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Microbial Biofilms in Bioremediation and Wastewater Treatment - Y.V. Nancharaiyah 2019-10-18

Biofilms represent the natural living style of microbial communities and play a pivotal role in biogeochemical cycles and natural attenuation. Biofilms can be engineered for biodegradation and biotransformation of organic and inorganic contaminants, for both in situ bioremediation and ex situ treatment in bioreactors. This book focuses on microbial biofilms and their potential technological applications for sustainable development. It covers recent advances in biofilm technologies for contaminant remediation coupled to recovery of resources and serves as a complete reference on the science and technology behind biofilm mediated bioremediation and wastewater treatment.

Wastewater Engineering - Metcalfe & Eddy Inc 2013-06-01

This update of a popular book for civil and environmental engineering majors describes the technological and regulatory changes that have occurred over the last ten years in the discipline.

Sludge Reduction Technologies in Wastewater Treatment Plants - Paola Foladori 2010-07-31

Sludge Reduction Technologies in Wastewater Treatment Plants is a review of the sludge reduction techniques integrated in wastewater treatment plants with detailed chapters on the most promising and most widespread techniques. The aim of the book is to update the international community on the current status of knowledge and techniques in the field of sludge reduction. It will provide a comprehensive understanding of the following issues in sludge reduction: principles of sludge reduction techniques; process configurations; potential performance; advantages and drawbacks; economics and energy consumption. This book will be essential reading for managers and technical staff of wastewater treatment plants as well as graduate students and post-graduate specialists.

Water Reuse - Inc. & Eddy an AECOM Company 2007-02-05

An Integrated Approach to Managing the World's Water Resources Water Reuse: Issues, Technologies, and Applications equips water/wastewater students, engineers, scientists, and professionals with a definitive account of the latest water reclamation, recycling, and reuse theory and practice. This landmark textbook presents an integrated approach to all aspects of water reuse _ from public health protection to water quality criteria and regulations to advanced technology to implementation issues. Filled with over 500 detailed illustrations and photographs, Water Reuse: Issues, Technology, and Applications features: In-depth coverage of cutting-edge water reclamation and reuse applications Current issues and developments in public health and environmental protection criteria, regulations, and risk management Review of current advanced treatment technologies, new developments, and practices Special emphasis on process reliability and multiple barrier concepts approach Consideration of satellite and decentralized water reuse facilities Consideration of planning and public participation of water reuse Inside This Landmark Water/Wastewater Management Tool • Water Reuse: An Introduction • Health and Environmental

Concerns in Water Reuse • Technologies and Systems for Water Reclamation and Reuse • Water Reuse Applications • Implementing Water Reuse

Wastewater Engineering - George Tchobanoglous 2014

This is a thorough update of an authoritative book on wastewater treatment. This text describes the rapidly evolving field of wastewater engineering technological and regulatory changes that have occurred over the last ten years in this discipline and it includes: a new view of a wastewater as a source of energy, nutrients and potable water; more stringent discharge requirements related to nitrogen and phosphorus; enhanced understanding of the fundamental microbiology and physiology of the microorganisms responsible for the removal of nitrogen and phosphorus and other constituents; an appreciation of the importance of the separate treatment of return flows with respect to meeting more stringent standards for nitrogen removal and opportunities for nutrient recovery; increased emphasis on the treatment of sludge and the management of biosolids; increased awareness of carbon footprints impacts and greenhouse gas emissions, and an emphasis on the development of energy neutral or energy positive wastewater plants through more efficient use of chemical and heat energy in wastewater. This revision contains a strong focus on advanced wastewater treatment technologies and stresses the reuse aspects of wastewater and biosolids.

Water and Wastewater Engineering: Design Principles and Practice, Second Edition - Mackenzie L. Davis 2019-10-04

Publisher's Note: Products purchased from Third Party sellers are not guaranteed by the publisher for quality, authenticity, or access to any online entitlements included with the product. A Fully Updated, In-Depth Guide to Water and Wastewater Engineering Thoroughly revised to reflect the latest advances, procedures, and regulations, this authoritative resource contains comprehensive coverage of the design and construction of municipal water and wastewater facilities. Written by an environmental engineering expert and seasoned academic, Water and Wastewater Engineering: Design Principles and Practice, Second Edition, offers detailed explanations, practical strategies, and design techniques as well as hands-on safety protocols and operation and maintenance procedures. You will get cutting-edge information on water quality standards, corrosion control, piping materials, energy efficiency, direct and indirect potable reuse, and more. Coverage includes: • The design and construction processes • General water supply design considerations • Intake structures and wells • Chemical handling and storage • Coagulation and flocculation • Lime-soda and ion exchange softening • Reverse osmosis and nanofiltration • Sedimentation • Granular and membrane filtration • Disinfection and fluoridation • Removal of specific constituents • Water plant residuals management, process selection, and integration • Storage and distribution systems • Wastewater collection and treatment design considerations • Sanitary sewer design • Headworks and preliminary treatment • Primary treatment • Wastewater microbiology • Secondary treatment by suspended growth biological processes •

