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High-Performance Computing using FPGA covers the area of high performance reconfigurable computing (HPRC). This book provides an overview of architectures, tools and applications for High-Performance Reconfigurable Computing (HPRC). FPGAs offer very high I/O bandwidth and fine-grained, custom and flexible parallelism and with the ever-increasing computational needs coupled with the frequency/power wall, the increasing maturity and capabilities of FPGAs, and the advent of multicore processors which has caused the acceptance of parallel computational models. The Part on architectures will introduce different FPGA-based HPC platforms: attached co-processor HPRC architectures such as the CHREC's Novo-G and EPCC's Maxwell systems; tightly coupled HPRC architectures, e.g. the Convey hybrid-core computer; reconfigurably networked HPRC architectures, e.g. the QPACE system, and standalone HPRC architectures such as EPFL's CONFETTI system. The Part on Tools will focus on high-level programming approaches for HPRC, with chapters on C-to-Gate tools (such as Impulse-C, AutoESL, Handel-C, MORA-C++); Graphical tools (MATLAB-Simulink, NI LabVIEW); Domain-

specific languages, languages for heterogeneous computing (for example OpenCL, Microsoft's Kiwi and Alchemy projects). The part on Applications will present case from several application domains where HPRC has been used successfully, such as Bioinformatics and Computational Biology; Financial Computing; Stencil computations; Information retrieval; Lattice QCD; Astrophysics simulations; Weather and climate modeling. Developed within the context of the expansion of the Canadian welfare state in the years following the Great Depression, the present organization of Canadian health care delivery is now in serious need of reform. This book documents the causes and effects of changes made in this century to Canada's health care policy. Particular emphasis is placed on the decades following 1940, the years in which Canada moved away from an individualistic entrepreneurial medical care system, first toward a collectivist biomedical model and then to a social model for health care. This book presents advances in state-of-the-art solution methods and their applications to real life practical problems in optimization, control and operations research. Contributions from world-class experts in the field are collated here in two parts, dealing first with optimization and control theory and then with techniques and applications. Topics covered in the first part include control theory on infinite dimensional Banach spaces, history-dependent inclusion and linear programming complexity theory. Chapters also explore the use of approximations of Hamilton-Jacobi-Bellman inequality for solving periodic optimization problems and look at multi-objective semi-infinite optimization problems and production planning problems. In the second part, the authors address techniques and applications of optimization and control in a variety of disciplines, such as chaos synchronization, facial expression recognition and dynamic input-output economic models. Other applications considered here include image retrieval, natural earth satellites orbital transfers, snap-back repellers and modern logistic systems. Readers will learn of advances in optimization, control and operations research, as well as potential new avenues of

research and development. The book will appeal to scientific researchers, mathematicians and all specialists interested in the latest advances in optimization and control. This is the first text to cover all aspects of solution processed functional oxide thin-films. Chemical Solution Deposition (CSD) comprises all solution based thin-film deposition techniques, which involve chemical reactions of precursors during the formation of the oxide films, i. e. sol-gel type routes, metallo-organic decomposition routes, hybrid routes, etc. While the development of sol-gel type processes for optical coatings on glass by silicon dioxide and titanium dioxide dates from the mid-20th century, the first CSD derived electronic oxide thin films, such as lead zirconate titanate, were prepared in the 1980's. Since then CSD has emerged as a highly flexible and cost-effective technique for the fabrication of a very wide variety of functional oxide thin films. Application areas include, for example, integrated dielectric capacitors, ferroelectric random access memories, pyroelectric infrared detectors, piezoelectric micro-electromechanical systems, antireflective coatings, optical filters, conducting-, transparent conducting-, and superconducting layers, luminescent coatings, gas sensors, thin film solid-oxide fuel cells, and photoelectrocatalytic solar cells. In the appendix detailed "cooking recipes" for selected material systems are offered. Developments in three-dimensional cloud radiation over the past few decades are assessed and distilled into this contributed volume. Chapters are authored by subject-matter experts who address a broad audience of graduate students, researchers, and anyone interested in cloud-radiation processes in the solar and infrared spectral regions. After two introductory chapters and a section on the fundamental physics and computational techniques, the volume extensively treats two main application areas: the impact of clouds on the Earth's radiation budget, which is an essential aspect of climate modeling; and remote observation of clouds, especially with the advanced sensors on current and future satellite missions. The secrets of Arthurian history revealed

