
Thermal Design And Optimization

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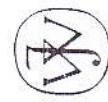
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This book provides a comprehensive and rigorous introduction to system design and optimization from a contemporary perspective. The presentation is intended for engineering students at the senior or graduate level and for practicing engineers and technical managers within the energy field. The book is appropriate for use in a capstone design or a technical elective course, and for self-study. Sufficient end-of-chapter problems are provided for these uses. In class testing, the material has to work well with the intended audience.

We assume readers have had introductory courses in engineering dynamics and heat transfer and are familiar with the basics of fluid transfer, and engineering economics. reviews are provided in Chapters 6 and 7, respectively. Our presentation does not provide a detailed treatment of component design or extensive operating and cost data. Information on these topics is available in various standard references, handbooks, manufacturers' catalogs. Readers should refer to such sources as needed. Extensive reference lists to facilitate this. The book has been provided to allow flexibility in the use of units. It can be studied using the System (SI) units only or a mix of SI and English units.

In the area of thermal systems, engineering curricula are largely and design analysis oriented. Students initially learn to apply mass balances and, increasingly, entropy and exergy balances. Then, of known engineering descriptions and specifications, students calculate the size, performance, and cost of heat exchangers, turbines and other components. These activities are important, but the systems engineering design is much wider. Design is primarily system oriented. The objective is to effect a design solution; to devise a means for a stated purpose subject to real-world constraints. Design requires selecting and putting together components to form a smoothly working system. Design also often requires that principles from different disciplines be integrated.

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