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## **B55JZO - LAYLAH LAMBERT**

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A classic now in its 14th edition, Communication Technology Update and Fundamentals is the single best resource for students and professionals looking to brush up on how these technologies have developed, grown, and converged, as well as what's in store for the future. It begins by developing the communication technology framework—the history, ecosystem, and structure—then delves into each type of technology, including everything from mass media, to computers and consumer electronics, to networking technologies. Each chapter is written by faculty and industry experts who provide snapshots of the state of each individual field, altogether providing a broad overview of the role communication technologies play in our everyday lives. Key features: Gives students and professionals the latest information in all areas of communication technology The companion website offers updated information and useful links to related in-

dustry resources, and an instructor site provides a sample syllabus and a test bank This edition features new chapters on automotive telematics, digital health, and telepresence, as well as expanded coverage of tablets/phablets and 4K (ultra high definition television)

The job interview is probably the most important step you will take in your job search journey. Because it's always important to be prepared to respond effectively to the questions that employers typically ask at a job interview Petrogav International has prepared this eBooks that will help you to get a job in oil and gas industry. Since these questions are so common, hiring managers will expect you to be able to answer them smoothly and without hesitation. This eBook contains 150 questions and answers for job interview and as a BONUS web addresses to 220 video movies for a better understanding of the technological process. This course covers aspects like HSE, Process, Mechanical, Electrical and Instrumentation & Control that will enable you

to apply for any position in the Oil and Gas Industry.

Do you know why repeatability is more important than accuracy? Do you know what makes a closed-tank system simpler than an open tank? What determines the rate of flow through a control valve? How might 'dead time' affect a paper mill machine? How would you evaluate a vendor's online adaptive-tuning system? After reading Paul Murrill's *Fundamentals of Process Control Theory*, 3rd Edition, you'll know how to find the answer to questions like these, and many more advanced concepts you can apply to your day-to-day work. ISA's all-time best-selling book is now updated and expanded, offering a time-tested way for you to teach yourself the complexities of process control theory. *Fundamentals of Process Control Theory* has long been praised for its clear, stylish presentation of the basic principles of process automation and its excellent overview of advanced control techniques. More than just a reference book, it's a complete course in the subject, with exercises and answers to work through. Now, not only has the author updated it to reflect the most recent changes in technology, he has also incorporated material from his much-praised ISA book on putting the theory into practice: *Application Concepts of Process Control*. Both theoretical and practical, this guide allows readers to teach themselves the fundamental scientific principles that govern process control, particularly feedback control. Its 17 self-study units provide a solid foundation in theory, as well as a discussion of recent technologies such as computer-integrated manufacturing, statistical process control and expert systems. New chapters focus on the conceptual framework for an application, offering a practical understanding of the theory, along

with specific illustrations on how concepts are implemented. Contents: Introduction and Overview Basic Control Concepts Functional Structure of Feedback Control Sensors and Transmission Systems Typical Measurements Controllers Control Valves Process Dynamics Tuning Control Systems Cascade Control Feedforward and Multivariable Control Special Purpose Concepts Dead Time Control Nonlinear Compensation and Adaptive Control Sequential Control Modern Control System Architecture New Directions for Process Control Glossary Index.

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This book presents the principles, methods and techniques to characterize materials and technical systems. The book is organized with concise text-graphics compilations in three parts: The first part describes the fundamentals of measurement, testing and sensor technology, including a survey of sensor types for dimensional metrology, kinematics, dynamics, and temperature. It describes also microsensors and embedded sensors. The second part gives an overview of ma-

materials and explains the application of measurement, testing and sensor technology to characterize composition, microstructure, properties and performance of materials as well as deterioration mechanisms and reliability. The third part introduces the general systems theory for the characterization of technical systems, exemplified by mechatronic and tribological systems. It describes technical diagnostics for structural health monitoring and performance control.

**Annotation** This book provides a thorough introduction and a practical guide to the principles and characteristics of controls, and how to apply them in the use, selection, specification and design of control systems.

The manufacturing industry will reap significant benefits from encouraging the development of digital manufacturing science and technology. Digital Manufacturing Science uses theorems, illustrations and tables to introduce the definition, theory architecture, main content, and key technologies of digital manufacturing science. Readers will be able to develop an in-depth understanding of the emergence and the development, the theoretical background, and the techniques and methods of digital manufacturing science. Furthermore, they will also be able to use the basic theories and key technologies described in Digital Manufacturing Science to solve practical engineering problems in modern manufacturing processes. Digital Manufacturing Science is aimed at advanced undergraduate and postgraduate students, academic researchers and researchers in the manufacturing industry. It allows readers to integrate the theories and technologies described with their own research works, and to propose new ideas and new methods to improve the theory

and application of digital manufacturing science.

