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Photocatalysis, reactions carried out in the presence of a semiconductor and light, is rapidly becoming one of the most active areas of chemical research, with applications in areas such as electrochemistry, medicine, and environmental chemistry. Photocatalysis: Principles and Applications stresses the development of various types of photocatalytic semiconductors, including binary, ternary, quaternary, and composite, and their modifications by metallization, sensitization, and doping to enhance their photocatalytic activities. In addition to describing the principles and mechanisms of photocatalysis, it also discusses other possible applications of photocatalysis such as use as antifouling agents, controlling air pollution by degrading contaminants present in the environment, self-cleaning of glasses and tiles in the presence of light/artificial light, green composites, wastewater treatment, hydrogen generation, and inactivation of microorganisms. The book also describes medical applications and summarizes efforts in the field of photosplitting of water as a newer energy source and photoreduction of carbon dioxide for providing synthetic fuels and also a step towards mimicking photosynthesis. Introduces the basic

principle of photocatalysis. Provides an overview of the types of semiconductors, their immobilization, and modifications to make them more active. Gives possible applications of photocatalysis in wastewater treatment and strategy to combat against different kinds of pollutions like water, air, and soil. Summarizes efforts in the field of photosplitting of water as a newer energy source and photoreduction of carbon dioxide for providing synthetic fuels and as a step towards mimicking photosynthesis. Discusses inactivation of different kinds of microorganisms. Covers medical applications. Features Introduces the basic principle of photocatalysis. Provides an overview of the types of semiconductors, their immobilization, and modifications to make them more active. Gives possible applications of photocatalysis in wastewater treatment and strategy to combat against different kinds of pollutions like water, air, and soil. Summarizes efforts in the field of photosplitting of water as a newer energy source and photoreduction of carbon dioxide for providing synthetic fuels and as a step towards mimicking photosynthesis. Discusses inactivation of different kinds of microorganisms. Covers medical applications. This introduction to the principles and application of electrochemistry is presented in a manner designed for undergraduates in chemistry and related fields. The author covers the essential aspects of the subject and points the way to further study, his concern being with the overall shape of electrochemistry, its

coherence and its wider application. This edition differs from its predecessors in having principles and applications separated, and greater prominence is given to areas such as electrochemical sensors and electroanalytical techniques, of which a number of modern methods were not included in previous editions. A range of numerical problems and outline solutions is provided for each chapter to cover most situations that a student might encounter. Giorgio Rizzoni and James Kearns 6th edition provides a solid overview of the electrical engineering discipline that is especially geared toward the many non-electrical engineering students who take this course. The hallmark feature of the text is its liberal use of practical applications to illustrate important principles. The applications come from every field of engineering and feature exciting technologies such as Ohio State's world-record setting electric car. The appeal to non-EE's is further heightened by such special features as the book's Focus on Measurement sections, Focus on Methodology sections, and Make the Connection sidebars. McGraw-Hill is also proud to offer Connect with the sixth edition of Rizzoni and Kearns, Principles and Applications of Electrical Engineering. Connect is the only integrated learning system that empowers students by continuously adapting to deliver precisely what they need, when they need it, how they need it, so that your class time is more engaging and effective. Rizzoni and Kearns Principles and Applications of Electrical

Engineering, sixth edition, includes the power of McGraw-Hill's LearnSmart--a proven adaptive learning program that helps students learn faster, study more efficiently, and retain more knowledge for greater success. LearnSmart is included in ConnectPlus. Computational Fluid Dynamics (CFD) is an important design tool in engineering and also a substantial research tool in various physical sciences as well as in biology. The objective of this book is to provide university students with a solid foundation for understanding the numerical methods employed in today's CFD and to familiarise them with modern CFD codes by hands-on experience. It is also intended for engineers and scientists starting to work in the field of CFD or for those who apply CFD codes. Due to the detailed index, the text can serve as a reference handbook too. Each chapter includes an extensive bibliography, which provides an excellent basis for further studies. Covering the theory, application, and testing of contact materials, *Electrical Contacts: Principles and Applications, Second Edition* introduces a thorough discussion on making electric contact and contact interface conduction; presents a general outline of, and measurement techniques for, important corrosion mechanisms; considers the results of contact wear when plug-in connections are made and broken; investigates the effect of thin noble metal plating on electronic connections; and relates crucial considerations for making high- and low-power contact joints. It examines

