SciTech Book News Reviews

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**HYDROLOGY, OCEANOGRAPHY**

GB400  9781439872000
*Mathematical morphology in geomorphology and GISci.*
Daya, B. S. Sagar.  
*CRC Press*, ©2013  516 p.  $99.95  
The vast data on terrestrial phenomena at spatial and temporal intervals now available in various formats is posing problems for the informatics of earth and environmental sciences, says Sagar (systems science and informatics, Indian Statistical Institute, Bangalore). He shows how mathematical morphology could be used to deal with the quantitative morphologic and scaling analyses of terrestrial phenomena and processes. After introducing mathematical morphology as an advanced spatial statistical tool that is popular in image processing and analysis, he discusses such topics as feature extraction, morphological shape decompositions, directional spatial relationship, and spatial interpolations.

**ANTHROPOLOGY**

GN347  9781598744897
*Participatory visual and digital methods.*
Gubrium, Aline and Krista Harper. (Developing qualitative inquiry; 10)  
*Left Coast Press, Inc.*, ©2013  227 p.  $34.95 (pa)  
The authors (both of the U. of Massachusetts) write that new methodologies such as digital storytelling and participatory digital archiving, are changing the ways that social scientists conduct research are opening up new possibilities for participatory approaches that appeal to diverse audiences and reposition participants as co-producers of knowledge and potentially as co-researchers,” particularly in their own fields of public health and applied anthropology. In this volume, they introduce anthropologists and other social researchers to participatory visual and digital methods of qualitative inquiry that afford the “subject,” “community member,” and/or “field site” “greater narrative latitude when it comes to ethnographic knowledge production and a larger role in determining why and how research outcomes are produced and received by lay and academic audiences alike.” They discuss these methodologies through the presentation of case studies that demonstrate the work of prominent practitioners in the field. Chapters are included on basic theory and practice; digital research ethics; photovoice research; participatory film and videomaking; digital storytelling; participatory geographic information systems; participatory digital archives and exhibition as research; and opening up data analysis, writing, and research products.

**SOCIAL SCIENCES (GENERAL), STATISTICS**

H62  9781452258041
*Collecting and interpreting qualitative materials*, 4th ed.  
Title main entry. Ed. by Normal K. Denzin and Yvonna S. Lincoln.  
*Sage*, ©2013  630 p.  $60.00 (pa)  
When the *Handbook of Qualitative Research* was published in 1994, it proved so popular that by the 1998 second edition, it had grown into a three-volume set, which had been almost completely rewritten for this fourth edition. The other two volumes cover the landscape, and theories and issues of qualitative research. This one introduces basic methods of gathering, analyzing, and interpreting qualitative empirical materials. The topics include oral history, performative autoethnography: critical embodiments and possibilities, reflections on interpretive adequacy in qualitative research, analysis and representation across the continuum, and strategies for composition and evaluation.
ECONOMICS

HC79  9781466640627
Information systems and technology for organizations in a networked society.
Title main entry. Ed. by Tomayess Issa, Pedro Isaías and Piet Kommers. (Advances in business information systems and analytics)
Business Science Reference, ©2013 406 p. $185.00
Issa (information systems, Curtin U., Australia), Isaías, and Kommers compile 18 articles on information systems and technology for organizations by business, computer science, informatics, medicine, and other professionals from Europe, North America, Australia, Brazil, and Japan. They discuss aspects of users and technology, including the participation of children in the information society, technology and the elderly, the use of Living Labs, strategies for analyzing digital texts, and creating and analyzing a social network built from clips of online news; learning aspects, including the role of the academic community in the network society, improving participation of cybernetic organizations through participatory action research, applying problem-based learning to e-learning courses in computing using screencasting, and teaching basic software engineering to high school students; technology-enhanced teaching and learning in business marketing courses; and the characteristics of firms most prone to mobile selling. Subsequent sections cover e-governance, with discussion of the factors involved in evaluating the public value of e-government, the effects of e-government readiness on business aspects like corruption and new enterprises, and municipalities’ electronic services for citizens, and e-health, including educational resources for medical education, the adoption of new e-health applications, the effects of a home-based heart monitoring device on innovation in healthcare delivery, and the use of radiofrequency identification in medicine.

PRODUCTION, INDUSTRY, LABOR

HD9502  9780857933683
Handbook on energy and climate change.
Title main entry. Ed. by Roger Fouquet.
Edward Elgar Publishing, ©2013 322 p. $85.00
Fouquet (climate change and the environment, London School of Economics, UK) supplies students, academics, and policy makers with a 32-chapter handbook on the economics of energy and climate change. Economics, environment, energy, business, and other specialists from Europe, the US, and Canada address fossil fuel markets, including global oil production and prices, natural gas markets and their role in the global primary energy mix, the implications of an OPEC-style natural gas cartel, and the increased world demand for coal, followed by electricity markets, with discussion of the US electricity grid, the drivers of past research and development in energy storage and grid management, and factors promoting electric vehicle use. They consider energy policy, including identifying macro-level improvements in energy efficiency and policies promoting the development of renewable energy technologies and sources, climate agreements, international support and regional agreements, the Kyoto Protocol, and the conditions needed for an international climate regime. They also focus on carbon mitigation policies, such as financing projects in developing countries, taxes, state-contingent pricing mechanisms for carbon dioxide emissions, energy consumption and emissions in buildings, the econometric analysis of climate policies, tradable permits markets, and the European Union carbon dioxide emissions trading scheme; low-carbon behavior, including consumption and habits, decision making, the moral dimensions of polluting behavior, the need for a decentralized governance structure, and the continuing policy stalemate related to climate change; and low-carbon economics growth, with discussion of the relationship between economic growth and environmental limits, the possibility of a low-carbon transition in China, and scenarios of a future climate-changed and low-carbon economy.

HD9650  9783527332571
The future of the chemical industry by 2050.
Valencia, Rafael Cayuela.
Wiley-VCH, ©2013 322 p. $85.00
An economist with a large international chemical company, Valencia projects what the world and the chemicals business will look like at the middle of the century. The 20th century witnessed the largest and longest period of wealth creation in human history, he says, and predicts that the trend will accelerate until the gross domestic product is four times what it is today. He acknowledges energy scarcity
and climate change, but thinks the biggest challenges will be meeting global demand for everything and changes in how people live, communicate, and organize their lives.

**LAW**

K1420 9789041136695

*Copyright and the challenge of the new.*
Title main entry. Ed. by Brad Sherman and Leanne Wiseman. (Information law series; v.25)

This collection explore the ways in which copyright law has responded to and interacted with different technologies, with each chapter following the introduction focusing in turn on technologies associated with photography, telegraphy, radio, film, the phonogram, the photocopier, the tape player, television, and computer programs. The major concern of each chapter is with the challenges posed by new technologies (such as the phonogram’s ability to record live performances and then reproduce them in other times and places) and how those challenges induced changes in the law.

KF390 9780876640081

*The automation legal reference; a guide to legal risk in the automation, robotics and process industries.*
Voigtmann, Mark.
ISA, ©2013 159 p. $79.00 (pa)

Voigtmann, an attorney who advises automation providers, offers a guide to legal risk for those in the automation, robotics, and process industries, and lawyers working with them. He discusses automation projects and contracts; project delivery methods; the scope of work; contract clauses; negotiating contracts; specifications; intellectual property; automation standards; professional licensing; “green” considerations; changes and other mid-project communications; dispute resolution; negligence; insurance; liens, bonds, and other remedies; maintenance and service agreements; legalities for tough economic times; auditing legal health; and working with attorneys. There is no bibliography.

**SCIENCE (GENERAL)**

Q180 9781849201803

*An introduction to systematic reviews.*
Title main entry. Ed. by David Gough, Sandy Oliver and James Thomas.
Sage , ©2012 288 p. $100.00

Researchers at the Evidence for Policy and Practice Information and co-ordinating Centre (the EPPI-Centre) at the Institute of Education in London share what they learned between 1993 and 2011 about conducting systematic reviews of the literature in the social and human sciences. The topics include stakeholder perspectives and participation in reviews, getting started with a review, finding relevant studies, describing and analyzing studies, combining results systematically and appropriately, and making a difference with systematic reviews.

