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Infrastructures and Social Complexity CRC Press

Resilient supply chains are crucial to maintaining the consistent delivery of goods and services to the American people. The modern economy has made supply chains more interconnected than ever, while also expanding both their range and fragility. In the third quarter of 2017, Hurricanes Harvey, Irma and Maria revealed some significant vulnerabilities in the national and regional supply chains of Texas, Florida, the U.S. Virgin Islands, and Puerto Rico. The broad impacts and quick succession of these three hurricanes also shed light on the effectiveness of the nation's disaster logistics efforts during response through recovery. Drawing on lessons learned during the 2017 hurricanes, this report explores future strategies to improve supply chain management in disaster situations. This report makes recommendations to strengthen the roles of continuity planning, partnerships between civic leaders with small businesses, and infrastructure investment to ensure that essential supply chains will remain operational in the next major disaster. Focusing on the supply chains food, fuel, water, pharmaceutical, and medical supplies, the recommendations of this report will assist the Federal Emergency Management Agency as well as state and local officials, private sector decision makers, civic leaders, and others who can help ensure that supply chains remain robust and resilient in the face of natural disasters.

Advances in Biochemical Engineering Oxford University Press

Contemporary forms of infrastructural development herald alternative futures through their incorporation of digital technologies, mobile capital, international politics and the promises and fears of enhanced connectivity. In tandem with increasing concerns about climate change and the anthropocene, there is further an urgency around contemporary infrastructural provision: a concern about its fragility, and an awareness that these connective, relational systems significantly shape both local and planetary futures in ways that we need to understand more clearly. Offering a rich set of empirically detailed and conceptually sophisticated studies of infrastructural systems and experiments, present and past, contributors to this volume address both the transformative potential of infrastructural systems and their stasis. Covering infrastructural figures; their ontologies, epistemologies, classifications and politics, and spanning development, urban, energy, environmental and information infrastructures, the chapters explore both the promises and failures of infrastructure. Tracing the experimental histories of a wide range of infrastructures and documenting their variable outcomes, the volume offers a unique set of analytical perspectives on contemporary infrastructural complications. These studies bring a systematic empirical and analytical attention to human worlds as they intersect with more-than-human worlds, whether technological or biological.

The Amazing Scientific Adventures of Harvy, a Brilliant Cane Cambridge University Press

Biochemical Engineering Fundamentals, 2/e, combines contemporary engineering science with relevant biological concepts in a comprehensive introduction to biochemical engineering. The biological background provided enables students to comprehend the major problems in biochemical engineering and formulate effective solutions.

Clinical Biochemistry of Domestic Animals CRC Press

Process Intensification: Engineering for Efficiency, Sustainability and Flexibility is the first book to provide a practical working guide to understanding process intensification (PI) and developing successful PI solutions and applications in chemical process, civil, environmental, energy, pharmaceutical, biological, and biochemical systems. Process intensification is a chemical and process design approach that leads to substantially smaller, cleaner, safer, and more energy efficient process technology. It improves process flexibility, product quality, speed to market and inherent safety, with a reduced environmental footprint. This book represents a valuable resource for engineers working with leading-edge process technologies, and those involved research and development of chemical, process, environmental, pharmaceutical, and bioscience systems. No other reference covers both the technology and application of PI, addressing fundamentals, industry applications, and including a development and implementation guide Covers hot and high growth topics, including emission prevention, sustainable design, and pinch analysis World-class authors: Colin Ramshaw pioneered PI at ICI and is widely credited as the father of the technology

Foundations of Biochemical Engineering PHI Learning Pvt. Ltd.

