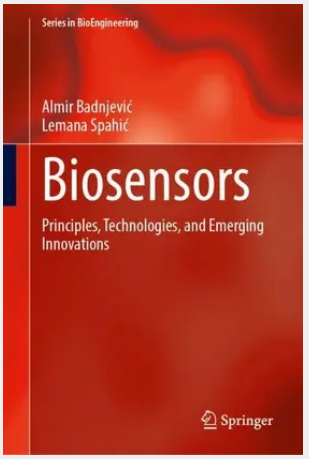
Badnjevic / Spahic

Biosensors

Principles, Technologies, and Emerging Innovations



This textbook provides a comprehensive introduction to biosensors, covering their fundamental principles, diverse applications, and the latest advancements in biosensing technologies. It explores various biosensor types, such as electrochemical biosensors for glucose monitoring and drug analysis, optical biosensors using fluorescence and surface plasmon resonance (SPR) for medical diagnostics and food safety, and impedance biosensors for cellular analysis and cancer detection. Additional sections cover acoustic and piezoelectric biosensors, field-effect transistor (FET)-based biosensors, and cutting-edge nanotechnology-enhanced immunosensors.

The book introduces measurement uncertainty in biosensors, addressing sources of variability, calibration methods, and statistical error analysis. The ISO Guide to the Expression of Uncertainty in Measurement (ISO GUM) is discussed, providing methodologies for uncertainty quantification and budgeting with practical case studies. A set of review and practice problems enables readers to test their knowledge. A useful companion for students, researchers, and professionals working in biomedical engineering, analytical chemistry, and sensor technology.

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