Nonlinear equations arise in essentially every branch of modern science, engineering, and mathematics. However, in only a very few special cases is it possible to obtain useful solutions to nonlinear equations via analytical calculations. As a result, many scientists resort to computational methods. This book contains the proceedings of the Joint AMS-SIAM Summer Seminar, ``Computational Solution of Nonlinear Systems of Equations,`` held in July 1988 at Colorado State University. The aim of the book is to give a wide-ranging survey of essentially all of the methods which comprise currently active areas of research in the computational solution of systems of nonlinear equations. A number of ``entry-level`` survey papers were solicited, and a series of test problems has been collected in an appendix. Most of the articles are accessible to students who have had a course in numerical analysis.

Sol-Gel Techniques for Glass Producers and Users provides technological information, descriptions and characterizations of prototypes, or products already on the market, and illustrates advantages and disadvantages of the sol-gel process in comparison to other methods. The first chapter entitled "Wet Chemical Technology" gives a summary of the basic principles of the sol-gel chemistry. The most promising applications are related to coatings. Chapter 2 describes the various "Wet Chemical Coating Technologies" from glass cleaning to many deposition and post-coating treatment techniques. These include patterning of coatings through direct or indirect techniques which have become very important and for which the sol-gel processing is particularly well adapted. Chapter 3 entitled "Bulk Glass Technologies" reports on the preparation of special glasses for different applications. Chapter 4 entitled "Coatings and Materials Properties" describes the properties of the different coatings and the sol-gel materials, fibers and powders. The chapter also includes a section dedicated to the characterization techniques especially applied to sol-gel coatings and products. This book presents selected topics on processing and properties of ferroelectric materials that are currently the focus of attention in scientific and technical research.

Ferro-piezoelectric ceramics are key materials in devices for many applications, such as automotive, healthcare and non-destructive testing. As they are polycrystalline, non-centrosymmetric materials, their piezoelectricity is induced by the so-called poling process. This is based on the principle of polarization reversal by the action of an electric field that characterizes the ferroelectric materials. This book was born with the aim of increasing the awareness of the multifunctionality of ferroelectric materials among different communities, such as researchers, electronic engineers, end-users and manufacturers, working on and with ferro-piezoelectric ceramic materials and devices which are based on them. The initiative to write this book comes from a well-established group of researchers at the Laboratories of Ferroelectric Materials, Materials Science Institute of Madrid (ICMM-CSIC). This group has been working in different areas concerning thin films and bulk ceramic materials since the mid-1980s. It is a partner of the Network of Excellence on Multifunctional and Integrated Piezoelectric Devices (MIND) of the EC, in which the European Institute of Piezoelectric Materials and Devices has its origin. Here's a concise, comprehensive, and carefully structured introduction to the analysis of non-blood body fluids. Through six editions, the authors, noted educators and clinicians, have taught generations of students the theoretical and practical knowledge every clinical laboratory scientist needs to handle and analyze non-blood body fluids, and to keep themselves and their laboratories safe from infectious agents. Their practical, focused, and reader friendly approach first presents the foundational concepts of renal function and urinalysis. Then, step by step, they focus on the examination of urine, cerebrospinal fluid, semen, synovial fluid, serous fluid, amniotic fluid, feces, and vaginal secretions. The 6th Edition has been completely updated to include all of the new information and new testing procedures that are important in this rapidly changing field. Case studies, clinical situations, learning objectives, key terms, summary boxes, and study questions show how work in the classroom