This book offers you a brief, but very involved look into the operations in the drilling of an oil & gas wells that will help you to be prepared for job interview at oil & gas companies. From start to finish, you'll see a general prognosis of the drilling process. If you are new to the oil & gas industry, you'll enjoy having a leg up with the knowledge of these processes. If you are a seasoned oil & gas person, you'll enjoy reading what you may or may not know in these pages. This course provides a non-technical overview of the phases, operations and terminology used on offshore drilling platforms. It is intended also for non-drilling personnel who work in the offshore drilling, exploration and production industry. This includes marine and logistics personnel, accounting, administrative and support staff, environmental professionals, etc. No prior experience or knowledge of drilling operations is required. This course will provide participants a better understanding of the issues faced in all aspects of drilling operations, with a particular focus on the unique aspects of offshore operations.

This open access Brief introduces the basic principles of control theory in a concise self-study guide. It complements the classic texts by emphasizing the simple conceptual unity of the subject. A novice can quickly see how and why the different parts fit together. The concepts build slowly and naturally one after another, until the reader soon has a view of the whole. Each concept is illustrated by detailed examples and graphics. The full software code for each example is available, providing the basis for experimenting with various assumptions, learning how to write programs for control analy-

sis, and setting the stage for future research projects. The topics focus on robustness, design trade-offs, and optimality. Most of the book develops classical linear theory. The last part of the book considers robustness with respect to nonlinearity and explicitly nonlinear extensions, as well as advanced topics such as adaptive control and model predictive control. New students, as well as scientists from other backgrounds who want a concise and easy-to-grasp coverage of control theory, will benefit from the emphasis on concepts and broad understanding of the various approaches.

This text provides a thorough understanding of the use of polysomnography and other technologies in the evaluation and management of sleep disorders. Coverage includes in-depth reviews of the neurophysiology and cardiopulmonary aspects of sleep and the pathophysiology of sleep disorders. Detailed sections on polysomnography include recording procedures, identifying and scoring sleep stages and sleep-related events, and report generation. Chapters discuss therapeutic interventions including positive airway pressure, supplemental oxygen, surgical and pharmacologic treatments, and patient education. A section focuses on pediatric sleep disorders and polysomnography. Also included are chapters on establishing and managing a sleep center and accrediting a sleep program.

A practical guide to semiconductor manufacturing from process control to yield modeling and experimental design *Fundamentals of Semiconductor Manufacturing and Process Control* covers all issues involved in manufacturing microelectronic devices and circuits, including fabrication sequences, process control, experimental design, process modeling, yield modeling, and CIM/CAM systems. Read-

ers are introduced to both the theory and practice of all basic manufacturing concepts. Following an overview of manufacturing and technology, the text explores process monitoring methods, including those that focus on product wafers and those that focus on the equipment used to produce wafers. Next, the text sets forth some fundamentals of statistics and yield modeling, which set the foundation for a detailed discussion of how statistical process control is used to analyze quality and improve yields. The discussion of statistical experimental design offers readers a powerful approach for systematically varying controllable process conditions and determining their impact on output parameters that measure quality. The authors introduce process modeling concepts, including several advanced process control topics such as run-by-run, supervisory control, and process and equipment diagnosis. Critical coverage includes the following:

- \* Combines process control and semiconductor manufacturing
- \* Unique treatment of system and software technology and management of overall manufacturing systems
- \* Chapters include case studies, sample problems, and suggested exercises
- \* Instructor support includes electronic copies of the figures and an instructor's manual

Graduate-level students and industrial practitioners will benefit from the detailed examination of how electronic materials and supplies are converted into finished integrated circuits and electronic products in a high-volume manufacturing environment. An Instructor's Manual presenting detailed solutions to all the problems in the book is available from the Wiley editorial department. An Instructor Support FTP site is also available.

