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Nota di contenuto	Introduction to Modeling of Biosensors -- Effects of Diffusion Limitations on the Response and Sensitivity of Biosensors -- Biosensors Utilizing Consecutive and Parallel Substrates Conversion -- Biosensors Response Amplification with Cyclic Substrates Conversion -- Biosensors Utilizing Synergistic Substrates Conversion -- Biosensors Acting in Injection Mode -- Chemically Modified Enzyme and Biomimetic Catalysts Electrodes -- Biosensors with Porous and Perforated Membranes -- Biosensors Utilizing Non Michaelis-Menten Kinetics -- Biosensors Based on Microreactors -- Modeling Carbon Nanotube Based Biosensors -- Modeling Biosensors Utilizing Microbial Cells -- Application of Mathematical Modeling to Optimal Design of Biosensors.
Sommario/riassunto	This newly designed and enlarged edition offers an up-to-date presentation of biosensor development and modeling from both a chemical and a mathematical point of view. An entire new chapter in particular is dedicated to optimal design of biosensors. Two more new chapters discuss biosensors which utilize microbial cells and are based on carbon nanotubes respectively. All the other chapters have been revised and updated. The book contains unique modeling methods for amperometric, potentiometric and optical biosensors based mainly on biocatalysts . It examines processes that occur in the sensors' layers and at their interface, and it provides analytical and numerical methods

to solve equations of conjugated enzymatic (chemical) and diffusion processes. The action of single enzyme as well as polyenzyme biosensors and biosensors based on chemically modified electrodes is studied. The modeling of biosensors that contain perforated membranes and multipart mass transport profiles is critically investigated. Furthermore, it is fully described how signals can be biochemically amplified, how cascades of enzymatic substrate conversion are triggered, and how signals are processed via a chemometric approach and artificial neuronal networks. The results of digital modeling are compared with both proximal analytical solutions and experimental data. .