Secondary treatment by attached growth and hybrid biological processes • Tertiary treatment • Advanced oxidation processes • Direct and indirect potable reuse

Water Quality & Treatment: A Handbook on Drinking Water

- American Water Works Association 2010-12-06

The definitive water quality and treatment resource-- fully revised and updated Comprehensive, current, and written by leading experts, *Water Quality & Treatment: A Handbook on Drinking Water, Sixth Edition* covers state-of-the-art technologies and methods for water treatment and quality control. Significant revisions and new material in this edition reflect the latest advances and critical topics in water supply and treatment. Presented by the American Water Works Association, this is the leading source of authoritative information on drinking water quality and treatment. **NEW CHAPTERS ON:** Chemical principles, source water composition, and watershed protection Natural treatment systems Water reuse for drinking water augmentation Ultraviolet light processes Formation and control of disinfection by-products **DETAILED COVERAGE OF:** Drinking water standards, regulations, goals, and health effects Hydraulic characteristics of water treatment reactors Gas-liquid processes and chemical oxidation Coagulation, flocculation, sedimentation, and flotation Granular media and membrane filtration Ion exchange and adsorption of inorganic contaminants Precipitation, coprecipitation, and precipitative softening Adsorption of organic compounds by activated carbon Chemical disinfection Internal corrosion and deposition control Microbiological quality control in distribution systems Water treatment plant residuals management

Activated Sludge: Developments And Sustainable Solutions

- Nicholas F Gray 2023-02-27

Activated sludge is the most widely used biological wastewater treatment process globally to date, although its high energy demand makes it a major contributor of greenhouse gas emissions. Over recent decades it has been constantly modified and retrofitted to treat ever higher loads or improve effluent standards which have often resulted in even greater carbon emissions. Conventional activated sludge treatment is at a crossroads where new sustainable solutions are required if we are to protect the quality of our rivers and meet net-zero carbon targets. The book details current operation and design with special emphasis on the biological aspects of the process. From the microbial kinetics to the fascinating process of floc formation and development, the book explores the development of our understanding of the process looking at new sustainable designs, including biological nutrient removal and new aeration systems. Sludge separation problems and control options are explained, with a trouble-shooting guide to non-bulking problems. Environmental issues including noise, odor, aerosols, micro-plastics and nanoparticles are all reviewed, as is pathogen removal and the problem of antibiotic resistant genes and bacteria. The development of membrane bioreactors has increased process reliability and effluent quality, while integrated fixed-film activated sludge processes are more efficient and compact. The book concludes by exploring how activated sludge can become more sustainable, for example, by carbon harvesting and byproduct recovery. This interdisciplinary book is essential reading for both engineers and scientists whether training at university or practitioners and consultants in the wastewater industry. Related Link(s)

Cleaner Production - Lennart Nilsson 2007

Membrane-based Hybrid Processes for Wastewater Treatment

- Maulin P. Shah 2021-05-27

Membrane-Based Hybrid Processes for Wastewater Treatment analyzes and discusses the potential of membrane-based hybrid processes for the treatment of complex industrial

wastewater, the recovery of valuable compounds, and water reutilization. In addition, recent and future trends in membrane technology are highlighted.

Industrial wastewater contains a large variety of compounds, such as heavy metals, salts and nutrients, which makes its treatment challenging. Thus, the use of conventional water treatment methods is not always effective. Membrane-based hybrid processes have emerged as a promising technology to treat complex industrial wastewater. Discusses the properties, mechanisms, advantages, limitations and promising solutions of different types of membrane technologies Addresses the optimization of process parameters Describes the performance of different membranes Presents the potential of Nanotechnology to improve the treatment efficiency of wastewater treatment plants (WWTPs) Covers the application of membrane and membrane-based hybrid treatment technologies for wastewater treatment Includes forward osmosis, electrodialysis, and diffusion dialysis Considers hybrid membrane systems expanded to cover zero liquid discharge, salt recovery, and removal of trace contaminants