Q183 9781439881392

*Data-intensive science.*
Title main entry. Ed. by Terence Critchlow and Kerstin Kleese van Dam. (Chapman & Hall/CRC computational science series)
CRC Press, ©2013 420 p. $89.95

Specialists in managing scientific data--many of them at Emory University’s biomedical informatics department in Atlanta, but others from across the US and Europe--begin by explaining what data-intensive science is and where all the data comes from. Then they consider data-intensive grand challenge science problems, case studies, and from challenges to solutions. Among the topics are large-scale microscopy imaging analytics for *in silico* biomedicine, materials from business suits to space suits, data-intensive production grids, transforming data into the appropriate context, and analyzing exploration data *in situ* for scientific discovery.

Q183 9780769549347

*Symbolic and numeric algorithms for scientific computing; proceedings.*
Computer Society Press, ©2012 524 p. $231.00 (pa)

The annual symposium is designed to stimulate the interaction between the symbolic
and numeric computing communities and to present interesting applications of the algorithms developed by both. From the 93 presentations, 65 were selected for publication. Six invited talks discuss such topics as interactive versus automated proofs in computational origami, computing with free algebras, and The Flexiformist Manifest. Other papers explore symbolic and numerical computing, logic and programming, artificial intelligence, distributed computing, developments in the theory of computing, managing resources and services in cloud and sky computing, hybrid parallelization concept services, and agents for complex systems. Only authors are indexed.

Q337 9780124051638 Swann intelligence and bio-inspired computation; theory and applications.
Title main entry. Ed. by Xin-Sheng Yang, Zhihua Cui, Renbin Xiao, Amir Hossein Gandomi, and Mehmet Karamanoglu. (Elsevier insights) Elsevier, ©2013  422 p.  $125.00
Civil and other engineers, mathematicians, computer scientists, and other contributors summarize the current status of biologically inspired computation and swarm intelligence, looking at both fundamentals and applications of algorithms based on swarm intelligence and other biological systems. The topics include a mimetic self-adaptive firefly algorithm, a problem-oriented approach to modeling and simulating an ant colony’s labor division, the development and application of the cuckoo search algorithm, modeling to generate alternatives using biologically inspired algorithms, and opportunities and challenges of integrating biologically inspired optimization and data mining algorithms. There is no index.

Q342 978118337844 Computational intelligence; synergies of fuzzy logic, neural networks and evolutionary computing.
Siddique, Nazmul and Hojjat Adeli. Wiley, ©2013  512 p.  $135.00
Siddique (computing and intelligent systems, U. of Ulster) and Adeli (engineering, The Ohio State U.) draw and expand on Adeli and Hung’s groundbreaking 1995 Machine Learning to provide a tutorial and reference on combining the three paradigms to create computational intelligence. The material is suitable for graduate and advanced undergraduate engineering and science students and researchers who have some knowledge of calculus, differential equations, and optimization theory. No prior knowledge of fuzzy logic, neural networks, or evolutionary computing is assumed. They introduce the MATLAB software system and use it for problems in most of the chapters.

MATH, COMPUTERS

QA8 9781138000162 A systemic perspective on cognition and mathematics.
Forrest, Jeffrey Yi-Lin. (Communications in cybernetics, systems science and engineering; v.1) CRC Press, ©2013  416 p.  $79.95
Continuing his search for more than anecdotal evidence that the human mind and the rest of the universe operate on similar principles, Forrest (economics and management, Nanjing U. of Aeronautics and Astronautics and mathematics, Slippery Rock U., Pennsylvania) looks at elementary properties of systemic yoyos, the mind, mathematics seen as a systemic flow, and the next stage of mathematics as a systemic field of thought. As a case study, he reconstructs two systems of mathematics, one assuming that actual and potential infinity are different, and the other assuming that all infinities are the same. The series will present cross-disciplinary theoretical and applied research centering on cybernetic and systems methodology that address questions conventional science cannot.

QA76.585 9780133387520 Cloud computing; concepts, technology, & architecture.
Characterizing cloud computing as the convergence of outsourcing in the business world and utility computing in the technology world, prolific writers and consultants on information technology explain how to seize it to leverage proven and mature components to fulfill existing strategic business goals and inspire businesses to set new objectives and directions. They cover fundamental cloud computing, mechanisms, architecture, and working with clouds.
Intelligent technologies and techniques for pervasive computing.
Title main entry. Ed. by Kostas Kolomvatsos, Christos Anagnostopoulos, and Stathes Hadjiefthymiades. (Advances in computational intelligence and robotics)
*Information Science Reference*, ©2013 331 p. $195.00
Computer and information scientists, but also contributors in diverse fields, present their theoretical and applied research findings in pervasive computing, multi-agent systems, and computational intelligence. The balance of theory and application makes the volume useful for people developing pervasive computing and computational intelligence systems for practical use. Among the topics are learning methodologies to support electronic business in the automated negotiation process, a multi-agent system for improving resource allocation in higher-education programs, a wireless sensor network design for energy-efficient monitoring, applying automata in game theory, and a mechanism for predicting intention in an intentional pervasive information system.

Automatic defense against zero-day polymorphic worms in communication networks.
Mohammed, Mohssen and Al-Sakib Khan Pathan.
*CRC Press*, ©2013 318 p. $89.95
A computer worm is a kind of malicious program that self-replicates automatically within a computer network, explain Mohammed (computer science and information sciences, Al-Imam Muhammad ibn Saud Islamic U., Saudi Arabia) and Pathan (computer science, International Islamic U., Malaysia), and a polymorphic version changes its payload in every infection attempt in order to evade intrusion. The defense against a polymorphic worm involves analyzing it manually to find its signature, which is much too slow to be effective against versions that replicate so fast that they can bring down the entire network in a few seconds--zero-day polymorphic worms. They draw from literature in a wide range of fields to describe how to generate signatures automatically for such worms. Among their topics are computer networking, intrusion detection and prevention systems, reading resources on automated signature generation systems, zero-day polymorphic worms collection methods, and developed signature generation algorithms.

Cases on usability engineering; design and development of digital products.
Title main entry. Ed. by Michael A. Garcia-Ruiz. (Advances in human and social aspects of technology)
*Information Science Reference*, ©2013 444 p. $175.00
Researchers and practitioners mostly in the computer and information sciences present case studies of usability methods, tests, and techniques to improve the human-computer interaction during the design and development of digital products. They cover web products, mobile applications, critical systems, virtual environments, simulations, and video games. The topics include social negotiations in web usability engineering, usability impact analysis of collaborative environments, towards a reliable strategy for evaluating the design of mobile text-based social applications, evaluating the usability of a touch screen in the flight deck, and a user-centered design based on brain computer interface for emotionally-driven user experience.

Computer system reliability; safety and usability.
Dhillon, B.S.
*CRC Press*, ©2013 231 p. $99.95
Dhillon (mechanical engineering management, U. of Ottawa) synthesizes the vast but scattered literature on computer reliability, safety, and utility for computer scientists, software engineers, network administrators, and others responsible for keeping computers working. Among his topics are basic mathematical concepts, computer system reliability basics, software quality, software safety and Internet reliability, and web usability. Chapter-end problems are provided.

Multimedia web design and development; using languages to build dynamic web pages. (DVD-ROM included)
Richardson, Theodor and Charles Thies.
*Mercury Learning and Information*, ©2013 263 p. $49.95 (pa)
In this guide to the concepts and best practices of interactive Web design and development, information technology instructors Richardson and Thies (the latter...
at Tulane U.) cover all of the stages of, and languages for, creating professional websites. The initial chapters provide guidelines for front-end design using the tools of HTML5, CSS3, Adobe Dreamweaver, Microsoft Expression Web, and JavaScript. Subsequent chapters introduce PHP and Perl programming languages for developing back-end code for Web applications. Includes hands-on activities, review questions with an answer key, and a DVD with video tutorials, source code and images from the text. Distributed by International Publishers Marketing.

QA76.9 9780123972002

**Advances in intelligence and security informatics.**

Mao, Wenji and Fei-Yue Wang. (Intelligent systems series)

*Academic Press*, ©2012 107 p. $125.00

Mao (automation, Chinese Academy of Sciences) and Wang (intelligent systems, National U. of Defense Technology, China) explain that the new field of intelligence and security informatics seeks to develop advanced information technologies, systems, algorithms, and databases for security-related applications. Their topics include agent modeling of terrorist organization behavior, generating a security story for computational experiments, forecasting group behavior with probabilistic plan inference, forecasting complex group behavior with multiple plan recognition, cyber-enabled social movement organizations, and cultural modeling for analyzing and predicting behavior. Academic Press is an imprint of Elsevier.