Unternehmen mit kurzen Lieferzeiten, hoher Liefertreue und niedrigen Beständen

wachsen schnell und erzielen hohe Gewinne. Wie Unternehmen diese logistische Herausforderung meistern können, zeigt das Buch anhand von aktuellen Forschungsergebnissen der Leibniz Universität Hannover. Der Band gibt einen umfassenden Überblick über die Aufgaben und Verfahren der Fertigungssteuerung und befähigt Leser dazu, Schwächen in diesem Bereich zu erkennen und zu korrigieren. Ein fundiertes Nachschlagewerk für Studierende, Dozenten, Ingenieure und Wissenschaftler.

The job interview is probably the most important step you will take in your job search journey. Because it's always important to be prepared to respond effectively to the questions that employers typically ask at a job interview Petrogav International has prepared this eBooks that will help you to get a job in oil and gas industry. Since these questions are so common, hiring managers will expect you to be able to answer them smoothly and without hesitation. This eBook contains 287 questions and answers for job interview and as a BONUS web addresses to 289 video movies for a better understanding of the technological process. This course covers aspects like HSE, Process, Mechanical, Electrical and Instrumentation & Control that will enable you to apply for any position in the Oil and Gas Industry.

Control engineering seeks to understand physical systems, using mathematical modeling, in terms of inputs, outputs and various components with different behaviors. It has an essential role in a wide range of control systems, from household appliances to space flight. This book provides an in-depth view of the technologies that are implemented in most varieties of modern industrial

control engineering. A solid grounding is provided in traditional control techniques, followed by detailed examination of modern control techniques such as real-time, distributed, robotic, embedded, computer and wireless control technologies. For each technology, the book discusses its full profile, from the field layer and the control layer to the operator layer. It also includes all the interfaces in industrial control systems: between controllers and systems; between different layers; and between operators and systems. It not only describes the details of both real-time operating systems and distributed operating systems, but also provides coverage of the microprocessor boot code, which other books lack. In addition to working principles and operation mechanisms, this book emphasizes the practical issues of components, devices and hardware circuits, giving the specification parameters, install procedures, calibration and configuration methodologies needed for engineers to put the theory into practice. Documents all the key technologies of a wide range of industrial control systems Emphasizes practical application and methods alongside theory and principles An ideal reference for practicing engineers needing to further their understanding of the latest industrial control concepts and techniques

Hybrid drives and the operation of hybrid vehicles are characteristic of contemporary automotive technology. Together with the electronic driver assistant systems, hybrid technology is of the greatest importance and both cannot be ignored by today's car drivers. This technical reference book provides the reader with a firsthand comprehensive description of significant components of automotive technology. All texts are complemented by numerous detailed illustra-

tions.

This textbook takes a unified view of the fundamentals of wireless communication and explains cutting-edge concepts in a simple and intuitive way. An abundant supply of exercises make it ideal for graduate courses in electrical and computer engineering and it will also be of great interest to practising engineers.

The aim of this book is the study of signals and deterministic systems, linear, time-invariant, finite dimensions and causal. A set of useful tools is selected for the automatic and signal processing and methods of representation of dynamic linear systems are exposed, and analysis of their behavior. Finally we discuss the estimation, identification and synthesis of control laws for the purpose of stabilization and regulation. The study of signal characteristics and properties systems and knowledge of mathematical tools and treatment methods and analysis, are lately more and more importance and continue to evolve. The reason is that the current state of technology, particularly electronics and computing, enables the production of very advanced processing systems, effective and less expensive despite the complexity.

This is the biggest, most comprehensive, and most prestigious compilation of articles on control systems imaginable. Every aspect of control is expertly covered, from the mathematical foundations to applications in robot and manipulator control. Never before has such a massive amount of authoritative, detailed, accurate, and well-organized information been available in a single volume. Absolutely everyone working in any aspect of systems and controls must have this book!

Geothermal energy stands out because

it can be used as a baseload resource. This book, unlike others, examines the geology related to geothermal applications. Geology dictates (a) how geothermal resources can be found, (b) the nature of the geothermal resource (such as liquid- or vapor-dominated) and (c) how the resource might be developed ultimately (such as flash or binary geothermal plants). The compilation and distillation of geological elements of geothermal systems into a single reference fills a notable gap.

This Solution Manual is prepared to accompany and supplement the author's text "Fundamentals of Dynamics and Control of Space Systems" by K. D. Kumar. It contains detailed solutions for most problems in the textbook.

