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| Nota di contenuto | Cover; Title Page; Copyright Page; Contents; Preface; Acknowledgments; 1 - The physics models; 1.1 - Heat flow fundamentals; 1.1.1 - Basic equations; 1.1.2 - Boundary conditions; 1.1.3 - Weak forms of the thermal equation; 1.1.4 - The shape functions for FEM; 1.1.5 - Formulations in matrix form; 1.1.6 - The nonlinearity in thermal analysis; 1.1.6.1 - Material properties; 1.1.6.2 - Convection term from computational fluid dynamics (CFD) coupling; 1.1.7 - Stabilization method for convection-dominant transport equations; 1.1.8 - Penalty-based thermal contact 1.1.8.1 - The matrix equation for thermal contact 1.2 - Fluid dynamics; 1.2.1 - Basic equations for fluid flow; 1.2.2 - Boundary and initial conditions for fluid flow; 1.2.3 - The constitutive equation for fluid flow; 1.2.4 - The weak forms; 1.2.4.1 - Galerkin formulation for N-S equations; 1.2.4.1.1 - The shape functions; 1.2.5 - Finite element equations; 1.2.6 - The nonlinearity and numerical challenging in CFD; 1.2.7 - The stabilization methods; 1.2.7.1 - SUPG and PSPG methods; 1.2.7.2 - Discontinuity capturing operator (Tezduyard, 2012) 1.2.7.3 - Underrelaxation method and solution capping 1.2.8 - Turbulence model in CFD; 1.2.8.1 - k-Epsilon turbulence model; 1.2.8.1.1 - Basic equations for the k-epsilon model; 1.2.8.1.2 - Equations in weak form; 1.2.8.1.3 - Boundary conditions; 1.2.8.1.4 - |

Equations in matrix form; 1.2.8.2 - Wilcox k-omega turbulence model; 1.2.8.2.1 - Basic equations for k-omega model; 1.2.8.2.2 - Boundary conditions; 1.2.8.2.3 - Weak forms of k-omega model; 1.2.8.2.4 - Equations in matrix form; 1.2.8.3 - Procedure for solving the k-epsilon/k-omega turbulence model; 1.2.8.4 - Large eddy simulation
1.2.9 - The general transport equations
1.2.9.1 - The governing equation of the transport equation; 1.2.9.2 - The weak form of advection diffusion equation; 1.2.9.3 - The SUPG stabilization for the advection-dominated advection-diffusion equation; 1.2.9.3.1 - Central differencing approach; 1.2.9.3.2 - Upwind method for convection-dominant transport equations (first-order accuracy); 1.2.9.4 - Discontinuity capturing operator for the advection-diffusion equation;
1.3 - Structural mechanics; 1.3.1 - Governing equations for structure analysis; 1.3.2 - The equation in matrix form
1.3.5.1 - Basic equations for thin shell structure
