

# Environmental Biotechnology Principles And Applications By

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**Environmental Biotechnology** - Gareth M. Evans 2003-06-13

The application of biologically-engineered solutions to environmental problems has become far more readily acceptable and widely understood. However there remains some uncertainty amongst practitioners regarding how and where the microscopic, functional level fits into the macroscopic, practical applications. It is precisely this gap which the book sets out to fill. Dividing the topic into logical strands covering pollution, waste and manufacturing, the book examines the potential for biotechnological interventions and current industrial practice, with the underpinning microbial techniques and methods described, in context, against this background. Each chapter is supported by located case studies from a range of industries and countries to provide readers with an overview of the range of applications for biotechnology. Essential reading for undergraduates and Masters students taking modules in Biotechnology or Pollution Control as part of Environmental Science, Environmental Management or Environmental Biology programmes. It is also suitable for professionals involved with water, waste management and pollution control.

*Environmental Biotechnology: Principles and Applications, Second Edition* - Bruce E. Rittmann 2020-03-06  
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. The classic environmental biotechnology textbook—fully updated for the latest advances This thoroughly revised educational resource presents the biological principles that underlie modern microbiological treatment technologies. Written by two of the field's foremost researchers, *Environmental Biotechnology: Principles and Applications, Second Edition*, clearly explains the new technologies that have evolved over the past 20 years, including direct anaerobic treatments, membrane-based processes, and granular processes. The first half of the book focuses on theory and tools; the second half offers practical applications that are clearly illustrated through real-world examples. Coverage includes: • Moving toward sustainability • Basics of microbiology • Biochemistry, metabolism, genetics, and information flow • Microbial ecology • Stoichiometry and energetics • Microbial kinetics and products • Biofilm kinetics • Reactor characteristics and kinetics • Methanogenesis • Aerobic suspended-growth processes • Aerobic biofilm processes • Nitrogen transformation and recovery • Phosphorus removal and recovery • Biological treatment of drinking water

**Environmental Biotechnology Vol. 1** - K. M. Gothandam 2020-05-06

This book provides the information on the application of nanotechnology in cleaning wastewater and the impact of microbial ecosystem to solve environmental problems has been critically reviewed in the chapters. It also gives detailed reviews about the conversion of wastewater nutrients into a biofertilizer using microalgae, as well as the applications of Biochar for heavy metal remediation from water. Most importantly, this book contains critical review on microbial fuel cells and highlights the emerging risks of bioplastics on the aquatic ecosystem.

**Emerging Technologies in Environmental Bioremediation** - Maulin P. Shah 2020-04-18

Emerging Technologies in Environmental Bioremediation introduces emerging bioremediation technologies for the treatment and management of industrial wastes and other environmental pollutants for the sake of environmental sustainability. Emerging bioremediation approaches such as nano-bioremediation technology, electro-bioremediation technology, microbial fuel cell technology, Modified Ludzack-Ettinger

Process, Modified Activated Sludge Process, and phytotechnologies for the remediation of industrial wastes/pollutants are discussed in a comprehensive manner not found in other books. Furthermore, the book includes updated information as well as future directions for research in the field of bioremediation of industrial wastes. This book will be extremely useful to students, researchers, scientists and professionals in the field of microbiology and biotechnology, Bio (chemical) engineers, environmental researchers, ecotoxicology, and many more. Includes the recovery of resources from wastewater Describes the importance of microorganisms in environmental bioremediation technologies Points out the reuse of treated wastewater through emerging technologies Pays attention to the occurrence of novel micro-pollutants Emphasizes the role of nanotechnology in pollutant bioremediation

**Anaerobic Biotechnology for Bioenergy Production** - Samir Kumar Khanal 2011-11-18

Anaerobic biotechnology is a cost-effective and sustainable means of treating waste and wastewaters that couples treatment processes with the reclamation of useful by-products and renewable biofuels. This means of treating municipal, agricultural, and industrial wastes allows waste products to be converted to value-added products such as biofuels, biofertilizers, and other chemicals. *Anaerobic Biotechnology for Bioenergy Production: Principles and Applications* provides the reader with basic principles of anaerobic processes alongside practical uses of anaerobic biotechnology options. This book will be a valuable reference to any professional currently considering or working with anaerobic biotechnology options.