Environmental Engineering - Howard S. Peavy 1985

Design of Municipal Wastewater Treatment Plants MOP 8,

Fifth Edition - Water Environment Federation 2009-10-02

Contemporary Municipal Wastewater Treatment Plant Design Methods Fully revised and updated, this three-volume set from the Water Environment Federation and the Environmental and Water Resources Institute of the American Society of Civil Engineers presents the current plant planning, configuration, and design practices of wastewater engineering professionals, augmented by performance information from operating facilities. *Design of Municipal Wastewater Treatment Plants, Fifth Edition*, includes design approaches that reflect the experience of more than 300 authors and reviewers from around the world. Coverage includes: Integrated facility design Sustainability and energy management Plant hydraulics and pumping Odor control and air emissions Thoroughly updated information on biofilm reactors Biological, physical, and chemical liquid treatment Membrane bioreactors, IFAS, and other integrated biological processes Nutrient removal Sidestream treatment Wastewater disinfection Solids minimization, treatment, and stabilization, including thermal processing Biosolids use and disposal

On-farm treatment options for wastewater, greywater and fecal sludge with special reference to West Africa -

Keraita, B. 2014-04-03

Nothing provided

Effective Waste Management and Circular Economy - Sadhan Kumar Ghosh 2022-09-07

Effective Waste Management and Circular Economy: Legislative Framework and Strategies is an invaluable resource for researchers, policymakers, implementers and PhD, graduate and Under Graduate level students in universities and colleges analysing the legal framework, strategies in waste management, circular economy adoption, use of mathematical and statistical modelling in setting waste management strategies, sanitation and Hygiene in waste management. While huge wastes are wasted by dumping, there is potential of resource circulation by enforcing legislative framework to effective resource utilisation and creating business opportunities. Circularity of resources in waste streams can contribute to a more secure, sustainable, and economically sound future through the followings: Effective legal framework, strategies and policy instruments, Adoption of circular economy and recycling technologies, Support of IoT and appropriate decision making and modelling, Adoption of alternatives to plastics and other hazardous materials, Economic feasibility as business case, commercialisation, generating employment. This book addresses most of the

above issues in a lucid manner by experts in the field from different countries, which are helpful for the related stakeholders, edited by experts in the field. Sadhan Kumar Ghosh, Professor at Jadavpur University, internationally well-known expert working in varied interdisciplinary fields including waste management having research collaboration in 40 countries. Sasmita Samanta, Pro-Vice Chancellor, KIIT Deemed to be University, Bhubaneswar, Odisha, India having research experience in management & academic administration. Harish Hirani, Director at CSIR-CMERI, Durgapur, having wider fields of research in IIT Delhi with a number of research collaboration. Carlos RV Silva Filho, Director, Presidente, ABRELPE, Sao Paulo/SP - Brazil & Presidente, International Solid Waste Association, Netherlands has experience of working in number of international projects

Water and Wastewater Calculations Manual, 2nd Ed. - Shun Dar Lin 2007-06-26

Quick Access to the Latest Calculations and Examples for Solving All Types of Water and Wastewater Problems! The Second Edition of Water and Wastewater Calculations Manual provides step-by-step calculations for solving a myriad of water and wastewater problems. Designed for quick-and-easy access to information, this revised and updated Second Edition contains over 110 detailed illustrations and new material throughout. Written by the internationally renowned Shun Dar Lin, this expert resource offers techniques and examples in all sectors of water and wastewater treatment. Using both SI and US customary units, the Second Edition of Water and Wastewater Calculations Manual features: Coverage of stream sanitation, lake and impoundment management, and groundwater Conversion factors, water flow calculations, hydraulics in pipes, weirs, orifices, and open channels, distribution, outlets, and quality issues In-depth emphasis on drinking water treatment and water pollution control technologies Calculations specifically keyed to regulation requirements New to this edition: regulation updates, pellet softening, membrane filtration, disinfection by-products, health risks, wetlands, new and revised examples using field data Inside this Updated Environmental Reference Tool • Streams and Rivers • Lakes and Reservoirs • Groundwater • Fundamental and Treatment Plant Hydraulics • Public Water Supply • Wastewater Engineering • Appendices: Macro invertebrate Tolerance List • Well Function for Confined Aquifers • Solubility Product Constants for Solution at or near Room Temperature • Freundlich Adsorption Isotherm Constants for Toxic Organic Compounds • Conversion Factors

Wastewater Characteristics, Treatment and Disposal - Marcos Von Sperling 2007-03-30

