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Titolo	Implantable Medical Electronics : Prosthetics, Drug Delivery, and Health Monitoring // by Vinod Kumar Khanna
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ISBN	3-319-25448-0
Edizione	[1st ed. 2016.]
Descrizione fisica	1 online resource (468 p.)
Disciplina	620
Soggetti	Biomedical engineering Microtechnology Microelectromechanical systems Biomaterials Therapeutics Medical informatics Biomedical Engineering and Bioengineering Microsystems and MEMS Health Informatics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Introduction, Scope and Overview -- Part I: Basic Concepts and Principles -- Diagnostic and Therapeutic Roles of Implantable Devices in the Human Electrical Machine: A Quick Primer -- Generic Implant Architecture and Organization.- Dilemmas and Enigmas of Implantable IC Design -- Neural Stimulation and Charge Balancing Approaches -- Implant Clocking and Timing Circuits -- Electro-Stimulation Pulse Generators -- Biomaterials for Implants -- Batteries for Implants. - Wireless Communications and Powering of Implants -- Cyber Security and Confidentiality Concerns with Implants -- Part II: Applications -- Neural Amplifier Circuits in Implants -- Implantable Sensors -- Cardiac Pacemakers -- Implantable Cardioverter Defibrillators -- Deep Brain Stimulation -- Epidural Spinal Cord Stimulation -- Vagus Nerve Stimulation.- Diaphragmatic/Phrenic Nerve Stimulation -- Sacral Nerve

Stimulation -- Cochlear Implants -- Retinal Prostheses --
Drug Delivery Implants.

Sommario/riassunto

This book is a comprehensive, interdisciplinary resource for the latest information on implantable medical devices, and is intended for graduate students studying electrical engineering, electronic instrumentation, and biomedical engineering. It is also appropriate for academic researchers, professional engineers, practicing doctors, and paramedical staff. Divided into two sections on Basic Concepts and Principles, and Applications, the first section provides an all-embracing perspective of the electronics background necessary for this work. The second section deals with pacing techniques used for the heart, brain, spinal cord, and the network of nerves that interlink the brain and spinal cord with the major organs, including ear and eye prostheses. The four main offshoots of implantable electronics, which this book discusses, are: The insertion of an implantable neural amplifier for accurate recording of neural signals for neuroengineering studies The use of implantable pulse generators for pacing the activities of diseased organs The use of implantable sensors for observing the influence of therapy and monitoring a patient's biological parameters The use of drug delivery systems to supervise the supply of accurate doses of medicine to affected parts Readers will also find chapters on the essentials of clocking and timing circuits, pulse generator circuits, neural amplifiers, batteries, biomaterials and biocompatibility, and more. Unique to this book is also a chapter on cyber security and confidentiality concerns with implants. End-of-chapter questions and exercises help readers apply the content to practical use, making this an ideal book for anyone wishing to learn more about implantable devices.