**Microbial Biotechnology** - Yuan Kun Lee 2006

In the second edition of this bestselling textbook, new materials have been added, including a new chapter on real time polymerase chain reaction (RTPCR) and a chapter on fungal solid state cultivation. There already exist a number of excellent general textbooks on microbiology and biotechnology that deal with the basic principles of microbial biotechnology. To complement them, this book focuses on the various applications of microbial-biotechnological principles. A teaching-based format is adopted, whereby working problems, as well as answers to frequently asked questions, supplement the main text. The book also includes real life examples of how the application of microbial-biotechnological principles has achieved breakthroughs in both research and industrial production. Although written for polytechnic students and undergraduates, the book contains sufficient information to be used as a reference for postgraduate students and lecturers. It may also serve as a resource book for corporate planners, managers and applied research personnel.

*Environmental Biotechnology* - Viswanath Buddolla 2017

This book discusses environmental microbiology, phytoremediation, solid waste disposal and management, biological methods of pest management, plant biotechnology, animal biotechnology, sericulture, apiculture, industrial sustainability, and ethical issues of environmental biotechnology. This excellent collection of information is designed both as a basic environmental biotechnology textbook as well as a reference book useful to scientists, researchers and educators and provides cutting-edge illustration of the theories and principles of biotechnologies, systems, processes, and methodologies.

**Basic Concepts in Environmental Biotechnology** - Neetu Sharma 2021-09

The book includes current and emerging concepts in the areas of environmental biotechnology such as pollution sources, control and measurement, solid waste management, bioremediation, biofuels, biosensors,

bioleaching, conservation biotechnology and more. The book also includes recent innovations made in this field and incorporates case studies to help in understanding the concepts. This book applies principles from multidisciplinary sciences of environmental engineering, metabolic engineering, rDNA technology and omics to study the role of microbes and plants in tackling environmental issues. It also includes content related to risk assessment and environmental management systems. Each chapter provides problems and solutions of different topics with diagrammatic illustrations and tables for students, researchers and other professionals in environmental biotechnology. Explores cutting-edge technologies, including nanotechnology-based bioremediation, value-added products from waste and emerging techniques related to environmental risk assessment and monitoring Reviews the current methods being applied in the environment field for pollution control, waste management, biodegradation of organic and inorganic pollutants and so on Provides in-depth knowledge of the latest advancements in the field of environmental biotechnology such as bioleaching, biomining and advances in biotechnology-based conservation of biodiversity Introduces undergraduate and post-graduate students to basic concepts of environmental biotechnology and allied fields Discusses different products such as biofuels, biopolymers and biosensors that are being produced using biotechnological methods, thus contributing towards the goal of sustainable development Dr. Neetu Sharma is Assistant Professor in the Department of Biotechnology, GGSDS College, Chandigarh, India. The main thrust of her research centers on biotechnology, bioremediation and nanotechnology. Abhinashi Singh Sodhi is Assistant Professor in the Department of Biotechnology, GGSDS College, Chandigarh, India. His current research focuses on waste reduction, valorization and bioproduct formation. Dr. Navneet Batra is Associate Professor and Head, Department of Biotechnology, GGSDS College, Chandigarh, India. He has extensive academic and research experience of over 20 years with specialization in biotechnology and biochemical engineering.

**Environmental Biotechnology Vol. 2** - K. M. Gothandam 2020-05-01

This book provides the technological insight on biorefinery and nanoremediation and provides comprehensive reviews on applications of Biochar for environmental sustainability. Critical review on biosurfactants in food applications as well as sustainable agricultural practices has also been provided in this book. It also highlights the microbial-omics and microRNAs for protecting ecotoxicity. Overall, this book provides critical as well as comprehensive chapters on wastewater treatment using different technologies.