Wastewater Characteristics, Treatment and Disposal is the first volume in the series Biological Wastewater Treatment, presenting an integrated view of water quality and wastewater treatment. The book covers the following topics: wastewater characteristics (flow and major constituents) impact of wastewater discharges to rivers and lakes overview of wastewater treatment systems complementary items in planning studies. This book, with its clear and practical approach, lays the foundations for the topics that are analysed in more detail in the other books of the series. About the series: The series is based on a highly acclaimed set of best selling textbooks. This international version is comprised by six textbooks giving a state-of-the-art presentation of the science and technology of biological wastewater treatment. Other titles in the series are: Volume 2: Basic Principles of Wastewater Treatment; Volume 3: Waste Stabilisation Ponds; Volume 4: Anaerobic Reactors; Volume 5: Activated Sludge and Aerobic Biofilm Reactors; Volume 6: Sludge Treatment and Disposal *Sludge Treatment and Disposal* - Cleverson Vitorio Andreoli 2007-03-30

Sludge Treatment and Disposal is the sixth volume in the series Biological Wastewater Treatment. The book covers in a clear and informative way the sludge characteristics, production, treatment (thickening, dewatering, stabilisation, pathogens removal) and disposal (land application for agricultural purposes, sanitary landfills, landfarming and other methods). Environmental and public health issues are also fully described. About the series: The series is based on a highly acclaimed set of best selling textbooks. This international version is comprised by six textbooks giving a state-of-the-art presentation of the science and technology of biological wastewater treatment. Other titles in the series are: Volume 1: Waste Stabilisation Ponds; Volume 2: Basic Principles of Wastewater Treatment; Volume 3: Waste Stabilization Ponds; Volume 4: Anaerobic Reactors; Volume 5: Activated Sludge and Aerobic Biofilm Reactors

Biological Wastewater Treatment: Principles, Modeling and Design - Guang-Hao Chen 2020-07-15

The first edition of this book was published in 2008 and it went on to become IWA Publishing's bestseller. Clearly there was a need for it because over the twenty years prior to 2008, the knowledge and understanding of wastewater treatment had advanced extensively and moved away from empirically-based approaches to a fundamental first-principles approach based on chemistry, microbiology, physical and bioprocess engineering, mathematics and modelling. However the quantity, complexity and diversity of these new developments was overwhelming for young water professionals, particularly in developing countries without readily available access to advanced-level tertiary education courses in wastewater treatment. For a whole new generation of young scientists and engineers entering the wastewater treatment profession, this book assembled and integrated the postgraduate course material of a dozen or so professors from research groups around the world who have made significant contributions to the advances in wastewater treatment. This material had matured to the degree that it had been codified into mathematical models for simulation with computers. The first edition of the book offered, that upon completion of an in-depth study of its contents, the modern approach of modelling and simulation in wastewater treatment plant design and operation could be embraced with deeper insight, advanced knowledge and greater confidence, be it activated sludge, biological nitrogen and phosphorus removal, secondary settling tanks, or biofilm systems. However, the advances and developments in wastewater treatment have accelerated over the past 12 years since publication of the first edition. While all the chapters of the first edition have been updated to accommodate these advances and developments, some, such as granular sludge, membrane bioreactors, sulphur conversion-based bioprocesses and biofilm reactors which were new in 2008, have matured into new industry approaches and are also now included in this second edition. The target readership of this second edition remains the young water professionals, who will still be active in the field of protecting our precious water resources long after the aging professors who are leading some of these advances have retired. The authors, all still active in the field, are aware that cleaning dirty water has become more complex but that it is even more urgent now than 12 years ago, and offer this second edition to help the young water professionals engage with the scientific and bioprocess engineering principles of wastewater treatment science and technology with deeper insight, advanced knowledge and greater confidence built on stronger competence.

Stantec's Water Treatment - John C. Crittenden 2022-11-08

The updated third edition of the definitive guide to water treatment engineering, now with all-new online

content Stantec's Water Treatment: Principles and Design provides comprehensive coverage of the principles, theory, and practice of water treatment engineering. Written by world-renowned experts in the field of public water supply, this authoritative volume covers all key aspects of water treatment engineering, including plant design, water chemistry and microbiology, water filtration and disinfection, residuals management, internal corrosion of water conduits, regulatory requirements, and more. The updated third edition of this industry-standard reference includes an entirely new chapter on potable reuse, the recycling of treated wastewater into the water supply using engineered advanced treatment technologies. QR codes embedded throughout the book connect the reader to online resources, including case studies and high-quality photographs and videos of real-world water treatment facilities. This edition provides instructors with access to additional resources via a companion website. Contains in-depth chapters on processes such as coagulation and flocculation, sedimentation, ion exchange, adsorption, and gas transfer Details membrane filtration technologies, advanced oxidation, and potable reuse Addresses ongoing environmental concerns, pharmacological agents in the water supply, and treatment strategies Describes reverse osmosis applications for brackish groundwater, wastewater, and other water sources Includes high-quality images and illustrations, useful appendices, tables of chemical properties and design data, and more than 450 exercises with worked solutions Stantec's Water Treatment: Principles and Design, Updated Third Edition remains an indispensable resource for engineers designing or operating water treatment plants, and is an essential textbook for students of civil, environmental, and water resources engineering.

