

InfoGenerator

Your source of information – trustworthy, beneficial and handy

In this issue:

Electronic Books:

- Theoretical Foundations of Electrical Engineering **2**
 - Elements of Medical Devices and Systems **3**
 - Automation **4**
 - Human Anatomy and Physiology **5**
 - Biomechanics **6**
 - Medical and Biological Physics **7**
 - Biomedical Signals Analysis and Processing **8**
 - Design and Manufacturing of Artificial Human Organs and Joints. Equipment for People with Disabilities **9**
 - Medical Mechanical and Electrical Equipment **10**
- ### Online Resources:
- Design **11**
 - Properties of Biological Objects **12**
 - Medical and Biological Physics **13**
 - Medical Mechanical and Electrical Equipment **14**
- ### News. Contact Information **15**

Dear friends!

Scientific Library of Belarusian National Technical University (BNTU) offers you new issue of «InfoGenerator» digest, a free access resource providing information support to teachers, students and university staff. This time we have packed it with new electronic books from library collections and open access resources concerning the following subjects: electrical engineering, elements of medical devices and systems, biomechanics, medical and biological physics, biomedical signals analysis and processing, design and manufacturing of artificial human organs and joints and others.

The digest is prepared by library professionals and includes book reviews, Internet resources and latest university news. Systematization by branch of science, annotations and additional materials make it a useful tool for readers' advisory, curriculum and research support.

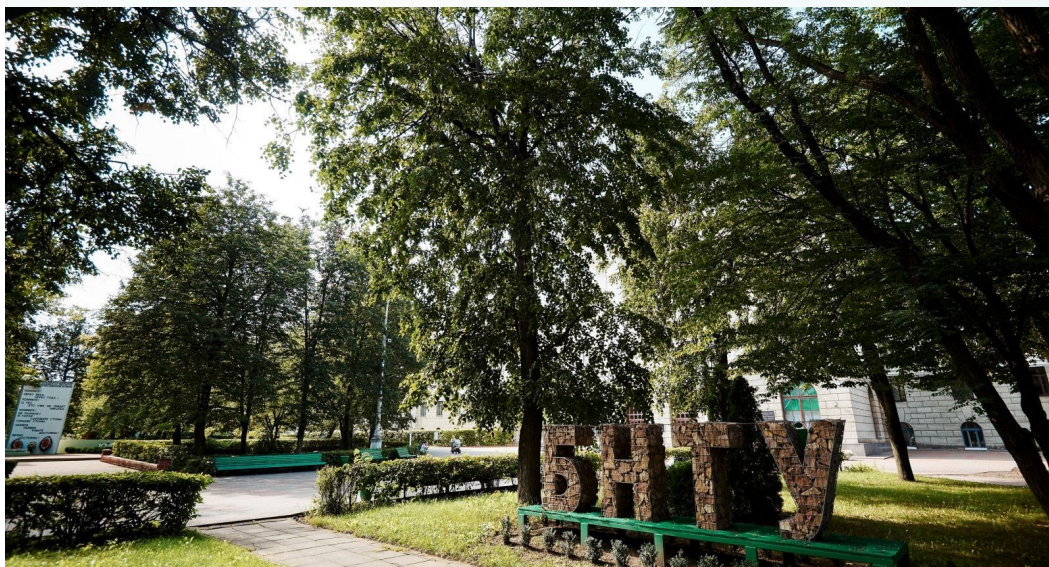
Access to the electronic books listed in the digest is provided in the electronic resources room of the library [information services department](#).

Scientific Library of BNTU wishes you successful and productive work and study!

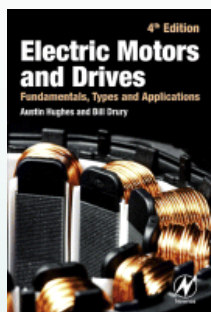
BNTU Summer School. Touch the dream

On June 22, 2020 the opening up of the BNTU Summer School - a unique program for exploring the university and its advantages. Summer school is an opportunity to determine your future and choose an interesting and successful career all over the world. If you are a foreign student, then fill in the [application form](#) for participation.