**Fungal Applications in Sustainable Environmental Biotechnology** - Diane Purchase 2016-09-13

Fungi are distinct eukaryotic organisms renowned for their remarkable biodiversity and extensive habitat range. Many fungal species have long been exploited for food and medicines. This volume considers other important applications of fungal biotechnology especially in an environmental context, showcasing the essential contributions of these amazingly versatile organisms. It explores how fungi offer sustainable solutions to tackle various environmental concerns. Written by eminent experts in their fields, this work presents a broad array of current advances and future prospects in fungal environmental biotechnology and discusses their limitations and potential. The book is organized in five parts, each addressing a theme of the UN Sustainable Development Goals (SDG): strengthen food security (Zero Hunger), wastewater treatment (Clean Water & Sanitation), pollution reduction (Life on Land), biofuel production (Affordable & Clean Energy) and biosynthesis of novel biomolecules (Responsible Consumption & Production).

**Environmental Biotechnology** - Marian Petre 2013-02-07

Taking into consideration the outstanding importance of studying and applying the biological means to remove or mitigate the harmful effects of global pollution on the natural environment, as direct consequences of quantitative expansion and qualitative diversification of persistent and hazardous contaminants, the present book provides useful information regarding New Approaches and Prospective Applications in Environmental Biotechnology. This volume contains twelve chapters divided in the following three parts: biotechnology for conversion of organic wastes, biodegradation of hazardous contaminants and, finally, biotechnological procedures for environmental protection. Each chapter provides detailed information regarding scientific experiments that were carried out in different parts of the world to test different procedures and methods designed to remove or mitigate the impact of hazardous pollutants on environment. The book is addressed to researchers and students with specialties in biotechnology,

bioengineering, ecotoxicology, environmental engineering and all those readers who are interested to improve their knowledge in order to keep the Earth healthy.

**Environmental Microbiology for Engineers** - Volodymyr Ivanov 2015-11-04

Updated Edition Includes a New Chapter and Enhanced Study Material The second edition of Environmental Microbiology for Engineers explores the role that microorganisms play in the engineered protection and enhancement of an environment. Offering a perfect balance of microbiological knowledge and environmental biotechnology principles, it provides a

*Concepts in Biotechnology* - Charles F. A. Bryce 2004-10

The Book Covers The Fundamental Principles And Concepts In Biotechnology Which Form The Basis For The Subject And Illustrates Their Applications In Selected Areas Such As Health Care, Agriculture, Animal Systems, Bioprocess Technologies And Environmental Aspects. This Textbook Is The Outcome Of A Costed-Ibn Project On Curriculum Development In Biotechnology For Undergraduate Study. It Is Designed To Provide A Strong Base In This Emerging, Interdisciplinary Are Which Holds Great Promise For Economic Development.

**Microbial Biotechnology** - Yuan Kun Lee 2006-08-24

In the second edition of this bestselling textbook, new materials have been added, including a new chapter on real time polymerase chain reaction (RTPCR) and a chapter on fungal solid state cultivation. There already exist a number of excellent general textbooks on microbiology and biotechnology that deal with the basic principles of microbial biotechnology. To complement them, this book focuses on the various applications of microbial-biotechnological principles. A teaching-based format is adopted, whereby working problems, as well as answers to frequently asked questions, supplement the main text. The book also includes real life examples of how the application of microbial-biotechnological principles has achieved breakthroughs in both research and industrial production. Although written for polytechnic students and undergraduates, the book contains sufficient information to be used as a reference for postgraduate students and lecturers. It may also serve as a resource book for corporate planners, managers and applied research personnel.

