





Does a machine run well by virtue of its accuracies, or its freedoms? This work presents an exciting, diagrammatic display of the hidden geometry of freedom and constraint. It bolsters the imaginative design of robots, but applies across all fields of machinery. The figures and their captions comprise alone a self-standing story, and this connects effectively with the rigorously argued text. The seamless combination of the two volumes (1984, 1990) renders the internal cross-referencing (forward and backward within the volumes) easier to look up. The appearance of this paperback is a clear testament to the work's ongoing readership. The term screw theory occurs throughout. This relates (after Ball) to the book's philosophy; and one might equally mention kinetostatics (after Federhofer). An all-pervading, counter-intuitive fact accordingly presents itself: while, analogously, angular velocity relates to force, linear velocity relates to couple. A direct consequence of Freedom in Machinery is a more recent book by the same author. Specifically titled General Spatial Involute Gearing and published in Germany (2003), it exemplifies the many ways in which Freedom in Machinery clarifies the enigmatic field of spatial mechanism. That field continuously expands with the current, continuous thrust of ordinary engineering practice.

Featuring contributions from worldwide leaders in the field, the carefully crafted Electric Power Generation, Transmission, and Distribution, Third Edition (part of the five-volume set, The Electric Power Engineering Handbook) provides convenient access to detailed information on a diverse array of power engineering topics. Updates to nearly every chapter keep this book at the forefront of developments in modern power systems, reflecting international standards, practices, and technologies. Topics covered include: Electric power generation: nonconventional methods Electric power generation: conventional methods Transmission system Distribution systems Electric power utilization Power quality L.L. Grigsby, a respected and accomplished authority in power engineering, and section editors Saifur Rahman, Rama Ramakumar, George Karady, Bill Kersting, Andrew Hanson, and Mark Halpin present substantially new and revised material, giving readers up-to-date information on core areas. These include advanced energy technologies, distributed utilities, load characterization and modeling, and power quality issues such as power system harmonics, voltage sags, and power quality monitoring. With six new and 16 fully revised chapters, the book supplies a high level of detail and, more importantly, a tutorial style of writing and use of photographs and graphics to help the reader understand the material. New chapters cover: Water Transmission Line Reliability Methods High Voltage Direct Current Transmission System Advanced Technology High-Temperature Conduction Distribution Short-Circuit Protection Linear Electric Motors A volume in the Electric Power Engineering Handbook, Third Edition. Other volumes in the set: K12648 Power Systems, Third Edition (ISBN: 9781439856338) K13917 Power System Stability and Control, Third Edition (ISBN: 9781439883204) K12650 Electric Power Substations Engineering, Third Edition (ISBN: 9781439856383) K12643 Electric Power Transformer Engineering, Third Edition (ISBN: 9781439856291)

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Design Optimization of Fluid Machinery: Applying Computational Fluid Dynamics and Numerical Optimization Drawing on extensive research and experience, this timely reference brings together numerical optimization methods for fluid machinery and its key industrial applications. It logically lays out the context required to understand computational fluid dynamics by introducing the basics of fluid mechanics, fluid machines and their components. Readers are then introduced to single and multi-objective optimization methods, automated optimization, surrogate models, and evolutionary algorithms. Finally, design approaches and applications in the areas of pumps, turbines, compressors, and other fluid machinery systems are clearly explained, with special emphasis on renewable energy systems. Written by an international team of leading experts in the field Brings together optimization methods using computational fluid dynamics for fluid machinery in one handy reference Features industrially important applications, with key sections on renewable energy systems Design Optimization of Fluid Machinery is an essential guide for graduate students, researchers, engineers working in fluid machinery and its optimization methods. It is a comprehensive reference text for advanced students in mechanical engineering and related fields of fluid dynamics and aerospace engineering.

Today's readers learn the basic concepts of power systems as they master the tools necessary to apply these skills to real world situations with POWER SYSTEM ANALYSIS AND DESIGN, 6E. This new edition highlights physical concepts while also giving necessary attention to mathematical techniques. The authors develop both theory and modeling from simple beginnings so readers are prepared to readily extend these principles to new and complex situations. Software tools and the latest content throughout this edition aid readers with design issues while reflecting the most recent trends in the field. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

This collection of solved electrical engineering problems should help you review for the Fundamentals of Engineering (FE) and Principles and Practice (PE) exams. With this guide, you'll hone your skills as well as your understanding of both fundamental and more difficult topics. 100% problems and step-by-step solutions.

Kinematics, Dynamics, and Design of Machinery, Third Edition, presents a fresh approach to kinematic design and analysis and is an ideal textbook for senior undergraduates and graduates in mechanical, automotive and production engineering Presents the traditional approach to the design and analysis of kinematic problems and shows how GCP can be used to solve the same problems more simply Provides a new and simpler approach to cam design Includes an increased number of exercise problems Accompanied by a website hosting a solutions manual, teaching slides and MATLAB® programs

Laboratory Applications in Microbiology: A Case Study Approach uses real-life case studies as the basis for exercises in the laboratory. This is the only microbiology lab manual focusing on this means of instruction, an approach particularly applicable to the microbiology laboratory. The author has carefully organized the exercises so that students

develop a solid intellectual base beginning with a particular technique, moving through the case study, and finally applying new knowledge to unique situations beyond the case study.

Considering that the biggest machines that do the most work are made up of smaller machines and components, it becomes obvious that when a large machine breaks, it is normally due to small components acting antagonistically. Detailing a time-tested method for increasing productivity and lowering operational costs, Spend Analysis and Specification Development Using Failure Interpretation explains how to establish performance-based procurement specifications for the components, devices, and items that contribute the most to operational downtime and repair/replacement costs. The book emphasizes the critical need to perform both spend and failure analysis in order to develop a procurement document, which will ultimately reduce overall costs. Accompanied by a CD with helpful material such as, specification checklists, case study worksheets, form letters, and return on investment (ROI) worksheets that you can customize to your needs, the text discusses how to: Identify the products that will cost the most if they fail Develop performance-based procurement specifications to reduce direct and indirect costs Examine cost analysis as it relates to operations, maintenance, and production Determine effective criteria based on properties, test results, and standards for each operation Written by an industry expert with decades of experience giving seminars, training customers and associates, and authoring numerous papers and articles, the text provides the real-world understanding of the influential components and materials' physical properties needed to engage in effective failure and spend analysis. It addresses product submission and monitoring and includes helpful tools so you can immediately get started on conducting your own cost-saving analysis.

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