Preface

This special edition focuses attention on recent advances in materials science and engineering, including structural alloys and functional materials, building materials, and thermal processes in various engineering systems.

Chapter 1: Microstructural and Mechanical Properties of Alloys presents studies on the relationship between alloy composition, processing conditions, microstructural evolution, and resulting mechanical behaviour. The contributions emphasise modern characterisation methods, property optimisation, and approaches for designing high-performance alloys.

Chapter 2: Functional Materials focuses on materials engineered to exhibit specific physical, chemical, electronic, or optical properties. Topics include functional materials such as zinc oxide and titanium dioxide in nanoscale form, and plant-based biopolymers as drag-reducing additives in oil production.

Chapter 3: Building Materials explores developments in materials used in the construction sector, emphasising durability, sustainability, performance improvements and environmental considerations.

Chapter 4: Heat and Mass Transfer in Engineering Systems examines the fundamental principles and practical applications of thermal and mass transport phenomena. Modelling, optimisation, and engineering solutions relevant to heat energy systems, thermal management of drying systems, and other related industrial processes are addressed.

This special edition is intended to serve as a valuable reference for researchers, engineers, and students, and to support further innovation across interdisciplinary research fields.