**Environmental Biotechnology: Principles and Applications, Second Edition** - Bruce E. Rittmann 2020-03-03

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. The classic environmental biotechnology textbook—fully updated for the latest advances This thoroughly revised educational resource presents the biological principles that underlie modern microbiological treatment technologies. Written by two of the field's foremost researchers, Environmental Biotechnology: Principles and Applications, Second Edition, clearly explains the new technologies that have evolved over the past 20 years, including direct anaerobic treatments, membrane-based processes, and granular processes. The first half of the book focuses on theory and tools; the second half offers practical applications that are clearly illustrated through real-world examples. Coverage includes: • Moving toward sustainability • Basics of microbiology • Biochemistry, metabolism, genetics, and information flow • Microbial ecology • Stoichiometry and energetics • Microbial kinetics and products • Biofilm kinetics • Reactor characteristics and kinetics • Methanogenesis • Aerobic suspended-growth processes • Aerobic biofilm processes • Nitrogen transformation and recovery • Phosphorus removal and recovery • Biological treatment of drinking water

**Environmental Biotechnology** - Lawrence K. Wang 2010-04-05

The past 30 years have seen the emergence of a growing desire worldwide that positive actions be taken to restore and protect the environment from the degrading effects of all forms of pollution – air, water, soil, and noise. Since pollution is a direct or indirect consequence of waste production, the seemingly idealistic demand for “zero discharge” can be construed as an unrealistic demand for zero waste. However, as long as waste continues to exist, we can only attempt to abate the subsequent pollution by converting it to a less noxious form. Three major questions usually arise when a particular type of pollution has been identified: (1) How serious is the pollution? (2) Is the technology to abate it available? and (3) Do the costs of abatement justify the degree of abatement achieved? This book is one of the volumes of the Handbook of

Environmental Engineering series. The principal intention of this series is to help readers formulate answers to the last two questions above. The traditional approach of applying tried-and-true solutions to specific pollution problems has been a major contributing factor to the success of environmental engineering, and has accounted in large measure for the establishment of a "methodology of pollution control." However, the realization of the ever-increasing complexity and interrelated nature of current environmental problems renders it imperative that intelligent planning of pollution abatement systems be undertaken.

**Molecular Biotechnology** - Glick Bernard R 1998

The second edition explains the principles of recombinant DNA technology as well as other important techniques such as DNA sequencing, the polymerase chain reaction, and the production of monoclonal antibodies.

**Environmental Biotechnology** - Hans-Joachim Jördening 2006-03-06

A deeper insight into the complex processes involved in this field, covering the biological, chemical and engineering fundamentals needed to further develop effective methodologies. The book devotes detailed chapters to each of the four main areas of environmental biotechnology -- wastewater treatment, soil treatment, solid waste treatment, and waste gas treatment -- dealing with both the microbiological and process engineering aspects. The result is the combined knowledge contained in the extremely successful volumes 11a through 11c of the "Biotechnology" series in a handy and compact form.

Environmental Biotechnology Volume 4 - K. M. Gothandam 2021-09-24

This book reviews the production of bioplastic from various raw materials and recycling wastewater into useful bioproducts by bacteria. In addition, it also addresses the recent advancement in pest control in rice plants, different methods to analyse genotoxicity on soil samples and the effect of phytocompounds on acrylamide-induced toxicity in *Drosophila*. Interestingly, this book also discusses mesoporous silica nanoparticles' role as nanocarrier material for inhibiting the cancer cell, especially breast cancer and various biotechnological applications of marine fungal exopolysaccharides.

