

An Introduction To Thermal Power Plant Engineerin

Design of Solar Thermal Power Plants introduces the basic design methods of solar thermal power plants for technicians engaged in solar thermal power generation engineering. This book includes the author's theoretical investigation and study findings in solar heat concentrators, a performance evaluation of solar thermal collectors, a numerical simulation of the heat transfer process between complex geometrics, heat transfer through radiation, and more. Containing theoretical descriptions of solar concentrators and receivers, practical engineering examples, and detailed descriptions of site selections for solar thermal power plants, this book has a strong theoretical and practical value for readers. Contains practical guidance and applications, making it more useful and user-friendly for CSP engineers Includes theoretical investigation in solar heat concentrators, performance evaluation of solar thermal collectors, and the numerical simulation of heat transfer between complex geometrics with practical applications

An introduction to thermal physics which combines both a macroscopic and microscopic approach for each method, giving a basis for further studies of the properties of matter, whether from a thermodynamic or statistical angle.

Introduction to Thermal and Fluid Engineering combines coverage of basic thermodynamics, fluid mechanics, and heat transfer for a one- or two-term course for a variety of engineering majors. The book covers fundamental concepts, definitions, and models in the context of engineering examples and case studies. It carefully explains the methods used to evaluate changes in equilibrium, mass, energy, and other measurable properties, most notably temperature. It then also discusses techniques used to assess the effects of those changes on large, multi-component systems in areas ranging from mechanical, civil, and environmental engineering to electrical and computer technologies. Includes a motivational student study guide on CD to promote successful evaluation of energy systems This material helps readers optimize problem solving using practices to determine equilibrium limits and entropy, as well as track energy forms and rates of progress for processes in both closed and open thermodynamic systems. Presenting a variety of system examples, tables, and charts to reinforce understanding, the book includes coverage of: How automobile and aircraft engines work Construction of steam power plants and refrigeration systems Gas and vapor power processes and systems Application of fluid statics, buoyancy, and stability, and the flow of fluids in pipes and machinery Heat transfer and thermal control of electronic components Keeping sight of the difference between system synthesis and analysis, this book contains numerous design problems. It would be useful for an intensive course geared toward readers who know basic physics and mathematics through ordinary differential equations but might not concentrate on thermal/fluids science much further. Written by experts in diverse fields ranging from mechanical, chemical, and electrical engineering to applied mathematics, this book is based on the assertion that engineers from all walks absolutely must understand energy processes and be able to quantify them.

Mechanical engineering, as its name suggests, deals with the mechanics of operation of mechanical systems. This is the branch of engineering which includes design, manufacturing, analysis and maintenance of mechanical systems. It combines engineering physics and mathematics principles with material science to design, analyse, manufacture and maintain mechanical systems. This book covers the field requires an understanding of core areas including thermodynamics, material science, manufacturing, energy conversion systems, power transmission systems and mechanisms. This book includes basic knowledge of various mechanical systems used in day to day life. My hope is that this book, through its careful explanations of concepts, practical examples and figures bridges the gap between knowledge and proper application of that knowledge.

Air Pollution Modeling for Thermal Power Plants

Engineering Fundamentals: An Introduction to Engineering

Report on Trip to Seven Thermal Power Plants, December 1968

Erosion-Corrosion: An Introduction to Flow Induced Macro-Cell Corrosion

Feasibility of Alternative Means of Cooling for Thermal Power Plants Near Lake Michigan

An Introduction to Thermal-Fluid Engineering

Winner of an Outstanding Academic Title Award from CHOICE Magazine Encyclopedia of Environmental Management gives a comprehensive overview of environmental problems, their sources, their assessment, and their solutions. Through in-depth entries and a topical table of contents, readers will quickly find answers to questions about specific pollution and management issues. Edited by the esteemed Sven Erik Jørgensen and an advisory board of renowned specialists, this four-volume set shares insights from more than 500 contributors—all experts in their fields. The encyclopedia provides basic knowledge for an integrated and ecologically sound management system. Nearly 400 alphabetical entries cover everything from air, soil, and water pollution to agriculture, energy, global pollution, toxic substances, and general pollution problems. Using a topical table of contents, readers can also search for entries according to the type of problem and the methodology. This allows readers to see the overall picture at a glance and find answers to the core questions: What is the pollution problem, and what are its sources? What is the "big picture," or what background knowledge do we need? How can we diagnose the problem, both qualitatively and quantitatively, using monitoring and ecological models, indicators, and services? How can we solve the problem with environmental technology, ecotechnology, cleaner technology, and environmental legislation? How do we address the problem as part of an integrated management strategy? This accessible encyclopedia examines the entire spectrum of tools available for environmental management. An indispensable resource, it guides environmental managers to find the best possible solutions to the myriad pollution problems they face. Also Available Online This Taylor & Francis encyclopedia is also available through online subscription, offering a variety of extra benefits for researchers, students, and librarians, including: Citation tracking and alerts Active reference linking Saved searches and marked lists HTML and PDF format options Contact us to inquire about subscription options and print/online combination packages. US: (Tel) 1.888.318.2367 / (email) e-reference@taylorandfrancis.com International: (Tel) +44 (0) 20 7017 6062 / (email) online.sales@tandf.co.uk