translates to work in the lab. For the 2021 Exam! AP® Calculus AB & BC Crash Course A Higher Score in Less Time! REA's Crash Course quick-review study guide is the top choice for AP® students who want to make the most of their study time and earn a high score. Here's why more AP® teachers and students turn to REA's AP® Calculus Crash Course: Targeted, Focused Review - Study Only What You Need to Know. REA's new 3rd edition addresses all the latest test revisions. We cover only the information tested on the exam, so you can make the most of your valuable study time. Expert Test-taking Strategies and Advice. Authored by a team of AP® Calculus teachers, the book gives you the tips and topics that matter most on exam day. Crash Course relies on the authors' extensive analysis of the test's structure and content. By following their advice, you can boost your score in every section of the test. Realistic Practice Questions - a Mini-Test in the Book, a Full-Length Exam Online. Are you ready for your exam? Try our focused practice set inside the book. Then take our full-length online practice exam (one each for Calculus AB & BC) to ensure you're ready for test day. If you're cramming for the exam or looking for a concise course review, Crash Course is the study guide every AP® student needs. About Our Authors Joan Marie Rosebush teaches calculus courses at the University of Vermont. Ms. Rosebush has taught mathematics to elementary, middle school, high school, and college students. She taught AP® Calculus via satellite television to high school students scattered throughout Vermont. Ms. Rosebush earned her B.A. degree in elementary education, with a concentration in mathematics, at the University of New York in Cortland, N.Y. She received her Master's Degree in education from Saint Michael's College, Colchester, Vermont. Flavia Banu graduated from Queens College of the City University of New York with a B.A. in Pure Mathematics and an M.A. in Pure Mathematics in 1997. Ms. Banu was an adjunct professor at Queens College where she taught Algebra and Calculus II. Currently, she teaches mathematics at Bayside High School in Bayside, New York, and coaches the math team for the school. Her favorite course to teach is AP Calculus because it

requires "the most discipline, rigor and creativity." About Our Revisions Editor Stu Schwartz has been teaching mathematics since 1973. For 35 years he taught in the Wissahickon School District, in Ambler, Pennsylvania, specializing in AP Calculus AB and BC and AP Statistics. Mr. Schwartz received his B.S. degree in Mathematics from Temple University, Philadelphia. Mr. Schwartz was a 2002 recipient of the Presidential Award for Excellence in Mathematics Teaching and also won the 2007 Outstanding Educator of the Year Award for the Wissahickon School District. Mr. Schwartz's resource-rich website, www.mastermathmentor.com, is geared toward helping educators teach AP® Calculus, AP® Statistics, and other math courses. Mr. Schwartz is always looking for ways to provide teachers with new and innovative teaching materials, believing that it should be the goal of every math teacher not only to teach students mathematics, but also to find joy and beauty in math as well. The annual publication Antisemitism Worldwide is compiled by the Stephen Roth Institute for the Study of Contemporary Antisemitism and Racism at Tel Aviv University. Unique in scope, structure, and variety of sources, this volume is an analysis of antisemitism in 2000 and early 2001. It includes scholarly articles and book reviews as well as country-by-country surveys. In 2000, the number of major violent acts of antisemitism more than doubled from 1999, and other acts of violence increased by over 50 percent. Antisemitism Worldwide is based on information systematically collected by the institute throughout the world in many languages, then summarized and computerized in its database in English. The source materials come from individuals and institutes, all forms of media, ministries, and committees, as well as Jewish communities and organizations. Publisher's Note: Products purchased from Third Party sellers are not guaranteed by the publisher for quality, authenticity, or access to any online entitlements included with the product. The BEST EDITION yet of the #1 text for surgical practice and education For half-a-century, no other text has provided such a solid grounding in basic science, anatomy, operative techniques, and more recently, professional development and

