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Introduction to Chemical Engineering Fluid Mechanics John Wiley & Sons

Designed for introductory undergraduate courses in fluid mechanics for chemical engineers, this stand-alone textbook illustrates the fundamental concepts and analytical strategies in a rigorous and systematic, yet mathematically accessible manner. Using both traditional and novel applications, it examines key topics such as viscous stresses, surface tension, and the microscopic analysis of incompressible flows which enables students to understand what is important physically in a novel situation and how to use such insights in modeling. The many modern worked examples and end-of-chapter problems provide calculation practice, build confidence in analyzing physical systems, and help develop engineering judgment. The book also features a self-contained summary of the mathematics needed to understand vectors and tensors, and explains solution methods for partial differential equations. Including a full solutions manual for instructors available at www.cambridge.org/deen, this balanced textbook is the ideal resource for a one-semester course.

Modern Robotics Cambridge University Press

Power system operation from an operator's perspective Power systems are operated with the primary objectives of safety, reliability, and efficiency. Practical Power System Operation is the first book to provide a comprehensive picture of power system operation for both professional engineers and students alike. The book systematically describes the operator's functions, the processes required to operate the system, and the enabling technology solutions deployed to facilitate the processes. In his book, Dr. Ebrahim Vaahedi, an expert practitioner in the field, presents a holistic review of: The current state and workings of power system operation Problems encountered by operators and solutions to remedy the problems Individual operator functions, processes, and the enabling technology solutions Deployment of real-time assessment, control, and optimization solutions in power system operation Energy Management Systems and their architecture Distribution Management Systems and their architecture Power system operation in the changing energy industry landscape and the evolving technology solutions Because power system operation is such a critical function around the world, the consequences of improper operation range from financial repercussions to societal welfare impacts that put people's safety at risk. Practical Power System Operation includes a step-by-step illustrated guide to the operator functions, processes, and decision support tools that enable the processes. As a bonus, it includes a detailed review of the emerging technology and operation solutions that have evolved over the last few years. Written to the standards of higher education and university curriculums, Practical Power System Operation has been classroom tested for excellence and is a must-read for anyone looking to learn the critical skills they need for a successful career in power system operations.

Modern Control Systems Cambridge University Press

"Programming Mobile Robots with Aria and Player" provides a guide to creating object-oriented C++ programs for robots using the Player and Aria APIs within a Linux environment. The book is supported throughout with examples, diagrams, sample programs, and configuration files. MobileRobot's Pioneers are used as vehicles throughout the book, but most of the techniques and programs that are demonstrated for Player are applicable to the other makes and models that the API supports. In addition, the Aria section is also appropriate for other robots made by MobileRobots. The book discusses how to install the various pieces of software needed and also describes how to: configure robots; control robots remotely; program each individual sensor and actuator; and set up and control robots.

"Programming Mobile Robots with Aria and Player" serves as a complete text for undergraduate and postgraduate robotics programming modules, and is also an invaluable reference source for students, teachers and researchers. Additional material for this book can be found at <http://extras.springer.com>. Proceedings of CoMSO 2020 John Wiley & Sons

Textbook concisely introduces engineering thermodynamics, covering concepts including energy, entropy, equilibrium and reversibility Novel explanation of entropy and the second law of thermodynamics Presents abstract ideas in an easy to understand manner Includes solved examples and end of chapter problems Accompanied by a website hosting a solutions manual

Dynamics of Structures: Second Edition John Wiley & Sons

Niku offers comprehensive, yet concise coverage of robotics that will appeal to engineers. Robotic applications are drawn from a wide variety of fields. Emphasis is placed on design along with analysis and modeling. Kinematics and dynamics are covered extensively in an accessible style. Vision systems are discussed in detail, which is a cutting-edge area in robotics. Engineers will also find a running design project that reinforces the concepts by having them apply what they've learned.

Theory of Computing Pearson Higher Ed

An Integrated Approach to Product Development Reliability Engineering presents an integrated approach to the design, engineering, and management of reliability activities throughout the life cycle of a product, including concept, research and development, design, manufacturing, assembly, sales, and service. Containing illustrative guides that include worked problems, numerical examples, homework problems, a solutions manual, and class-tested materials, it demonstrates to product development and manufacturing professionals how to distribute key reliability practices throughout an organization. The authors explain how to integrate reliability methods and techniques in the Six Sigma process and Design for Six Sigma (DFSS). They also discuss relationships between warranty and reliability, as well as legal and liability issues. Other topics covered include: Reliability engineering in the 21st Century Probability life distributions for reliability analysis Process control and process capability Failure modes, mechanisms, and effects analysis Health monitoring and prognostics Reliability tests and reliability estimation Reliability Engineering provides a comprehensive list of references on the topics covered in each chapter. It is an invaluable resource for those interested in gaining fundamental knowledge of the

practical aspects of reliability in design, manufacturing, and testing. In addition, it is useful for implementation and management of reliability programs.