QA76.9 9781439877302

**The complete book of data anonymization; from planning to implementation.**

Raghunathan, Balaji. (Infosys press)

*CRC Press*, ©2013 247 p. $79.95

A software architect and information manager with an Indian business support company, Raghunathan describes the theory and procedures of separating personal information from the person in computer systems, so it cannot be used for illicit purposes. He provides a guide first for data anonymization program sponsors and then for practitioners. Among the topics are an enterprise data privacy governance model, the different phases of a program, tools and technology, data anonymization patterns, data flow patterns across environments, and implementing data anonymization.

QA76.9 9781845647087

**Data management and security; applications in medicine, science and engineering.**

Title main entry. Ed. by A. Rabasa, C.A. Brebbia, and A. Bia. (WIT Transactions on information and communications technology; v.45)

*WIT Press*, ©2013 243 p. $220.00

The First International Conference on Data Management and Security: Applications in Medicine, Sciences and Engineering was held in Elche, Spain. The 21 papers in the proceedings cover coding theory and cryptography applications, encryption, data management, statistical processing and data mining to solve real problems, and applications in medicine. Among specific topics
are improving image compression by using evolutionary computing algorithms, estimating traffic using the Levenberg-Marquardt neural network of a large information protocol system, the fuzzy logic modeling of a performance evaluation system for academic programs in Nigerian higher education, a methodology for planning evacuation routes inside buildings using geospatial technology, and heat transfer analysis in the human abdomen with a focus on correlation between the amount of abdominal fat and skin temperature. Only authors are indexed. The US office of WIT Press is Computational Mechanics.

QA76.9 9781439886816
Granular computing; analysis and design of intelligent systems.
Pedrycz, Witold. (Industrial electronics series)
CRC Press, ©2013 287 p. $129.95
Pedrycz (computational intelligence, U. of Alberta-Edmonton) explains granular computing, which was developed about a decade ago as a unified conceptual and processing framework by which to make meaning from the rising tide of data that washes nearly every human endeavor now. In natural languages information granules are implicit, he says, but to function fully in intelligent systems, they must be made explicit, which is accomplished with prudent formalisms. His topics include key formalisms for representing information granules and processing mechanisms, information granules of higher type and higher order, the design of information granules, a granular description of data and pattern classification, granular time series, and collaborative and linguistic models of decision making.

QA76.9 9781439879078
Identification and management of distributed data; NGN, content-centric networks and the web.
Bartolomeo, Giovanni and Tatiana Kováčiková.
CRC Press, ©2013 278 p. $89.95
Bartolomeo (Italian ministry of justice) and Kováčiková (U. of Zilina, Slovakia) introduce some of the protocols for naming and addressing on the internet, managing XML data, communicating over content-centric networks, and linking data. A section on next generation networks (NGN) describes the NGN functional architecture, the session initiation protocol, identifiers for NGN, the generic authentication architecture, and extensible markup language document management. Resource description framework (RDF) code illustrates the triples format, RDF schema vocabulary, the web ontology language (OWL), reification, named graphs, graph patterns and querying from multiple graphs.

QA76.9 9780123971678
Managing data in motion; data integration best practice techniques and technologies.
Reeve, April.
Morgan Kaufmann Pub., Inc., ©2013 174 p. $49.95 (pa)
Reeve, an enterprise information consultant with EMC, describes different techniques, technologies, and best practices for managing the transfer of data between computer systems and integrating disparate databases together within a large organization. Separate sections address batch data integration and real-time data integration, and the closing chapters discuss cloud solutions, data virtualization, big data architecture, and business intelligence tools.

QA76.9 9781466640306
Theory and practice of cryptography solutions for secure information systems.
Information Science Reference, ©2013 583 p. $195.00
This collection explains cryptographic methods for securing information systems, exploring hardware design, schemes for distributed systems, and trust solutions. Nineteen contributions describe GOST algorithms, search in encrypted data, side channel information leakage attacks, secure neighborhood discovery deployment, secure multiparty computation, and PKI trust models. Case studies of electronic mail, e-voting systems, an online auction, and patient records in a health monitoring system demonstrate schemes and protocols for engineered secure information systems.
Constraint satisfaction problems; CSP formalisms and techniques.
Ghédira, Khaled. (Computer engineering and IT series)

Writing for engineers, beginning or experienced researchers, and instructors, Ghédira (U. of Tunis, Tunisia) introduces the Constraint Satisfaction Problem (CSP) formalism and its foundation. Then he presents the main CSP-based techniques, which either solve such problems by backtracking-like algorithms, or speed up the resolution by consistency enforcing and/or heuristics using and/or learning. Other topics are search heuristics, maximal constraint satisfaction problems, constraint satisfaction and optimization problems, and distributed constraint satisfaction problems.

Applied diffusion processes from engineering to finance.
Janssen, Jacques and Oronzio Manca, Raimondo Manca. (Applied stochastic methods series)

Janssen (honorary, Solvay Business School, Belgium), O. Manca (thermal sciences, Seconda U. degli Studi di Napoli, Italy), and R. Manca (mathematics of economics, finance, and actuarial science; U. of Rome “La Sapienza”) show how partial differential equations can link the fields of engineering, physics, and finance. Among the topics are probabilistic models of diffusion processes, exotic and American options pricing theory, hitting times for diffusion processes and stochastic models in insurance, Lévy processes, and Monte Carlo semi-Markov simulation methods. Professionals in any of the three fields who have a good knowledge of probability theory could find the material useful.

Distribution theory; with applications in engineering and physics.
Teodorescu, Petre P. and Wilhelm W. Kecs, Antonela Toma.

Romanian scientists Teodorescu (U. of Bucharest) Kecs (U. of Petrosani), and Toma (U. Politehnica Bucharest) present elements of the theory of distributions as well as theorems with possibility of application. Particular emphasis is paid to the mathematical representation of concentrated and distributed loads, in order to provide a unitary form for solutions to problems encountered in the mechanics of deformable solids. Among their topics are integral transformations of distributions, the representation in distributions of mechanical and physical quantities, applications of the distribution theory to the mechanics of the linear elastic bodies, applications in electrical engineering, and applications in physics.

Results and opportunities -- the decade of utilization; proceedings. (CD-ROM included)

Some 400 scientists attended the conference to share results of research on or associated with the International Space Station (ISS). The approximately 150 full papers and abstracts in the proceedings explore such areas as human research, communications and navigation technologies, technical Earth imaging, materials science and combustion science, cell biology and tissue engineering, plant and animal biology in space, fundamental physics, human exploration, robotics, fluid physics, international partners, and enabling exploration beyond Earth orbit. A supplement to Advances in the Astronautical Sciences. The volume is not indexed, but the disk is searchable, and is available separately from the book.

Introductory fluid mechanics for physicists and mathematicians.
Pert, Geoffrey J.

Fluid mechanics tends to be neglected by modern physics curricula, says Pert (physics, U. of York, Britain), and attributes that to its being considered classical, so old fashion, and because it was generally developed by engineers and applied mathematicians, so grew up on the wrong side of the academic tracks. He offers a pedagogical summary of...
the physics of fluid flow, abstracting several classic texts that readers are referred to for more detail. The succinctness of his treatment has forced him to exclude flows in a rotating environment and computational fluid dynamics. His topics include flow of ideal fluids, waves and instabilities in fluids, convective heat transfer, aerofoils in low-speed incompressible flow, and self-similar methods in compressible gas flow and intermediate asymptotics.

QC176  9783037857014
Engineering applications of nanoscience and nanomaterials; special topic volume with invited peer reviewed papers only.
Title main entry. Ed. by Ajay Bansal and Rajesh J. Tayade. (Materials science forum; v.757)
Trans Tech Publications, ©2013  297 p. $166.00 (pa)
Contributors from a wide range of sciences describe how science and engineering at the nanometer scale is being used in a number of fields. The topics include nano-sized and nano-crystalline sulfated zirconia solid acid catalysts for organic synthesis, incorporating modified nano-montmorillonite in polyurethane coating base on acrylic copolymer and trimer of isophorone disocyanate, thermal conductivity of nanofluids, the stability of nanofluids, solid oxide fuel cell as a future source of power and heat generation, and carbon doping to enhance the photofunctions of dye-encapsulated photocatalytic activity of nano-titanium oxide.