**Applied Environmental Biotechnology: Present Scenario and Future Trends** - Garima Kaushik 2015-01-16

Applied Environmental Biotechnology: Present Scenario and Future Trends is designed to serve as a reference book for students and researchers working in the area of applied environmental science. It presents various applications of environmental studies that involve the use of living organisms, bioprocesses engineering technology, and other fields in solving environmental problems like waste and waste waters. It includes not only the pure biological sciences such as genetics, microbiology, biochemistry and chemistry but also from outside the sphere of biology such as chemical engineering, bioprocess engineering, information technology, and biophysics. Starting with the fundamentals of bioremediation, the book introduces various environmental applications such as bioremediation, phytoremediation, microbial diversity in conservation and exploration, in-silico approach to study the regulatory mechanisms and pathways of industrially important microorganisms biological phosphorous removal, ameliorative approaches for management of chromium phytotoxicity, sustainable production of biofuels from microalgae using a biorefinery approach, bioelectrochemical systems (BES) for microbial electroremediation and oil spill remediation. The book has been designed to serve as comprehensive environmental biotechnology textbooks as well as wide-ranging reference books. Environmental remediation, pollution control, detection and monitoring are evaluated considering the achievement as well as the perspectives in the development of environmental biotechnology. Various relevant articles are chosen up to illustrate the main areas of environmental biotechnology: industrial waste water treatment, soil treatment, oil remediation, phytoremediation, microbial electro remediation and development of biofuels dealing with microbial and process engineering aspects. The distinct role of environmental biotechnology in future is emphasized considering the opportunities to contribute with new approached and directions in remediation of contaminated environment, minimising waste releases and development pollution prevention alternatives at before and end of pipe.

Bioremediation - Ronald L. Crawford 2005-09-08

Industrial and agricultural activity throughout this century has led to considerable contamination of soil

and groundwater resources by hazardous chemicals. The technique of bioremediation uses living organisms--usually bacteria and fungi--to remove pollutants from soil and water with minimal disturbance to these environments. This approach, which is potentially more cost-effective than traditional techniques such as incineration of soils and carbon filtration of water, requires an understanding of how organisms transform chemicals, how they survive in polluted environments, and how they can be used in the field. This book examines these issues for many of the most serious and common environmental contaminants, presenting the most recent position on the application of bioremediation to polluted soil and water.

*Environmental Biotechnology Vol. 3* - K. M. Gothandam 2020-10-01

This volume is a collection of informative chapters on various subjects. It provides information on the effects of pesticides on avian fauna, the impact of microbial ecosystems to solve environmental problems, a detailed review on issues in membrane distillations process, microbial sensor for detection of pollutants, microbial biosurfactants, biotechnological applications of immobilised microalgae as well as a review on Biochar production. Most importantly, this book contains a critical review on microbial degradation of plastic wastes and highlights the Biodegradation and Bioremediation of Herbicides.

**Environmental Biotechnology** - Murray Moo-Young 2013-06-29

Biotechnology offers a 'natural' way of addressing environmental problems, ranging from identification of biohazards to bioremediation techniques for industrial, agricultural and municipal effluents and residues. Biotechnology is also a crucial element in the paradigm of 'sustainable development'. This collection of 66 papers, by authors from 20 countries spanning 4 continents, addresses many of these issues. The material presented will interest scientists, engineers, and others in industry, government and academia. It incorporates both introductory and advanced aspects of the subject matter, which includes water, air and soil treatment, biosensor and biomonitoring technology, genetic engineering of microorganisms, and policy issues in applying biotechnology to environmental problems. The papers present a variety of aspects ranging from current state-of-the-art research, to examples of applications of these technologies.

**Principles and Applications of Environmental Biotechnology for a Sustainable Future** - Ram Lakhan Singh 2016-10-14

This textbook on Environmental Biotechnology not only presents an unbiased overview of the practical biological approaches currently employed to address environmental problems, but also equips readers with a working knowledge of the science that underpins them. Starting with the fundamentals of biotechnology, it subsequently provides detailed discussions of global environmental problems including microbes and their interaction with the environment, xenobiotics and their remediation, solid waste management, waste water treatment, bioreactors, biosensors, biomining and biopesticides. This book also covers renewable and non-renewable bioenergy resources, biodiversity and its conservation, and approaches to monitoring biotechnological industries, genetically modified microorganism and foods so as to increase awareness. All chapters are written in a highly accessible style, and each also includes a short bibliography for further research. In summary this textbook offers a valuable asset, allowing students, young researchers and professionals in the biotechnology industry to grasp the basics of environmental biotechnology.