contact use in switching devices, including the interruption of AC and DC circuits with currents in the range 10mA to 100kA and circuits up to 1000V, and describes arc formation between open contacts and between opening contacts. Arcing effects on contacts such as erosion, welding, and contamination are also addressed. Containing nearly 3,000 references, tables, equations, figures, drawings, and photographs, the book provides practical examples encompassing everything from electronic circuits to high power circuits, or microamperes to mega amperes. The new edition: Reflects the latest advances in electrical contact science and technology Examines current research on contact corrosion, materials, and switching Includes updates and revisions in each chapter, as well as up-to-date references and new figures and examples throughout Delivers three new chapters on the effects of dust contamination, electronic sensing for switching systems, and contact phenomena for micro-electronic systems (MEMS) applications With contributions from recognized experts in the field, *Electrical Contacts: Principles and Applications, Second Edition* assists practicing scientists and engineers in the prevention of costly system failures, as well as offers a comprehensive introduction to the subject for technology graduate students, by expanding their knowledge of electrical contact phenomena. An attempt to explain and chart the photochemical processes and to provide an

understanding of the relationships between reactivity and electronic and molecular structure. The book surveys photochemical processes found in nature, and some commercial and laboratory applications. Optical technology is essential to communications and medical technology. K.K. Sharma has written a comprehensive volume on optics. Beginning with introductory ideas and equations, Sharma takes the reader through the world of optics detailing problems encountered, advanced subjects, and actual applications. Elegantly written, this book rigorously examines optics with over 300 illustrations and several problems in each chapter. The book begins with light propagation in anisotropic media considered much later in most books. Sharma has started with this because it provides a more general and beautiful example of light propagation. Nearly one third of the book deals with applications of optics. This simple idea of merging the sometimes overwhelming and dry subject of optics with real world applications will create better future engineers. It will make 'optics' jump off the page for readers and they will see it take shape in the world around them. In presenting optics practically, as well as theoretically, readers will come away not only with a complete knowledge base but a context in which to place it. FOR INSTRUCTORS: To obtain access to the solutions manual for this title simply register on our textbook website (textbooks.elsevier.com) and request access to the Electronics and Electrical Engineering

subject area. Once approved (usually within one business day) you will be able to access all of the instructor-only materials through the "Instructor Manual" link on this book's academic web page at textbooks.elsevier.com.
*Strong emphasis on applications to demonstrate the relevance of the theory
*Includes chapter on problem solving of ray deviations, focusing errors, and distortion
*Problems are included at the end of each chapter for thorough understanding of this dense subject matter
A powerful pocket guide for practitioners that distills all of the research and materials found in Otto Scharmer's seminal texts *Theory U* and *Leading from the Emerging Future. Creating a Better Future*. This book offers a concise, accessible guide to the key concepts and applications in Otto Scharmer's classic *Theory U*. Scharmer argues that our capacity to pay attention shapes the world. What prevents us from attending to situations more effectively is that we aren't fully aware of that interior condition from which our attention and actions originate. Scharmer calls this lack of awareness our blind spot. He illuminates the blind spot in leadership today and offers hands-on methods to help change makers overcome it through the process, principles, and practices of *Theory U*. And he outlines a framework for updating the "operating systems" of our educational institutions, our economies, and our democracies. This book enables leaders and organizations in all industries and sectors to shift awareness, connect with the highest

future possibilities, and strengthen the capacity to co-shape the future. *Principles and Applications of Antimicrobial Nanomaterials* introduces the reader to the microbial world, antimicrobial nanomaterials, how microbial evolution works, and how knowledge of these areas can facilitate the development of sustainable antimicrobials. Due to the widespread occurrence of multidrug-resistant microbes, there is an increasing interest in the use of novel nanostructured materials as antimicrobials. This book is designed to help researchers from fields such as materials science, nanoscience, and nanoengineering who are attempting to develop these antimicrobial materials. Provides crucial background in microbiology and microbial evolution to help researchers design experiments that can produce sustainable results. Offers detailed coverage on the antimicrobial properties of different types of nanomaterials. Discusses the major challenges of using nanomaterials for antimicrobial applications. *Food Processing: Principles and Applications* second edition is the fully revised new edition of this best-selling food technology title. Advances in food processing continue to take place as food scientists and food engineers adapt to the challenges imposed by emerging pathogens, environmental concerns, shelf life, quality and safety, as well as the dietary needs and demands of humans. In addition to covering food processing principles that have long been essential to food quality and safety, this edition