QC611  9783527332588
Graphene; synthesis, properties, and phenomena.
Wiley-VCH, ©2013  416 p. $170.00
Materials scientists, chemists, and physicists survey some of the salient aspects of single-layer or few-layer graphene and a few graphene-like inorganic layered materials that are of current interest. Among the topics are investigating graphene with Raman scattering, the physics of quanta and quantum fields in graphene, suspected graphene devices for nanoelectromechanics of and for studying the quantum Hall effect, a detailed computational study of electronic and magnetic properties of patterned nanoribbons, heterogeneous catalysis by metal nanoparticles supported on graphene, and biomedical applications. The anthology could introduce students, teachers, and researchers to the recently discovered form of carbon.

QD382  9783527331437
Conjugated polyelectrolytes; fundamentals and applications.
Title main entry. Ed. by Bin Liu and Guillermo C. Bazan.
Wiley-VCH, ©2013  418 p. $165.00
A unique combination of physical properties and their recent role as key elements in emerging technologies have brought conjugated polyelectrolytes to the attention of scientists. This is the first volume devoted to the fundamentals and applications of the broad class of materials. Chemists and nuclear engineers consider such aspects as their design and synthesis, ionically functionalized polyacetylenes, sensing applications using energy transfer from conjugated polyelectrolytes, biocide applications, imaging and monitoring protein aggregation using conjugated polyelectrolytes, and organic optoelectronic devices containing water/alcohol-soluble conjugated polymers and conjugated polyelectrolytes.
Metallofoldamers; supramolecular architectures from helicates to biomimetics.
Title main entry. Ed. by Galia Maayan and Markus Albrecht.
Wiley, ©2013 445 p. $155.00
Metallofoldamers are synthetic oligomers that fold upon interactions with metal ions to give various stable architectures in solution. In this volume, chemists explore the whole field of structure control in oligomeric, polymeric, biomimetic, and biological systems from the simple helicates to polymers and natural or artificial peptides or DNA. The topics include metalloproteins and metallopeptides as natural metallofoldamers, self-assembly principles of helicates, helical structures featuring thiolato donors, designing the supramolecular liquid-crystalline helicates, metal complexes as alternative base pairs for triplets in natural and synthetic nucleic acid structures, and applications.

Polymers for energy storage and conversion.
Title main entry. Ed. by Vikas Mittal. (Polymer science and plastics engineering)
Wiley, ©2013 253 p. $175.00
Physical scientists and engineers describe new application of polymers in storing and converting energy that are possible because a number of recent improvements in controlling polymer molecular structure allow the properties of the polymer to be tuned more finely. The topics include high-performance materials for fuel cells based on polymer hydrogels, lithium polymer batteries based on ionic liquids, organic quantum dots grown by molecular layer deposition for photovoltaics, solvent effects in polymer-based organic photovoltaics, and energy as storage in porous polymers.

Modern fluoroorganic chemistry; synthesis, reactivity, applications.
Kirsch, Peer.
Wiley-VCH, ©2013 379 p. $190.00
A chemist with a German drug company, Kirsch introduces synthetic chemists to a wide range of synthesis methods based on fluoroorganic compounds. Some of them can be performed with relatively standard laboratory equipment, he says, to allow readers to ease into the field. After introductory chapters, he covers perfluoroalkylation; selected fluorinated structures and reaction types; the chemistry of highly fluorinated olefins; fluorous chemistry; fluorous synthesis and combinatorial chemistry; halofluorocarbons, hydrofluorocarbons, and related compounds; and pharmaceutical and other biomedical applications.

Ionic liquids uncoiled; critical expert overviews.
Wiley, ©2013 413 p. $149.95
Chemists, chemical engineers, biochemists, and biologists recognized for their knowledge of ionic liquids were solicited to provide an authoritative reference on selected aspects of ionic liquid chemistry. Among the topics are interfaces of ionic liquids, separation science, theoretical approaches from past history to future directions, ionic liquids derived from natural sources, the potential of filamentous fungi in pioneering biological processes in the presence of ionic liquids, using ionic liquids in dye-sensitized solar cells, and the phase behavior of gases in ionic liquids. All the contributors have presented papers at one of the Congress on Ionic Liquids (COIL) meetings, but these essays are separate from those presentations, thus are unCOILed.

Histochemical and cytochemical methods of visualization.
Title main entry. Ed. by Jean-Marie Exbrayat. (Methods in visualization)
CRC Press, ©2013 335 p. $179.95
Microscopic observations in histochemistry and cytochemistry became rare after the 1980s, and now that some researchers are using them again in specific cases, references on them are difficult to find. Researchers mostly in France, but also Belgium and Britain, explain the basics of using both light and transmission electron microscopy in the two fields, describing several classical techniques for both experienced and novice researchers, technicians, and students. Among the topics are enzyme histochemistry methods, visualizing apoptosis, cytochemical techniques, preparing samples for electron microscopy, and image quantification in histology and cytology.
**MEDICINE (GENERAL)**

R855 9781439848036  
*Imaging in cellular and tissue engineering.*  
Title main entry. Ed. by Hanry Yu and Nur Aida Abdul Rahim. (Series in cellular and clinical imaging)  
*CRC Press, ©2013 262 p. $149.95*  
Physicists, electronic and biochemical engineers, and other contributors describe how imaging is used in specific application of cellular and tissue engineering. Their topics include confocal microscopy for high-content cellular screening, magnetic resonance imaging to monitor implanted constructs, applying imaging technologies to stem-cell tracking in vivo, imaging therapeutic processes in animals using optical reporter genes, and image analysis for cellular and tissue engineering.

R857 9780857090171  
*Biomaterials and medical tribology; research and development.*  
Title main entry. Ed. by J. Paulo Davim. (Woodhead Publishing series in biomaterials; no.65)  
*Woodhead Publishing, ©2013 459 p. $270.00*  
Contributors mostly from the physical sciences and engineering, but also a few from medical sciences, explore medical tribology, which studies the design, friction, wear, and lubrication of sliding and frictional interfaces in the human body, with a particular focus on implants. The book can be used in a senior undergraduate engineering course or in a graduate course on biomaterials and medical tribology. The topics include synergism effects during friction and fretting corrosion experiments on biomaterials used as orthopedic implants, applying biomedical-grade titanium alloys in trabecular bone and artificial joints, determining wear on a retrieved metal-on-metal hip arthroplasty with an example of extreme wear, the importance of bearing porosity in engineering and natural lubricants, and the tribological characterization of human tooth enamel.

R857 9781118140420  
*Micro and nanotechnologies in engineering stems cells and tissues.*  
Title main entry. Ed. by Murugan Ramalingam, Esmail Jabbari, Seeram Ramakrishna and Ali Khademhosseini.  
*IEEE/Wiley, ©2013 306 p. $149.95*  
Biological and chemical engineers, materials scientists, and other researchers provide a snapshot of the current state of technologies at the micrometer and nanometer scales being used to design novel materials that display the complex cell-cell and cell-matrix interactions that are the basis of building new body parts by assembling basic biological components. The topics include stem cells and nanotechnology in tissue engineering and regenerative medicine, micro-engineering and nano-engineering approaches to developing gradient biomaterials suitable for interface tissue engineering, integrating top-down and bottom-up scaffolding tissue engineering approaches for bone regeneration, characterizing the adhesive interactions between cells and biomaterials, vascular tissue engineering, and applying stem cells in ischemic heart disease.

R858 9780323100953  
*Health informatics; an interprofessional approach. (online access included)*  
Nelson, Ramona and Nancy Staggers.  
*Elsevier Mosby, ©2014 535 p. $72.95 (pa)*  
Nelson (nursing, Slippery Rock U.) and Staggers (informatics, U. of Maryland) bring together nurses and informatics specialists mainly from the US for this textbook on health informatics for advanced undergraduate and graduate students in various health disciplines. In 31 chapters, they describe the history of the field, terms and definitions, theories, models, conceptual frameworks, evidence-based practice, practice-based evidence, and program evaluation; the major areas of healthcare practice, related applications, and supporting technical infrastructure, including electronic health records, telehealth, home health, clinical decision support, and public health informatics; e-patient and related applications or technology, such as social media and personal health records; leading informatics-related projects, including policies and procedures for privacy and security; quality, usability, and standards; governance and organizational structures, legal issues, and health policy; education and informatics,
including educational tools, simulation, distributive education, educational applications and issues, and informatics in the curriculum; and international informatics.