Water and Wastewater Engineering - Mackenzie L Davis
2010-04-05

An In-Depth Guide to Water and Wastewater Engineering This authoritative volume offers comprehensive coverage of the design and construction of municipal water and wastewater facilities. The book addresses water treatment in detail, following the flow of water through the unit processes and coagulation, flocculation, softening, sedimentation, filtration, disinfection, and residuals management. Each stage of wastewater treatment--preliminary, secondary, and tertiary--is examined along with residuals management. *Water and Wastewater Engineering* contains more than 100 example problems, 500 end-of-chapter problems, and 300 illustrations. Safety issues and operation and maintenance procedures are also discussed in this definitive resource. Coverage includes: Intake structures and wells Chemical handling and storage Coagulation and flocculation Lime-soda and ion exchange softening Reverse osmosis and nanofiltration Sedimentation Granular and membrane filtration Disinfection and fluoridation Removal of specific constituents Drinking water plant residuals management, process selection, and integration Storage and distribution systems Wastewater collection and treatment design considerations Sanitary sewer design Headworks and preliminary treatment Primary treatment Wastewater microbiology Secondary treatment by suspended and attached growth biological processes Secondary settling, disinfection, and postaeration Tertiary treatment Wastewater plant residuals management Clean water plant process selection and integration

Water and Wastewater Treatment - Joanne E. Drinan
2015-09-15

Lauded for its engaging, highly readable style, the best-selling first edition became the premier guide for nonengineers involved in water and wastewater treatment operations. *Water and Wastewater Treatment: A Guide for the Nonengineering Professional, Second Edition*

continues to provide a simple, nonmathematical account of the unit processes used to treat both drinking water and wastewater. Completely revised and expanded, this second edition adds new material on technological advances, regulatory requirements, and other current issues facing the water and wastewater industries. Using step-by-step, jargon-free language, the authors present all the basic unit processes involved in drinking water and wastewater treatment. They describe each unit process, the function of the process in water or wastewater treatment, and the basic equipment used in each process. They also explain how the processes fit together within a drinking water or wastewater treatment system and discuss the fundamental concepts that constitute water and wastewater treatment processes as a whole. Avoiding mathematics, chemistry, and biology, the book includes numerous illustrations for easy comprehension of concepts and processes. It also contains chapter summaries and an extensive glossary of terms and abbreviations for quick reference.

Wastewater Engg.: Treatmt & Re - Metcalf 2002-09

Integrated Sustainable Urban Water, Energy, and Solids Management - Vladimir Novotny 2020-02-05

A guide for urban areas to achieve sustainability by recovering water, energy, and solids *Integrated Sustainable Urban Water, Energy, and Solids Management* presents an integrated and sustainable system of urban water, used (waste) water, and waste solids management that would save and protect water quality, recover energy and other resources from used water and waste solids including plastics, and minimize or eliminate the need for landfills. The author—a noted expert on the topic—explains how to accomplish sustainability with drainage infrastructures connected to receiving waters that protect or mimic nature and are resilient to natural and anthropogenic stresses, including extreme events. The book shows how to reduce emissions of greenhouse gasses to net zero level through water conservation, recycling, and generating blue and green energy from waste by emerging emission free technologies while simultaneously installing solar power on houses and wind power in communities. Water conservation and stormwater capture can provide good water quality for diverse applications from natural and reclaimed water to blue and green energy and other resources for use by present and future generations. This important book: Considers municipal solid waste as an ongoing source of energy and resources that will eliminate the need for landfills and can be processed along with used water Presents an integrated approach to urban sustainability Offers an approach for reducing greenhouse gas emissions by communities to net zero Written for students, urban planners, managers, and waste management professionals, *Integrated Sustainable Urban Water, Energy, and Solids Management* is a must-have guide for achieving sustainable integrated water, energy, and resource recovery in urban areas.

Bacterial Biofilms - Sadik Dincer 2020-10-07

This book examines biofilms in nature. Organized into four parts, this book addresses biofilms in wastewater treatment, inhibition of biofilm formation, biofilms and infection, and ecology of biofilms. It is designed for clinicians, researchers, and industry professionals in the fields of microbiology, biotechnology, ecology, and medicine as well as graduate and postgraduate students.