of Food Processing: Principles and Applications, unlike the former edition, covers microbial/enzyme inactivation kinetics, alternative food processing technologies as well as environmental and sustainability issues currently facing the food processing industry. The book is divided into two sections, the first focusing on principles of food processing and handling, and the second on processing technologies and applications. As a hands-on guide to the essential processing principles and their applications, covering the theoretical and applied aspects of food processing in one accessible volume, this book is a valuable tool for food industry professionals across all manufacturing sectors, and serves as a relevant primary or supplemental text for students of food science. A volume in the Principles and Applications in Engineering series, Clinical Engineering focuses on managing the deployment of medical technology and integrating it appropriately with desired clinical practices. It provides a description of the wide range of responsibilities clinical engineers encounter, describes technology management and assessment. Forming a wide and comprehensive coverage of the fundamental aspects of biotechnology, Biotechnology: Principles and Applications serves as the perfect guide for students in understanding the principles and applied aspects of the field. This book presents the subject matter tailor-made for the latest syllabus as per CBCS Odisha to enable its students to study the course material

through a single book without having to refer to multiple sources and comprehend the subject in simple, understandable language. With its exciting introduction of the Harley-Davidson focus company theme, this book continues to provide a solid, enduring foundation of the tools of modern theory while at the same time developing the logic behind their use. The “10 Principles of Finance” (formerly “Axioms”) provide the framework, or “the big picture” of finance, which ties the major concepts of the book together. A six-part organization covers the scope and environment of financial management, valuation of financial assets, investment in long-term assets, capital structure and dividend policy, working-capital management, and special topics in finance, and special topics in finance. For an enduring understanding of the basic tools and fundamental principles upon which finance is based. This fifth edition of the most accessible introduction to MRI principles and applications from renowned teachers in the field provides an understandable yet comprehensive update. Accessible introductory guide from renowned teachers in the field Provides a concise yet thorough introduction for MRI focusing on fundamental physics, pulse sequences, and clinical applications without presenting advanced math Takes a practical approach, including up-to-date protocols, and supports technical concepts with thorough explanations and illustrations Highlights sections that are directly relevant to radiology board exams

Presents new information on the latest scan techniques and applications including 3 Tesla whole body scanners, safety issues, and the nephrotoxic effects of gadolinium-based contrast media Heat Transfer Principles and Applications is a welcome change from more encyclopedic volumes exploring heat transfer. This shorter text fully explains the fundamentals of heat transfer, including heat conduction, convection, radiation and heat exchangers. The fundamentals are then applied to a variety of engineering examples, including topics of special and current interest like solar collectors, cooling of electronic equipment, and energy conservation in buildings. The text covers both analytical and numerical solutions to heat transfer problems and makes considerable use of Excel and MATLAB(R) in the solutions. Each chapter has several example problems and a large, but not overwhelming, number of end-of-chapter problems. This new resource presents the principles and applications in the emerging discipline of Activity-Based Intelligence (ABI). This book will define, clarify, and demystify the tradecraft of ABI by providing concise definitions, clear examples, and thoughtful discussion. Concepts, methods, technologies, and applications of ABI have been developed by and for the intelligence community and in this book you will gain an understanding of ABI principles and be able to apply them to activity based intelligence analysis. The book is intended for intelligence professionals, researchers, intelligence studies,