[More](#)

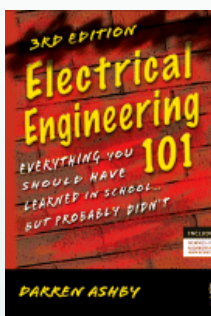


Theoretical Foundations of Electrical Engineering



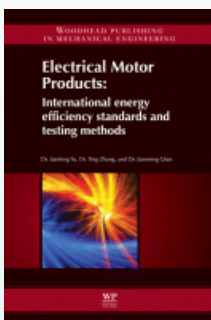
Hughes, A. Electric Motors and Drives / A. Hughes, B. Drury. — 4th ed. — Newnes, 2013. — 440 p. — Doi : <https://doi.org/10.1016/C2011-0-07555-5>

Electric Motors and Drives is intended for non-specialist users of electric motors and drives, filling the gap between maths- and theory-based academic textbooks and the more prosaic 'handbooks', which provide useful detail but little opportunity for the development of real insight and understanding. The book explores all of the widely-used modern types of motor and drive, including conventional and brushless D.C., induction motors and servo drives, providing readers with the knowledge to select the right technology for a given job. The third edition includes additional diagrams and worked examples throughout.



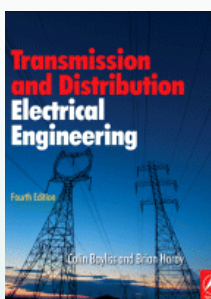
Ashby, D. Electrical Engineering 101 : Everything You Should Have Learned in School... but Probably Didn't / D. Ashby. — 3rd ed. — Newnes, 2012. — 304 p. — Doi : <https://doi.org/10.1016/C2010-0-66423-6>

Electrical Engineering 101 covers the basic theory and practice of electronics, starting by answering the question "What is electricity?" It goes on to explain the fundamental principles and components, relating them constantly to real-world examples. Sections on tools and troubleshooting give engineers deeper understanding and the know-how to create and maintain their own electronic design projects.



Yu, J. Electrical Motor Products : International Energy-Efficiency Standards and Testing Methods / J. Yu, T. Zhang, J. Qian. — Woodhead Publishing, 2011. — 192 p.

Electrical motor products reviews the energy efficiency management laws for electrical motor products in United States, European Union (EU) and China. The energy efficiency certification requirements for the electrical motor products vary from country to country and are summarised here. International standards, testing methods and certification requirements for specific electrical motor products are discussed, including electric motors, pumps and fans. Finally, methods for improving energy efficiency are examined.



Bayliss, C. R. Transmission and Distribution Electrical Engineering / C. R. Bayliss, B. J. Hardy. — 4th ed. — Newnes, 2011. — 1180 p. — Doi : <https://doi.org/10.1016/C2009-0-64342-7>

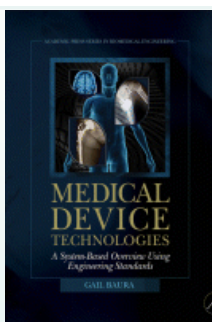
This market leading classic is a true comprehensive on-the-job reference, covering all aspects of getting electricity from the source to user via the power grid. Electric power transmission and distribution is a huge sector, and engineers require the real world guidance of this book in order to upgrade networks to handle smart and renewable sources of power. This new edition covers renewable and distributed energy developments, international regulatory compliance issues with coverage of IEC standards, and new key conversions to US based standards and terminologies

Elements of Medical Devices and Systems



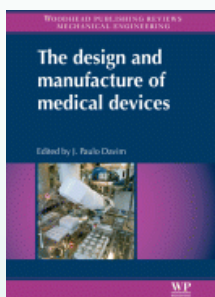
Elahi, B. Safety Risk Management for Medical Devices / B. Elah. — Academic Press, 2018. — 424 p. — Doi : <https://doi.org/10.1016/C2016-0-04614-4>

This book delivers not only theory, but also practical guidance for applying the theory in daily risk management work. The reader is familiarized with the vocabulary of risk management and guided through a process to ensure compliance with the international standard ISO 14971—a requirement for all medical devices. This book outlines sensible, easily comprehensible, and state-of-the-art methodologies that are rooted in current industry best practices.



Baura, G. D. Medical Device Technologies : A Systems Based Overview Using Engineering Standards / G. D. Baura. — Academic Press, 2012. — 528 p. — Doi : <https://doi.org/10.1016/C2009-0-20222-4>

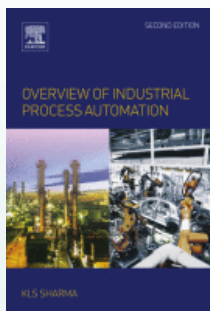
Medical Device Technologies introduces undergraduate engineering students to commonly manufactured medical devices. It is the first textbook that discusses both electrical and mechanical medical devices.



The Design and Manufacture of Medical Devices : A volume in Woodhead Publishing Reviews / ed. : J. P. Davim. — Woodhead Publishing, 2012. — 386 p. — (Mechanical Engineering Series).