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Chemical Engineering Design, Second Edition, deals with the application of chemical engineering principles to the design of chemical processes and equipment. Revised throughout, this edition

has been specifically developed for the U.S. market. It provides the latest US codes and standards, including API, ASME and ISA design codes and ANSI standards. It contains new discussions of conceptual plant design, flowsheet development, and revamp design; extended coverage of capital cost estimation, process costing, and economics; and new chapters on equipment selection, reactor design, and solids handling processes. A rigorous pedagogy assists learning, with detailed worked examples, end of chapter exercises, plus supporting data, and Excel spreadsheet calculations, plus over 150 Patent References for downloading from the companion website. Extensive instructor resources, including 1170 lecture slides and a fully worked solutions manual are available to adopting instructors. This text is designed for chemical and biochemical engineering students (senior undergraduate year, plus appropriate for capstone design courses where taken, plus graduates) and lecturers/tutors, and professionals in industry (chemical process, biochemical, pharmaceutical, petrochemical sectors). New to this edition: Revised organization into Part I: Process Design, and Part II: Plant Design. The broad themes of Part I are flowsheet development, economic analysis, safety and environmental impact and optimization. Part II contains chapters on equipment design and selection that can be used as supplements to a lecture course or as essential references for students or practicing engineers working on design projects. New discussion of conceptual plant design, flowsheet development and revamp design Significantly increased coverage of capital cost estimation, process costing and economics New chapters on equipment selection, reactor design and solids handling processes New sections on fer-

mentation, adsorption, membrane separations, ion exchange and chromatography Increased coverage of batch processing, food, pharmaceutical and biological processes All equipment chapters in Part II revised and updated with current information Updated throughout for latest US codes and standards, including API, ASME and ISA design codes and ANSI standards Additional worked examples and homework problems The most complete and up to date coverage of equipment selection 108 realistic commercial design projects from diverse industries A rigorous pedagogy assists learning, with detailed worked examples, end of chapter exercises, plus supporting data and Excel spreadsheet calculations plus over 150 Patent References, for downloading from the companion website Extensive instructor resources: 1170 lecture slides plus fully worked solutions manual available to adopting instructors The third edition of Fundamentals of Information Technology is a 'must have' book not only for BCA and MBA students, but also for all those who want to strengthen their knowledge of computers. The additional chapter on MS Office is a comprehensive study on MS Word, MS Excel and other components of the package. This book is packed with expert advice from eminent IT professionals, in-depth analyses and practical examples. It presents a detailed functioning of hardware components besides covering the software concepts. A broad overview of Computer architecture, Data representation in the computer, Operating systems, Database management systems, Programming languages, etc., has also been included. An additional chapter on Mobile Computing and other state-of-the-art innovations in the IT world have been incorporated. Not only that, the latest Internet technologies have also been covered

in detail. One should use this book to acquire computer literacy in terms of how data is represented in a computer, how hardware devices are integrated to get the desired results, how the computer can be networked for interchanging data and establishing communication. Each chapter is followed by a number of review questions.

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Covering control system elements, from sensors to final control elements, in the context of overall control strategies and system design, this work covers topics including: internet communications, industrial communications, network hardware and software, wireless networks, enterprise computing, and, computer and control system security.

This textbook covers digital design, fundamentals of computer architecture, and assembly language. The book starts by introducing basic number systems, character coding, basic knowledge in digital design, and components of a computer.

The book goes on to discuss information representation in computing; Boolean algebra and logic gates; sequential logic; input/output; and CPU performance. The author also covers ARM architecture, ARM instructions and ARM assembly language which is used in a variety of devices such as cell phones, digital TV, automobiles, routers, and switches. The book contains a set of laboratory experiments related to digital design using Logisim software; in addition, each chapter features objectives, summaries, key terms, review questions and problems. The book is targeted to students majoring Computer Science, Information System and IT and follows the ACM/IEEE 2013 guidelines.

- Comprehensive textbook covering digital design, computer architecture, and ARM architecture and assembly
- Covers basic number system and coding, basic knowledge in digital design, and components of a computer
- Features laboratory exercises in addition to objectives, summaries, key terms, review questions, and problems in each chapter

This book provides readers with the most current knowledge on hazardous waste management practices. It addresses the rapidly changing advances in waste stream characterization and the discovery of new chemicals - which have led to new hazardous wastes, technological innovation, stringent environmental regulations, changes in transport and dispersion modelling of hazardous pollutants, and new waste management techniques. Hazardous Waste Management: Advances in Chemical and Industrial Waste Treatment and Technologies is an invaluable reference for waste management and treatment professionals, chemical engineers and technicians, medical professionals, and environmental regulators, as well as students taking courses



on hazardous waste management, environmental engineering, and environmental science.