RS192 9781907568275
Computer-aided applications in pharmaceutical technology.
Title main entry. Ed. by Jelena Djuris. (Woodhead Publishing series in biomedicine; 52)
Woodhead Publishing, ©2013 269 p. $220.00
The contributors explain the basics of experimental design application and interpretation used in the development and evaluation of pharmaceutical products. This review of numerous current computer-aided pharmaceutical technology applications touches on a variety of topics, including: quality by design in pharmaceutical development; computer-aided formulation development, experimental design application and interpretation, neural computing in pharmaceutical products and process development, computational fluid dynamics applications, and computer-aided biopharmaceutical characterization in gastrointestinal absorption simulation. An extensive list of abbreviations also is included. Editor is Djuris (pharmaceutical technology and cosmetology, U. of Belgrade, Serbia.

RS201 9781118148877
Nanoparticulate drug delivery systems; strategies, technologies, and applications.
Title main entry. Ed. by Yoon Yeo. Wiley, ©2013 312 p. $150.00
Enthusiasm for nanomedicine has grown exponentially because it addresses critical problems in delivery of some drugs such as poor absorption, toxic side effects, and multiple drug resistance, but challenges remain in translating novel ideas into clinical benefits, e.g. the promise of the active targeting strategy to increase tumor accumulations of nanoparticles has not proved to be a magic bullet. In this state-of-the-art contribution to the field, Yeo (industrial and physical pharmacy, biochemical engineering, Purdue U., Indiana) introduces a dozen chapters reviewing the latest nanomedicine technologies and their preclinical evaluation. Following an overview of targeted nanomedicine, chapters discuss nanoparticulate drug delivery systems that have gained growing recognition, and opportunities and challenges posed by the relevant biology. Includes supporting tables and figures, and extensive references.

TECHNOLOGY (GENERAL)

T10 9783037856727
Trans Tech Publications, ©2013 567 p. $206.00 (pa)
The 94 selected papers cover advanced computer and information science, network, communication, and virtual system applications in industry; applied mathematics; recognition and monitoring technologies; electrical and electronic engineering, automation, and applied mechanics applications; creative and product design, knowledge innovation in industry; green technology and architecture engineering; material science engineering and technology; medical engineering applications; and miscellaneous topics. Among specific topics are the social network service of university library websites, a fast and smooth carving algorithm for online three-dimensional reconstruction, analyzing motion trauma for human running by motion capture, concept development in creative product design, computer simulation of the fractal growth of semiconductor thin films, and the effects of a blogger’s moral intensity on ethical decision making.

T55 9781439878200
Hazardous chemicals; safety management and global regulations. Dikshith, T.S.S.
CRC Press, ©2013 638 p. $149.95
Toxicologist Dikshith has worked extensively in agriculture, pharmaceuticals, and chemicals and with government and international agencies and programs in India and around the world. Here he provides quick access to information on the safety management of chemical substances, and appropriate recent scientific information for students, workers in occupations where they might encounter hazardous chemicals, and scientists who study such chemicals. Most of the volume describes safe handling and precautions.
for specific chemicals in alphabetical order. Other chapters cover characterizations of hazardous chemicals, perspectives and scenarios of chemicals that can injure eyes, global regulations, and a hazardous chemical substances and safety management system.

T57 9781420082562
Enterprise dynamics sourcebook.
Title main entry. Ed. by Kenneth C. Hoffman, Chris Glazner, William Bunting, Len Wojcik and Anne Cady. (Complex and enterprise systems engineering)
CRC Press, ©2013 355 p. $89.95
Reprinted, sometimes revised, published papers and reports document case studies that provide a starting point for a new discipline of enterprise dynamics as a core capability of enterprise systems engineering. The topics include foundations of enterprise systems engineering and architecting, simulating enterprise architecture for a business strategy, optimal control and differential game modeling of a systems engineering process for transformation, nuclear waste management strategic framework for a large-scale government program, and modeling the nation’s healthcare system as a dynamic enterprise.

T58 9780133155501
Patterns of information management.
Chessell, Mandy and Harald C. Smith.
IBM Press, ©2013 700 p. $54.99
This book is for enterprise, information, and solution architects working on linking information systems in complex environments. Stressing that information patterns form the basis of a whole new architectural approach to systems design, the book demonstrates how technologies for information management, SOA, and business process management can be blended to create a manageable IT landscape. The book presents architecture patterns that characterize typical information issues associated with distributed systems; the patterns show how information is managed and used along the 'information supply chain.' Techniques are applied in a chapter-length case study of a fictional company. Chessell is affiliated with the IBM Academy of Technology Leadership Teams. Smith is an IBM Software Architect.

ENGINEERING (GENERAL, CIVIL)

TA9 9781118344576
Dictionary of industrial terms.
Holloway, Michael and Chikezio Nwaoha.
Scrivener/Wiley, ©2013 665 p. $249.00
This is a nearly no-frills dictionary of industrial terms, where industrial refers to both engineering and management aspects of production processes, as well as business terms. There are over 11,000 entries, such as lag time, idle mode, hard failure, drift of an operating characteristic, planned downtime, order processing, and more. They’re listed in alphabetical order in a simple block format and are at most a couple hundred words, though the vast majority are only a sentence or two. They are written in plain language, but are not meant to comprehensively introduce any given word and at times assume background knowledge of related terminology. Each entry also ends with a note about the field a term applies to, like civil engineering or quality or procurement, but there is no index for these terms or the text as whole. Holloway is writes about industrial concerns, while Nwaoha is a petroleum engineering and writer.

TA164 9780123944306
Synthetic biology; tools and applications.
Title main entry. Ed. by Huimin Zhao.
Academic Press, ©2013 333 p. $149.95
Chemical, biological, and biochemical engineers describe tools and methodologies developed for engineering biological systems at a wide range of levels, including molecular, pathway, network, whole cell, and multicell. They also explore practical applications of synthetic biology, a branch of genetic engineering that incorporates systems biology. Among their topics are protein engineering as an enabling tool for synthetic biology, theoretical considerations for reprogramming multicellular systems, computational methods for strain design, the synthetic biology of microbial biofuel production, and towards engineering the conversion of light into energy by non-photosynthetic microorganisms.
Integrated tracking, classification, and sensor management; theory and applications.
Title main entry. Ed. by Mahendra Mallick, Vikram Krishnamurthy and Ba-Ngu Vo.
IEEE/Wiley, ©2013 712 p. $145.00
Computer scientists and electrical engineers survey the current state of multi-target tracking and sensor management, first developed for aerospace and space exploration but now also used in image processing, oceanography, autonomous vehicles, and other applications. They cover filtering, multi-target multi-sensor tracking, sensor management and control, estimation and classification, and decision fusion and decision support. Among specific topics are angle-only filtering in three dimensions, the continuous time roots of the interacting multiple model filter, track-before-detect techniques, a stochastic control approach to managing radar resources for target tracking, evaluating multi-sensor classification performance with Bayesian networks, and evidential networks for decision support in surveillance systems.

Smart sensors for industrial applications.
Title main entry. Ed. by Krzysztof Iniewski. (Devices, circuits, and systems)
CRC Press, ©2013 562 p. $149.95
Engineers mostly in academic positions survey various types of sensors being used for commercial purposes. They cover photonic and optoelectronic; infrared and thermal; magnetic and inductive; sound and ultrasound; and piezo-resistive, wireless, and electric sensors. The topics include laser Doppler velocimetry technology for integration and directional discrimination, thin film resistance temperature detectors, inductive sensors fitted in aircraft windows to measure lightning current, wideband ultrasonic transmitter and sensor array for in-air applications, and applying inertial sensors in developing smart particles.

Engineering risk management.
Meyer, Thierry and Genserik Reniers.
De Gruyter, ©2013 284 p. $98.00 (pa)
Chemical engineers Meyer (Swiss Federal Institute of Technology, Lausanne) and Reniers (Catholic U. of Leuven, Belgium) specialize in risk management and offer an engineering perspective on managing a company’s risk in all areas except finances. They cover engineering and managing risks, risk management principles, risk diagnosis and analysis, treating and reducing risk, event analysis, crisis management, economic issues of safety, risk governance, examples of practical implementation of risk management, and major industrial accidents and learning from them. The information and ideas could be useful to any manager, but particularly to safety engineers.
Developments in fiber-reinforced polymer (FRP) composites for civil engineering.
Title main entry. Ed. by Nasim Uddin.
(Woodhead Publishing series in civil and structural engineering; no.45)
Woodhead Publishing, ©2013 525 p. $290.00
Approaching from both the engineering and the materials side, researchers explore how some thermosetting or thermoplastic resins are combined with glass and/or carbon fibers, so that in civil engineering applications, the fiber network provides the load-bearing component while the resin transfers the load to the fibers, maintains the fiber orientation, and protects the fibers from the environment. The topics include types of fiber and fiber arrangement, failure modes in structural applications and their prevention, hybrid composites for structural applications, thermoplastic composite structural insulated panels for modular panelized construction, strengthening steel structures, and environmental engineering applications.