Wastewater Treatment and Reuse, Theory and Design Examples, Volume 1 - Syed R. Qasim 2017-11-22

This book will present the theory involved in wastewater treatment processes, define the important design parameters involved, and provide typical values of these parameters for ready reference; and also provide numerical applications and step-by-step calculation procedures in solved examples. These examples and solutions will help enhance the readers' comprehension

and deeper understanding of the basic concepts, and can be applied by plant designers to design various components of the treatment facilities. It will also examine the actual calculation steps in numerical examples, focusing on practical application of theory and principles into process and water treatment facility design.

Wastewater Treatment and Reuse Theory and Design Examples, Volume 2: - Syed R. Qasim 2017-11-22

This book will present the theory involved in wastewater treatment processes, define the important design parameters involved, and provide typical values of these parameters for ready reference; and also provide numerical applications and step-by-step calculation procedures in solved examples. These examples and solutions will help enhance the readers' comprehension and deeper understanding of the basic concepts, and can be applied by plant designers to design various components of the treatment facilities. It will also examine the actual calculation steps in numerical examples, focusing on practical application of theory and principles into process and water treatment facility design.

Harvesting Rainwater from Buildings - Syed Azizul Haq, PEng 2016-12-31

The present book describes in detail all aspects of rainwater harvesting, including the basic concepts, procedures, opportunities and practice of rainwater harvesting mainly focusing its application in buildings of various occupancies and sizes. It provides a user-friendly methodology for the planning, design, construction and maintenance of rainwater harvesting infrastructure, in buildings and its premise, as a supplement to conventional water supplies. It highlights the application of plumbing technology, which is an important aspect of rainwater harvesting in buildings. It also includes global rainfall scenario and brief notes on all the elements of rainwater harvesting used in buildings. It is a valuable reference resource for policy and decision-makers, as well as for engineers, architects and students.

Experimental Methods in Wastewater Treatment - Mark C. M. van Loosdrecht 2016-05-15

Over the past twenty years, the knowledge and understanding of wastewater treatment has advanced extensively and moved away from empirically based approaches to a fundamentally-based first principles approach embracing chemistry, microbiology, and physical and bioprocess engineering, often involving experimental laboratory work and techniques. Many of these experimental methods and techniques have matured to the degree that they have been accepted as reliable tools in wastewater treatment research and practice. For sector professionals, especially a new generation of young scientists and engineers entering the wastewater treatment profession, the quantity, complexity and diversity of these new developments can be overwhelming, particularly in developing countries where access to advanced level laboratory courses in wastewater treatment is not readily available. In addition, information on innovative experimental methods is scattered across scientific literature and only partially available in the form of textbooks or guidelines. This book seeks to address these deficiencies. It assembles and integrates the innovative experimental methods developed by research groups and practitioners around the world. *Experimental Methods in Wastewater Treatment* forms part of the internet-based curriculum in wastewater treatment at UNESCO-IHE and, as such, may also be used together with video records of experimental methods performed and narrated by the authors including guidelines on what to do and what not to do. The book is written for undergraduate and postgraduate students, researchers, laboratory staff, plant operators, consultants, and other sector

professionals.

Water Resource Management Issues - Louis Theodore 2019-11-26

Drinking Water Safety: Basic Principles and Applications, examines the technical and scientific, as well as regulatory, ethical, and emerging issues of pollution prevention, sustainability, and optimization for the production and management of safe drinking water to cope with environmental pollution, population growth, increasing demand, terrorist threats, and climate change pressures. It presents a summary of conventional water and wastewater treatment technologies, in addition to the latest processes. Features include: □ Provides a summary of current and future of global water resources and availability. □ Summarizes key U.S. regulatory programs designed to ensure protection of water quality and safe drinking water supplies, with details on modern approaches for water utility resilience. □ Examines the latest water treatment technologies and processes, including separate chapters on evaporation, crystallization, nanotechnology, membrane-based processes, and innovative desalination approaches. □ Reviews the specialized literature on pollution prevention, sustainability, and the role of optimization in water treatment and related areas, as well as references for further reading. □ Provides illustrative examples and case studies that complement the text throughout, as well as an appendix with sections on units and conversion constants.