In the decade since the 'Earth Summit' in Rio de Janeiro, the response of the world's governments and authorities to the threats to the global environment has been to enforce the reduction of energy consumption and harmful emissions - solutions primarily based around conventional energy resources and conventional thinking. The question is, though, whether this strategy is radical enough to address the key challenges how facing the environment, and whether it can be

effective in avoiding catastrophe on a global scale. For Herman Scheer, the answer is a definite no. In this fully updated edition of *A Solar Manifesto*, he once more attacks the lack of political will to find answers outside a conventional frame of reference. Climate change, pollution, deforestation, destruction of the ozone layer, poverty and the population explosion are all problems created or exacerbated by the use of conventional energy. Seven years after the first edition of this book, answers are now more urgently required than ever, as current policies serve merely to alleviate the escalating symptoms rather than attempting a cure for what could become a terminal affliction. Herman Scheer shows that this crisis may yet be reversed – but it can only be made to happen through a fundamental change in political and economic strategies, paving the way towards a global solar energy economy sustained by new social principles. *A Solar Manifesto* champions the replacement of fossil and nuclear fuels with solar energy, as a real solution to the threat to the environment and associated social consequences. Scheer constructs a radical yet innovative political and economic model and argues the case with passion and conviction for the global solar economy as the route to a sustainable environment. Thought-provoking and profoundly challenging, this book will be an inspiration to anyone concerned with energy and the global environment.

This book aims to examine innovation in the fields of computer engineering and networking. The book covers important emerging topics in computer engineering and networking, and it will help researchers and engineers improve their knowledge of state-of-art in related areas. The book presents papers from the 4th International Conference on Computer Engineering and Networks (CENet2014) held July 19-20, 2014 in Shanghai, China.

Introduces readers to the fundamentals and applications of variational formulations in mechanics Nearly 40 years in the making, this book provides students with the foundation material of mechanics using a variational tapestry. It is centered around the variational structure underlying the Method of Virtual Power (MVP). The variational approach to the modeling of physical systems is the preferred approach to address complex mathematical modeling of both continuum and discrete media. This book provides a unified theoretical framework for the construction of a wide range of multiscale models. *Introduction to the Variational Formulation in Mechanics: Fundamentals and Applications* enables readers to develop, on top of solid mathematical (variational) bases, and following clear and precise systematic steps, several models of physical systems, including problems involving multiple scales. It covers: Vector and Tensor Algebra; Vector and Tensor Analysis; Mechanics of Continua; Hyperelastic Materials; Materials Exhibiting Creep; Materials Exhibiting Plasticity; Bending of Beams; Torsion of Bars; Plates and Shells; Heat Transfer; Incompressible Fluid Flow; Multiscale Modeling; and more. A self-contained reader-friendly approach to the variational formulation in the mechanics Examines development of advanced variational formulations in different areas within the field of mechanics using rather simple arguments and explanations Illustrates application of the variational modeling to address hot topics such as the multiscale modeling of complex material behavior Presentation of the Method of Virtual Power as a systematic tool to construct mathematical models of physical systems gives readers a fundamental asset towards the architecture of even more complex (or open) problems *Introduction to the Variational Formulation in Mechanics: Fundamentals and Applications* is a ideal book for advanced courses in engineering and mathematics, and an excellent resource for researchers in engineering, computational modeling, and scientific computing.