policy makers, government staffers, and industry representatives. This book will help practicing professionals understand ABI and how it can be applied to real-world problems. Optics clearly explains the principles of optics using excellent pedagogy to support student learning. Beginning with introductory ideas and equations, K.K. Sharma takes the reader through the world of optics by detailing problems encountered, advanced subjects, and actual applications. Elegantly written, this book rigorously examines optics with over 300 illustrations and several problems in each chapter. The book begins with light propagation in anisotropic media considered much later in most books. Nearly one third of the book deals with applications of optics. This simple idea of merging the sometimes overwhelming and dry subject of optics with real world applications will create better future engineers. It will make 'optics' jump off the page for readers and they will see it take shape in the world around them. In presenting optics practically, as well as theoretically, readers will come away not only with a complete knowledge base but a context in which to place it. This book is recommended for optical engineers, libraries, senior undergraduate students, graduate students, and professors. Strong emphasis on applications to demonstrate the relevance of the theory Includes chapter on problem solving of ray deviations, focusing errors, and distortion Problems are included at the end of each chapter for thorough

understanding of this dense subject matter Tocci and Widmer use a block diagram approach to basic logic operations, enabling readers to have a firm understanding of logic principles before they study the electrical characteristics of the logic ICs. KEY TOPICS For each new device or circuit, the authors describe the principle of the operation, give thorough examples, and then show its actual application. An excellent reference on modern digital systems. Considers a new generation of sensors for use in industrial processes, which measure the chemical environment directly by means of a biological agent mainly enzymes so far. Various specialists from Europe, the US, and Japan identify the device's place in their disciplines; review the principles of m From one person to the next, optimal health is governed by a huge array of minor genetic differences. When modulated by a variety of food bioactives, these differences result in changes in gene expression and subsequent phenotypic expression. Combining biomedical and social science with contributions from leaders in both fields, *Personalized Nutrition: Principles and Applications* illustrates molecular, physiological, epidemiological, and public health aspects with examples from major diseases and discusses the behavioral, ethical, and consumer perspectives that will influence a successful introduction of personalized nutrition. Divided into three sections, the book answers pertinent questions crucial to the mainstream acceptance of personalized

nutrition: to what extent is this personal diet-and-health relationship practically valid? how can nutrition science demonstrate this? And what is the proposition of stakeholders in society, including the consumer? The book begins with an overview of the state-of-the-science in nutrigenomic technologies including transcriptomics, proteomics, and metabolomics. It covers the use of genomics technology for a better understanding of the molecular mechanisms involved in major diet-related chronic disorders such as chronic inflammation, cardiovascular disease, diabetes, cancer, and obesity. Section two compares the practices and opinions of scientists, food companies, consumers, competitive athletes, and health care providers on the subject of personalized nutrition. It reviews marketing potential, consumer attitudes, and the ethical issues surrounding personalized advice. The final section focuses on humanitarian concerns related to developing countries and calls for international efforts to develop best practices, collaboration, and dataset sharing. The authors also consider ongoing innovations in food technology, nutrigenomics, and food delivery systems. *Analytical Methods for Pesticides, Plant Growth Regulators, and Food Additives, Volume 1: Principles, Methods, and General Applications* provides information on analytical techniques useful for the determination of pesticides, plant growth regulators, and food additives. The book discusses the potential hazard of minute residues to human and animal

health; the principles of formulation and residue analyses; and the principles of food additive analysis. The text also describes the extraction and clean-up procedures; and the principles of toxicological testing methods. The methods for pesticide analysis in meat products; and the formulation and residue analysis in government laboratories are also considered. The book further tackles other methods, such as spectrophotometric methods, chromatography, isotope methods, enzymatic methods; and bioassay. Agricultural toxicologists and people studying pesticides and food additives will find the text invaluable. Publisher description Lithium secondary batteries have been key to mobile electronics since 1990. Large-format batteries typically for electric vehicles and energy storage systems are attracting much attention due to current energy and environmental issues. Lithium batteries are expected to play a central role in boosting green technologies. Therefore, a large number of scientists and engineers are carrying out research and development on lithium secondary batteries. The book is written in a straightforward fashion suitable for undergraduate and graduate students, as well as scientists, and engineers starting out in the field. The chapters in this book have been thoroughly edited by a collective of experts to achieve a cohesive book with a consistent style, level, and philosophy. They cover a wide range of topics, including principles and technologies of key materials such as the cathode, anode,

