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**Introductory Biomechanics is a
new, integrated text written**

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specifically for engineering students. It provides a broad overview of this important branch of the rapidly growing field of bioengineering. A wide selection of topics is presented, ranging from the

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mechanics of single cells to the dynamics of human movement. No prior biological knowledge is assumed and in each chapter, the relevant anatomy and physiology are first described. The biological

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system is then analyzed from a mechanical viewpoint by reducing it to its essential elements, using the laws of mechanics and then tying mechanical insights back to biological function. This

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integrated approach provides students with a deeper understanding of both the mechanics and the biology than from qualitative study alone. The text is supported by a wealth of illustrations, tables

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and examples, a large selection of suitable problems and hundreds of current references, making it an essential textbook for any biomechanics course. Designed as a text for the

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undergraduate students of instrumentation, electrical, electronics and biomedical engineering, it covers the entire range of instruments and their measurement methods used in the medical

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field. The functions of the biomedical instruments and measurement methods are presented keeping in mind those students who have minimum required knowledge of human physiology. The

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purpose of this book is to review the principles of biomedical instrumentation and measurements employed in the hospital industry. Primary emphasis is laid on the method rather than micro

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level mechanism. This book serves two purposes: One is to explain the mechanism and functional details of human body, and the other is to explain how the biological signals of human body can be

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acquired and used in a successful manner. KEY FEATURES : More than 180 illustrations throughout the book. Short questions with answers at the end of each chapter. Chapter-end exercises

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to reinforce the understanding of the subject.

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hundreds of images as well as detailed working instructions for the newest and more popular instruments used by biomedical engineers today. Biosensors Based on Nanomaterials and

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Nanodevices links interdisciplinary research from leading experts to provide graduate students, academics, researchers, and industry professionals alike with a comprehensive source for key

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advancements and future trends in nanostructured biosensor development. It describes the concepts, principles, materials, device fabrications, functions, system integrations, and applications

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of various types of biosensors based on signal transduction mechanisms, including fluorescence, photonic crystal, surface-enhanced Raman scattering, electrochemistry, electro-luminescence, field-

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effect transistor, and magnetic effect. The book: Explains how to utilize the unique properties of nanomaterials to construct nanostructured biosensors to achieve enhanced performance Features examples of

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biosensors based on both typical and emerging nanomaterials, such as gold nanoparticles, quantum dots, graphene, graphene oxides, magnetic nanoparticles, carbon nanotubes, inorganic

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plasmonic nanostructures, and
photonic crystals
Demonstrates the broad
applications of nanostructured
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monitoring, food safety,**

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and in vitro and in vivo health
diagnosis Inspires new ideas
for tackling multiscale and
multidisciplinary issues in
developing high-performance
biosensors for complex**

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**practical biomedical problems
Focusing on the connection
between nanomaterials
research and biosensor
development, Biosensors
Based on Nanomaterials and
Nanodevices illustrates the**

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exciting possibilities and critical challenges of biosensors based on nanomaterials and nanodevices for future health monitoring, disease diagnosis, therapeutic treatments, and

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beyond.

**Principles and Practices
Handbook of Biomedical
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Bio-Medical Electronics &
Instrumentation
From Cells to Organisms**

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Biomedical Instrumentation: Technology and Applications

The book presents developments and applications of these methods, such as NMR, mass, and others, including their applications in pharmaceutical and biomedical analyses. The book is divided into two sections. The first

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section covers spectroscopic methods, their applications, and their significance as characterization tools; the second section is dedicated to the applications of spectrophotometric methods in pharmaceutical and biomedical analyses. This book would be useful for students, scholars, and scientists

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engaged in synthesis, analyses, and applications of materials/polymers. This publication is aimed at students and teachers involved in teaching programmes in field of medical radiation physics, and it covers the basic medical physics knowledge required in the form of a syllabus for

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modern radiation oncology. The information will be useful to those preparing for professional certification exams in radiation oncology, medical physics, dosimetry or radiotherapy technology.

Biomedical Instrumentation Principles of Medical Electronics and Biomedical

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An Introduction to Biomedical
Instrumentation presents a course of
study and applications covering the
basic principles of medical and

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biological instrumentation, as well as the typical features of its design and construction. The book aims to aid not only the cognitive domain of the readers, but also their psychomotor domain as well. Aside from the seminar topics provided, which are divided into 27 chapters, the book complements

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these topics with practical applications of the discussions. Figures and mathematical formulas are also given. Major topics discussed include the construction, handling, and utilization of the instruments; current, voltage, resistance, and meters; diodes and transistors; power supply; and storage

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and processing of data. The text will be invaluable to medical electronics students who need a reference material to help them learn how to use competently and confidently the equipment that are important in their field.