leadership training, as Schwartz's Principles of Surgery. Written by the world's foremost surgeons, this landmark reference offers distinctly modern and all-encompassing coverage of every important topic in general surgery. Enhanced by a new two volume presentation, the Eleventh Edition has been completely updated and refreshed with an emphasis on state-of-the-art, evidence-based surgical care. You will find an exciting array of new contributors from around the world, new chapters on cutting-edge topics, plus the acclaimed learning aids that make the material easier to understand and memorize. This outstanding content is bolstered by more than 800 photographs and 1,300 line drawings, most in full color, as well as online videos demonstrating key operations. Here's why the Eleventh Edition is the best edition yet: Six timely new chapters on important topics such as enhanced recovery after surgery (ERAS), ambulatory/outpatient surgery, evidence for surgery practice, skills and simulation, and web-based education and social media. High-quality full-color design showcases an unsurpassed illustration program. Emphasis on high-yield discussion of diagnosis and treatment of surgical disease, arranged by organ system and surgical specialty. Acclaimed learning aids (many new to this edition), including an abundance of completely up-to-date tables that summarize the most current evidence, boxed key points, detailed anatomical figures, diagnostic and management algorithms, and an abundance of completely up-to-date tables, and key references. More than the field's cornerstone textbook, Schwartz's Principles of Surgery is an international compendium of the knowledge and technique of the world's leading surgeons. This volume is part of the Ceramic Engineering and Science Proceeding (CESP) series. This series contains a collection of papers dealing with issues in both traditional ceramics (i.e., glass, whitewares, refractories, and porcelain enamel) and advanced ceramics. Topics covered in the area of advanced ceramic include bioceramics, nanomaterials, composites, solid oxide fuel cells, mechanical properties and structural design, advanced ceramic coatings, ceramic armor, porous ceramics, and more.

Climate change is a major challenge facing the modern world. The chemistry of air and its influence on the climate system forms the main focus of this monograph. The book presents a problem-based approach to presenting global atmospheric processes, evaluating the effects of changing air composition as well as possibilities for interference within these processes and indicates ways for solving the problem of climate change through chemistry. The new edition includes innovations and latest research results. Seeking to identify the plant origins of the early sacramental beverages Soma and Haoma, this study draws a connection between the psychoactive properties of these drinks and the widespread use of cannabis among Indo-Europeans during this time. Exploring the role of these libations as inspiration for the Indian Rig Veda and the Persian Avestan texts, this examination discusses the spread of cannabis use across Europe and Asia, the origins of the Soma and Haoma cults, and the shamanic origins of modern religion. "Bowersock's fascinating lectures add much to the new perception of the early empire as a time of experiment and cultural cross-fertilization."—Averil Cameron, author of *Christianity and the Rhetoric of Empire* "An exhilarating exploration of the multicultural world of the Roman empire. . . . Did the Latin and Greek 'novels' (from the comic *Satyricon*, contemporary with Nero and Paul, onwards through the whole range of romantic narratives) with their exotic locations and dramatic incident, draw on Christian belief in resurrection and the Eucharist? . . . Bowersock dissects the body of the evidence with a skeptical scalpel and magically restores it intact and alive."—Susan Treggiari, author of *Roman Marriage: Iusti Coniuges from the Time of Cicero to the Time of Ulpian* "Conceived in admirably broad and imaginative terms and treated with erudition and boldness in equal parts. Fiction as History, controversial as some of its conclusions may seem, opens up a whole new vein in scholarship in this field, and shows that the ancient novel is worth the attention of not only literary scholars but historians as well. A much-needed book."—B. P. Reardon, editor of *Collected Ancient Greek Novels* A collection of

papers on ferroelectric thin films, materials for intelligent/smart systems and adaptive structures, and processing of thin films. Contributors discuss preparation and characteristics of thin films, materials design and properties, and sensor characteristics. The papers were original A comprehensive, state-of-the-art review of the biochemistry, molecular and cellular biology, pharmacology, physiology, and pathology of natriuretic peptides. Written by the foremost researchers in the field, the reviews range from describing the actions of these peptides on the kidney, adrenal gland, vasculature, and brain, to their effects on immune regulation, reproduction, and cell growth. Special attention is given to the potential involvement of these hormones in clinical pathology and to their possible therapeutic use. Especially enlightening is the first-time review of molecular understanding of key cellular signaling pathways and of the importance of the vascular smooth muscle-endothelial interface. The book is designed for undergraduate or beginning level graduate students, and students from interdisciplinary areas including engineers, and others who need to use partial differential equations, Fourier series, Fourier and Laplace transforms. The prerequisite is a basic knowledge of calculus, linear algebra, and ordinary differential equations. The textbook aims to be practical, elementary, and reasonably rigorous; the book is concise in that it describes fundamental solution techniques for first order, second order, linear partial differential equations for general solutions, fundamental solutions, solution to Cauchy (initial value) problems, and boundary value problems for different PDEs in one and two dimensions, and different coordinates systems. Analytic solutions to boundary value problems are based on Sturm-Liouville eigenvalue problems and series solutions. The book is accompanied with enough well tested Maple files and some Matlab codes that are available online. The use of Maple makes the complicated series solution simple, interactive, and visible. These features distinguish the book from other textbooks available in the related area. All Access for the AP® Calculus AB & BC Exams Book + Web +

