

A Textbook on Biomaterials That Appeals to a Wide Readership from Undergraduate, via Instructor to Researcher

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Abstract

***Introduction to Biomaterials: Basic Theory with Engineering Applications* is an expertly written and comprehensive textbook that comfortably fills a hole in the market for an up-to-date teaching resource on biomaterials. It covers a range of material types, processing options and characterizations, and describes in detail their multidisciplinary applications. It should appeal to not only undergraduate students of biomedicine and bioengineering but also postgraduate and postdoctoral researchers in material science related to human biological systems.**

Keywords

Biomaterials, Nanotechnology, Bioengineering, Metals, Polymers, Ceramics, Textbook

1. Book Review

A biomaterial is a natural or synthetic substance that is engineered to take a form which, alone or in combination, interacts with components of a living system to provide a beneficial effect [1]. They are often used in medical applications, to perform, augment or replace a natural function—think heart valves, cochlear implants and hip replacements. A broad range of physical, biological and chemical sciences underpin the design of biomaterials and the clinical disciplines to which they are relevant [2]. These include polymer synthesis and characterisation, drug and gene vector design, biology of the host response, immunology and toxicology and self-assembly at the nanoscopic scale. This textbook is aimed at engineering, bioscience and medical undergraduate students but would equally provide a valuable primer for a postgraduate researcher who is new to biomedical engineering [3]. The opening chapters introduce and outline the basic properties of the materials—metals, polymers, ceramics, composite and naturally occurring substances. The preparatory techniques of surface modification, sterilisation

and cell matrix compatibility testing are considered before concluding by discussing in detail diverse applications such as drug delivery, tissue engineering, and specific medical and dental functions. This well compiled book is readily accessible to a wide readership as the authors do not assume background knowledge of any particular field of study. Moreover, a pleasing balance is struck between life science and engineering, so that both scientific principles and engineering applications are presented with a view to blending theory and practice.

2. Book Details

- 1) Title: Introduction to Biomaterials: Basic Theory with Engineering Applications.
- 2) Authors: C. Mauli Agrawal, Joo L. Ong, Mark R. Appleford and Gopinath Mani.
- 3) Publisher: Cambridge University Press.
- 4) Year of Publication: 2014.
- 5) Number of Pages: xviii + 402.
- 6) ISBN: 978-0521116909.
- 7) Retail Price: \$73.00.

Reference

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- [2] Williams, D.F. (2009) On the Nature of Biomaterials. *Biomaterials*, **30**, 5897-5909. <http://dx.doi.org/10.1016/j.biomaterials.2009.07.027>
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