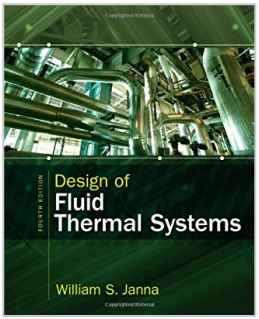

Design of Fluid Thermal Systems

By William S. Janna

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This book is designed to serve senior-level engineering students taking a capstone design course in fluid and thermal systems design. It is built from the ground up with the needs and interests of practicing engineers in mind; the emphasis is on practical applications. The book begins with a discussion of design methodology, including the process of bidding to obtain a project, and project management techniques. The text continues with an introductory overview of fluid thermal systems (a pump and pumping system, a household air conditioner, a baseboard heater, a water slide, and a vacuum cleaner are among the examples given), and a review of the properties of fluids and the equations of fluid mechanics. The text then offers an in-depth discussion of piping systems, including the economics of pipe size selection. Janna examines pumps (including net positive suction head considerations) and piping systems. He provides the reader with the ability to design an entire system for moving fluids that is efficient and cost-effective. Next, the book provides a review of basic heat transfer principles, and the analysis of heat exchangers, including double pipe, shell and tube, plate and frame cross flow heat exchangers. Design considerations for these exchangers are also discussed. The text concludes with a chapter of term projects that may be undertaken by teams of students.

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Design of Fluid Thermal Systems By William S. Janna Bibliography

- Sales Rank: #816055 in Books
- Published on: 2014-02-14
- Original language: English
- Number of items: 1
- Dimensions: 9.10" h x 1.00" w x 7.30" l, .0 pounds
- Binding: Paperback
- 656 pages

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"The most appealing part of the text is the practical approach to the material. The analysis procedures are very well laid out, making it easy for students to step through the procedures."

"The book is very well written and is exactly at the right level for my senior undergraduate students."

About the Author
Dr. William S. Janna is a Professor in the Department of Mechanical Engineering at the University of Memphis. He has served as Department Chair at U of Memphis from 1987-1991. He served also as Associate Dean for Graduate Studies and Research (1999-2003). Previously, he served as Department Chair at the University of New Orleans, where he was employed from 1976 to 1987. Dr. Janna has written three textbooks, as well as several laboratory manuals. He was a member of The American Society for Engineering Education, and currently serves as web master for the Mechanical Engineering Division. He is also a member of ASME. Dr. Janna is committed to improving undergraduate engineering education, and to the sharing of information that will produce better engineers. His current research interests include flow in piping systems, heat and mass transfer from melting ice objects, flow over a sublimating flat plate, and design of fluid-thermal systems. He teaches undergraduate and graduate courses in the areas of thermodynamics, fluid mechanics, and heat transfer.

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