electrolyte, and separator. Battery technologies such as design, manufacturing processes, and evaluation methods as well as applications are addressed. In addition, analytical methods for determining electrochemical and other properties of batteries are also included. Hence, this book is a must-have for everyone interested in obtaining all the basic information on lithium secondary batteries. This is an introductory textbook for an emerging paradigm that addresses the failure of conventional economics to reflect the value of clean air, water, species diversity and generational equity. It defines a revolutionary 'transdiscipline' that incorporates insights from the environmental sciences. Maximum Principles and Their Applications Renowned international academicians and food industry professionals have collaborated to create Food Processing: Principles and Applications. This practical, fully illustrated resource examines the principles of food processing and demonstrates their application by describing the stages and operations for manufacturing different categories of basic food products. Ideal as an undergraduate text, Food Processing stands apart in three ways: The expertise of the contributing authors is unparalleled among food processing texts today. The text is written mostly by non-engineers for other non-engineers and is therefore user-friendly and easy to read. It is one of the rare texts to use commodity manufacturing to illustrate the principles of

food processing. As a hands-on guide to the essential processing principles and their application, this book serves as a relevant primary or supplemental text for students of food science and as a valuable tool for food industry professionals. Business Communication, Business Writing found in departments of Business, English or Communication. This text is designed to help students improve their ability to communicate more effectively especially in a business setting both in writing and orally. It outlines writing concepts essential for all types of business documents, discusses appropriate content and structure for specific types of business documents, and explains how employees can make more effective presentations in both small and larger groups. Asymmetric synthesis remains a challenge to practicing scientists as the need for enantiomerically pure or enriched compounds continues to increase. Over the last decade, a large amount of literature has been published in this field. Principles and Applications of Asymmetric Synthesis consolidates and evaluates the most useful methodologies into a one-volume resource for the convenience of practicing scientists and students. Authored by internationally renowned scientists in the field, this reliable reference covers more than 450 reactions and includes important stoichiometric as well as catalytic asymmetric reactions. The first chapter reviews the basic principles, common nomenclature, and analytical methods,

and the remainder of the book is organized according to reaction type. The text examines such topics as: Carbon-carbon bond formations involving carbonyls, enamines, imines, and enolates Asymmetric C-O bond formations including epoxidation, dihydroxylation, and aminohydroxylation Asymmetric synthesis using the Diels-Alder reaction and other cyclizations Applications to the total synthesis of natural products Use of enzymes in asymmetric synthesis Practicing chemists in the pharmaceutical, fine chemical, and agricultural professions as well as graduate students will find that Principles and Applications of Asymmetric Synthesis affords comprehensive and current coverage. Fluorescence spectroscopy is an important investigational tool in many areas of analytical science, due to its extremely high sensitivity and selectivity. With many uses across a broad range of chemical, biochemical and medical research, it has become an essential investigational technique allowing detailed, real-time observation of the structure and dynamics of intact biological systems with extremely high resolution. It is particularly heavily used in the pharmaceutical industry where it has almost completely replaced radiochemical labelling. Principles and Applications of Fluorescence Spectroscopy gives the student and new user the essential information to help them to understand and use the technique confidently in their research. By integrating the treatment of absorption and fluorescence, the student is

shown how fluorescence phenomena arise and how these can be used to probe a range of analytical problems. A key element of the book is the inclusion of practical laboratory experiments that illustrate the fundamental points and applications of the technique. The latest edition of a highly successful textbook, Mass Spectrometry, Third Edition provides students with a complete overview of the principles, theories and key applications of modern mass spectrometry. All instrumental aspects of mass spectrometry are clearly and concisely described: sources, analysers and detectors. Tandem mass spectrometry is introduced early on and then developed in more detail in a later chapter. Emphasis is placed throughout the text on optimal utilisation conditions. Various fragmentation patterns are described together with analytical information that derives from the mass spectra. This new edition has been thoroughly revised and updated and has been redesigned to give the book a more contemporary look. As with previous editions it contains numerous examples, references and a series of exercises of increasing difficulty to encourage student understanding. Updates include: Increased coverage of MALDI and ESI, more detailed description of time of flight spectrometers, new material on isotope ratio mass spectrometry, and an expanded range of applications. Mass Spectrometry, Third Edition is an invaluable resource for all undergraduate and postgraduate students using this technique

