Preface

The special edition presents a collection of research articles dedicated to the development, properties analysis, processing, and practice of application of advanced materials for various modern engineering systems. The presented research results reflect the growing importance of multifunctional materials that combine performance, sustainability, and adaptability across a wide range of applications.

The first chapter, Polymers and Composites, explores innovative polymeric materials and composite systems with enhanced mechanical, thermal, antibacterial, and functional properties. The advanced processing techniques, lightweight structural solutions using waste, and examples of applications in transportation, construction, manufacturing, and environmental technologies are highlighted here.

The second chapter, Applied Materials, addresses materials designed and optimised for specific engineering purposes. Topics include material characterisation, performance evaluation, durability, and the relationship between processing methods and operational behaviour in real-world applications.

The final chapter, Materials for Energy Applications, focuses on materials used in energy generation, storage, and conversion technologies. Contributions examine advanced materials for batteries, flexible electronics, and photovoltaics that enhance the efficiency of final technical solutions, supporting sustainability through the transition toward cleaner technologies.

This edition is intended to serve as a valuable resource for researchers, engineers, and practitioners working in materials science, energy technologies, and applied engineering.