

Table of Contents

Preface

Chapter 1: Computational and Experimental Investigations of Heat and Mass Transfer Processes in Engineering Systems

Impact of the Thermophysical Properties of a CuO-H₂O-Based Nanofluid on the Performance of a Cylindrical Solar Concentrator E.O. Sangotayo and O.E. Itabiye	3
Unsteady Two Dimensional Mixed Convection MHD Couple Stress Fluid Flow through an Inclined Stretching Sheet with Chemical Reaction A.A. Opanuga, J.O. Akinremi, H.I. Okagbue and O.O. Agboola	23
Influence of Non-Linear Radiation and Viscous Dissipation on the Convective Fluid Flow with Variable Viscosity and Quadratic Boussinesq Approximation across a Cylinder with Uniform Heat Flux at the Wall S.I. Opadiran and S.S. Okoya	37
Experimental Investigation for the Performance of the Solar Air Dryer with Vortex Generator K.S. Mushatet and N.M. Bader	57
Effective Thermal Conductivity of Structured Porous Medium: Numerical Study A.I. Popov, D.M. Bragin and A.V. Eremin	69

Chapter 2: Strength of Materials and Structural Integrity

An Approach in Analyzing Longitudinal Fracture of Inhomogeneous Beams with Using Generalized Viscoplastic Models V.I. Rizov	79
Inhomogeneous Beam of Circular Cross-Section with Concentric Lengthwise Cracks: A Fracture Analysis with Considering Viscoplastic Behaviour V.I. Rizov	85
A Mixed FEM for Simulating Laminated Glass Beam Stiffness and Strength D. Baraldi	91
A Test System for Plastic Metal Materials Subjected to Multi-particle Erosion via Air Ejector Z.Q. Fang, S.L. Peng and L. Zhang	97
Temperature Effect on Deformation Response in Austenitic Stainless Steel S.A. Barannikova and P.V. Iskhakova	103
Research of the Radial Strength of a Composite Matrix of a Cable-Pusher for Oil Wells A. Asheichik and M.R. Bahrami	109
Simplified Approach to Verification of Numerical Models for Deformation and Fracture Analysis of Structural Composite Subjected to High-Velocity Impact N.A. Olivenko, O.A. Kudryavtsev and A.V. Ignatova	117

Chapter 3: Materials Physics and Computational Materials Science

Theoretical Analysis of the Thermodynamic, Structural, Surface and Transport Properties of PbSn Liquid Alloys at 1050 K R.P. Chaudhary, N. Kumari, J. Mandal and I.S. Jha	127
Structural Evolution of Single-Walled Carbon Nanotubes: Molecular Dynamics Simulation M.V. Dung	141
High Temperature Stability of K-Pb Liquid Alloy N. Panthi, I.B. Bhandari and I. Koirala	147
Intensity Dependent Transient Response of Amorphous Photodiode and Solar Cell M. Smrity	155