Mobile Updated for the new 2017 Exams Everything you need to prepare for the Advanced Placement® Calculus exams, in a study system built around you! There are many different ways to prepare for an Advanced Placement® exam. What's best for you depends on how much time you have to study and how comfortable you are with the subject matter. To score your highest, you need a system that can be customized to fit you: your schedule, your learning style, and your current level of knowledge. This book, and the online tools that come with it, will help you personalize your AP® Calculus prep by testing your understanding, pinpointing your weaknesses, and delivering flashcard study materials unique to you. REA's All Access system allows you to create a personalized study plan through three simple steps: targeted review of exam content, assessment of your knowledge, and focused study in the topics where you need the most help. Here's how it works: Review the Book: Study the topics tested on the AP® Calculus AB & BC exams and learn proven strategies that will help you tackle any question you may see on test day. Test Yourself and Get Feedback: As you review the book, test yourself with 9 end-of-chapter quizzes and 3 mini-tests. Score reports from your free online tests and quizzes give you a fast way to pinpoint what you really know and what you should spend more time studying. Improve Your Score: Armed with your score reports, you can personalize your study plan. Review the parts of the book where you are weakest, and use the REA Study Center to create your own unique e-flashcards, adding to the 100 free cards included with this book. Visit The REA Study Center for a suite of online tools: The best way to personalize your study plan is to get frequent feedback on what you know and what you don't know. At the online REA Study Center, you can access three types of assessment: topic-level quizzes, mini-tests, and a full-length practice test. Each of these tools provides true-to-format questions and delivers a detailed score report that follows the topics set by the College Board®. Topic Level Quizzes: Short, 15-minute quizzes are available throughout the review and test your immediate understanding of the topics just covered. Mini-

Tests: Three online mini-tests cover what you've studied. These tests are like the actual AP® exam, only shorter, and will help you evaluate your overall understanding of the subject. 2 Full-Length Practice Tests - (1 for Calculus AB and 1 for Calculus BC): After you've finished reviewing the book, take our full-length practice exams to practice under test-day conditions. Available both in the book and online, these tests give you the most complete picture of your strengths and weaknesses. We strongly recommend you take the online versions of the exams for the added benefits of timed testing, automatic scoring, and a detailed score report.

Improving Your Score with e-Flashcards: With your score reports from the quizzes and tests, you'll be able to see exactly which AP® Calculus topics you need to review. Use this information to create your own flashcards for the areas where you are weak. And, because you will create these flashcards through the REA Study Center, you can access them from any computer or smartphone. REA's All Access test prep is a must-have for students taking the AP® Calculus AB & BC exams!

Olympiad mathematics is not a collection of techniques of solving mathematical problems but a system for advancing mathematical education. This book is based on the lecture notes of the mathematical Olympiad training courses conducted by the author in Singapore. Its scope and depth not only covers and beyond the usual syllabus, but introduces a variety of concepts and methods in modern mathematics as well. In each lecture, the concepts, theories and methods are taken as the core. The examples serve to explain and enrich their intentions and to indicate their applications. Besides, appropriate number of test questions is available for the readers' practice and testing purpose. Their detailed solutions are also conveniently provided. The examples are not very complicated so readers can easily understand. There are many real competition questions included which students can use to verify their abilities. These test questions originate from many countries all over the world. This book will serve as a useful textbook of mathematical Olympiad courses, a self-study lecture notes for students, or as a reference book for related teachers

