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Nota di contenuto	Machine generated contents note: Chapter 1. Introduction to Biomaterials Natural and synthetic biomaterials - an introduction Applications of biomaterials A few case studies related to failures of biomaterials and its impact - focus on need for appropriate characterization of biomaterials Chapter 2: Physical and Chemical Characterization of Biomaterials Physical properties of biomaterials - an introduction Microstructural characterization of biomaterials Phase changes in biomaterials - this part will focus on understanding phase change behavior and their measurement techniques in various materials like NiTi type shape memory alloys for stents or calcium phosphate ceramics and their phase change as a function of temperature, pH and so on. Porous biomaterials - Different types of porosity and their impact on biomaterials. Structural characterization of biomaterials - focus will be on different techniques such as IR, NMR, and other spectroscopic analysis. Chapter 3. Mechanical Characterization of Biomaterials Mechanical properties of biomaterials - an introduction Uniaxial deformation in biomaterials Multiaxial such as biaxial and bending/flexural deformation in biomaterials Cyclic

deformation in biomaterials Rotating bending fatigue Tension-tension, tension-compression and compression-compression fatigue Chapter 4. Surface Characterization of Biomaterials Surface properties of biomaterials - an introduction Surface chemistry, surface roughness, wetting and surface energy Hardness measurements - macro, micro and nano-indentations Adhesion and interfacial strengths of coatings Surface degradation of biomaterials Chapter 5. In vitro Characterization of Biomaterials I Cell-materials interactions on biomaterials - an introduction Cytocompatibility assessment Measurements of cell adhesion, proliferation and differentiation of cell-materials interactions Immunochemistry and protein assays Anti-microbial characterization of materials Chapter 6. In vivo Characterization of Biomaterials II Tissue materials interactions with biomaterials - an introduction Biocompatibility studies Tissue materials interactions - Histology and histomorphometric analysis Biodistribution studies Tissue integration and bio-mechanical analysis Chapter 7. Characterization of Biomedical Devices Device level testing vs. materials analysis - an introduction Case studies - a few selected case studies will be presented towards device level characterization such as Wear behavior of articulating surfaces in biomaterials.

Sommario/riassunto

"Characterization of Biomaterials will serve as a comprehensive resource for biomaterials researchers requiring detailed information on physical, chemical, mechanical, surface, in vitro or in vivo characterization. The book is designed for materials scientists, bioengineers, biologists, clinicians and biomedical device researchers seeking input towards planning on how to test their novel materials or structures or biomedical devices towards a specific application. Chapters are developed considering the need for both industrial researchers as well as academics"--