

Preface

The advancement of materials and technologies lies at the heart of progress in modern science, manufacturing, and engineering. The presented special edition collected research results in two highly active research areas: polymer and composite materials and thin films and membranes. These areas are instrumental in enabling innovations across industries such as electronics, energy, healthcare, and environmental engineering, etc.

In articles from Chapter 1: Polymers and Composites, the characterisations, synthesis and testing methods, and variants of applications of some polymeric materials and composites are explored and analysed. Emphasis is placed on structural performance, multifunctionality, and processing techniques that enhance strength, flexibility, thermal resistance, and biodegradability. The chapter also discusses advances in nanocomposites, fiber-reinforced materials, and hybrid structures that combine lightweight design with high mechanical reliability.

Chapter 2: Thin Films and Membranes focuses on surface-engineered and layered materials' design, fabrication, and functional behaviour analysis. Discussion includes tungsten oxide thin films and the effect of heat treatment on the mechanical properties of electrospun polymeric nanofibrous membranes.

This special edition is intended for researchers and professionals in materials science, chemical engineering, nanotechnology, etc. By providing foundational concepts and current research directions, it aims to support the development of next-generation materials that meet performance and sustainability goals.