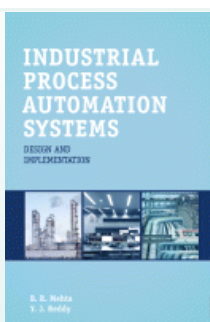
Medical devices play an important role in the field of medical and health technology, and encompass a wide range of health care products. Chapters in the book cover materials used in medical implants, such as Titanium Oxide, polyurethane, and advanced polymers; devices for specific applications such as spinal and craniofacial implants, and other issues related to medical devices, such as precision machining and integrated telemedicine systems.

Automation



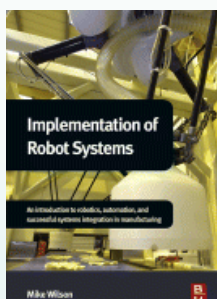
Sharma, K. L. S. Overview of Industrial Process Automation / K. L. S Sharma. — 2nd ed. — Elsevier, 2017. — 429 p. — Doi : <https://doi.org/10.1016/C2015-0-01929-3>

This updated edition adds new developments in the automation domain, and its reorganization of chapters and appendixes provides better continuity and seamless knowledge transfer. Manufacturing and chemical engineers involved in factory and process automation, and students studying industrial automation will find this book to be a great, comprehensive resource for further explanation and study.



Mehta, B. R. Industrial Process Automation Systems : Design and Implementation / B. R. Mehta, Y. J. Reddy. — Butterworth-Heinemann, 2015. — 668 p. — Doi : <https://doi.org/10.1016/C2013-0-18954-4>

Industrial Process Automation Systems: Design and Implementation is a clear guide to the practicalities of modern industrial automation systems. Bridging the gap between theory and technician-level coverage, it offers a pragmatic approach to the subject based on industrial experience, taking in the latest technologies and professional practices.



Wilson, M. Implementation of Robot Systems : An Introduction to Robotics, Automation, and Successful Systems Integration in Manufacturing / M. Wilson. — Butterworth-Heinemann, 2015. — 242 p. — Doi : <https://doi.org/10.1016/C2012-0-00795-8>

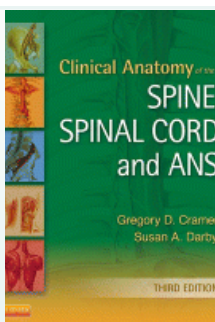
This book starts with the basics of typical applications and robot capabilities before covering all stages of successful robot integration. Potential problems and pitfalls are flagged and worked through so that you can learn from others' mistakes and plan proactively with possible issues in mind.

Human Anatomy and Physiology



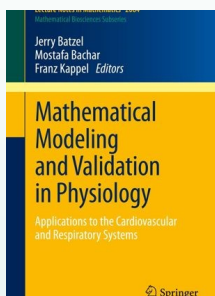
Cole, L. Human Physiology, Biochemistry and Basic Medicine / L. Cole, P. R. Kramer. - Academic Press, 2016. - 248 p. - Doi : <https://doi.org/10.1016/C2014-0-04282-7>

Human Physiology, Biochemistry and Basic Medicine is a unique perspective that draws together human biology, physiology, biochemistry, nutrition, and cell biology in one comprehensive volume. In this way, it is uniquely qualified to address the needs of the emerging field of humanology, a holistic approach to understanding the biology of humans and how they are distinguished from other animals.



Clinical Anatomy of the Spine, Spinal Cord, and ANS / ed. : G. D. Cramer, S. A. Darby. — 3rd ed. — Mosby, 2014. — 680 p. — Doi : <https://doi.org/10.1016/C2009-0-42801-0>

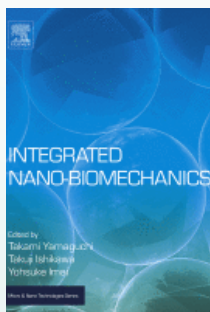
High-quality color illustrations and photographs, as well as abundant radiographs, CT, and MRI images, visually demonstrate specific anatomic and neuromusculoskeletal relationships and highlight structures that may be affected by manual and surgical spinal techniques or other diagnostic and therapeutic procedures.