Intelligent Communication, Control and

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Devices

Basic Electrical & Electronics

Engineering

Bioinstrumentation

Principles of Medical Electronics and

Biomedical Instrumentation

Electricity and Magnetism

This book covers the complete

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syllabi prescribed for undergraduate courses in electrical, electronics, mechanical and instrumentation engineering offered by various Indian universities. The objective of this text is to provide thorough

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knowledge in the emerging field of special electrical machines. It discusses the stepper motor, switched reluctance motor, permanent magnet dc and ac motors, brushless dc motors, single phase special electric

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motors, servomotors, linear electric machines and permanent magnet axial flux machines. Key Features • Chapter on permanent magnet axial flux machines (not available in other Indian authors' books) • Numerous worked-out

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examples • Based on classroom tested materials • Simplified mathematical analysis Besides undergraduate students, the book will also be useful to the postgraduate students specialising in drives and control,

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power electronics, control systems and mechatronics.
Market_Desc: · Biomedical Engineers · Medical and Biological Personnel (who wish to learn measurement techniques)
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measurements in new fields such as cellular and molecular biology and nanotechnology. Equips readers with the necessary background in electric circuits . Statistical coverage shows how to determine trial sizes About The

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Book: This comprehensive book encompasses measurements in the growing fields of molecular biology and biotechnology, including applications such as cell engineering, tissue engineering and biomaterials. It

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addresses measurements in new fields such as cellular and molecular biology and nanotechnology. It equips the readers with the necessary background in electric circuits and the statistical coverage

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shows how to determine trial sizes.

With the rise of advanced computerized data collection systems, monitoring devices, and instrumentation technologies, large and complex datasets

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accrue as an inevitable part of biomedical enterprise. The availability of these massive amounts of data offers unprecedented opportunities to advance our understanding of underlying biological and

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physiological functions, structures, and dynamics.

Biosignal Processing: Principles and Practices provides state-of-the-art coverage of contemporary methods in biosignal processing with an emphasis on brain signal

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analysis. After introducing the fundamentals, it presents emerging methods for brain signal processing, focusing on specific non-invasive imaging techniques such as electroencephalography (EEG),

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magnetoencephalography (MEG), magnetic resonance imaging (MRI), and functional near-infrared spectroscopy (fNIR). In addition, the book presents recent advances, reflecting the evolution of

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biosignal processing. As biomedical datasets grow larger and more complicated, the development and use of signal processing methods to analyze and interpret these data has become a matter of course. This

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book is one step in the development of biosignal analysis and is designed to stimulate new ideas and opportunities in the development of cutting-edge computational methods for biosignal

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processing.

Bioinstrumentation deals with the instrumentation techniques and principles used for measuring physical, physiological, biochemical and biological factors in man or other

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living organisms. This book provides a comprehensive knowledge about the basic principles and applications of the tools and techniques generally used in biology and also those used in the growing field of

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molecular biology. This book will prove to be a dependable reference book for students and teachers of biological sciences. Proceedings of ICICCD 2020 Medical Instrumentation Your Health

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The SAGES Manual on the Fundamental Use of Surgical Energy (FUSE)

The Technology of Patient Care

This book focuses on the integration of intelligent communication systems,

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control systems and devices related to all aspects of engineering and sciences. It includes high-quality research papers from the 4th International Conference on Intelligent Communication, Control and Devices (ICICCD

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2020), organized by the Department of Electronics, Instrumentation and Control Engineering at the University of Petroleum and Energy Studies, Dehradun, India during 27–28 November 2020. The topics covered are

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a range of recent advances in intelligent communication, intelligent control, and intelligent devices.

Primarily intended as a textbook for the undergraduate students of

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Instrumentation, Electronics, and Electrical Engineering for a course in biomedical instrumentation as part of their programmes. The book presents a detailed introduction to the fundamental principles and

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applications of biomedical instrumentation. The book familiarizes the students of engineering with the basics of medical science by explaining the relevant medical terminology in simple language. Without

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presuming prior knowledge of human physiology, it helps the students to develop a substantial understanding of the complex processes of functioning of the human body. The mechanisms of all major biomedical

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instrumentation systems—ECG, EEG, CT scanner, MRI machine, pacemaker, dialysis machine, ultrasound imaging machine, laser lithotripsy machine, defibrillator, and plethysmograph—are explained comprehensively. A large

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number of illustrations are provided throughout the book to aid in the development of practical understanding of the subject matter. Chapter-end review questions help in testing the students' grasp of the underlying concepts.

