-FCC radio regulation standards. ADC professionals will profit from the detailed overview of current technologies, the legal guidelines and the breadth of applications examples combined within this single resource. End users of RFID products and electrical engineering postgraduates will appreciate this introduction to the basic functionality and the physical principles underlying this new technology.

Mechatronic Systems - Rolf Isermann
2007-12-29

Mechatronic Systems introduces these developments by considering the dynamic modelling of components together with their interactions. The whole range of elements is presented from actuators, through different kinds of processes, to sensors. Structured tutorial style takes learning from the basics of unified theoretical modelling, through information processing to examples of system development. End-of-chapter exercises provide ready-made homework or self-tests. Offers practical advice for engineering derived from experience with real systems and application-oriented research.

Grundlagen der Elektrotechnik - Manfred Albach
2011

Co-Rotating Twin-Screw Extruder - Klemens Kohlgrüber 2012-11-12

Co-rotating screws and/or extruders are used in many branches of industry for producing, preparing and/or processing highly viscous materials. They find a wide variety of applications especially in the plastics, rubber and food industries. Co-rotating twin-screw machines usually have modular configurations and are thus quite flexible for adapting to changing tasks and material properties. Well-founded knowledge of machines, processes and material behavior are required in order to design twin-screw extruder for economically successful operations. This book provides basic engineering knowledge regarding twin-screw machines; it lists the most important machine-technical requirements and provides examples based on actual practice. Better understanding of the processes is emphasized as this is a prerequisite for optimizing twin-screw designs and operating them efficiently. Besides basic

functions, such as compounding, the book focuses on: - the historical development of twin-screws - the geometry of the screw elements (fundamentals, basic patents, patents overview) - material properties and material behavior in the machine - fundamentals of feed behavior, pressure build-up and power input - examples of applications for various processing tasks - compounding: tasks, applications, processing zones - potential and limits of modeling - scaling-up various processes - machine design incl. drives and materials

Plastics Additives Handbook - Hans Zweifel 2009

Plastics without additives are not viable. Additives are essential to make plastics processable and to assure their end-use properties. The demands on additives have continued to evolve, not only because of changes in processing conditions and production techniques but also because plastics are being used in more demanding applications. This revised and updated edition, described earlier by one reviewer as the "bible" for anyone involved in the chemistry and technology of plastics additives, again provides an excellent overview of the complex science and technology of plastics additives and their industry. It offers guidance for all professionals involved in the development of new thermoplastic resin grades and novel end-use applications.

Injection Molds for Beginners - Rainer Dangel 2020-04-06

This applications-oriented book describes the construction of an injection mould from the ground up. Included are explanations of the individual types of tools, components, and technical terms; design procedures; techniques, tips, and tricks in the construction of an injection mould; and pros and cons of various solutions. Based on a plastic part ("bowl with lid") specially developed for this book, easily understandable text and many illustrative pictures and drawings provide the necessary knowledge for practical implementation. Step by step, the plastic part is modified and enhanced. The technologies and designs that are additionally needed for an injection mould are described by engineering drawings. Maintenance and repair, and essential manufacturing techniques are also discussed.

Now if full color, this second edition builds on the success of the first, with updates and small corrections throughout, as well as a new expanded section covering the process chain.

Einführung in die Automatisierungstechnik - Tilo Heimbold 2015-10-05

Dieses Lehrbuch liefert eine fundierte und kompakte Einführung in das breite Gebiet der Automatisierungstechnik. Angefangen bei den Grundlagen des Fachgebiets und der Klärung wichtiger Grundbegriffe und technischer Prozesse werden Aufbau und Struktur von Automatisierungssystemen näher erläutert. Schritt für Schritt lernen Leser so die Schnittstellen zum Prozess kennen und anwenden. Die Projektierung und Planung von Automatisierungsanlagen stellt dabei einen Schwerpunkt dar und zeigt den Weg von der Automatisierungsaufgabe bis hin zu den notwendigen Planungsunterlagen zur Errichtung einer Anlage. Ein durchgängiges Beispiel verdeutlicht dabei die einzelnen Bearbeitungsstufen. Zahlreiche Beispiele, Bilder und Übungen runden das Lehrbuch ab und dienen dem besseren Verständnis. Das Buch richtet sich an Studierende der Elektrotechnik, der Mechatronik sowie der Steuer- und Regelungstechnik. Für Ingenieure und Wirtschaftsingenieure in der Praxis ist es ebenfalls ein praktisches Nachschlagewerk. Aus dem Inhalt: Grundlagen; Aufbau und Struktur von Automatisierungssystemen; Messtechnik; Stelltechnik; Kommunikation; Informationsverarbeitung; Projektierung und Planung von Automatisierungsanlagen