Over the past century, mechanization has been an important means for optimizing resource utilization, improving worker health and safety and reducing labor requirements in farming while increasing productivity and quality of 4F (Food, Fuel, Fiber, Feed). Recognizing this contribution, agricultural mechanization was considered as one of the top ten engineering achievements of 20th century by the National Academy of Engineering. Accordingly farming communities have adopted increasing level of automation and robotics to further improve the precision management of crops (including input resources), increase productivity and reduce farm labor beyond what has been possible with conventional mechanization technologies. It is more important than ever to continue to develop and adopt novel automation and robotic solutions into farming so that some of the most complex agricultural tasks, which require huge amount of seasonal labor such as fruit and vegetable harvesting, could be automated while meeting the rapidly increasing need for 4F. In addition, continual innovation in and adoption of agricultural automation and robotic technologies is essential to minimize the use of depleting resources including water, minerals and other chemicals so that sufficient amount of safe and healthy food can be produced for current generation while not compromising the potential for the future generation. This book aims at presenting the fundamental principles of various aspects of automation and robotics as they relate to production agriculture (the branch of agriculture dealing with farming operations from field preparation to seeding, to harvesting and field logistic-

s). The building blocks of agricultural automation and robotics that are discussed in the book include sensing and machine vision, control, guidance, manipulation and end-effector technologies. The fundamentals and operating principles of these technologies are explained with examples from cutting-edge research and development currently going on around the world. This book brings together scientists, engineers, students and professionals working in these and related technologies to present their latest examples of agricultural automation and robotics research, innovation and development while explaining the fundamentals of the technology. The book, therefore, benefits those who wish to develop novel agricultural engineering solutions and/or to adopt them in the future. .

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Mechatronic Systems introduces these developments by considering the dynamic modelling of components together with their interactions. The whole range

of elements is presented from actuators, through different kinds of processes, to sensors. Structured tutorial style takes learning from the basics of unified theoretical modelling, through information processing to examples of system development. End-of-chapter exercises provide ready-made homework or self-tests. Offers practical advice for engineering derived from experience with real systems and application-oriented research. This title is directed primarily towards health care professionals outside of the United States. It is written specifically to meet the needs of nursing students undertaking the common foundation programme. It aims to explain how and why sensitive, holistic and evidence-based nursing care is carried out. Therefore it is relevant to students who will enter all branches of nursing and includes material that is both common to all and specific to each branch. The book aims to provide all students on foundation nursing and health care programmes with material of sufficient depth/breadth to achieve the NMC outcomes required for entry into the branch programmes. There is an emphasis not only on the theory that underpins nursing practice in the common foundation programme but also on nursing skills which form an increasingly emphasized part of the programme. The chapters have been reviewed by experts from each branch and also clinical skills to ensure the content reflects each branch accurately and appropriately. Emphasis on clinical skills & lifelong learning Realistic scenarios reinforce the need for patient/client-centred care with a holistic approach Activity boxes for all branches and age groups in each chapter ensure relevance to nurses in diverse settings An integrated approach to health promotion with activity boxes emphasises that health maintenance

and promotion are central to contemporary nursing practice Reflection, critical thinking and research/appraisal skills are encouraged with a problem centred approach that will help to develop the skills needed to provide sensitive and effective, high quality care and to integrate theory with practice The emphasis on nursing/clinical skills underlines the importance of core skills - an integral part of the patient/client experience Cultural diversity is a core theme throughout The importance of evidence-based practice is highlighted and the text helps readers are assisted to acquire the skills to provide evidence-based care A wide range of general and branch-specific interactive boxes help to develop an understanding of some issues in other branches as well as the core issues that affect all nurses. Self- test questions and answers provide an opportunity for readers to take responsibility for and check their learning. Valuable learning tools are included: glossary of key terms, useful websites and references

This book provides a critical discussion of fuzzy controllers from the perspective of classical control theory. Special emphasis is placed on topics of importance for industrial applications, including self-tuning of fuzzy controllers, optimisation and stability analysis. The text begins with a detailed introduction to fuzzy systems and control theory, and guides the reader to a thorough understanding of up-to-date research results.