Mechanics of Machines John Wiley & Sons

Designed to meet the needs of undergraduate students, "Introduction to Biomechanics" takes the fresh approach of combining the viewpoints of both a well-respected teacher and a successful student. With an eye toward practicality without loss of depth of instruction, this book seeks to explain the fundamental concepts of biomechanics. With the accompanying web site providing models, sample problems, review questions and more, Introduction to Biomechanics provides students with the full range of instructional material for this complex and dynamic field.

Introduction to Robotics John Wiley & Sons

Industrial revolutions have impacted both, manufacturing and service. From the steam engine to digital automated production, the industrial revolutions have conducted significant changes in operations and supply chain management (SCM) processes. Swift changes in manufacturing and service systems have led to phenomenal improvements in productivity. The fast-paced environment brings new challenges and opportunities for the companies that are associated with the adaptation to the new concepts such as Internet of Things (IoT) and Cyber Physical Systems, artificial intelligence (AI), robotics, cyber security, data analytics, block chain and cloud technology. These emerging technologies facilitated and expedited the birth of Logistics 4.0. Industrial Revolution 4.0 initiatives in SCM has attracted stakeholders' attentions due to its ability to empower using a set of technologies together that helps to execute more efficient production and distribution systems. This initiative has been called Logistics 4.0 of the fourth Industrial Revolution in SCM due to its high potential. Connecting entities, machines, physical items and enterprise resources to each other by using sensors, devices and the internet along the supply chains are the main attributes of Logistics 4.0. IoT enables customers to make more suitable and valuable decisions due to the data-driven structure of the Industry 4.0 paradigm. Besides that, the system's ability of gathering and analyzing information about the environment at any given time and adapting itself to the rapid changes add significant value to the SCM processes. In this peer-reviewed book, experts from all over the world, in the field present a conceptual framework for Logistics 4.0 and provide examples for usage of Industry 4.0 tools in SCM. This book is a work that will be beneficial for both practitioners and students and academicians, as it covers the theoretical framework, on the one hand, and includes examples of practice and real world.

A Guide to C++ Object-Oriented Control Springer Science & Business Media

Complete, state-of-the-art coverage of robot analysis This unique book provides the fundamental knowledge needed for understanding the mechanics of both serial and parallel manipulators. Presenting fresh and authoritative material on parallel manipulators that is not available in any other resource, it offers an in-depth treatment of position analysis, Jacobian analysis, statics and stiffness analysis, and dynamical analysis of both types of manipulators, including a discussion of industrial and research applications. It also features: * The homotopy continuation method and dialytic elimination method for solving polynomial systems that apply to robot kinematics * Numerous worked examples and problems to reinforce learning * An extensive bibliography offering many resources for more advanced study Drawing on Dr. Lung-Wen Tsai's vast experience in the field as well as recent research publications, Robot Analysis is a first-rate text for upper-level undergraduate and graduate students in mechanical engineering, electrical engineering, and computer studies, as well as an excellent desktop reference for robotics researchers working in industry or in government.

An Introduction to Thermodynamics Pearson Educación

The second edition of this book would not have been possible without the comments and suggestions from students, especially those at Columbia University. Many of the new topics introduced here are a direct result of student feedback that helped refine and clarify the material. The intention of this book was to develop material that the author would have liked to have had available as a student. Theory of Applied Robotics: Kinematics, Dynamics, and Control (2nd Edition) explains robotics concepts in detail, concentrating on their practical use. Related theorems and formal proofs are provided, as are real-life applications. The second edition includes updated and expanded exercise sets and problems. New coverage includes: components and mechanisms of a robotic system with actuators, sensors and controllers, along with updated and expanded material on kinematics. New coverage is also provided in sensing and control including position sensors, speed sensors and acceleration sensors. Students, researchers, and practicing engineers alike will appreciate this user-friendly presentation of a wealth of robotics topics, most notably orientation, velocity, and forward kinematics.

Dynamic Modeling and Control of Engineering Systems Oxford University Press, USA

Written to be equally useful for all engineering disciplines, this book is organized around the concept of control systems theory as it has been developed in the frequency and time domains. It provides coverage of classical control employing root locus design, frequency and response design using Bode and Nyquist plots. It also covers modern control methods based on state variable models including pole placement design techniques with full-state feedback controllers and full-state observers. The book covers several important topics including robust control systems and system sensitivity, state variable models, controllability and observability, computer control systems, internal model control, robust PID controllers, and computer-aided design and analysis. For all types of engineers who are interested in a solid introduction to control systems.