Mathematical Modeling and Validation in Physiology : Applications to the Cardiovascular and Respiratory Systems / ed. : J. J. Batzel, M. Bachar, F. Kappel. — Springer, 2013. — 270 p.— Doi : <https://doi.org/10.1007/978-3-642-32882-4>

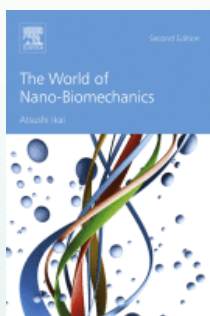
This volume synthesizes theoretical and practical aspects of both the mathematical and life science viewpoints needed for modeling of the cardiovascular-respiratory system specifically and physiological systems generally. Theoretical points include model design, model complexity and validation in the light of available data, as well as control theory approaches to feedback delay and Kalman filter applications to parameter identification. State of the art approaches using parameter sensitivity are discussed for enhancing model identifiability through joint analysis of model structure and data.

Biomechanics



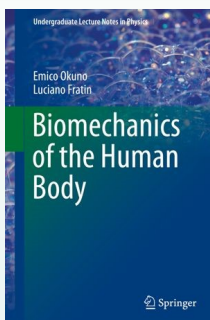
Integrated Nano-Biomechanics : A volume in Micro and Nano Technologies / ed. : T. Yamaguchi, T. Ishikawa, Y. Imai. – Elsevier, 2018. – 314 p. – Doi : <https://doi.org/10.1016/C2014-0-03756-2>

Integrated Nano-Biomechanics provides an integrated look into the rapidly evolving field of nano-biomechanics. The book demystifies the processes in living organisms at the micro- and nano-scale through mechanics, using theoretical, computational and experimental means. The book develops the concept of integrating different technologies along the hierarchical structure of biological systems and clarifies biomechanical interactions among different levels for the analysis of multi-scale pathophysiological phenomena.



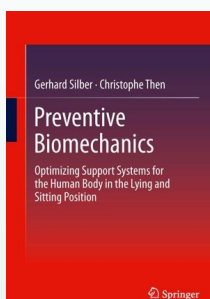
The World of Nano-Biomechanics / ed. : A. Ikai. – 2nd Ed. — Elsevier, 2017. – 340 p. — Doi : <https://doi.org/10.1016/C2015-0-01857-3>

The World of Nano-Biomechanics, Second Edition, focuses on the remarkable progress in the application of force spectroscopy to molecular and cellular biology that has occurred since the book's first edition in 2008. The initial excitement of seeing and touching a single molecule of protein/DNA is now culminating in the development of various ways to manipulate molecules and cells almost at our fingertips, enabling live cell operations.



Okuno, E. Biomechanics of the Human Body / E. Okuno, L. Fratin. — Springer, 2014. — Doi : <https://doi.org/10.1007/978-1-4614-8576-6>

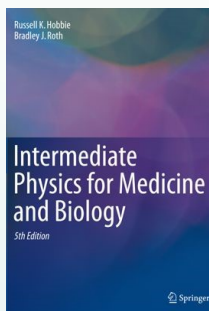
Biomechanics of the Human Body teaches basic physics concepts using examples and problems based on the human body. The reader will learn how the laws of mechanics may help to understand the conditions of the static and dynamic equilibrium of one of the marvels of nature: the human body.



Silber, G. Preventive Biomechanics : Optimizing Support Systems for the Human Body in the Lying and Sitting Position / G. Silber, Ch. Then. — Springer, 2013. — 380 p. — Doi : <https://doi.org/10.1007/978-3-642-29003-9>

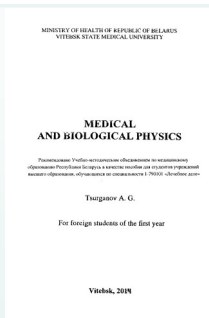
How can we optimize a bedridden patient's mattress? How can we make a passenger seat on a long distance flight or ride more comfortable? What qualities should a runner's shoes have? To objectively address such questions using engineering and scientific methods, adequate virtual human body models for use in computer simulation of loading scenarios are required. The authors have developed a novel method incorporating subject studies, magnetic resonance imaging, 3D-CAD-reconstruction, continuum mechanics, material theory and the finite element method.

Medical and Biological Physics



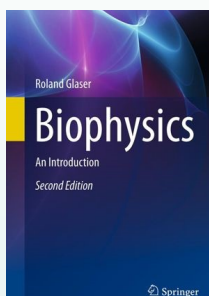
Hobbie, R. K. Intermediate Physics for Medicine and Biology / R. K. Hobbie, B. J. Roth. — Springer, 2015. — 630 p. — Doi : <https://doi.org/10.1007/978-3-319-12682-1>

This classic text has been used in over 20 countries by advanced undergraduate and beginning graduate students in biophysics, physiology, medical physics, neuroscience, and biomedical engineering. It bridges the gap between an introductory physics course and the application of physics to the life and biomedical sciences. Extensively revised and updated, the fifth edition incorporates new developments at the interface between physics and biomedicine.