Nanocoatings; principles and practice; from research to production.
Abbott, Steven and Nigel Holmes.
DEStech Publications, Inc., ©2013 329 p. $179.50
Abbott (independent consultant; visiting professor, U. of Leeds, UK) and Holmes (UK-based coatings scientist) have seen it all: great inventions in the lab that go nowhere because of glitches in production or the impossibility of scaling up or unrealistic expectations regarding production time and money. Getting a product to market is fraught with pitfalls from start to finish, and “nanohype” (the authors’ term) refers to the many high hopes that have been dashed for one reason or another. This lively, authoritative treatise addresses just what’s announced in the title. Coverage includes why we need nano, finding the right nanoadditive, creating stable nanoformulations, the perfect solvent, printing and drying, 3D coatings, and nanosafety, among other topics.

Non-destructive evaluation (NDE) of polymer matrix composites; techniques and applications.
Title main entry. Ed. by Vistasp M. Karbhari.
(Woodhead Publishing series in composites science and engineering; no.43)
Woodhead Publishing, ©2013 692 p. $325.00
Twenty-five contributions address non-destructive evaluation and testing techniques with regard to monitoring structural health when polymer matrix composites are part of the picture, as they are, increasingly. Coverage encompasses the use of acoustic emission, eddy current, shearography, dielectric measurements, ultrasound, microwave, fiber optic sensing, and infrared thermography techniques. Applications include adhesive bonds, sandwich panels, delamination defects, aerospace composites, and civil and marine structures. Karbhari, a seasoned expert in the field, is president of the U. of Texas at Arlington.

Update on carbon fibre.
Bajpai, Pratima.
Smithers Rapra, ©2013 145 p. $130.00
Bajpai (chemical and biochemical engineering, U. of Western Ontario) brings together current information on the production, properties, applications, and future of carbon fibers. She also reviews the status of carbon-fiber reinforced polymer recycling operations, focusing on reclamation and re-manufacturing processes, and on the commercialization and potential applications of recycled products.

Nano- and micro-mechanics of polymers; structure modification and improvement of properties.
Michler, Goerg H. and Francisco J. Baltá-Calleja.
Hanser Publications, ©2012 566 p. $299.95
Michler (physics, Martin Luther U., Wittenberg, Germany) and Baltá-Calleja (structure of materials, Spanish National Research Council--CSIC, Madrid) begin by reviewing the importance of polymers in materials science particularly and in the world at large, and methods and investigating techniques for studying their structure and dynamics at very small scales. Then they set out the general mechanisms of deformation and fracture, and devote the rest of the volume...
to showing how these mechanisms apply to the main groups of polymer materials. These are amorphous and semicrystalline polymers, polymer blends, rubber-toughened polymers, composites, nanostructured polymers, and special forms and applications. High quality microphotographs illustrate many of the structures described.

TA481 9781847356383
Advances in nanofibre research, v.3
Haghi, Akbar K. and Gennady E. Zaikov. Smithers Rapra, ©2012 118 p. $200.00
Haghi (U. of Guilan, Rasht, Iran) and Zaikov (Russian Academy of Science, Moscow, Russia) have created this third volume, which describes the many directions in which the science and technology of polymer and nonofibres are now evolving and highlights the current understanding of polymer nanofibres and nanocomposites. The book is divided into four parts: Update on Nanofinishign of Textiles; Update on Fabrication of Modified Electrospun Nanofibres; Update on Production of Metal/Plymer Nanocomposites and Biocompatible Nanofibres; and Update on the Role of Process Control Parameters on the Production of Electrospun Nanofibres. Contains scanning electron microscope (SEM) micrographs, tables, figures, and charts.

TA484 9783037857304
Machining of titanium alloys and composites for aerospace applications.
Title main entry. Ed. by R. Zitoune, V. Krishnaraj, and Paulo Davim. (Materials science forum; v.763)
Trans Tech Publications, ©2013 171 p. $138.00 (pa)
Eight invited and peer-reviewed papers offer perspectives by mechanical and materials engineers on issues related to machining aerospace parts made of the two materials. Their topics include turning investigations on machining of titanium alloy Ti64 with different cutting tool inserts, the multi-objective optimization of drilling titanium alloy Ti64A4V, the laser assisted machining of titanium alloys, the influence of tool geometry and machining parameters on the surface quality and the effect of surface quality on the compressive strength of plastic reinforced with carbon fiber, and challenges in drilling multi-materials.
medical researchers, university instructors, and graduate engineering students. After introducing multi-resolution analysis, they cover discrete wavelet transform-based multi-fractal analysis, a supervised insertion approach to multimodal compression using JPEG 2000, and the synchronous detection of cerebral micro-embolism with wavelet packets.

TA1700  9781119990338
Semiconductor laser engineering, reliability and diagnostics; a practical approach to high power and single mode devices.
Epperlein, Peter W.
Wiley, ©2013  496 p.  $130.00
By integrating diode laser engineering, reliability engineering, and diagnostics, British semiconductor technology consultant Epperlein presents a novel approach to analyzing and designing high-power and single-mode optical devices. It provides just the blend of underlying basic physics and practical realization to deal with the issues encountered, he says. His topics include basic diode laser engineering principles; optical strength engineering; a diode laser reliability engineering program; and novel diagnostic laser data for active layer material integrity, impurity trapping effects, and mirror temperatures.

TA1700  9780857091215
Semiconductor lasers; fundamentals and applications.
Physicists, electrical engineers, and other researchers review the science and technology of semiconductor lasers half a century after they were first developed. Among the topics are photonic crystal lasers, semiconductor laser beam combining, ultrafast pulse generation by semiconductor lasers, vertical cavity surface emitting lasers, semiconductor disk lasers, interband cascade lasers, whispering gallery mode lasers, and tunable mid-infrared laser absorption spectroscopy.

TA1770  9783527410569
Advances in acoustic microscopy and high resolution imaging; from principals to applications.
Title main entry. Ed. by Roman Gr. Maev.
Wiley-VCH, ©2013  381 p.  $185.00
Thirteen contributed chapters begin with the fundamentals, addressing multiwave imaging to elasticity imaging, and speckle interferometry and nonlinear methods. Following is coverage of novel developments in techniques and methods such as applications of a quantitative ultrasonic microscope for soft biological tissues, and portable ultrasonic imaging devices. Subsequent chapters address advanced biomedical applications, and advanced materials applications. Editor Maev is affiliated with the U. of Windsor Institute for Diagnostic Imaging Research, Canada; contributors include a couple of his associates as well as scientists based around the world.

ENVIRONMENTAL TECHNOLOGY

TD430  9781612336190
Nanotechnology for water purification.
Title main entry. Ed. by Tania Dey.
Universal Publishers, ©2012  249 p.  $69.95 (pa)
This book describes how cutting-edge nanotechnology can be used to address today’s burning issue of water pollution. This book is written from materials science perspective and not from the bio-treatment point of view. The strength of this book lies in covering a wide range of nanomaterials (e.g. magnetic nanoparticles, cellulose nanofibers, carbon nanotubes, silver-impregnated cyclodextrin nanocomposites, nanostructured iron-zeolites, carbo-iron nanomaterials, photocatalytic titania nanoparticles, nanofiltration membranes and functionalized silica nanoparticles), clearly elucidating the science behind their specific applications and including ecological risk assessment at the end. These 10 chapters are primarily based on literature review and not just on authors’ own research work. This book will be a useful reference for scientists working in the same field. Dey has worked as a research scientist in colloid/polymer science, advanced materials and nanotechnology. No index is provided.
Photocatalysis and water purification; from fundamentals to recent applications.
Specialists in heterogeneous photocatalysis to purify water synthesize the vast technical literature on the process to provide an opening for people who would like to enter the field. They cover the fundamentals of active species, mechanisms, and reaction pathways; improving the photocatalytic efficacy; the effects of photocatalysis on natural organic matter and bacteria; and modeling, reactors, and pilot plants. Among the topics are photocatalytic mechanisms and reaction pathways drawn from kinetic and probe molecules, designing and developing active titania and related photocatalysts, photoelectrocatalysis for water purification, waterborne Escherichia coli inactivated by titanium oxide photoassisted processes, and commercially available reactors.

