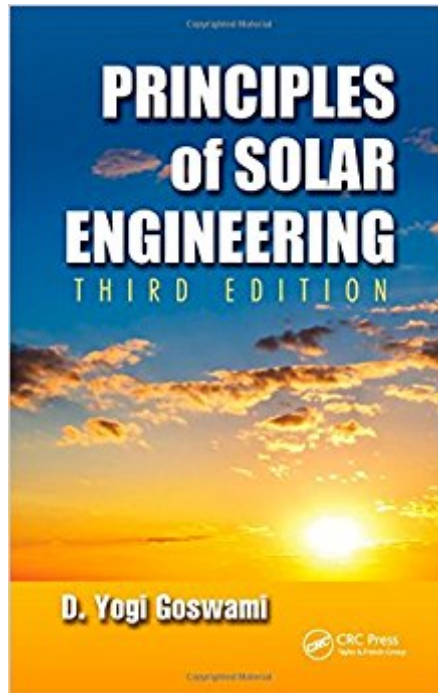




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Principles Of Solar Engineering, Third Edition



Synopsis

An Engineering-Based Survey of Modern Solar Energy Concepts and Practical Applications

Reflecting major developments in solar energy since the publication of the last edition, *Principles of Solar Engineering, Third Edition* follows the changes in energy policies that have led to the rapid growth of solar energy systems. This latest edition focuses on the fundamentals and the design of systems for various applications including building, heating and cooling, industrial process heat, electric power plants (including PV and CSP), and environmental systems. What's New in the Third Edition: The third edition introduces new topics that include organic and dye sensitized solar cells in the photovoltaics chapter, advanced thermodynamic power cycles such as supercritical CO₂ cycle and information on design software packages. The chapters on solar radiation and solar thermal collectors have been completely changed. Because of its increased importance, solar thermal power is covered in much more depth than in the previous edition. The book contains increased coverage of high temperature thermal storage for CSP in the chapter for energy storage and transport. It changes many end-of-chapter problems, provides examples and problems for both northern and southern hemispheres and countries around the world, includes a solutions manual, and revises the retained material. A significant change in the new edition is the addition of economic analysis in the first chapter, which includes a number of solved examples, and allows the students to analyze the applications in the later chapters from an economic standpoint. Designed to be both a textbook and a reference, this work: Introduces the global energy situation and addresses changes taking place in the distribution of available energy resources Covers concentrating and nonconcentrating solar thermal collectors in much more depth than before Highlights the latest developments in collector materials as well as new correlations for heat transfer and thermal performance analysis Explores thermal energy storage, new developments, including materials, analysis, and design Examines CSP and PV power, and outlines what students need to learn for future upcoming developments in these areas Provides in detail solar central receiver systems, commonly known as power towers, including the design of a solar heliostat field, receiver/absorber, and higher temperature thermodynamic power cycles Details the latest developments in thin film solar cells Presents environmental applications of solar energy *Principles of Solar Engineering, Third Edition* addresses the need for solar resource assessment, and highlights improvements and advancements involving photovoltaics and solar thermal technologies, grid power, and energy storage.

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"The book is an excellent source of high quality information on current and advanced technological topics on solar energy. I intend to upgrade the textbook for my solar energy classes, by replacing the current 2nd edition with the 3rd edition of this book." — Charles Cohn, Stevens Institute of Technology, Hoboken, New Jersey, USA "This is a book written by one of the prominent experts in solar engineering. The treatment of the design and analysis of solar thermal heating and power generating systems is thorough and unparalleled." — Dr. Teshome Jiru, Oregon Institute of Technology, Klamath Falls, USA "The authors have done a nice job updating this edition of their classic textbook by enhancing the chapter on photovoltaics and by including more recent advances in solar thermal power technologies such as the supercritical Rankine cycle and the supercritical CO₂ power cycle." — Dr. Kevin Anderson, Cal Poly Pomona, Mechanical Engineering, California, USA "The organization of the book seems much better than the second edition. The present chapter eight is a great piece of work, which provides many details in solar thermal power design. To my best knowledge, no other textbook on solar engineering can compete with this book regarding this topic." — Yuan Zheng, University of Wyoming, Laramie, USA

Dr. D. Yogi Goswami is a distinguished university professor and director of the Clean Energy Research Center at the University of South Florida. He conducts fundamental and applied research on solar thermal power and cooling, photocatalytic detoxification and disinfection, thermodynamics, third-generation photovoltaics, and hydrogen production and storage. Professor Goswami is the

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