Tsurganov, A. G. Medical and biological physics lectures course (for internal using only) for foreign students of the first year : The manual / A. G. Tsurganov. — 2nd ed. — Vitebsk : VSMU Press, 2014. — 315 p.

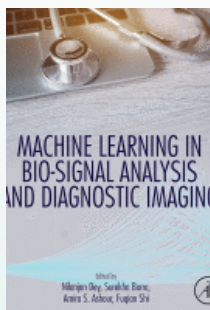
The issue “Medical and biological physics” is prepared in conformity with the typical syllabus for medical faculty. This issue contains all necessary data (text, formulas and diagrams) for study of medical and biological physics.



Glaser, R. Biophysics : An Introduction / R. Glaser. — Springer, 2012. — 424 p. — Doi : <https://doi.org/10.1007/978-3-642-25212-9>

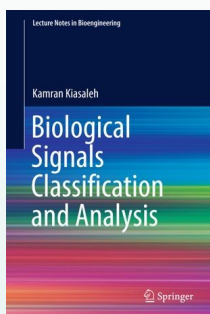
This fully revised 2nd English edition is an introductory text that spans all steps of biological organization, from the molecular, to the organism level, as well as influences of environmental factors. In response to the enormous progress recently made, especially in theoretical and molecular biophysics, the author has updated the text, integrating new results and developments concerning protein folding and dynamics, molecular aspects of membrane assembly and transport, noise-enhanced processes, and photo-biophysics.

Biomedical Signals Analysis and Processing



Machine Learning in Bio-Signal Analysis and Diagnostic Imaging / N. Dey [et al.]. — Academic Press, 2019. — 345 p. — Doi : <https://doi.org/10.1016/C2017-0-02827-6>

Machine Learning in Bio-Signal Analysis and Diagnostic Imaging presents original research on the advanced analysis and classification techniques of biomedical signals and images that cover both supervised and unsupervised machine learning models, standards, algorithms, and their applications, along with the difficulties and challenges faced by healthcare professionals in analyzing biomedical signals and diagnostic images. These intelligent recommender systems are designed based on machine learning, soft computing, computer vision, artificial intelligence and data mining techniques.



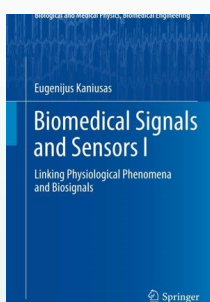
Kiasaleh, K. Biological Signals Classification and Analysis / K. Kiasaleh. — Springer, 2015. — Doi : <https://doi.org/10.1007/978-3-642-54879-6>

This authored monograph presents key aspects of signal processing analysis in the biomedical arena. Unlike wireless communication systems, biological entities produce signals with underlying nonlinear, chaotic nature that elude classification using the standard signal processing techniques, which have been developed over the past several decades for dealing primarily with standard communication systems. At its core, this work gives the reader a perspective on biomedical signals and the means to classify and process such signals.



Meyer-Baese, A. Pattern Recognition and Signal Analysis in Medical Imaging / A. Meyer-Baese, V. Schmid. — 2nd ed. — Academic Press, 2014. — 466 p. — Doi : <https://doi.org/10.1016/C2012-0-00347-X>

Medical imaging is one of the heaviest funded biomedical engineering research areas. The second edition of Pattern Recognition and Signal Analysis in Medical Imaging brings sharp focus to the development of integrated systems for use in the clinical sector, enabling both imaging and the automatic assessment of the resultant data.



Kaniusas, E. Biomedical Signals and Sensors I : Linking Physiological Phenomena and Biosignals / E. Kaniusas. — Springer, 2012. — 313 p. — (Biological and Medical Physics, Biomedical Engineering). — Doi : <https://doi.org/10.1007/978-3-642-24843-6>

The first volume is devoted to the interface between physiologic mechanisms and arising biosignals, whereas the second volume is focussed on the interface between biosignals and biomedical sensors. The physiologic mechanisms behind the biosignals are described from the basic cellular level up to their advanced mutual coordination level during sleep. The arising biosignals are discussed within the scope of vital physiologic phenomena to foster their understanding and comprehensive analysis.

Design and Manufacturing of Artificial Human Organs and Joints. Equipment for People with Disabilities.



Love, B. Biomaterials : A Systems Approach to Engineering Concepts / B. Love. — Academic Press, 2017. — 410 p.