This special volume "Tools and Applications of Biochemical Engineering Science" is dedicated to Professor Wolf-Dieter Deckwer on the occasion of his 60th bir- day. It was a great pleasure for me to act together with Professor Karl Schtigelr as volume editor and to present here a collection of 11 outstanding review articles written mainly by former students, associates, colleagues and friends of Wolf- Dieter Deckwer. The title of this special volume well reflects the research interests and sci- tific pursuit of Wolf-Dieter Deckwer during his more than 20 years ' work in the area of biochemical engineering, particularly during the last 15 years when he was the head of the Biochemical Engineering Division of GBF (German Nat- nal Research Center for Biotechnology). He has decisively pushed the devel- ment not only of "software tools" ranging from analytical means and mathe- tical models for monitoring and understanding cellular processes to gene expression systems for designing microorganisms, but also of "hardware tools" such as computer control systems, bioreaction and separation devices for eff- tively producing a variety of bioproducts on semi-production scale. New

developments in some of these important tools in biochemical engineering are reviewed in articles included in this volume. Wolf-Dieter Deckwer was among the leading biochemical engineers who timely pointed out the necessity of applying these tools in an integrated manner for bioprocess development. By establishing "Integrated Bioprocess Development" as one of the GBF main - search topics as early as 1990 he also actively promoted this idea.

Tools and Applications of Biochemical Engineering Science ASM International

This work provides comprehensive coverage of modern biochemical engineering, detailing the basic concepts underlying the behaviour of bioprocesses as well as advances in bioprocess and biochemical engineering science. It includes discussions of topics such as enzyme kinetics and biocatalysis, microbial growth and product formation, bioreactor design, transport in bioreactors, bioproduct recovery and bioprocess economics and design. A solutions manual is available to instructors only.

Biochemical Engineering (PB) Academic Press

This is the 20th Volume in the series Memorial Tributes compiled by the National Academy of Engineering as a personal remembrance of the lives and outstanding achievements of its members and foreign associates. These volumes are intended to stand as an enduring record of the many contributions of engineers and engineering to the benefit of humankind. In most cases, the authors of the tributes are contemporaries or colleagues who had personal knowledge of the interests and the engineering accomplishments of the deceased. Through its members and foreign associates, the Academy carries out the responsibilities for which it was established in 1964. Under the charter of the National Academy of Sciences, the National Academy of Engineering was formed as a parallel organization of outstanding engineers. Members are elected on the basis of significant contributions to engineering theory and practice and to the literature of engineering or on the basis of demonstrated unusual accomplishments in the pioneering of new and developing fields of technology. The National Academies share a responsibility to advise the federal government on matters of science and technology. The expertise and credibility that the National Academy of Engineering brings to that task stem directly from the abilities, interests, and achievements of our members and foreign associates, our colleagues and friends, whose special gifts we remember in this book.

Chemical Engineering in Medicine John Wiley & Sons

Tissue Engineering is a comprehensive introduction to the engineering and biological aspects of this critical subject. With contributions from internationally renowned authors, it provides a broad perspective on tissue engineering for students coming to the subject for the first time. In addition to the key topics covered in the previous edition, this update also includes new material on the regulatory authorities, commercial considerations as well as new chapters on microfabrication, materiomics and cell/biomaterial interface. Effectively reviews major foundational topics in tissue engineering in a clear and accessible fashion Includes state of the art experiments presented in break-out boxes, chapter objectives, chapter summaries, and multiple choice questions to aid learning New edition contains material on regulatory authorities and commercial considerations in tissue engineering

Reactors and reactions Butterworth-Heinemann

Taking greater advantage of powerful computing capabilities over the last several years, the development of fundamental information and new models has led to major advances in nearly every aspect of chemical engineering. Albright ' s Chemical Engineering Handbook represents a reliable source of updated methods, applications, and fundamental concepts that will continue to play a significant role in driving new research and improving plant design and operations. Well-rounded, concise, and practical by design, this handbook collects valuable insight from an exceptional diversity of leaders in their respective specialties. Each chapter provides a clear review of basic information, case examples, and references to additional, more in-depth information. They explain essential principles, calculations, and issues relating to topics including reaction engineering, process control and design, waste disposal, and electrochemical and biochemical engineering. The final chapters cover aspects of patents and intellectual property, practical communication, and ethical considerations that are most relevant to engineers. From fundamentals to plant operations, Albright ' s Chemical Engineering Handbook offers a thorough, yet succinct guide to day-to-day methods and calculations used in chemical engineering applications. This handbook will serve the needs of practicing professionals as well as students preparing to enter the field.