Activated Sludge and Aerobic Biofilm Reactors - Marcos Von Sperling 2007-03-30

Activated Sludge and Aerobic Biofilm Reactors is the fifth volume in the series *Biological Wastewater Treatment*. The first part of the book is devoted to the activated sludge process, covering the removal of organic matter, nitrogen and phosphorus. A detailed analysis of the biological reactor (aeration tank) and the final sedimentation tanks is provided. The second part of the book covers aerobic biofilm reactors, especially trickling filters, rotating biological contractors and submerged aerated biofilters. For all the systems, the book presents in a clear and informative way the main concepts, working principles, expected removal efficiencies, design criteria, design examples, construction aspects and operational guidelines. About the series: The series is based on a highly acclaimed set of best selling textbooks. This international version is comprised by six textbooks giving a state-of-the-art presentation of the science and technology of biological wastewater treatment. Other titles in the series are: Volume 1: Waste Stabilisation Ponds; Volume 2: Basic Principles of Wastewater Treatment; Volume 3: Waste Stabilization Ponds; Volume 4: Anaerobic Reactors; Volume 6: Sludge Treatment and Disposal

Wastewater Engineering - Metcalf & Eddy Inc. 2013-08-30

Sludge Thermal Hydrolysis: Application and Potential - Bill Barber 2020-05-15

Thermal hydrolysis is revolutionizing wastewater treatment. Current treatment methods have evolved little since pioneering work in the late 19th and early 20th centuries. Subsequently, most wastewater treatment plants are not designed to meet modern drivers such as energy conservation and nutrient recovery. Additionally, sludge management is expensive and often not viewed in high regard by external stakeholders. By changing the properties of sewage sludge, thermal hydrolysis allows wastewater treatment works to become more efficient, enabling the treatment of greater flowrates to higher standards. Production of renewable energy from sludge is increased, whilst quantity of treated material reduced, which further decreases processing requirements and costs regardless of what they may be. This book, aimed at students and practitioners alike, describes the

development of the technology, and highlights the design and economics by means of examples. Benefits and challenges related to thermal hydrolysis are also characterized alongside selected case-studies and ideas for future applications. Dr William (Bill) Barber has had a keen interest in thermal hydrolysis for numerous years and was instrumental in the development of Europe's largest facility as well as advising water utilities, consultants, researchers and government organizations on its potential to modernize wastewater treatment.

Experiment Design for Environmental Engineering - Francis J. Hopcroft 2022-02-07

Experiment Design for Environmental Engineering provides a wide range of practical environmental engineering laboratory experiments for implementation by students in a university laboratory or by practicing professionals in the field, along with an extensive discussion on how to design an experiment that will provide meaningful and useful data, how to interpret the data generated from an experiment, and how to present those data to an audience of other students or professionals. The example experiments provide a way to evaluate a new design against an existing experiment to determine what information is most appropriate in each section and how to format the data for the most effective outcome. Features Fills in the gap in ABET requirements to teach students how to design experiments and includes key elements for a successful design Covers experiments for a wide range of environmental engineering topics Provides standardized approach that includes a basic background to the concepts and step-by-step procedure for conducting the experiment Explains designs that are suitable for college laboratory and professional applications Shows how to organize experimental data as it is collected to optimize usefulness Provides templates for design of the experiment and for presenting the resulting data to technical and nontechnical audiences or clients

Current Developments in Biotechnology and Bioengineering - Xuan-Thanh Bui 2023-02-15

Current Developments in Biotechnology and Bioengineering: Membrane Technology for Sustainable Water and Energy Management covers a variety of advanced technologies for membrane processes, including water/wastewater treatment and reuse, membrane materials, operation and maintenance, fouling control, life cycle assessment, removal of micro/emerging pollutants, and operational cost of membrane processes. Supported by prominent editors and global contributors, this reference contains chapters on membrane treatment strategies for the current pollution of complex organic matters, nutrients, toxic substances, microplastics, membrane fouling control in different water resources, and reusing water resources through promising separation technologies, including reverse osmosis, forward osmosis, and membrane distillation. Delivers advances on membrane processes, including water and wastewater treatment and reuse by membranes Provides state-of-the-art information on design and operation of novel membrane systems, energy consumption, fouling control, etc. Describes hybrid membrane processes

Biological Wastewater Treatment in Warm Climate Regions - Marcos Von Sperling 2005-09-30

Biological Wastewater Treatment in Warm Climate Regions gives a state-of-the-art presentation of the science and technology of biological wastewater treatment, particularly domestic sewage. The book covers the main treatment processes used worldwide with wastewater treatment in warm climate regions given a particular emphasis where simple, affordable and sustainable solutions are required. This comprehensive book presents in a clear and informative way the basic principles of biological wastewater treatment, including theory and practice, and covering conception, design and operation.

