

Preface

This special edition focuses on research results across three materials science domains: functional materials for advanced technologies, materials for biomedical applications, green building materials and some issues in the mechanical behaviour of building materials and structural elements.

The first chapter examines the characteristics and behaviour of materials engineered for their magnetic and electronic properties. It is critical to developing cutting-edge solutions in many advanced areas, such as spintronics, sensors, data storage devices, and next-generation computing. Topics include the structure-property relationships governing ferromagnetism, superconductivity, and semiconductivity, as well as the influence of nanoscale effects. Integrating these materials into electronic systems is explored with an emphasis on innovation and functionality.

The second chapter highlights the results of materials development and their application variants in medical diagnostics, therapeutics, and orthopaedics. Key topics are biocompatible polymers, alloys for implantology and orthopaedics and drug delivery systems.

The final chapter addresses the urgent issues for sustainable construction practices by developing and applying green building materials. Topics include low-carbon alternatives for cementitious composites, waste application for partial element replacement in cement pastes and more. Some issues in structural mechanics are discussed in the context of minimising the impact of blast pressure loading on the structural integrity of tall buildings.

This edition is intended to serve as a resource for researchers and professionals seeking a multidisciplinary perspective on the frontiers and innovative solutions in materials science.