

1. Record Nr.	UNINA9910460391603321
Autore	Blazek J
Titolo	Computational fluid dynamics [[electronic resource]] : principles and applications // J. Blazek
Pubbl/distr/stampa	Amsterdam ; ; Boston ; ; London, : Elsevier, 2005
ISBN	0-08-052967-4 1-281-79526-7 9786611795269
Edizione	[2nd ed.]
Descrizione fisica	1 online resource (466 p.)
Disciplina	532.050285
Soggetti	Fluid dynamics - Computer simulation Fluid dynamics - Mathematical models Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Previous ed.: Oxford: Elsevier Science, 2001.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	<p>""Front Cover""; ""Computational Fluid Dynamics: Principles and Applications""; ""Copyright""; ""Contents""; ""Acknowledgments""; ""List of Symbols""; ""Abbreviations""; ""Chapter 1: Introduction""; ""Chapter 2: Governing Equations""; ""2.1 The Flow and Its Mathematical Description""; ""2.1.1 Finite control volume""; ""2.2 Conservation Laws""; ""2.2.1 The continuity equation""; ""2.2.2 The momentum equation""; ""2.2.3 The energy equation""; ""2.3 Viscous Stresses""; ""2.4 Complete System of the Navier-Stokes Equations""; ""2.4.1 Formulation for a perfect gas""</p> <p>""2.4.2 Formulation for a real gas""""2.4.3 Simplifications to the Navier-Stokes equations""; ""Thin shear layer approximation""; ""Parabolized Navier-Stokes equations""; ""Euler equations""; ""References"";</p> <p>""Chapter 3: Principles of Solution of the Governing Equations""; ""3.1 Spatial Discretization""; ""3.1.1 Finite-difference method""; ""3.1.2 Finite-volume method""; ""3.1.3 Finite-element method""; ""3.1.4 Other discretization methods""; ""Spectral-element method""; ""Lattice Boltzmann method""; ""Gridless method""; ""3.1.5 Central and upwind schemes""; ""Central schemes""</p> <p>""Upwind schemes""""Flux-vector splitting schemes""; ""Flux-difference</p>

splitting schemes"; "TVD Schemes"; "Fluctuation-splitting schemes";
"Solution reconstruction"; "First- and second-order schemes";
"ENO/WENO Schemes"; "Central versus upwind schemes"; "Upwind
schemes for real gas flows"; "3.2 Temporal Discretization"; "3.2.1
Explicit schemes"; "3.2.2 Implicit schemes"; "3.3 Turbulence
Modeling"; "3.4 Initial and Boundary Conditions"; "References";
"Chapter 4: Structured Finite-Volume Schemes"; "4.1 Geometrical
Quantities of a Control Volume"
"4.1.1 Two-dimensional case"; "4.1.2 Three-dimensional case"; "4.2
General Discretization Methodologies"; "4.2.1 Cell-centered scheme";
"4.2.2 Cell-vertex scheme: overlapping control volumes"; "4.2.3 Cell-
vertex scheme: dual control volumes"; "4.2.4 Cell-centered versus
cell-vertex schemes"; "4.3 Discretization of the Convective Fluxes";
"4.3.1 Central scheme with artificial dissipation"; "Scalar dissipation
scheme"; "Matrix dissipation scheme"; "4.3.2 Flux-vector splitting
schemes"; "Van Leer's scheme"; "AUSM"; "CUSP scheme"
"4.3.3 Flux-difference splitting schemes"; "Roe upwind scheme";
"4.3.4 Total variation diminishing schemes"; "Upwind TVD scheme";
"4.3.5 Limiter functions"; "Limiter functions for MUSCL
interpolation"; "MUSCL scheme with $\theta=0$ "; "MUSCL scheme with
 $\theta=1/3$ "; "Limiter for CUSP scheme"; "Limiter for TVD scheme"; "4.4
Discretization of the Viscous Fluxes"; "4.4.1 Cell-centered scheme";
"4.4.2 Cell-vertex scheme"; "References"; "Chapter 5: Unstructured
Finite-Volume Schemes"; "5.1 Geometrical Quantities of a Control
Volume"; "5.1.1 Two-dimensional case"
"Triangular element"

Sommario/riassunto

Computational Fluid Dynamics: Principles and Applications, Third Edition presents students, engineers, and scientists with all they need to gain a solid understanding of the numerical methods and principles underlying modern computation techniques in fluid dynamics. By providing complete coverage of the essential knowledge required in order to write codes or understand commercial codes, the book gives the reader an overview of fundamentals and solution strategies in the early chapters before moving on to cover the details of different solution techniques. This updated edition includes new
