

Preface

This special edition presents recent advances in the analysis of heat and mass transfer phenomena, performance, and structural transformation of engineering materials under complex operating conditions.

Chapter 1 focuses on the numerical investigation of heat and mass transfer processes, highlighting modern mathematical modelling approaches, computational techniques, and simulation strategies for predicting thermal and transport phenomena in engineering systems.

Chapter 2 addresses the corrosion and tribological properties of structural materials, emphasising degradation mechanisms, wear behaviour, surface interactions, and strategies to improve durability and service life.

Chapter 3 explores microstructure evolution in advanced materials, examining phase transformations, grain refinement, defect dynamics, and structure-property relationships that govern mechanical and functional performance.

These chapters provide an integrated perspective on modelling, characterisation analysis, and optimisation of materials microstructure and treatment processes relevant to contemporary engineering applications.