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The second edition of the book incorporates detailed explanations to action potential supported with illustrative example and improved figure, ionic action of silver-silver chloride electrode, and

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isolation amplifiers. It also includes mathematical treatment to ultrasonic transit time flowmeters. A method to find approximate axis of heart and image reconstruction in CT scan is explained with simple

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examples. A topic on MRI has been simplified for clear understanding and a new section on Positron Emission Tomography (PET), which is an emerging tool for cancer detection, has been introduced.

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"Handbook of Artificial Intelligence in Biomedical Engineering focuses on recent AI technologies and applications that provide some very promising solutions and enhanced technology in the biomedical

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field. Recent advancements in computational techniques, such as machine learning, Internet of Things (IoT), and big data, accelerate the deployment of biomedical devices in various healthcare applications.

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This volume explores how artificial intelligence (AI) can be applied to these expert systems by mimicking the human expert's knowledge in order to predict and monitor the health status in real time. The accuracy of

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the AI systems is drastically increasing by using machine learning, digitized medical data acquisition, wireless medical data communication, and computing infrastructure AI approaches, helping to

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solve complex issues in the biomedical industry and playing a vital role in future healthcare applications. The volume takes a multidisciplinary perspective of employing these new applications in

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biomedical engineering, exploring the combination of engineering principles with biological knowledge that contributes to the development of revolutionary and life-saving concepts. Topics include: Security and

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privacy issues in biomedical
AI systems and potential
solutions Healthcare
applications using
biomedical AI systems
Machine learning in
biomedical engineering Live
patient monitoring systems

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Semantic annotation of healthcare data This book presents a broad exploration of biomedical systems using artificial intelligence techniques with detailed coverage of the applications, techniques,

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algorithms, platforms, and tools in biomedical AI systems. This book will benefit researchers, medical and industry practitioners, academicians, and students" --

The Handbook of Biomedical

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Instrumentation describes the physiological basis and engineering principles of various electromedical equipment. It also includes information on the principles of operation and the performance parameters

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and Measurements
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Since the publication of Carr and Brown's biomedical equipment text more than ten years ago, it has become the industry standard. Now, this completely revised second

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who are the foremost experts in their respective fields. Our Indian authors do research and teach at the most respected Indian medical schools and academic hospitals. Specially designed for medical students, this

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book presents a succinct exposition of the clinical procedures involved in the diagnosis and management of common pediatric cases. Key Features:1. In a simple and easy- to- understand language, the book explains

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the fundamentals of:History taking &ndash both general and systemic Clinical examination- both general and systemic Differential diagnosis Investigations Diagnosis Management and prognosis². The book also

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explains the various disorders seen in children and adolescents and highlights their: Definition Epidemiology Aetiology Pathogenesis Clinical Features3. A simple point wise style of presentation

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is followed throughout the text and important features are summarized in appropriate tables and boxes.4. Relevant clinical photographs are included in the text.

The field of medical

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instrumentation is interdisciplinary, having interest groups both in medical and engineering professions. The number of professionals associated directly with the medical instrumentation field is

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increasing rapidly due to intensive penetration of medical instruments in the health care sector. In addition, the necessity and desire to know about how instruments work is increasingly apparent. Most

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dictionaries/encyclopedias do not illustrate properly the details of the bio-medical instruments which can add to the knowledge base of the person on those instruments. Often, the technical terms are not

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covered in the dictionaries. Unless there is a seamless integration of the physiological bases and engineering principles underlying the working of a wide variety of medical instruments in a

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publication, the curiosity of the reader will not be satisfied. The purpose of this book is to provide an essential reference which can be used both by the engineering as well as medical communities to

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understand the technology and applications of a wide range of medical instruments. The book is so designed that each medical instrument/ technology will be assigned one or two pages, and approximately 450

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medical instruments are referenced in this edition. The definitive "bible" for the field of biomedical engineering, this collection of volumes is a major reference for all practicing biomedical engineers and

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students. Now in its fourth edition, this work presents a substantial revision, with all sections updated to offer the latest research findings. New sections address drugs and devices, personali

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The revised edition of the book

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"Bio Medical Electronics & Instrumentation" gives an exhaustive and updated Information in the field of Medical Electronics. The book also provides broad and advanced technologies in instrumentation

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field with technologies under process also. The book provides information about the Anatomy and Physiology and concept of man-instrument system. It also provides information on Bio Medical System, Physiological

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This 3rd Edition has been thoroughly revised and updated taking into account technological innovations and introduction of new and improved methods of medical diagnosis and treatment. Capturing recent developments

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and discussing new topics, the 3rd Edition includes a separate chapter on 'Telemedicine Technology', which shows how information and communication technologies have made significant contribution in better