Nanofabrication and Biosystems Butterworth-Heinemann

Clinical Biochemistry of Domestic Animals, Second Edition, Volume I, is a major revision of the first edition prompted by the marked expansion of knowledge in the clinical biochemistry of animals. In keeping with this expansion of knowledge, this edition is comprised of two volumes. Chapters on the pancreas, thyroid, and pituitary- adrenal systems have been separated and entirely rewritten. Completely new chapters on muscle metabolism, iron metabolism, blood clotting, and gastrointestinal function have been added. All the chapters of the first edition have been revised with pertinent new information, and many have been completely rewritten. This volume contains 10 chapters and opens with a discussion of carbohydrate metabolism and associated disorders. Separate chapters follow on lipid metabolism, plasma proteins, and porphyrins. Subsequent chapters deal with liver, pancreatic, and thyroid functions; the role of the pituitary and adrenal glands in health and disease; the function of calcium, inorganic phosphorus, and magnesium metabolism in health and disease; and iron metabolism.

Memorial Tributes Elsevier

New Frontiers in Biomedical Engineering will be an edited work taken from the 1st Annual World Congress of Chinese Biomedical Engineers - Taipei, Taiwan 2002. As the economy develops rapidly in China and the Asian-Pacific population merges into the global healthcare system, many researchers in the West are trying to make contact with the Chinese BME scientists. At WCCBME 2002, invited leaders, materials scientists, bioengineers, molecular and cellular biologists, orthopaedic surgeons, and manufacturers from P.R. of China, Taiwan, Singapore and Hong Kong covered all five major BME domains: biomechanics, biomaterials and tissue engineering, medical imaging, biophotonics and instrumentation, and rehabilitation. This edited work taken from the World Congress proceedings will capture worldwide readership.

Making the Diagnosis: a Practical Guide to Breast Imaging OUP Oxford

This is the second edition of the text "Bioreaction Engineering Principles" by Jens Nielsen and John Villadsen, originally published in 1994 by Plenum Press (now part of Kluwer). Time runs fast in Biotechnology, and when Kluwer Plenum stopped reprinting the first edition and asked us to make a second, revised edition we happily accepted. A text on bioreactions written in the early 1990's will not reflect the enormous development of experimental as well as theoretical aspects of cellular reactions during the past decade. In the preface to the first edition we admitted to be newcomers in the field. One of us (JV) has had 10 more years of job training in biotechnology, and the younger author (IN) has now received international recognition for his work with the hottest topics of "modern" biotechnology. Furthermore we are happy to have induced Gunnar Liden, professor of chemical reaction engineering at our sister university in Lund, Sweden to join us as co-author of the second edition. His contribution, especially on the chemical engineering aspects of "real" bioreactors has been of the greatest value. Chapter 8 of the present edition is largely unchanged from the first edition. We wish to thank professor Martin Hjortso from LSU for his substantial help with this chapter.

