



METADATA

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Abstract

This textbook covers the material of the course "Biomaterials – Applications," which is taught as a compulsory elective course in the 8th semester at the School of Chemical Engineering, National Technical University of Athens. Its aim is to provide a theoretical in-depth understanding of biomaterials and their applications. The book provides an introduction to biomaterials and describes their categories (metallic, ceramics, polymers, composites), their chemistry, mechanics, and physicochemical properties, the design and synthesis of biomaterials, biocompatibility, toxicity, and degradation of biomaterials. It also presents in detail the applications of biomaterials in medicine (dental

implants, dental restorations and prostheses, surgery, orthopedics, hip arthroplasty, cardiovascular prostheses, stents, valves, artificial skin, silicone implants) are presented in detail. Biomaterials are cutting-edge materials with high added value and many applications in health sciences. By studying this textbook, students will acquire sufficient knowledge to further investigate the relationship between structure, properties, biocompatibility, and biodegradability of biomaterials. The ultimate goal is to provide the necessary basic knowledge so that students can design new materials with specific physicochemical properties to meet the new demands of health sciences.