and researchers. This book is a result of contributions of experts from international scientific community working in different aspects of piezoelectric materials and devices through original and innovative research studies. Through its 7 chapters the reader will have access to works related to the various applications of piezoelectric materials such as piezoelectric stacks in level sensors, pressure sensors, actuators for functionally graded plates, active and passive health monitoring systems, machining processes, nondestructive testing of aeronautical structures and acoustic wave velocity measurements. The text is addressed not only to researchers, but also to professional engineers, students and other experts in a variety of disciplines, both academic and industrial seeking to gain a better understanding of what has been done in the field recently, and what kind of open problems are in this area. Solution Processed Metal Oxide Thin Films for Electronic Applications discusses the fundamentals of solution processing materials chemistry techniques as they are applied to metal oxide materials systems for key device applications. The book introduces basic information (materials properties, materials synthesis, barriers), discusses ink formulation and solution processing methods, including sol-gel processing, surface functionalization aspects, and presents a comprehensive accounting on the electronic applications of solution processed metal oxide films, including thin film transistors, photovoltaic cells and other electronics devices and circuits. This is an important reference for those interested in oxide electronics, printed electronics, flexible electronics and large-area electronics. Provides in-depth information on solution processing fundamentals, techniques, considerations and barriers combined with key device applications Reviews important device applications, including transistors, light-emitting diodes, and photovoltaic cells Includes an overview of metal oxide materials systems (semiconductors, nanomaterials and thin films), addressing materials synthesis, properties, limitations and surface aspects Furthering efforts to simulate the potency and specificity exhibited by peptides

and proteins in healthy cells, this remarkable reference supplies pharmaceutical scientists with a wealth of techniques for tapping the enormous therapeutic potential of these molecules—providing a solid basis of knowledge for new drug design. Provides a broad, comprehensive overview of peptides and proteins as mediators of cell movement, proliferation, differentiation, and communication. Written by more than 50 leading international authorities, Peptides and Protein Drug Analysis discusses strategies for dealing with the complexity of peptides and proteins in conformational flexibility and amino acid sequence variability analyzes drug formulations facilitated by solid-phase peptide synthesis and recombinant DNA technology examines chemical purity analysis by high-pressure chromatographic, capillary electrophoretic, gel electrophoretic, and isoelectric focusing methods highlights drug design elements derived from protein folding, bioinformatics, and computational chemistry demonstrates uses of unnatural mutagenesis and combinatorial chemistry explores mass spectrometry, protein sequence, and carbohydrate analysis illustrates bioassays and other new functional analysis methods surveys spectroscopic techniques such as ultraviolet, fluorescence, Fourier transform infrared, and nuclear magnetic resonance (NMR) addresses ways of distinguishing between levels of therapeutic and endogenous agents in cells reviews structural analysis tools such as ultracentrifugation and light, X-ray, and neutron scattering and more! Featuring over 3400 bibliographic citations and more than 500 tables, equations, and illustrations, Peptide and Protein Drug Analysis is a must-read resource for pharmacists; pharmacologists; analytical, organic, and pharmaceutical chemists; cell and molecular biologists; biochemists; and upper-level undergraduate and graduate students in these disciplines. This monograph provides the theoretical foundations needed for the construction of fundamental solutions and fundamental matrices of (systems of) linear partial differential equations. Many illustrative examples also show techniques for finding such solutions in terms of integrals. Particular

attention is given to developing the fundamentals of distribution theory, accompanied by calculations of fundamental solutions. The main part of the book deals with existence theorems and uniqueness criteria, the method of parameter integration, the investigation of quasihyperbolic systems by means of Fourier and Laplace transforms, and the representation of fundamental solutions of homogeneous elliptic operators with the help of Abelian integrals. In addition to rigorous distributional derivations and verifications of fundamental solutions, the book also shows how to construct fundamental solutions (matrices) of many physically relevant operators (systems), in elasticity, thermoelasticity, hexagonal/cubic elastodynamics, for Maxwell's system and others. The book mainly addresses researchers and lecturers who work with partial differential equations. However, it also offers a valuable resource for students with a solid background in vector calculus, complex analysis and functional analysis.