Industrial Biotechnology - Loveleen Kaur 2015-02-01

Industrial biotechnology can be defined as the use of modern biological life sciences in various industries. Biotechnology has a myriad of applications in our day to day life such as with simple processes such as the brewing of beer, use of enzymes in detergents, production of fermented food, production of antibiotics, nutritional supplements etc. This book also includes processes (production of biofuels, treatment of effluents) that contribute to creating efficient, eco-friendly environments. This book discusses the different aspects of bioprocesses; media design, fermenter design and the economics of it. It also explains in detail the processes and techniques involved in the production of commercially important products. This book is an up-to-date collection of the latest practices being followed in the field of industrial biotechnology for students both at the undergraduate and postgraduate level.

**Environmental Biotechnology** - Daniel Vallero 2015-09-11

Environmental Biotechnology: A Biosystems Approach, Second Edition presents valuable information on how biotechnology has acted as a vital buffer among people, pollution, and the environment. It answers the most important questions on the topic, including how, and why, a knowledge and understanding of the

physical, chemical, and biological principles of the environment must be achieved in order to develop biotechnology applications. Most texts address either the applications or the implications of biotechnology. This book addresses both. The applications include biological treatment and other environmental engineering processes. The risks posed by biotechnologies are evaluated from both evidence-based and precautionary perspectives. Using a systems biology approach, the book provides a context for researchers and practitioners in environmental science that complements guidebooks on the necessary specifications and criteria for a wide range of environmental designs and applications. Users will find crucial information on the topics scientific researchers must evaluate in order to develop further technologies. Provides a systems approach to biotechnologies which includes the physical, biological, and chemical processes in context Presents relevant case studies on cutting-edge technologies, such as nanobiotechnologies and green engineering Addresses both the applications and implications of biotechnologies by following the lifecycle of a variety of established and developing biotechnologies Includes crucial information on the topics scientific researchers must evaluate in order to develop further technologies

Marine OMICS - Se-Kwon Kim 2016-11-18

This book provides comprehensive coverage on current trends in marine omics of various relevant topics such as genomics, lipidomics, proteomics, foodomics, transcriptomics, metabolomics, nutrigenomics, pharmacogenomics and toxicogenomics as related to and applied to marine biotechnology, molecular biology, marine biology, marine microbiology, environmental biotechnology, environmental science, aquaculture, pharmaceutical science and bioprocess engineering.

**Peptide Applications in Biomedicine, Biotechnology and Bioengineering** - Sotirios Koutsopoulos 2017-11-16

Peptide Applications in Biomedicine, Biotechnology and Bioengineering summarizes the current knowledge on peptide applications in biomedicine, biotechnology and bioengineering. After a general introduction to peptides, the book addresses the many applications of peptides in biomedicine and medical technology. Next, the text focuses on peptide applications in biotechnology and bioengineering and reviews of peptide applications in nanotechnology. This book is a valuable resource for biomaterial scientists, polymer scientists, bioengineers, mechanical engineers, synthetic chemists, medical doctors and biologists. Presents a self-contained work for the field of biomedical peptides Summarizes the current knowledge on peptides in biomedicine, biotechnology and bioengineering Covers current and potential applications of biomedical peptides

**Biological Wastewater Treatment** - C. P. Leslie Grady Jr. 2011-05-09

Following in the footsteps of previous highly successful and useful editions, Biological Wastewater Treatment, Third Edition presents the theoretical principles and design procedures for biochemical operations used in wastewater treatment processes. It reflects important changes and advancements in the field, such as a revised treatment of the micr

*Bioluminescence* - 2019-09-25

This book includes reviews of molecular- and organismal-level studies in bioluminescence in order to elucidate the mechanisms behind this phenomenon. It is intended for molecular biology researchers involved in bioluminescent reactions, molecular engineering of bioluminescent sensor probes, and biomonitoring of environmental toxins.. Field researchers as well as students will also find this volume to be of interest.