Waste to energy conversion technology.
This collection of individually authored chapters presents research essays on the challenges and opportunities of converting waste in human-built systems into useful energy. In many cases this is achieved through combustion and on-site case-studies. Chapters explore the social impact of waste to energy conversion plants, treating municipal solid waste, and equipment considerations for treatment plants. They are organized into three sections that introduce the impact of waste to energy recovery engineering, survey several waste to energy systems, and also examine pollution control systems in waste to energy technologies. The chapters are technically demanding and require a background in engineering or related scientific fields. They are self-contained and only integrated by an editorial introduction. The editors and contributors include engineers working at private firms and teaching at universities.

Building construction

Green technologies for sustainable & innovation in materials; select papers.
The Institute of Materials Malaysia has been organizing the biennial conference since 1990, and over 300 papers were presented at its 2012 incarnation. Of those, 46 were selected for publication in the proceedings. They cover nanomaterials and green technology; polymer, composite, and advanced materials; metals and alloys; corrosion and coating technology; ceramic materials; and material processing and technology. Among specific topics are the effect of milling time on the production of herbal nanopowders, flow behavior in the resin infusion of a glass-fiber-reinforced polymer wind turbine blade, mechanical properties of chitosan-modified montmorillonite-filled tapioca starch nanocomposite films, fabricating and characterizing ceramic membrane by a gel-cast technique for filtering water, and zero-valent iron supported by nano-clay as an efficient adsorbent material for arsenic.

Mechanical engineering & machinery

Handbook of compliant mechanisms.
Compliant mechanisms bend to achieve their purpose. Designers and engineers have compiled this reference to help colleagues and students understand the principles of compliant mechanisms and see examples to they can design their own products. After introductory chapters and sections on modeling and synthesis, they provide a library of compliant mechanisms. The topics include analyzing flexure mechanisms in the intermediate displacement range, using pseudo-rigid body models, synthesis through topology optimization, elements of mechanisms, and example application.
Fundamentals in modeling and control of mobile manipulators.
Li, Zhijun and Shuzhi Sam Ge. (Automation and control engineering)
CRC Press, ©2013 279 p. $129.95
Li (automation science and engineering, South China U. of Technology) and Ge (electrical and computer engineering and social robotics, National University of Singapore and robotics, U. of Electronic Science and Technology of China, Chengdu) offer a theoretical treatment of several fundamental problems for robotic manipulators mounted on mobile bases, platforms, or vehicles, including some issues they themselves have been grappling with for over a decade. They cover kinematics and dynamics, path planning and motion generation, model-based control, adaptive robust hybrid motion/force control, under-actuated control, coordination control, and cooperation control.

Stress corrosion cracking of pipelines.
Stress corrosion cracking was first observed in pipelines in the US during the 1960s and in Canada during the 1980s, says Cheng (pipeline engineering, U. of Calgary, Canada), and has proved to be an impediment to the safe operation of pipelines and a motivation for scientists to discover the detailed mechanism behind the process. He summarizes the current state of scientific understanding and relevant engineering practice for scientists, engineers, managers, technologists, students, and others (but apparently not regulators or activists concerned about petroleum spewing in their community). The topics are fundamentals, nearly-neutral-pH and high-pH cracking, acidic soil environments, pipeline welds, high-strength pipeline steels, and managing pipeline stress corrosion cracking.

Fundamental elements of applied superconductivity in electrical engineering.
Wang, Yinshun.
Wiley, ©2013 444 p. $149.95
Wang (alternative electrical power systems with renewable energy sources, North China Electric Power U., Beijing) presents a textbook for graduate or undergraduate students of electrical engineering, and a reference for researchers and practitioners. He introduces the basic theory of superconductivity and material characteristics, circuitry design, and other matters that influence its application. Among the topics are mechanical properties and anisotropy of superconducting materials, alternative current losses, fabricating technologies of practical superconducting materials, cryogenic insulating materials and performances, and the basic structure and principles of superconducting apparatus in a power system.

Structure preserving energy functions in power systems; theory and applications.
Padiyar, K. R.
CRC Press, ©2013 358 p. $149.95
Structure preserving energy functions (SPEF) is an approach to monitoring an electrical grid that is proving more reliable and easier to calculate than the direct methods used in the transient energy function approach. Padiyar (emeritus, electrical engineering, Indian Institute of Science-Bangalore) presents some analytical techniques based on SPEF for identifying problems and correcting them. His topics include direct methods for evaluating the transient stability of systems with simplified models, SPEF for systems with detailed generator and load models, detecting instability based on identifying critical cutsets, sensitivity analysis for dynamic security and prevention control using damping controllers based on a flexible alternating-current transmission system (FACTS), and applying FACTS controllers for emergency control.
Energy efficiency in wireless networks. Jumira, Oswald and Sherali Zeadally. (Focus series in networks and telecommunications) *ISTE/Wiley*, ©2013 104 p. $70.00

A telecommunications engineering researcher in Cape Town, Jumira and Zeadally (computer science and information technology, U. of the District of Columbia) survey the current energy-efficient methods, designs, and implementations that are being used in various types of wireless networks. They cover energy efficiency in cellular networks, wireless *ad hoc* networks, and wireless local area networks; energy harvesting in wireless sensor networks; and future challenges and opportunities. The main goal is to provide a reference for researchers, students, regulatory authorities, and educators, they say, but the material could also serve as an introduction to the field for readers with an engineering background.

Intelligent systems for optical networks design; advancing techniques.


Many of them from Brazil, electrical engineers and related professionals explore theoretical and practical aspects of intelligent methodologies and algorithms used for planning and designing optical networks. Among the topics are optical network optimization, monitoring devices for providing network intelligence in optical packet switched networks, energy efficient optical transport networks with mixed regenerator placement, topological design genetic algorithms, wavelength and routing assignment in all-optical networks using ant colony optimization, and Hopfield neural networks for routing in communication networks.

Optical coding theory with prime.


Kwong (Hofstra U.) and Yang (National Chung Hsing U.) explain the construction, properties, and performance of 1-D synchronous prime codes, 2-D synchronous carrier-hopping prime codes, and multilength prime codes with low periodic cross-correlation functions.

Examples compare Gaussian, soft-limiting, and hard-limiting code performance under a chip-synchronous assumption, and combine optical time-division multiple access with synchronous optical code-division multiple access in the same synchronous network. The opening chapters review Galois fields, matrix theory, Gaussian approximation, combinatorial analysis for unipolar codes, and the coding techniques and enabling hardware technologies of seven optical coding schemes.

Advanced location-based technologies and services.

Title main entry. Ed. by Hassan A. Karimi. *CRC Press*, ©2013 310 p. $129.95

Now that so many people can be located at any time through their telephone, services that exploit this information are emerging. Here contributors identified only by name look at techniques and technologies, new trends, and services. Among their topics are positioning and tracking approaches and technologies, modeling and computational concerns for multimodal route planning, geo-crowdsourcing, generating a pedestrian path through GPS traces, multisensor map matching for pedestrian and wheelchair navigation, and the open geospatial consortium and location service standards.

Cases on open-linked data and semantic web applications.

Title main entry. Ed. by Patricia Ordonez de Pablos, Miltiadis D. Lytras, Robert Tennyson and Jose Emilio Labra Gayo. *Information Science Reference*, ©2013 288 p. $175.00

The open-linked data and semantic web approaches to information systems and ontology-based information systems are addressed by researchers in computer and information sciences, along with various underlying database and knowledge representation aspects that impact personalization and customization. Among the topics are enhancing access to public procurement notices by promoting product scheme classifications to the linked open data initiative, extracting and predicting a biomedical database identifier using neural networks towards data network construction, the role of vocabularies for semantic interoperability in enabling linked open data.
publishing, a semantic framework for tourist information systems, and publishing statistical data following the linked open data principles.

TK5105 9781118122389
Wireless networking; understanding internetworking challenges.
A team of communications engineers at Johns Hopkins University provides an overview of the entire wireless networking landscape that is comprehensive in breadth and as deep as will fit in 666 pages. The goal is to provide a quick reference, a reminder, and a guide to more detailed accounts of particular aspects. Among the topics are the wireless ecosystem, wireless personal area networks, wireless metropolitan area networks second-to-fourth-generation cellular communications, mobile internetworking, and building the wireless internet.