The eighth edition of *Hydroponic Food Production: A Definitive Guidebook for the Advanced Home Gardener and the Commercial Hydroponic Grower* serves as a comprehensive guide to soilless culture (hydroponics) for hobby and commercial growers. Extensively updated from the seventh edition published in 2013, this bestseller is a "methods" book to show the reader how to set up a hydroponic operation with the options of using any of many hydroponic cultures presently used in the industry to grow vegetable crops. Written by Dr Howard M. Resh, a recognized authority worldwide on hydroponics, the book presents detailed information on hydroponic growing systems and features more than 600 photographs (200 in full color), drawings, and tables. New to this edition: Presents greenhouse environmental control systems and examples of sustainable greenhouse technology, and demonstrates uses of automation and robotics in harvesting, grading, and packing. Introduces indoor vertical farming, and vertical growing systems, as well as the expansion of tropical hydroponics and rooftop greenhouses. Provides information on automation in large-scale raft culture and nutrient film technique (NFT) operations in the growing of lettuce, leafy greens,

and herbs. A new chapter 12 discusses control of environmental factors in greenhouses. It covers information on systems to regulate temperature, relative humidity, carbon dioxide enrichment, lighting, and fertigation with examples of sustainable greenhouse technology. This chapter demonstrates automation in the regulation of the greenhouse environment to crop production methods with emphasis on robotics in harvesting to transporting, grading, and packing equipment. The use of retractable roof structures in tropical, humid climates is an alternative for growing greenhouse crops. A new chapter 14 describes vertical indoor farming. It presents background information on early vertical greenhouses and sack culture systems to present vertical systems used by greenhouses and existing vertical greenhouses and future concepts. Vertical indoor farming reviews systems of vertical tiers of shelving growing lettuce, leafy greens, and herbs under LED lighting in large warehouses. The chapter exemplifies automation in these vertical farms with each specific system and it contains information on vertical growing in containers and/or modular units. Chapter 15 contains new information on tropical hydroponics describing hydroponics in Peru. Expansions of rooftop greenhouses with new locations in New York, Chicago, and Montreal display updated facilities and crops. The #1 surgical practice and education resource -- completely updated and now in full-color! A Doody's Core Title ESSENTIAL PURCHASE for 2011! 4 STAR DOODY'S REVIEW! "In its evolution over nine editions, Schwartz's Principles of Surgery has reflected the latest in surgical practice. In the age of minimally invasive surgery, illustrations are important and these authors include a wealth of visual material of good to excellent quality."--Doody's Review Service Written by the world's foremost practitioners and instructors, this landmark reference logically progresses from basic science principles, including topics such as cells, genomics, and molecular surgery, to clinical areas such as pancreas. From cover to cover, the book reflects a distinctly modern approach in the dissemination of surgical knowledge, providing up-to-date coverage of all key surgical

areas, from trauma and transplantation, to neurosurgery. In each chapter, this content is supported by a skill-building format that includes boxed key points, detailed anatomical figures, diagnostic and management algorithms, an abundance of informative tables, and key references. For every kind of procedure, this one-of-a-kind clinical companion helps you meet the sequential demands in the care of surgical patients, leading to the best possible outcomes. NEW TO THIS EDITION: Full color design for easier navigation 2 new chapters: "Accreditation Council for Graduate Medical Core Competencies," examines the six areas designated as critical for general surgery resident training and "Ethics, Palliative Care, and Care at the End of Life," offers an overview of biomedical ethics, and surveys specific issues in surgical and professional ethics, the general principles and considerations of palliative care, and care at the end of life Greater focus on evidence-based medicine with highlighted references in each chapter and separate key reference list Increased number of treatment and diagnostic algorithms Key points in every chapter International advisory board comprising renowned surgeons contributes important regional feedback on content and curricula Companion DVD of surgical video clips Sol--Gel--Optics encompasses numerous schemes for fabricating optical materials from gels -- materials such as bulk optics, optical waveguides, doped oxides for laser and nonlinear optics, gradient refractive index (GRIN) optics, chemical sensors, environmental sensors, and 'smart' windows. Sol--Gel--Optics: Processing and Applications provides in-depth coverage of the synthesis and fabrication of these materials and discusses the optics related to microporous, amorphous, crystalline and composite materials. The reader will also find in this book detailed descriptions of new developments in silica optics, bulk optics, waveguides and thin films. Various applications to sensor and device technology are highlighted. For researchers and students looking for novel optical materials, processing methods or device ideas, Sol--Gel--Optics: Processing and Applications surveys a wide array of promising new avenues for further

investigation and for innovative applications. (This book is the first in a new subseries entitled `Electronic Materials: Science and Technology).

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