Automotive Systems Engineering - Markus Maurer 2013-05-22

This book reflects the shift in design paradigm in automobile industry. It presents future innovations, often referred as "automotive systems engineering". These cause fundamental innovations in the field of driver assistance systems and electro-mobility as well as fundamental changes in the architecture of the vehicles. New driving functionalities can only be realized if the software programs of multiple electronic control units work together correctly. This volume presents the new and innovative methods which are mandatory to master the complexity of the vehicle of the future.

Micrometeorology - Thomas Foken 2017-02-18

The book focusses on atmospheric processes, which directly affect human environments within the lowest 100-1000 meters of the atmosphere over regions of only a few kilometres in extent. The book is the translation into English of the third edition of the German book "Applied Meteorology - Micrometeorological Methods". It presents, with selected examples, the basics of micrometeorology applied to disciplines such as biometeorology, agrometeorology, hydrometeorology, technical meteorology, environmental meteorology, and biogeosciences. The important issues discussed in this book are the transport processes and fluxes between the atmosphere and the underlying surface. Vegetated and heterogeneous surfaces are special subjects. The author covers the areas of theory, measurement techniques, experimental methods, and modelling all in ways that can be used independently in teaching, research, or practical applications.

Mechatronics and Information Technology - Qing Kai Han 2011-12-22

Volume is indexed by Thomson Reuters CPCI-S (WoS). These are the proceedings of the 2011 International Conference on Mechatronics and Information Technology (ICMIT 2011), which was held on August 16-19th, 2011, in Shenyang, Liaoning Province, P.R. China. The primary aim of ICMIT 2011 was to share ideas and to discuss new techniques and applications in mechatronics and information technology in order to speed the development of advanced equipment manufacture, within the conference theme of "mechatronics and information technology for advanced equipment manufacture". The topics covered by ICMIT 2011 included: Control Theory and Applications, Magnetic Resonance Imaging, Actuators and Mechanisms, Communication and Network Systems, Smart Materials and Structures, Ubiquitous Applications, Welfare Engineering, Sensors and Signal/Image Processing, Biomedical Engineering, Embedded Systems, Robotics, Human Interfaces, Mechatronics and MEMS, Information Technology, Intelligent Control and Systems, Condition Monitoring/Fault Diagnosis, Applied Electromagnetics and Mechanics and Power Electronics.

Sensors in Science and Technology - Ekbert

Hering 2022

Sensors are used to measure physical, chemical and biological quantities. The book offers a comprehensive overview of physical principles, functions and applications of sensors. It is structured according to the fields of activity of sensors and shows their application by means of typical examples. Measured variables that can be recorded by sensors are e.g. mechanical, dynamic, thermal, electrical and magnetic. Furthermore, optical and acoustical sensors are discussed in detail in the book. The sensor signals are recorded, processed and converted into control signals for actuators. Such sensor systems are also presented. This book is a translation of the original German 2nd edition *Sensoren in Wissenschaft und Technik* by Ekbert Hering, published by Springer Fachmedien Wiesbaden GmbH, part of Springer Nature in 2017. The translation was done with the help of artificial intelligence (machine translation by the service DeepL.com). A subsequent human revision was done primarily in terms of content, so that the book will read stylistically differently from a conventional translation. Springer Nature works continuously to further the development of tools for the production of books and on the related technologies to support the authors. The Content Fundamentals of sensor systems · Physical effects for sensor use · Measured variables that can be recorded by sensors · Mechanical measured variables · Thermal measured variables · Electrical and magnetic measured variables · Optical measured variables · Acoustic measured variables · Climatic and meteorological measured variables · Chemical measured variables · Biological and medical measured variables The Target Groups " Engineers and natural scientists in practice " Students and lecturers at universities " Experts in the field of sensor technology The Authors Prof. Dr. Dr. Ekbert Hering has been teaching physics, electronics, photonics and business administration at Aalen University since 1971. He was rector of the university, served on various supervisory boards and was the author of 70 textbooks, 45 of which were published by Springer Vieweg. Dr.-Ing. Gert Schönfelder received his doctorate in digital measurement technology. He worked in the field of computer architecture, image-based measurement

technology (stereo) and system design of cameras and measurement technology. Since 8 years he is head of development at a manufacturer of pressure sensors.