TK6575 9781608076611
Signal processing in noise waveform radar.
Kulpa, Krzysztof. (Artech House radar series) Artech House, ©2013 255 p. $162.00
Noise or pseudo-noise radar can identify the otherwise unknown range and velocity of a target, explains Kulpa (Warsaw U. of Technology), but requires much more signal processing than other forms of radar. He presents the basic idea of noise radar and details of signal processing to readers who have a basic knowledge of signal processing and general radar technology. The topics are radar principles, noise radar, masking effects, multistatic noise radar, noise synthetic aperture radar, the passive detection of moving targets, and examples of noise radars.

TK6592 9781466510517
Multi-antenna synthetic aperture radar.
Wang, Wen-Qin. CRC Press, ©2013 438 p. $149.95
Wang (communication and information engineering, U. of Electronic Science and Technology of China, Chengdu) describes multi-antenna synthetic aperture radar (SAR) in microwave remote sensing applications such as high-resolution imaging, wide-swath remote sensing, and ground moving target indication. He pays special attention to signal processing aspects. Among his topics are azimuth multi-antenna SAR, elevation-plane multi-antenna SAR, multiple-input-multiple-output (MIMO) SAR waveform diversity and design, distributed multi-antenna SAR time and phase synchronization, azimuth-variant multi-antenna SAR image formulation processing, and multi-antenna SAR three-dimensional imaging.

TK7872 9783527328833
Supercapacitors; materials, systems, and applications.
Chemists, physicists, and materials scientists explain how electrochemical capacitors can play a part in energy management because they can store much more energy than traditional dielectric capacitors and charge much faster than batteries. Among the topics are general properties of electrochemical capacitors, modern theories of carbon-based electrochemical capacitors, lithium–ion-based hybrid supercapacitors in an organic medium, testing, reliability, and market and applications. The material is for fellow scientists and engineers who are interested in designing and improving the devices.

TK7874 9789814327909
Semiconductor spintronics.
Xia, Jianbai and Weikun Ge, Kai Chang. World Scientific, ©2012 533 p. $160.00
Xia, Chang (both Chinese Academy of Sciences), and Ge (Tsinghua U. and Sun Yat-Sen U.) introduce the developing field of semiconductor spintronics to graduate and advanced undergraduate students, instructors, and researchers. They consider such aspects as properties of magnetic ions in semiconductors, the injection of spin-polarized electrons, spin relaxation, optical responses of electron spins in semiconductors, spin-polarized electron and domain wall transport, and future quantum dot and quantum wire spintronics.

TK7875 9783527319039
System-level modeling of MEMS.
Structural engineers and other specialists provide a broad overview of the state of the art in the system-level modeling of
micro-electro-mechanical systems (MEMS), with a special emphasis on the theoretical fundamentals of compact modeling, applying different approaches to specific problem classes, and methodologies that are already available on commercial software. They cover physical and mathematical fundamentals, the lumped element modeling method, mathematical model order reduction, modeling entire systems, and software implementations. Among the topics are algorithm approaches for a system-level simulation of MEMS and aspects of co-simulation, a mixed-level approach for modeling distributed effects in microsystems, projection-based nonlinear model order reduction, applying reduced order models in the circuit-level design of radio frequency MEMS devices, and model order reduction implementations in a commercial MEMS design environment.

TK7895  9781466639225
**Embedded computing systems; applications, optimization, and advanced design.**
Title main entry. Ed. by Mohamed Khalgui, Olfa Mosbah and Antonio Valentini. *Information Science Reference*, ©2013 532 p. $195.00

The 23 papers in this collection share recent developments in reconfigurable intelligent embedded control systems, discussing formal modeling and verification, scheduling, execution models, optimal implementations, and feasible simulations of future reconfigurable intelligent centralized/distributed adaptive architectures. The opening chapter models short-term scheduling of crude oil refinery operations as a two-level control architecture in a hybrid Petri net. An international team of researchers proposes an architecture description language for automotive software-intensive systems called EAST-ADL. Other topics include flash-based storage, OCL constraint validation with graphs, reusable specification patterns, and industrial wireless sensor networks.

TK8304  9781439836101
**Handbook of silicon photonics.**
Title main entry. Ed. by Laurent Vivien and Lorenzo Pavesi. (Series in optics and optoelectronics) *CRC Press*, ©2013 835 p. $169.95

Researchers from computer and electrical engineering, chemistry and materials science, and information and communication technologies present a thorough reference to using silicon as an optical material. The topics include guided light in silicon-based materials, off-chip coupling, nonlinear optics in silicon, long-wavelength photonic circuits, silicon-based light sources, hybrid and heterogeneous photonic integration, fabricating silicon photonic devices, silicon photonics for biology, and silicon-based photovoltaics.

**CHEMICAL TECHNOLOGY**

TP691  9782710809920
**Gas chromatography and 2D-gas chromatography for petroleum industry; the race for selectivity.**
Bertoncini, Fabrice and Marion Courtiade-Tholance, Didier Thiébaut. Trans. by Trevor Jones. *Editions Technip*, ©2013 340 p. $72.00 (pa)

The technology is used to elucidate complex samples substantially better than conventional gas chromatography can achieve. Contributors from petroleum and other energy companies survey how it is used in their field. Among the topics are challenges and future needs for the molecular analysis of petroleum products, two-dimensional gas chromatography as a disruptive technique, data processing, coupled systems, the detailed analysis of hydrocarbons, calculating properties from chromatographic data, the speciation of heteroelements, and simulating distillation. Distributed in the US by Atlas Books.

**MILITARY & NAVAL SCIENCE**

U163  9781608077052
**Information warfare and electronic warfare systems.**
Poisel, Richard A. *Artech House*, ©2013 414 p. $129.00

Information and electromagnetic warfare are an ever increasing part of modern military operations. Poisel, with a doctorate in electrical and computer engineering, offers a highly technical reference on the topic that is intended primarily for people with at least a bachelor's degree in engineering and knowledge of linear systems theory (matrix operations). For those who may not have much knowledge of information or probability theory there is a chapter where the necessary aspects are discussed. A detailed model of information warfare also gets a whole chapter. The author divides the topic into three domains: cognitive, information, and
physical. These concern, respectively, the human process of decision making based on information gathered on the battlefield, the uses of information theory in conducting operations, and the physical aspects of the information infrastructure such as antennas, cables and electromagnetic means of denying enemy use of information. There is an extensive list of abbreviations towards the back.

UF503 9780313396137
Emerging military technologies; a guide to the issues.
Wong, Wilson W. S. (Contemporary military, strategic, and security issues)
Praeger, ©2013 232 p. $52.00
Wong (research fellow with the Centre for Defense and Security Studies, University of Manitoba, Winnipeg, Canada) has created this highly technical and valuable resource for members of the military and intelligence communities, which is also accessible to general readers. This book has six chapters: Introduction; Ubiquitous Space Access; Directed Energy Weapons; Computer Autonomy; Nanotechnology; and Biotechnology. The appendix has four parts: Small Satellites; Military Space Planes; competition to Direct Energy Weapons; and Electromagnetic Railguns. The book also has a useful, three-page list of acronyms.

PUBLISHING, LIBRARY SCIENCE, BIBLIOGRAPHY

Z286 9781107020856
The handbook of journal publishing.
Morris, Sally, Ed Barnas, Douglas LaFrenier and Margaret Reich.
Cambridge U. Press, ©2013 467 p. $95.00
Encompassing the entire publishing process for both online and print journal publishing, this handbook will be useful to new publishers and those branching out into new territory, as well as librarians and those who submit to journals. After a chapter devoted to managing journals, the book covers editing, production, metrics, marketing and sales, fulfillment, finances, subsidiary and contract income, copyright and other legal aspects, and ethical issues. The final chapter looks ahead to the future of scholarly communication. The book features abundant checklists and sample documents, along with a list of organizations, journals, magazines, newsletters, blogs, and websites. The list of vendors gives contacts for everything from document delivery suppliers to citation management systems, hosting platforms, and abstracting and indexing services. The authors are veteran professionals in the journal and academic publishing industry.

Z669 9789814350297
New trends in qualitative and quantitative methods in libraries; select papers.
International Conference on Qualitative and Quantitative Methods in Libraries (2nd: 2010: Chania, Crete, Greece) Ed. by Anthi Katsirikou and Christos Skiadas.
World Scientific, ©2012 455 p. $160.00
The 55 selected papers explore using the two approaches in research to investigate various aspects of libraries. They cover views from the academic library reference desk on assessing and evaluating reference, library marketing and management, digital library education and research, library and information science post-graduate student research, users and their behaviors, academic libraries, digital libraries, library applications and methodologies, and information and learning. Authors and titles are indexed, but not subjects.