

Preface

This special edition brings together recent advances in engineering and applied materials, with a focus on the fundamental processes in engineering systems and material behaviours, as well as technical solutions that drive innovation in modern technologies. The issue is organised into four chapters, each addressing a critical area of current research and engineering practice.

Chapter 1: Heat and Mass Transfer in Engineering Systems examines the practical aspects of thermal and mass transport phenomena based on modern techniques of numerical investigations. The studies presented the possible decisions that can be used in various engineering systems and advanced technological processes.

Chapter 2: Heat Treatment of Metals discusses methods for modifying the surface and microstructure to increase the wear properties of metallic materials through controlled thermal processes. Emphasis is placed on the relationship between processing parameters, microstructural evolution, and performance outcomes.

Chapter 3: Tribological Research presents investigations into friction processes and wear possibilities of brake systems, as well as corrosion defects in materials of pipeline systems.

Chapter 4: Materials for Energy Storage Devices examines the development of electrodes and the electrochemical properties of the materials used in lithium-ion batteries and supercapacitors. The focus is on enhancing efficiency, stability, and sustainability for next-generation solutions.

The special edition offers readers a detailed overview of the modern challenges and solutions in materials science and engineering, serving as a valuable reference for researchers and engineers, and as a foundation for fostering innovation across disciplines.