Process Intensification John Wiley & Sons

The successful implementation of greener chemical processesrelies not only on the development of more efficient catalysts forsynthetic chemistry but also, and as importantly, on thedevelopment of reactor and separation technologies which candeliver enhanced processing performance in a safe, cost-effectiveand energy efficient manner. Process intensification has emerged asa promising field which can effectively tackle the challenges ofsignificant process enhancement, whilst also offering the potentialto diminish the environmental impact presented by the chemicalindustry. Following an introduction to process intensification and theprinciples of green chemistry, this book presents a number ofintensified technologies which have been researched and developed,including case studies to illustrate their application to greenchemical processes. Topics covered include: • Intensified reactor technologies: spinning discreactors, microreactors, monolith reactors, oscillatory flowreactors, cavitational reactors • Combined reactor/separator systems: membrane reactors,reactive distillation, reactive extraction, reactiveabsorption • Membrane separations for green chemistry • Industry relevance of process intensification,including economics and environmental impact, opportunities forenergy saving, and practical considerations for industrialimplementation. Process Intensification for Green Chemistry is a valuableresource for practising engineers and chemists alike who areinterested in applying intensified reactor and/or separator systemsin a range of industries to achieve green chemistry principles.

Memorial Tributes Academic Press

The book fills a void as a textbook with hands-on laboratory exercises designed for biomedical engineering undergraduates in their senior year or the first year of graduate studies specializing in electrical aspects of bioinstrumentation. Each laboratory exercise concentrates on measuring a biophysical or biomedical entity, such as force, blood pressure, temperature, heart rate, respiratory rate, etc., and guides students though all the way from sensor level to data acquisition and analysis on the computer. The book distinguishes itself from others by providing electrical circuits and other measurement setups that have been tested by the authors while teaching undergraduate classes at their home institute over many years. Key Features: • Hands-on laboratory exercises on measurements of biophysical and biomedical variables • Each laboratory exercise is complete by itself and they can be covered in any sequence desired by the instructor during the semester • Electronic equipment and supplies required are typical for biomedical engineering departments • Data collected by undergraduate students and data analysis results are provided as samples • Additional information and references are included for preparing a report or further reading at the end of each chapter Students using this book are expected to have basic knowledge of electrical circuits and troubleshooting. Practical information on circuit components, basic laboratory equipment, and circuit troubleshooting is also provided in the first chapter of the book.

21st European Symposium on Computer Aided Process Engineering National Academies Press

This is the 11th Volume in the series Memorial Tributes compiled by the National Academy of Engineering as a personal remembrance of the lives and outstanding achievements of its members and foreign associates. These volumes are intended to stand as an enduring record of the many contributions of engineers and engineering to the benefit of humankind. In most cases, the authors of the tributes are contemporaries or colleagues who had personal knowledge of the interests and the engineering accomplishments of the deceased. Through its members and foreign associates, the Academy carries out the responsibilities for which it was established in 1964. Under the charter of the National Academy of Sciences, the National Academy of Engineering was formed as a parallel organization of outstanding engineers. Members are elected on the basis of significant contributions to engineering theory and practice and to the literature of engineering or on the basis of demonstrated unusual accomplishments in the pioneering of new and developing fields of technology. The National Academies share a responsibility to advise the federal government on matters of science and technology. The expertise and credibility that the National Academy of Engineering brings to that task stem directly from the abilities, interests, and achievements of our members and foreign associates, our colleagues and friends, whose special gifts we remember in this book.

Strengthening Post-Hurricane Supply Chain Resilience Springer

PG is getting on in years, and he bought a brilliant cherrywood cane to help him walk. PG named the cane Harvy, and the two became great companions. The special thing about Harvy is that he can talk. He has the inquisitive mind and vivid imagination of a child and a special curiosity about sciences. The story begins at JFK airport where Harvy is entranced by escalators, and he wonders where the moving stairs go once the basement fills up. Harvy also wonders about the origins of this mystical force called gravity. He's fascinated by the laws of buoyancy,

flotations, and the wonders of flight. Why don't airplanes have to flap their wings like birds to fly? Why can hummingbirds hover without having rotating blades like helicopters? A fiction book for children, The Amazing Scientific Adventures of Harvy, a Brilliant Cane offers a fun look at science and space through the eyes of a talking cane. "Blending together the perfect mix of scientific facts and fantasy, this thought-provoking the book will spark curiosity and wonder in all the budding middle-grade scientists who venture into the fascinating world of Harvy, the Brilliant Cane. Harvy's engrossing and inspiring story teaches and entertains on every page. Thank you Dr. Weinbaum for creating the quirky character of Harvy, who makes learning about science on experience to remember."