*Pharmaceutical Biotechnology* - Gary Walsh 2013-04-25

Pharmaceutical Biotechnology offers students taking Pharmacy and related Medical and Pharmaceutical courses a comprehensive introduction to the fast-moving area of biopharmaceuticals. With a particular focus on the subject taken from a pharmaceutical perspective, initial chapters offer a broad introduction to protein science and recombinant DNA technology- key areas that underpin the whole subject. Subsequent chapters focus upon the development, production and analysis of these substances. Finally the book moves on to explore the science, biotechnology and medical applications of specific biotech products categories. These include not only protein-based substances but also nucleic acid and cell-based products. introduces essential principles underlining modern biotechnology- recombinant DNA technology and protein science an invaluable introduction to this fast-moving subject aimed specifically at pharmacy and medical students

includes specific 'product category chapters' focusing on the pharmaceutical, medical and therapeutic properties of numerous biopharmaceutical products. entire chapter devoted to the principles of genetic engineering and how these drugs are developed. includes numerous relevant case studies to enhance student understanding no prior knowledge of protein structure is assumed

**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

**Environmental Biotechnology** - Daniel Vallero 2010-06-07

Environmental Biotechnology: A Biosystems Approach introduces a systems approach to environmental biotechnology and its applications to a range of environmental problems. A systems approach requires a basic understanding of four disciplines: environmental engineering, systems biology, environmental microbiology, and ecology. These disciplines are discussed in the context of their application to achieve specific environmental outcomes and to avoid problems in such applications. The book begins with a discussion of the background and historical context of contemporary issues in biotechnology. It then explains the scientific principles of environmental biotechnologies; environmental biochemodynamic processes; environmental risk assessment; and the reduction and management of biotechnological risks. It describes ways to address environmental problems caused or exacerbated by biotechnologies. It also emphasizes need for professionalism in environmental biotechnological enterprises. This book was designed to serve as a primary text for two full semesters of undergraduate study (e.g., Introduction to Environmental Biotechnology or Advanced Environmental Biotechnology). It will also be a resource text for a graduate-level seminar in environmental biotechnology (e.g., Environmental Implications of Biotechnology). \* Provides a systems approach to biotechnologies which includes the physical, biological, and chemical processes in context \* Case studies include cutting-edge technologies such as nanobiotechnologies and green engineering \* Addresses both the applications and implications of biotechnologies by following the life-cycle of a variety of established and developing biotechnologies

**Environmental Biotechnology** - Murray Moo-Young 2010-12-07

Biotechnology offers a 'natural' way of addressing environmental problems, ranging from identification of biohazards to bioremediation techniques for industrial, agricultural and municipal effluents and residues. Biotechnology is also a crucial element in the paradigm of 'sustainable development'. This collection of 66 papers, by authors from 20 countries spanning 4 continents, addresses many of these issues. The material presented will interest scientists, engineers, and others in industry, government and academia. It incorporates both introductory and advanced aspects of the subject matter, which includes water, air and soil treatment, biosensor and biomonitoring technology, genetic engineering of microorganisms, and policy issues in applying biotechnology to environmental problems. The papers present a variety of aspects

ranging from current state-of-the-art research, to examples of applications of these technologies.

**Environmental Biotechnology** - Bruce E. Rittmann 2001

In *Environmental Biotechnology-Principles and Applications*, the authors connect the many different facets of environmental biotechnology. The book develops the basic concepts and quantitative tools in the first six chapters, which comprise the principles. The text consistently calls upon those principles as it describes the applications in Chapters 7 through 16. The theme is that all microbiological processes behave in ways that are understandable, predictable, and unified. At the same time, each application has its own special features that must be understood. The special features do not overturn or sidestep the common principles. Instead, they complement the principles and are most profitably understood in light of the principles.

**Environmental Biotechnology** - Indu Shekhar Thakur 2011-01-01

Biotechnology impinges on everyone's lives. It is one of the major technologies of the twenty-first century with wide-ranging, multidisciplinary activities ranging from small entities of life to the application, and production of goods. Environmental biotechnology is a huge and fast growing field with increasing relevance for a sustainable development through protection of environment to production of biomaterials. It continues to revolutionize the understanding of basic life sustaining processes in the environment, identification and exploitation of the molecules, and its use to provide clean technologies and to deal with environmental problems. This book provides an overview of basic processes of the environment, perturbations in the environment due to natural and human activities and use of biotechnological principles for remediation for sustainable development of the environment.