Materials Characterization Morgan & Claypool Publishers

As the capability and utility of robots has increased dramatically with new technology, robotic systems can perform tasks that are physically dangerous for humans, repetitive in nature, or require increased accuracy, precision, and sterile conditions to radically minimize human error. The Robotics and Automation Handbook addresses the major aspects of designing, fabricating, and enabling robotic systems and their various applications. It presents kinetic and dynamic methods for analyzing robotic systems, considering factors such as force and torque. From these analyses, the book develops several controls approaches, including servo actuation, hybrid control, and trajectory planning. Design aspects include determining specifications for a robot, determining its configuration, and utilizing sensors and actuators. The featured applications focus on how the specific difficulties are overcome in the development of the robotic system. With the ability to increase human safety and precision in applications ranging from handling hazardous materials and exploring extreme environments to manufacturing and medicine, the uses for robots are growing steadily. The Robotics and Automation Handbook provides a solid foundation for engineers and scientists interested in designing, fabricating, or utilizing robotic systems.

Principles of Modern Communication Systems Cambridge University Press

For courses in Micro-Electro-Mechanical Systems (MEMS) taken by advanced undergraduate students, beginning graduate students, and professionals. Foundations of MEMS is an entry-level text designed to systematically teach the specifics of MEMS to an interdisciplinary audience. Liu discusses designs, materials, and fabrication issues related to the MEMS field by employing

concepts from both the electrical and mechanical engineering domains and by incorporating evolving microfabrication technology — all in a time-efficient and methodical manner. A wealth of examples and problems solidify students' understanding of abstract concepts and provide ample opportunities for practicing critical thinking.

Introduction to VHDL Tata McGraw-Hill Education

An accessible, yet mathematically rigorous, one-semester textbook, engaging students through use of problems, examples, and applications.

ROBOTICS AND CONTROL Cambridge University Press

Master the principles of thermodynamics, and understand their practical real-world applications, with this deep and intuitive undergraduate textbook.

Robotics and Automation Handbook Springer Science & Business Media

Introduces the basic concepts of FEM in an easy-to-use format so that students and professionals can use the method efficiently and interpret results properly. Finite element method (FEM) is a powerful tool for solving engineering problems both in solid structural mechanics and fluid mechanics. This book presents all of the theoretical aspects of FEM that students of engineering will need. It eliminates overlong math equations in favour of basic concepts, and reviews of the mathematics and mechanics of materials in order to illustrate the concepts of FEM. It introduces these concepts by including examples using six different commercial programs online. The all-new, second edition of *Introduction to Finite Element Analysis and Design* provides many more exercise problems than the first edition. It includes a significant amount of material in modelling issues by using several practical examples from engineering applications. The book features new coverage of buckling of beams and frames and extends heat transfer analyses from 1D (in the previous edition) to 2D. It also covers 3D solid element and its application, as well as 2D.

Additionally, readers will find an increase in coverage of finite element analysis of dynamic problems. There is also a companion website with examples that are concurrent with the most recent version of the commercial programs. Offers elaborate explanations of basic finite element procedures. Delivers clear explanations of the capabilities and limitations of finite element analysis. Includes application examples and tutorials for commercial finite element software, such as MATLAB, ANSYS, ABAQUS and NASTRAN. Provides numerous examples and exercise problems. Comes with a complete solution manual and results of several engineering design projects. *Introduction to Finite Element Analysis and Design, 2nd Edition* is an excellent text for junior and senior level undergraduate students and beginning graduate students in mechanical, civil, aerospace, biomedical engineering, industrial engineering and engineering mechanics.

Mobile Robotics CRC Press

A mathematically accessible textbook introducing all the tools needed to address modern inference problems in engineering and data science.

Practical Power System Operation Tata McGraw-Hill Education

Covers all aspects of the VHDL language

Modeling, Simulation and Optimization Springer Science & Business Media

Features The book provides a compressive overview of the fundamental skills underlying the mechanism and control of manipulators. Detailed chapter on Velocity Transformations, jacobian and Singularities. Trajectory Planning is developed using both joint space and Cartesian space methods. Dynamic Modeling is treated by Lagrange-Euler and Euler-Newton formulations; complex derivations are put in the appendix to ensure a smooth flow for the reader. A comprehensive chapter on Robotic Control covering control strategies like PD, PID, computed torque control, force and impedance control at an appropriate level. A METLAB tutorial on using the package for Robotics is included as an appendix. A full chapter on the industrial applications of robots. All important industrial robot configurations with varying degrees of freedom are covered in various chapters and solved examples. An elaborate chapter (Chapter 9) devoted to Robotic Sensors and Vision. Includes over 50 solved examples and more than 270 simple-to-complex end-of-chapter exercises. Appendix on the underlying maths – Linear Algebra, Moment of Inertia Tensor and Equations of Motion

Introduction to Finite Element Analysis and Design CRC Press

Presenting general designs and concepts, this book offers a strong cross-disciplinary perspective. It emphasizes creative problem-solving to help readers learn how to apply the information. Mechanical, electrical, architectural, and many other examples are integrated throughout the chapters. Readers will then learn how to imagine, visualize, and draw products and systems. The information in this book can be used by designers in a wide variety of industries.