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diagnosis and treatment of patients and management of health facilities. Alongside, there is coverage of new implantable devices as increasingly such devices are being preferred for treatment, particularly in

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neurological stimulation for pain management, epilepsy, bladder control, etc. The 3rd Edition also appropriately addresses 'Point of Care' equipment: as some technologies become easier to use and less expensive and

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equipment becomes more transportable, even complex technologies can diffuse out of hospitals and institutional settings into outpatient facilities and patient's homes. With expanded coverage, this

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exhaustive and comprehensive handbook would be useful for biomedical physicists and engineers, students, doctors, physiotherapists, and manufacturers of medical instruments. Salient features: All

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chapters updated to address the current state of technology

Separate chapter on

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Coverage of new implantable

devices Discussion on 'Point of

Care' equipment Distinctive

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visual impact of graphs and photographs of latest commercial equipment Updated list of references includes latest research material in the area Discussion on applications of developments in the following

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fields in biomedical equipment:
micro-electronics micro-
electromechanical systems
advanced signal processing
wireless communication new
energy sources for portable and
implantable devices Coverage of

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new topics, including: gamma knife cyber knife multislice CT scanner new sensors digital radiography PET scanner laser lithotripter peritoneal dialysis machine Describing the physiological basis and

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engineering principles of electro-medical equipment, Handbook of Biomedical Instrumentation also includes information on the principles of operation and the performance parameters of a wide range of instruments.

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Broadly, this comprehensive handbook covers: recording and monitoring instruments measurement and analysis techniques modern imaging systems therapeutic equipment
The SAGES Manual on the

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Fundamental Use of Surgical Energy (FUSE) emphasizes good communication and promotes best practice for the use of electrosurgical, ultrasonic, and microwave energy sources in the operating theatre. This

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manual describes the basic technology of energy sources in the operating room and demonstrates the correct use and indications of energy sources in clinical practice. It also addresses the potential

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complications, hazards, and errors in the use of surgical energy sources and evaluates the potential interactions of energy sources with other medical devices. Any healthcare professional who has ever

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picked up an energy device in the OR such as a “Bovie” , Ultrasonic or bipolar instrument will better understand how it works, when to apply it, and what are the possible hazards and errors in its use. The SAGES

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Manual on the Fundamental Use of Surgical Energy (FUSE) is the first volume of its kind to provide such guidance and will be of great value to surgeons, anesthesiologists, nurses, endoscopists, and allied health

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care professionals who use these devices.

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Introduction to Skin

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Biothermomechanics and Thermal Pain

The Science Inside
Experimental surgery is an important link for the development in clinical surgery,

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research and teaching. Experimental surgery was part of the most important surgical discoveries in the past century. Since 1901 nine Nobel Prizes have been

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awarded to the pioneers had remarkable achievements in the basic or practical surgery. In recent 20 years, experimental surgery has achieved new

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advances, like laparoscopic and robotic surgery, tissue engineering, and gene therapy which are widely applied in clinic surgery. The present

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book covers wide experimental surgery in preclinical research models subdivided in two volumes. Volume I introduces surgical basic notions,

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techniques, and
different surgical
models involved in basic
experimental surgery and
review the biomechanical
models,
ischemia/reperfusion

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injury models, repair and regeneration models, and organ and tissue transplantation models, respectively. Volume II introduces several specific experimental

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models such as laparoscopic and bariatric experimental surgical models. The second volume also introduces graft-versus-host disease, and other

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experimental models.

Review the advances and development of recent techniques such as tissue engineering, organ preservation, wound healing and

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scarring, gene therapy and robotic surgery. The book documents the enormous volume of knowledge we have acquired in the field of experimental surgery. In

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this book, we have invited experts from the United States, Canada, France, Germany, China, Japan, Korea, UK, Sweden, Netherland, Hungary and Turkey to

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contribute 36 chapters in the fields of their expertise. These two volumes are the compilation of basic experimental surgery and updated advances of new

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development in this field that will be invaluable to surgeons, residents, graduate students, surgical researchers, physicians, immunologists,

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veterinarians and nurses in surgery.

"Introduction to Skin Biothermomechanics and Thermal Pain" introduces the study of coupled bio-thermo-mechanical and

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neural behavior of skin tissue in response to thermal and mechanical loads. The research in this book focuses on the theoretical modeling and experimental

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investigation of heated skin tissue in order to provide a predictive framework for thermal therapies of diseased tissue in clinics.

Furthermore, by

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developing solution tools, it focuses on changes in treatment parameters leading to more effective therapies. The book is intended for researchers

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and scientists in Bioengineering, Heat Transfer, Mechanics, Biology and Neurophysiology, as well as clinicians. Dr. Feng Xu is a research fellow

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at Harvard Medical School, Boston, MA, USA.