**Principles of Environmental Physics** - John Monteith 1990-02-15

Thoroughly revised and up-dated edition of a highly successful textbook.

**Biotechnology of Metals** - K.A. Natarajan 2018-06-13

*Biotechnology of Metals: Principles, Recovery Methods and Environmental Concerns* deals with all aspects of metal biotechnology in different areas, such as biogenesis, biomaterials, biomimetic strategies, biohydrometallurgy, mineral biobeneficiation, electrobioleaching, microbial corrosion, human implants, concrete biocorrosion, microbiology of environment pollution, and bioremediation. As the technology of this interdisciplinary science has diversified over the last five years, this book provides a valuable source for scientists and students in a number of disciplines, including geology, chemistry, metallurgy, microbiology, chemical engineering, environment, civil engineering, and biomedical engineering. Offers comprehensive coverage of an interdisciplinary subject. Outlines the role of microbiology and biotechnology in mining, metallurgy, waste disposal and environmental control. Covers new topics, such as biogenesis, biomaterials processing, the role of micro-organisms in causing corrosion, and much more. Presents scientifically illustrated experimental research methods in metals biotechnology.

**Plant Biotechnology and Genetics** - C. Neal Stewart, Jr. 2012-12-13

Designed to inform and inspire the next generation of plant biotechnologists *Plant Biotechnology and Genetics* explores contemporary techniques and applications of plant biotechnology, illustrating the tremendous potential this technology has to change our world by improving the food supply. As an introductory text, its focus is on basic science and processes. It guides students from plant biology and genetics to breeding to principles and applications of plant biotechnology. Next, the text examines the critical issues of patents and intellectual property and then tackles the many controversies and consumer concerns over transgenic plants. The final chapter of the book provides an expert forecast of the future of plant biotechnology. Each chapter has been written by one or more leading practitioners in the field and then carefully edited to ensure thoroughness and consistency. The chapters are organized so that each one progressively builds upon the previous chapters. Questions set forth in each chapter help students deepen their understanding and facilitate classroom discussions. Inspirational autobiographical essays, written by pioneers and eminent scientists in the field today, are interspersed throughout the text. Authors explain how they became involved in the field and offer a personal perspective on their contributions and the future of the field. The text's accompanying CD-ROM offers full-color figures that can be used in classroom presentations with other teaching aids available online. This text is recommended for junior- and senior-level courses in plant biotechnology or plant genetics and for courses devoted to special topics at both the undergraduate and graduate levels. It is also an ideal reference for practitioners.

**Molecular Biotechnology** - Bernard R. Glick 2022-03-15

*Molecular Biotechnology: Principles and Applications of Recombinant DNA* SIXTH EDITION An authoritative introduction to the fast-changing world of molecular biotechnology. In continuous publication since 1994 and now in its sixth edition, *Molecular Biotechnology: Principles and Applications of Recombinant DNA* has been effective in introducing this complex field to students for more than 25 years. This textbook covers essentially every aspect of the field of molecular biotechnology, which is constantly changing and adapting in light of new advances. This edition includes the latest techniques in DNA sequencing and genetic engineering of microbial, plant, and animal genomes, including human genome editing, as well as updates across many areas, such as: Immunological assays for disease diagnosis, more effective bacteriophage therapy, and new ways of dealing with antibiotic-resistant bacteria. New and developing vaccines for influenza, tuberculosis, and emerging viral threats, including Zika and SARS-CoV-2. Engineering bacteria to perform plastic degradation and green algae to produce hydrogen, altering amino acid biosynthesis, and creating designer cellulosomes. Production of humanized monoclonal antibodies in plants, modifying hybrid plants to produce clonal hybrids, and protecting plants from viral and fungal diseases. *Molecular Biotechnology* features nearly 600 detailed figures and is an ideal textbook for undergraduate and graduate courses in introductory biotechnology, as well as courses dedicated to utilizing this technology, such as medical, agricultural, environmental, and industrial biotechnology applications.