Taschenbuch der Messtechnik - Jörg Hoffmann 2015-09-07

Das Taschenbuch der Messtechnik - deckt das Gesamtgebiet der elektrischen und nichtelektrischen Messtechnik ab - vermittelt Wissen kompakt und strukturiert - enthält viele Beispiele aus der messtechnischen Praxis - bringt Übersichten zu Formelzeichen, Einheiten und Umrechnungen - schlägt eine Brücke zur Spezialliteratur durch ein umfangreiches, fachlich gegliedertes Literaturverzeichnis Für Studierende, Ingenieure und Wissenschaftler

Fourier Transformation for Pedestrians - Tilman Butz 2015-05-12

This book is an introduction to Fourier Transformation with a focus on signal analysis, based on the first edition. It is well suited for undergraduate students in physics, mathematics, electronic engineering as well as for scientists in research and development. It gives illustrations and recommendations when using existing Fourier programs and thus helps to avoid frustrations. Moreover, it is entertaining and you will learn a lot unconsciously. Fourier series as well as continuous and discrete Fourier transformation are discussed with particular emphasis on window functions. Filter effects of digital data processing are illustrated. Two new chapters are devoted to modern applications. The first deals with data streams and fractional delays and the second with the back-projection of filtered projections in tomography. There are many figures and mostly easy to solve exercises with solutions.

Heat and Mass Transfer - Hans Dieter Baehr 2006-08-02

This book provides a solid foundation in the principles of heat and mass transfer and shows how to solve problems by applying modern methods. The basic theory is developed systematically, exploring in detail the solution methods to all important problems. The revised second edition incorporates state-of-the-art findings on heat and mass transfer correlations. The book will be useful not only to upper- and graduate-level students, but also to practicing scientists and engineers. Many worked-out

examples and numerous exercises with their solutions will facilitate learning and understanding, and an appendix includes data on key properties of important substances.

Linear Algebra - Klaus Jänich 1994-09-02

This book covers the material of an introductory course in linear algebra. Topics include sets and maps, vector spaces, bases, linear maps, matrices, determinants, systems of linear equations, Euclidean spaces, eigenvalues and eigenvectors, diagonalization of self-adjoint operators, and classification of matrices. It contains multiple choice tests with commented answers.

Handbook of Adhesion Technology - Lucas F. M. da Silva 2018-03-01

This 2nd edition is a complete revision with an update of the methods that have been investigated recently and that are now fully accepted by the adhesion community. Themes that are now treated in more detail include for example hybrid adhesives used for automotive applications, ecofriendly surface treatments, damage mechanics, joint durability prediction and functionally graded joints. There is also a new chapter related to the application of adhesives in the oil industry. Besides these content changes, there has been a complete revision of all chapters in terms of text, figures, tables and references for a more didactic character of this reference book. The Handbook of Adhesion Technology is intended to be the definitive reference in the field. Essential information is provided for all those concerned with adhesion, which is a phenomenon of interest in diverse scientific disciplines and of importance in a wide range of technologies. Therefore, this book includes the background science (physics, chemistry and materials science), engineering aspects and industry-specific applications. It is arranged in a user-friendly format with ten main sections: theory of adhesion, surface treatments, adhesive and sealant materials, testing of adhesive properties, joint design, durability, manufacture, quality control, applications and emerging areas. Each section contains about five chapters written by internationally renowned authors who are authorities in their fields. This book offers a quick, but authoritative, description of topics in the field of adhesion and the practical use of

adhesives and sealants. Scientists and engineers of many different backgrounds who need to have an understanding of various aspects of adhesion technology will find it highly valuable. These will include those working in research or design, as well as others involved with marketing services. Graduate students in materials, processes and manufacturing will also want to consult it.

Extrusion Blow Molding - Michael Thielen
2021-06

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