Instrumentation Handbook for Biomedical Engineers Elsevier

The only previous war to match the world wars of the twentieth century in scale and impact was the French War of 1793-1815. This book is the first book to compare these conflicts, which together shaped the history of the modern world. A.D. Harvey relates the causes, conduct and outcome of these wars to the fundamental nature of the societies which fought them. Political decisions, economic power and social attitudes interfaced with the demands of military technology to determine the outcome of each case. Britain is the centre of focus, but is seen against a background of the other combatants. Harvey's ability to make large-scale generalisations is backed up by a wealth of fascinating and carefully documented detail, making this outstanding and exceptionally well-written book a pleasure to read. The author has tackled a huge subject and has not been afraid to face up to either its complexities or its implications. By asking new questions and using a range of unfamiliar sources this book provides an unusually profound analysis not only of these wars but also of the nature of modern society and of our understanding of the past.

Bioreaction Engineering Principles McGraw-Hill Science, Engineering & Mathematics

An important resource that puts the focus on the chemical engineering aspects of biomedical engineering In the past 50 years remarkable achievements have been advanced in the fields of biomedical and chemical engineering. With contributions from leading chemical engineers, Biomedical Engineering Challenges reviews the recent research and discovery that sits at the interface of engineering and biology. The authors explore the principles and practices that are applied to the ever-expanding array of such new areas as gene-therapy delivery, biosensor design, and the development of improved therapeutic compounds, imaging agents, and drug delivery vehicles. Filled with illustrative case studies, this important resource examines such important work as methods of growing human cells and tissues outside the body in order to repair or replace damaged tissues. In addition, the text covers a range of topics including the challenges faced with developing artificial lungs, kidneys, and livers; advances in 3D cell culture systems; and chemical reaction methodologies for biomedical imagining analysis. This vital resource: Covers interdisciplinary research at the interface between chemical engineering, biology, and chemistry Provides a series of valuable case studies describing current themes in biomedical engineering Explores chemical engineering principles such as mass transfer, bioreactor technologies as applied to problems such as cell culture, tissue engineering, and biomedical imaging Written from the point of view of chemical engineers, this authoritative guide offers a broad-ranging but concise overview of research at the interface of chemical engineering and biology.

Kinetics and Thermodynamics in Biological Systems Taylor & Francis

Under the direction of John Enderle, Susan Blanchard and Joe Bronzino, leaders in the field have contributed chapters on the most relevant subjects for biomedical engineering students. These chapters coincide with courses offered in all biomedical engineering programs so that it can be used at different levels for a variety of courses of this evolving field. Introduction to Biomedical Engineering, Second Edition provides a historical perspective of the major developments in the biomedical field. Also contained within are the fundamental principles underlying biomedical engineering design, analysis, and modeling procedures. The numerous examples, drill problems and exercises are used to reinforce concepts and develop problem-solving skills making this book an invaluable tool for all biomedical students and engineers. New to this edition: Computational Biology, Medical Imaging, Genomics and Bioinformatics. * 60% update from first edition to reflect the developing field of biomedical engineering * New chapters on Computational Biology, Medical Imaging, Genomics, and Bioinformatics * Companion site: <http://intro-bme-book.bme.uconn.edu/> * MATLAB and SIMULINK software used throughout to model and simulate dynamic systems * Numerous self-study homework problems and thorough cross-referencing for easy use

BIOCHEMICAL ENGINEERING CRC Press

The book also aims to stimulate innovative, productive interactions among materials scientists, engineers, and biologists, and to explore ways in which materials scientists and engineers can exploit biological principles and biological assemblies to produce new and ever smaller devices.