Biomaterials: A Systems Approach to Engineering Concepts provides readers with a systems approach to biomaterials and materials engineering. By focusing on the mechanical needs of implants, disease states, and current clinical needs, readers are encouraged to design materials and systems targeted at specific conditions, and to identify the impact of their proposed solutions.



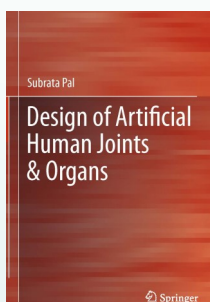
Ivanova, E. P. New Functional Biomaterials for Medicine and Healthcare / E. P. Ivanova, K. Bazaka, R. J. Crawford. — Woodhead Publishing, 2014. — 244 p.

The book begins with an overview of the use of biomaterials in contemporary healthcare and the process of developing novel biomaterials; the key issues and challenges associated with the design of complex implantable systems are also highlighted. The book then reviews the main materials used in functional biomaterials, particularly their properties and applications. Individual chapters focus on both natural and synthetic polymers, metallic biomaterials, and bio-inert and bioactive ceramics.



Joint Replacement Technology / ed. : P.A. Revell. — 2nd ed. — Woodhead Publishing, 2014. — 724 p. — Doi : <https://doi.org/10.1016/C2013-0-16375-1>

This second edition of Joint Replacement Technology provides a thoroughly updated review of recent developments in joint replacement technology. Joint replacement is a standard treatment for joint degeneration and has improved the quality of life of millions of patients. Collaboration between clinicians and researchers is critical to its continued success and to meet the rising expectations of patients and surgeons.



Pal, S. Design of Artificial Human Joints & Organs / S. Pal. — Springer, 2014. — 429 p. — Doi : <https://doi.org/10.1007/978-1-4614-6255-2>

Design of Artificial Human Joints & Organs is intended to present the basics of the normal systems and how, due to aging, diseases or trauma, body parts may need to be replaced with manmade materials. It is essential to figure out the forces, moments, pressure etc to design replacements that manage these stresses without breaking down. The mechanical characterization of the hard and the soft tissues are presented systematically using the principles of solid mechanics. This text covers the design science and methodology from concept to blueprint to the final component being replaced. Each chapter will be a brief overview of various joint/organ replacement systems.

Medical Mechanical and Electrical Equipment



Fitzpatrick, D. Implantable Electronic Medical Devices / D. Fitzpatrick. — Academic Press, 2015. — 194 p.

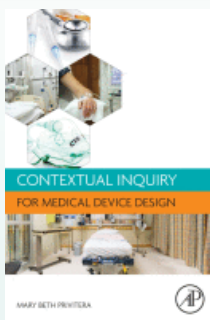
Implantable Electronic Medical Devices provides a thorough review of the application of implantable devices, illustrating the techniques currently being used together with overviews of the latest commercially available medical devices. This book provides an overview of the design of medical devices and is a reference on existing medical devices.



Medical Devices : Regulations, Standards and Practices / S. Ramakrishna [et al.]. — Woodhead Publishing, 2015. — 256 p. — Doi : <https://doi.org/10.1016/C2014-0-02797-9>

Medical Devices and Regulations: Standards and Practices will shed light on the importance of regulations and standards among all stakeholders, bioengineering designers, biomaterial scientists and researchers to enable development of future medical devices.

Based on the authors' practical experience, this book provides a concise, practical guide on key issues and processes in developing new medical devices to meet international regulatory requirements and standards.



Privitera, M. B. Contextual Inquiry for Medical Device Design / M. B. Privitera. — Academic Press, 2015. — 310 p.

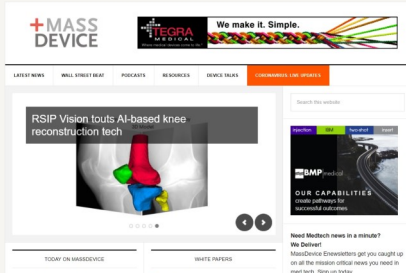
Contextual Inquiry for Medical Device Design helps users understand the everyday use of medical devices and the way their usage supports the development of better products and increased market acceptance. The text explains the concept of contextual inquiry using real-life examples to illustrate its application. Case studies provide a frame of reference on how contextual inquiry is successfully used during product design, ultimately producing safer, improved medical devices.



Zhou, Y. Joining and Assembly of Medical Materials and Devices : A volume in Woodhead Publishing Series in Biomaterials / ed. : Y. Zhou, M. D. Breyen. — Woodhead Publishing, 2013. — 574 p.

