

Preface

This special edition presents a comprehensive collection of research contributions spanning key areas of modern engineering sciences, with an emphasis on modelling, advanced manufacturing, development of intelligent systems, and infrastructure development. The articles reflect the integration of analytical, computational, and practical approaches to research and design in modern engineering.

The edition begins with Modelling and Research in Mechanical Engineering, where analytical methods, numerical simulations, and experimental investigations are employed to better understand the behaviour of mechanical systems and components. The contributions highlight optimisation and design improvements enabled by advanced modelling and research techniques.

Aerospace Engineering addresses cutting-edge developments in aerodynamics, structural design, materials, and system integration for aviation and space applications. Emphasis is placed on efficiency, safety, and innovation.

Robotics and Mechatronics explores the convergence of mechanical systems and elements, electronics, and intelligent control. The chapter presents advances in robotics and automation, sensor technologies, actuators, and control algorithms that enable adaptive, precise, and efficient engineering solutions.

Precision Manufacturing Processes focuses on advanced production technologies that ensure high accuracy, surface quality, and the performance of finished products. Contributions cover wire bonding, a critical process step in IC assembly and additive manufacturing for complex and high-value components.

Construction Technologies examines modern methods and materials used in infrastructure development, emphasising efficiency, sustainability, and durability. The chapter highlights innovative construction practices and technologies.

The final chapter, Advanced Approaches to Infrastructure Objects Research and Design, presents integrated methodologies for structural analysis, design, and management of infrastructure objects.

This edition is intended to serve as a valuable resource for researchers, engineers, and practitioners seeking to advance knowledge and innovation across interdisciplinary engineering fields.