

The Finite Element Method in Heat Transfer and Fluid Dynamics, Third Edition (Computational Mechanics and Applied Analysis)

By J. N. Reddy, D.K. Gartling

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As Computational Fluid Dynamics (CFD) and Computational Heat Transfer (CHT) evolve and become increasingly important in standard engineering design and analysis practice, users require a solid understanding of mechanics and numerical methods to make optimal use of available software. **The Finite Element Method in Heat Transfer and Fluid Dynamics, Third Edition** illustrates what a user must know to ensure the optimal application of computational procedures—particularly the Finite Element Method (FEM)—to important problems associated with heat conduction, incompressible viscous flows, and convection heat transfer.

This book follows the tradition of the bestselling previous editions, noted for their concise explanation and powerful presentation of useful methodology tailored for use in simulating CFD and CHT. The authors update research developments while retaining the previous editions' key material and popular style in regard to text organization, equation numbering, references, and symbols.

This updated third edition features new or extended coverage of:

Formulation of low-speed, compressible flows

With its presentation of realistic, applied examples of FEM in thermal and fluid

design analysis, this proven masterwork is an invaluable tool for mastering basic methodology, competently using existing simulation software, and developing simpler special-purpose computer codes. It remains one of the very best resources for understanding numerical methods used in the study of fluid mechanics and heat transfer phenomena.

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Editorial ReviewReview

"This third edition is an updated and extended version of a bestselling monograph, written by two well-known authors, about numerical simulation of the two disciplines heat transfer and fluid dynamics, closely couple in many engineering and scientific applications, by the finite element method. The text is based on graduate lectures and extended courses for a wide spectrum of engineering students and on own practical experiences. Also professionals in modeling of heat transfer, incompressible viscous flow, and heat convection and corresponding codes can profit from the book."

— Georg Hebermehl, Zentralblatt MATHAbout the Author

J.N. Reddy earned a Ph.D. in Engineering Mechanics from the University of Alabama in Huntsville, worked as a Postdoctoral Fellow at the University of Texas at Austin, was Research Scientist for Lockheed Missiles and Space Company during l974.75, and taught at the University of Oklahoma from 1975 to 1980 and Virginia Polytechnic Institute & State University from 1980 to 1992. Currently, he is a Distinguished Professor and the inaugural holder of the Oscar S. Wyatt Endowed Chair at Texas A&M University, College Station. Dr. Reddy has published over 400 journal papers and 16 textbooks on theoretical formulations and numerical simulations of problems in solid and structural mechanics, computational fluid dynamics, numerical heat transfer, computational biology, geology and geophysics, mechanics of nanosystems, and applied mathematics. Dr. Reddy is the recipient of numerous honors and awards, including the 1998 Nathan M. Newmark Medal from the American Society of Civil Engineers, the 2003 Computational Solid Mechanics award from the U.S. Association of Computational Mechanics, the 2004 Distinguished Research Award from the American Society for Composites, and an honorary degree (Honoris Causa) from the Technical University of Lisbon, Portugal (2009). Dr. Reddy is a fellow of the American Academy of Mechanics, the American Institute of Aeronautics and Astronautics, the American Society of Civil Engineers, the American Society of Mechanical Engineers, the American Society for Composites, International Association of Computational Mechanics, U.S. Association of Computational Mechanics, the Aeronautical Society of India, and the Institution of Structural Engineers, U.K. Dr. Reddy serves on the editorial boards of two dozen journals, and as the Editor-in-Chief of Applied Mechanics Reviews, Mechanics of Advanced Materials and Structures, International Journal of Computational Methods in Engineering Science and Mechanics, and International Journal of Structural Stability and Dynamics. As a result of his extensive publications of archival journal papers and books, Dr. Reddy is recognized by ISI Highly Cited Researchers with over 10,000 citations and an H-index of over 40 to his credit. A more complete resume with links to journal papers can be found at http://authors.isihighlycited.com/ or http://www.tamu.edu/acml.**D.K. Gartling** is a senior scientist in the Engineering Sciences Center at Sandia Nationa Laboratories, Albuquerque, New Mexico. He earned his B.S. and M.S. in Aerospace Engineering at the University of Texas at Austin and completed the diploma course at th von Karman Institute for Fluid Dynamics in Brussels, Belgium. After completion of his Ph.D. in Aerospace Engineering at the University of Texas at Austin, he joined the technical staff at Sandia National Laboratories. Dr. Gartling was a Visiting Associate Professor in the Mechanical Engineering Department at the University of Sydney, Australia, under a Fulbright Fellowship, and later he was a Supervisor in the Fluid and Thermal Sciences Department at Sandia National Laboratories. Dr. Gartling has published numerous papers dealing with Þnite element model development and finite element analysis of heat transfer and fluid dynamics problems of practical importance. He is the recipient of the 2001 Computational Fluid Dynamics Award from the U.S. Association of Computational Mechanics and is a fellow of the American Society of Mechanical Engineers. Dr. Gartling is presently a member of several professional societies, serves on the editorial boards o several journals, and is the Co-Editor of International Journal for Numerical Methods I Fluids.Users Review**From reader reviews:**

Kiley Kaufman:What do you concerning book? It is not important along with you? Or just adding material

when you want something to explain what the ones you have problem? How about your extra time? Or are you busy particular person? If you don't have spare time to do others business, it is make one feel bored faster. And you have extra time? What did you do? Every person has many questions above. They should answer that question due to the fact just their can do this. It said that about book. Book is familiar on every person. Yes, it is appropriate. Because start from on pre-school until university need this specific The Finite Element Method in Heat Transfer and Fluid Dynamics, Third Edition (Computational Mechanics and Applied Analysis) to read.

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