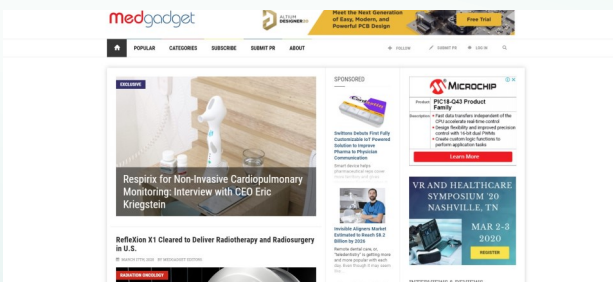
Joining and assembly of medical materials and devices is a technical guide for engineers and researchers within the medical industry, professionals requiring an understanding of joining and assembly techniques in a medical setting, and academics interested in this field.

Design



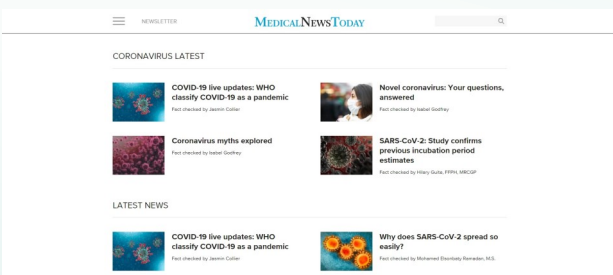
MassDevice.com

MassDevice.com provides news and information for the medical device industry and the companies that drive it. Recognized throughout the med-tech industry as a go-to source for originally-reported, quality news coverage.



Medgadget

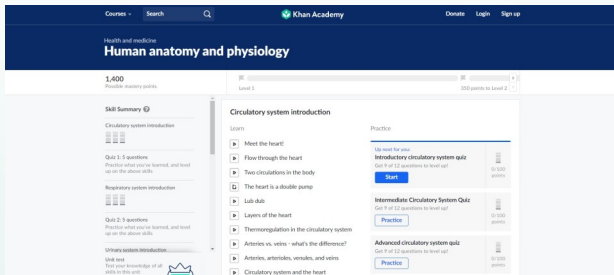
At Medgadget, we report the latest technology news, interview leaders in the field, and file dispatches from medical events around the world since 2004.



Medical News Today

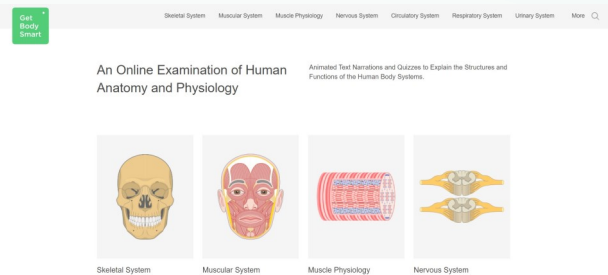
Find the latest medical devices and diagnostics research news from prestigious universities and journals throughout the world.

Properties of Biological Objects



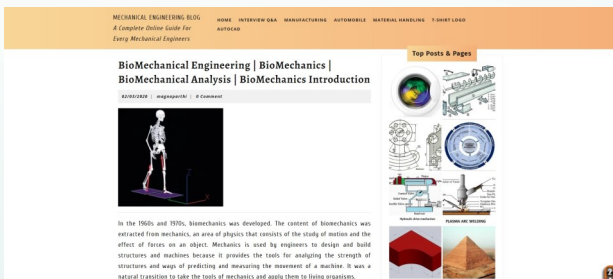
Khan Academy

Get introduced to the major organ systems of the human body.



GetBodySmart

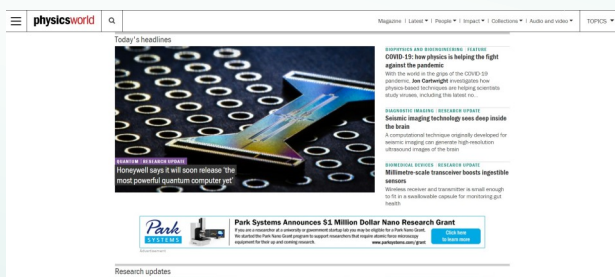
Animated Text Narrations and Quizzes to Explain the Structures and Functions of the Human Body Systems.