This book explores topics that are central to the field of spacecraft attitude determination and control. The authors provide rigorous theoretical derivations of significant algorithms accompanied by a generous amount of qualitative discussions of the subject matter. The book documents the development of the im-

portant concepts and methods in a manner accessible to practicing engineers, graduate-level engineering students and applied mathematicians. It includes detailed examples from actual mission designs to help ease the transition from theory to practice and also provides prototype algorithms that are readily available on the author's website. Subject matter includes both theoretical derivations and practical implementation of spacecraft attitude determination and control systems. It provides detailed derivations for attitude kinematics and dynamics and provides detailed description of the most widely used attitude parameterization, the quaternion. This title also provides a thorough treatise of attitude dynamics including Jacobian elliptical functions. It is the first known book to provide detailed derivations and explanations of state attitude determination and gives readers real-world examples from actual working spacecraft missions. The subject matter is chosen to fill the void of existing textbooks and treatises, especially in state and dynamics attitude determination. MATLAB code of all examples will be provided through an external website.

This book is a comprehensive introduction to model predictive control (MPC), including its basic principles and algorithms, system analysis and design methods, strategy developments and practical applications. The main contents of the book include an overview of the development trajectory and basic principles of MPC, typical MPC algorithms, quantitative analysis of classical MPC systems, design and tuning methods for MPC parameters, constrained multivariable MPC algorithms and online optimization decomposition methods. Readers will then progress to more advanced topics such as nonlinear MPC and its related

algorithms, the diversification development of MPC with respect to control structures and optimization strategies, and robust MPC. Finally, applications of MPC and its generalization to optimization-based dynamic problems other than control will be discussed. Systematically introduces fundamental concepts, basic algorithms, and applications of MPC. Includes a comprehensive overview of MPC development, emphasizing recent advances and modern approaches. Features numerous MPC models and structures, based on rigorous research. Based on the best-selling Chinese edition, which is a key text in China. Predictive Control: Fundamentals and Developments is written for advanced undergraduate and graduate students and researchers specializing in control technologies. It is also a useful reference for industry professionals, engineers, and technicians specializing in advanced optimization control technology.

The field of control provides the principles and methods used to design physical and information systems that maintain desirable performance by sensing and automatically adapting to changes in the environment. This report spells out some of the prospects for control in the current and future technological environment, describes the role the field will play in military, commercial, and scientific applications over the next decade, and recommends actions required to enable new breakthroughs in engineering and technology through the application of control research. This brief yet thorough report provides renewed vision, a detailed list of new application areas, and specific recommendations for future research directions in control, dynamics, and systems, compiled by experts in the field.

The first edition of this book was pub-

lished 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.

An impassioned look at games and game design that offers the most ambitious framework for understanding them to date. As pop culture, games are as important as film or television—but game design has yet to develop a theoretical framework or critical vocabulary. In *Rules of Play* Katie Salen and Eric Zimmerman present a much-needed primer for this emerging field. They offer a unified model for looking at all kinds of games, from board games and sports to computer and video games. As active participants in game culture, the authors have written *Rules of Play* as a catalyst for innovation, filled with new concepts, strategies, and methodologies for creating and understanding games. Building an aesthetics of interactive systems, Salen and Zimmerman define core concepts like "play," "design," and "interac-

tivity." They look at games through a series of eighteen "game design schemas," or conceptual frameworks, including games as systems of emergence and information, as contexts for social play, as a storytelling medium, and as sites of cultural resistance. Written for game scholars, game developers, and interactive designers, *Rules of Play* is a textbook, reference book, and theoretical guide. It is the first comprehensive attempt to establish a solid theoretical framework for the emerging discipline of game design. *Fractional-order Systems and Controls* details the use of fractional calculus in the description and modeling of systems, and in a range of control design and practical applications. It is largely self-contained, covering the fundamentals of

fractional calculus together with some analytical and numerical techniques and providing MATLAB® codes for the simulation of fractional-order control (FOC) systems. Many different FOC schemes are presented for control and dynamic systems problems. Practical material relating to a wide variety of applications is also provided. All the control schemes and applications are presented in the monograph with either system simulation results or real experimental results, or both. *Fractional-order Systems and Controls* provides readers with a basic understanding of FOC concepts and methods, so they can extend their use of FOC in other industrial system applications, thereby expanding their range of disciplines by exploiting this versatile new set of control techniques.