In order to ensure the practical and didactic view of the book, 371 illustrations, 322 summary tables and 117 examples are included. All major wastewater treatment processes are covered by full and interlinked design examples which are built up throughout the book, from the determination of wastewater characteristics, the impact of discharge into rivers and lakes, the design of several wastewater treatment processes and the design of sludge treatment and disposal units. The 55 chapters are divided into 7 parts over two volumes: Volume One: (1) Introduction to wastewater characteristics, treatment and disposal; (2) Basic principles of wastewater treatment; (3) Stabilisation ponds; (4) Anaerobic reactors; Volume Two: (5) Activated sludge; (6) Aerobic biofilm reactors; (7) Sludge treatment and disposal. As well as being an ideal textbook, Biological Wastewater Treatment in Warm Climate Regions is an important reference for practising professionals such as engineers, biologists, chemists and environmental scientists, acting in consulting companies, water authorities and environmental agencies.

Urban Drainage - David Butler 2017-07-12

Urban Drainage has been thoroughly revised and updated to reflect changes in the practice and priorities of urban drainage. New and expanded coverage includes: Sewer flooding The impact of climate change Flooding models The move towards sustainability Providing a descriptive overview of the issues involved as well as the engineering principles and analysis, it draws on real-world examples as well as models to support and demonstrate the key issues facing engineers dealing with drainage issues. It also deals with both the design of new drainage systems and the analysis and upgrading of existing infrastructure. This is a unique and essential textbook for students of water, environmental, and public health engineering as well as a valuable resource for practising engineers.

Plumbing Principles and Practice - Syed Azizul Haq 2021-09-07

This book provides a complete introduction to plumbing services. It explains the principles and provides practical examples of the planning, design, installation and maintenance of the plumbing technologies applicable to single-storey buildings, skyscrapers and everything in between. The book begins with an introduction to plumbing technology, the trade and its evolution. Chapters then cover: Pipes, fittings and accessories and their installation and testing Pumps and pumping systems Hydraulic principles Hot and cold water supply systems Fixtures and appliances Sanitary and storm drainage systems Special concerns such as seismic issues, safety, security and the state of the art. Written and the figures drawn by a registered professional engineer and experienced teacher, this book is suitable for use on a wide range of courses from building services engineering, civil engineering, construction technology, plumbing services, environmental engineering, water engineering and architectural technology.

Wastewater Engineering - Metcalf & Eddy 1981

"1 Wastewater Collection and Pumping An Overview 2 Review of Applied Hydraulics 3 Wastewater Flows and Measurements 4 Design of Sewers 5 Sewer Appurtenances 6 Infiltration/Inflow 7 Occurrence 8 Effect, and Control of the Biological Transformations in Sewers 9 Pumps and Pump Systems 10 Pumping Stations." -- Publisher.

Physical-Chemical Treatment of Water and Wastewater - A. P. Sincero 2002-07-31

The books currently available on this subject contain some elements of physical-chemical treatment of water and wastewater but fall short of giving comprehensive and authoritative coverage. They contain some equations that are not substantiated, offering empirical data based on assumptions that are therefore difficult to comprehend. This text brings together the information previously scattered in several books and adds the

knowledge from the author's lectures on wastewater engineering. Physical-Chemical Treatment of Water and Wastewater is not only descriptive but is also analytical in nature. The work covers the physical unit operations and unit processes utilized in the treatment of water and wastewater. Its organization is designed to match the major processes and its approach is mathematical. The authors stress the description and derivation of processes and process parameters in mathematical terms, which can then be generalized into diverse empirical situations. Each chapter includes design equations, definitions of symbols, a glossary of terms, and worked examples. One author is an environmental engineer and a professor for over 12 years and the other has been in the practice of environmental engineering for more than 20 years. They offer a sound analytical mathematical foundation and description of processes. Physical-Chemical Treatment of Water and Wastewater fills a niche as the only dedicated textbook in the area of physical and chemical methods, providing an analytical approach applicable to a range of empirical situations

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Fundamentals of Wastewater Treatment and Engineering -
Rumana Riffat 2022-04-27

The 2nd edition of Fundamentals of Wastewater Treatment and Design introduces readers to the fundamental concepts of wastewater treatment, followed by engineering design of unit processes for sustainable treatment of municipal wastewater and resource recovery. It has been completely updated with new chapters to reflect current advances in design, resource recovery practices and research. Another highlight is the addition of the last chapter, which provides a culminating design experience of both urban and rural wastewater treatment systems. Filling the need for a textbook focused on wastewater, it covers history, current practices, emerging concerns, future directions and pertinent regulations that have shaped the objectives of this important area of engineering. Basic principles of reaction kinetics, reactor design and environmental microbiology are introduced along with natural purification processes. It also details the design of unit processes for primary, secondary and advanced treatment, as well as solids processing and removal. Recovery of water, energy and nutrients are explained with the help of process concepts and design applications. This textbook is designed for undergraduate and graduate students who have some knowledge of environmental chemistry and fluid mechanics. Professionals in the wastewater industry will also find this a handy reference.