BioMechanical Engineering

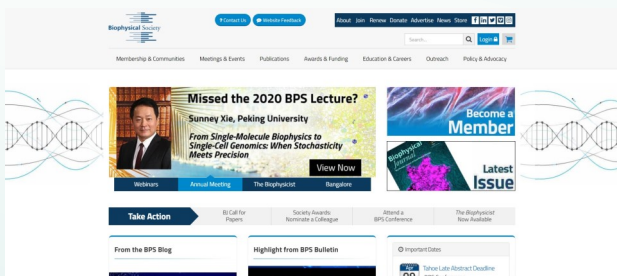
A Complete Online Guide For Every Mechanical Engineers.

Medical and Biological Physics



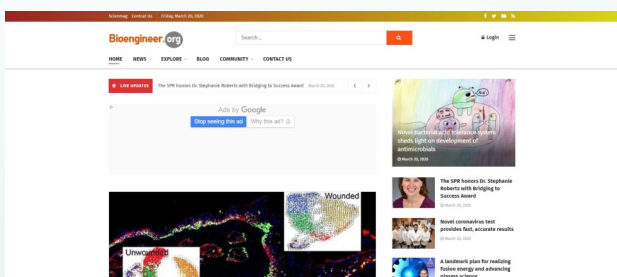
Physics World

Physics World helps scientists working in academic and industrial research stay up to date with the latest breakthroughs in physics and interdisciplinary science.



Biophysical Society

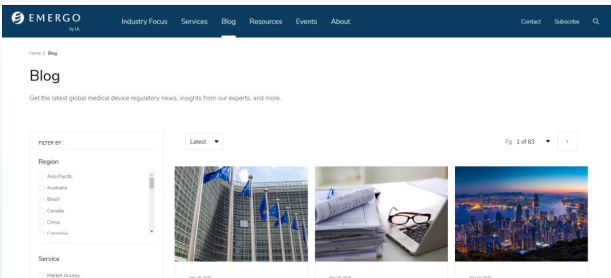
The Biophysical Society was founded in 1958 to lead the development and dissemination of knowledge in biophysics. It does so through its many programs, including its meetings, publications, and committee outreach activities.



Bioengineer.org

We bring you the latest biotechnology news from best research centers and universities around the world.

Medical Mechanical and Electrical Equipment



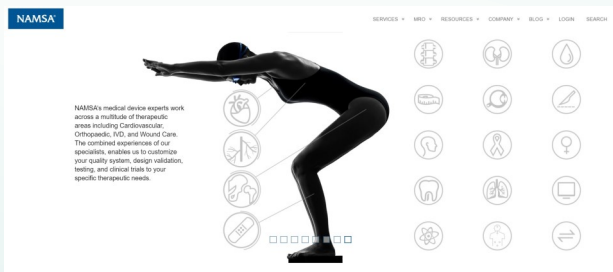
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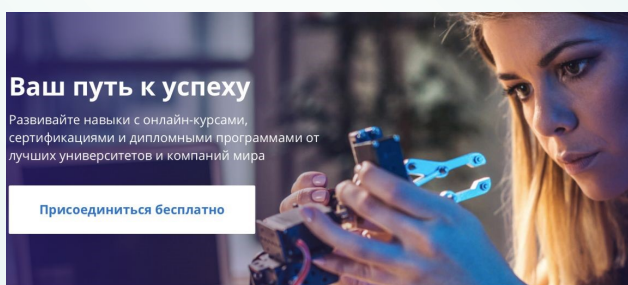
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News

Coursera granted BNTU free access to a great number of courses

Coursera, a learning platform that hosts online courses from leading world universities and companies with the possibility to obtain certificates, provided BNTU access to a huge base of online courses for free.

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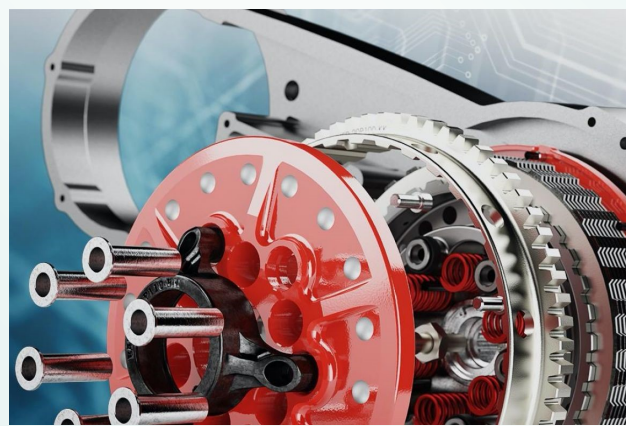
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Worked on the release:

Yurkevich Yuliya, Apanasevich Natal'ya

Editor:

Shkutova Alina

Design and layout:

Yurkevich Yuliya