Dr. Tianjian Lu is a professor at the School of Aerospace, Xi'an Jiaotong University, Xi'an, China. Dr. Xu and

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Dr. Lu are also affiliated with Biomedical Engineering and Biomechanics Center at Xi'an Jiaotong University, Xi'an, China.

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The book begins with a description of the fundamental concepts and basic design techniques of algorithms.

Gradually, it introduces more complex and

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advanced topics such as dynamic programming, backtracking, branch & bound and Non-deterministic algorithms. Supplies well-graded exercises to

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test students understanding of the subject.

The second edition of this text presents an overview of power generation and discusses

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the different types of equipment used in a steam thermal power generation unit. The book describes various conventional and non-conventional energy

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sources. It elaborates on the instrumentation and control of water-steam and fuel-air flue gas circuits along with optimization of combustion. The text

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also deals with the power plant management system including the combustion process, boiler efficiency calculation, and maintenance and safety

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aspects. In addition, the book explains Supervisory Control and Data Acquisition (SCADA) system as well as turbine monitoring and control. This book is

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designed for the undergraduate students of electronics and instrumentation engineering and electrical and electronics engineering.

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New To This Edition • A new chapter on Nuclear Power Plant Instrumentation is added, which elaborates how electricity is generated in a Nuclear

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Power Plant. Key Features • Includes numerous figures to clarify the concepts. • Gives a number of worked-out problems to help students enhance their

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learning skills. •

Provides chapter-end exercises to enable students to test their understanding of the subject.

A Textbook of

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Advances in Experimental
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Nanomaterials and
Nanodevices
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Biomedical
Instrumentation
A Handbook for Teachers
and Students

*This book is designed to
introduce the reader to the
fundamental information*

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necessary for work in the clinical setting, supporting the technology used in patient care. Beginning biomedical equipment technologists can use this book to obtain a working vocabulary and elementary knowledge of the industry. Content is presented

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through the inclusion of a wide variety of medical instrumentation, with an emphasis on generic devices and classifications; individual manufacturers are explained only when the market is dominated by a particular unit. Designed for

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the reader with a fundamental understanding of anatomy, physiology, and medical terminology appropriate for their role in the health care field and assumes the reader's understanding of electronic concepts, including voltage,

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current, resistance, impedance, analog and digital signals, and sensors. The material covered will assist the reader in the development of his or her role as a knowledgeable and effective member of the patient care team. Offering nearly 7000

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chemists, pharmacists, cardiovascular and plastic surgeons, and graduate and medical students in these disciplines. Completely revised and updated, it includes coverage of genetic engineering, synthesis of biodegradable polymers,

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hydrogels, and mucoadhesive polymers, as well as polymers for dermacosmetic treatments, burn and wound dressings, orthopedic surgery, artificial joints, vascular prostheses, and in blood contacting systems.

Sensor Technologies: Healthcare,

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Wellness and Environmental Applications explores the key aspects of sensor technologies, covering wired, wireless, and discrete sensors for the specific application domains of healthcare, wellness and environmental sensing. It

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discusses the social, regulatory, and design considerations specific to these domains. The book provides an application-based approach using real-world examples to illustrate the application of sensor technologies in a practical and

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experiential manner. The book guides the reader from the formulation of the research question, through the design and validation process, to the deployment and management phase of sensor applications. The processes and examples used in

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the book are primarily based on research carried out by Intel or joint academic research programs. "Sensor Technologies: Healthcare, Wellness and Environmental Applications provides an extensive overview of sensing technologies and their

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applications in healthcare, wellness, and environmental monitoring. From sensor hardware to system applications and case studies, this book gives readers an in-depth understanding of the technologies and how they can be

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applied. I would highly recommend it to students or researchers who are interested in wireless sensing technologies and the associated applications.”
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to the literature on sensors covers the broad complexity of sensing, sensor types, and the vast range of existing and emerging applications in a very clearly written and accessible manner. It is particularly good at capturing the exciting

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possibilities that will occur as sensor networks merge with cloud-based 'big data' analytics to provide a host of new applications that will impact directly on the individual in ways we cannot fully predict at present. It really brings this

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home through the use of carefully chosen case studies that bring the overwhelming concept of 'big data' down to the personal level of individual life and health.”

*Dermot Diamond Director,
National Centre for Sensor
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an engineering perspective, introducing how the data gleaned can be both processed and visualized, in addition to offering exemplar case studies in a number of application domains. It is a must-read for those studying any undergraduate course that

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