in departments of chemistry, biochemistry, medicine, pharmacology, agriculture, material science and food science. It is also of interest for researchers looking for an overview of the latest techniques and developments. Known for its uncompromising academic rigour and easy-to-read style and format, Stephen B Klein's Learning is back in its Fifth Edition! This book provides a broad overview of photonic crystals and, as the title suggests, covers their principles and applications. It is written from a physics point of view with an emphasis on materials science. Equations are well explained and often completely avoided to increase the readability of the book. The book is divided into eight chapters, starting with a brief introduction. The second chapter deals with different dimensionalities of the photonic crystals and their properties. The third chapter is very interestingly written and provides a survey of the various synthesis methods used for production of photonic crystals, including chemical routes, lithography, and self-assembly of colloidal photonic crystals. Chapters 4–8 constitute the bulk of the book and provide examples of applications of these photonic crystals. Chapter 4 offers a good explanation of optical switching. Bandgap and defect mode switching are also brought into focus along with many other mechanisms—14 different switching mechanisms in all, including thermal, electro, and magneto switching. Frequency tuning of photonic crystal filters with special attention to nanosize photonic crystals is

illustrated, providing a direct perspective on applications of these materials in integrated photonic circuits. The transition from chapter 5 to 6 dealing with photonic crystal lasers is smooth, especially after a clear description of frequency tuning. Here, one- to three-dimensional photonic lasers are explained along with laser oscillations produced by a variety of microcavity methods. Metallodielectric and liquid-crystal photonic lasers are equally well illustrated. Chapter 7 introduces logic devices based on photonic crystals. This chapter clearly explains, with the help of simple illustrations, how to obtain AND, OR, and XOR logic gates. Chapter 8 concludes the book by presenting possible applications, including gas, chemical, fluid, and cell sensing; their workings are very well described from a fundamental point of view. The diagrams and illustrations are appropriate and eye catching. There are ample references; thus readers are able to find more detailed information to satisfy their curiosity if the book does not suffice. Even though the introduction provides basics of these photonic crystals, I do get the impression that the bigger picture is missing. A nonexpert may not understand the direct application of such materials right from the beginning of the book. A flowchart or a diagram of these photonic

crystals, illustrating applications in daily life at the beginning of the book, could attract a broader readership. In this regard, I believe that this book is most adapted to physicists with a materials science background or vice versa. However, one should take into consideration that the principles of photonic crystals cannot be explained without physics, and therefore the quality of this book remains intact and could very well serve as a textbook for future physicists. "This book focuses on data mining for co-location pattern, a valid method for identifying patterns from all types of data and applying them in business intelligence and analytics. It explains the fundamentals of co-location pattern mining, co-location decision tree, and maximal instance co-location pattern mining along with an in-depth overview of data mining, machine learning, and statistics. This arrangement of chapters helps readers understand the methods of co-location pattern mining step-by-step and their applications in pavement management, image classification, geospatial buffer analysis, etc"-- Ellipsometry is a powerful tool used for the characterization of thin films and multi-layer semiconductor structures. This book deals with fundamental principles and applications of spectroscopic ellipsometry (SE). Beginning with an overview

of SE technologies the text moves on to focus on the data analysis of results obtained from SE, Fundamental data analyses, principles and physical backgrounds and the various materials used in different fields from LSI industry to biotechnology are described. The final chapter describes the latest developments of real-time monitoring and process control which have attracted significant attention in various scientific and industrial fields. This widely-used text prepares students for entry-level jobs in electronics, electrical trades and related fields. Its level and approach are ideal for both electronics and electricity programs looking for a relatively short, applied book covering DC/AC circuits. Additional chapters on topics such as safety, transformers, motors, instrumentation, and residential wiring are also included. No prior knowledge of electricity is assumed; the only prerequisites are arithmetic and basic algebra. Practical skills are emphasized throughout the text, and supported in the hands-on work provided in the companion Experiments Manual. MultiSim circuit files are provided, on a bound-in CD ROM, for those who want to bring software simulation work into their classes and labs.

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