Introduction to Thermal and Fluid Engineering

An Introduction, Second Edition

Tokyo Electric Power Company

Introduction to Hydro Energy Systems

A Theoretical Introduction and a Practical Guide

Introduction to Energy Essentials

This book is intended to meet the requirements of the fresh engineers on the field to endow them with indispensable information, technical know-how to work in the industries and its associated plants. The book provides a thorough understanding and the operating principles to solve the elementary and the difficult problems faced modern young engineers while working in the industries. This book is written on the basis of 'hands-on' experience, sound and in-depth knowledge gained by the author through their experiences faced while working in this field. The problem generally occurs in the power plants during operation and maintenance. It has been explained in a lucid and simple manner. This book 'Basic Mechanical Engineering' has been written to provide knowledge and insight into various aspects of Mechanical Engineering. This book is intended as text book to be used by the students in the technical institutions i.e. Engineering Colleges and Polytechnics. The book covers Syllabi of various Universities on 'Basic Mechanical Engineering', 'Elements of Mechanical Engineering', 'Mechanical Engineering', 'Introduction to Mechanical Engineering' and 'Fundamentals of Mechanical Engineering' for the students of all the disciplines of Engineering. Adequate attention has been paid to emphasize on basic principles involved in the subject matter. The explanation in the book has been supported with line diagrams, along with numerous solved problems. The readers will find the book highly useful as a comprehensive text covering basic principles in a simple language and easy to grasp formatting.

Provides an engaging and clearly structured source of information on the capture and storage of CO₂ Designed to bridge the gap between the many disciplines involved in carbon dioxide emission management, this book provides a comprehensive yet easy-to-understand introduction to the subject of CO₂ capture. Fit for graduate students, practicing process engineers, and others interested in the subject, it offers a clear understanding and overview of thermal power plants in particular and of carbon dioxide capture and storage (CCS) in general. *Carbon Dioxide Emission Management in Power Generation* starts with a discussion of the greenhouse effect, climate change, and CO₂ emissions as the rationale for the concept of CCS. It then looks at the long-term storage of CO₂. A chapter covering different fossil fuels, their usage, and properties comes next, followed by sections on: CO₂ generation, usage and properties; power plant technologies; theory of gas separation; power plant efficiency calculations; and classification of CO₂ capture methods. Other chapters examine: CO₂ capture by gas absorption and other gas separation methods; removing carbon from the fuel; pre- and post-combustion CO₂ capture; and oxy-combustion CO₂ capture in power cycles. -Discusses both CO₂ capture technologies as well as power generation technologies -Bridges the gap between many different disciplines?from scientists, geologists and engineers, to economists -One of the few books that covers all the different sciences involved in the capture and storage of CO₂ -Introduces the topic and provides useful information to the academic as well as professional reader *Carbon Dioxide Emission Management in Power Generation* is an excellent book for students who are interested in CO₂ capture and storage, as well as for chemists in industry, environmental chemists, chemical engineers, geologists and geologists.

Advances in Thermal Energy Storage Systems, 2nd edition, presents a fully updated comprehensive analysis of thermal energy storage systems (TES) including all major advances and developments since the first edition published. This very successful publication provides readers with all the information related to TES in one resource, a variety of applications across the energy/power and construction sectors, as well as, new to this edition, the transport industry. After an introduction to TES systems Prof. Luisa Cabeza and her team of expert authors consider the source, design and operation of the use of water, molten salts, concrete, aquifers, boreholes and a variety of phase-change materials for TES systems, before analyzing and simulating underground TES systems. This edition benefits from 5 new chapters covering the most advanced technologies including sorption systems, thermodynamic and dynamic modelling as well as applications to the transport industry and the environmental and economic aspects of TES. It will benefit researchers and academics of energy systems and thermal energy storage, construction engineering academics, engineers and practitioners in the energy and power industry, as well as architects of plants and storage systems and R&D managers. Includes 5 brand new chapters covering Sorption systems, Thermodynamic and dynamic models, applications to the transport sector, environmental aspects of TES and economic aspects of TES All existing chapters are updated and revised to reflect the most recent advances in the research and technologies of the field Reviews heat storage technologies, including the use of water, molten salts, concrete and borehole storage systems, and considers their applications in residential buildings, power plants and industry

Basic Mechanical Engineering

Insight into Nuclear, Renewable, and Non-Renewable Energies

Methods and Applications

An Introduction to Thermodynamics, Statistical Mechanics, and Kinetic Theory

Encyclopedia of Environmental Management, Four Volume Set

Introduction to the simulation of power plants for EBSILON®Professional Version 15

Multiattribute decision analysis is a methodology for providing information to a decision maker for comparing and selecting between complex alternatives. A brief introduction to the principal concepts of the Raiffa approach to multiattribute decision analysis is presented. The concepts of decision alternatives, outcomes, objectives, attributes and their states, attribute utility functions, and the need for the attribute states to be aggregated into a numerical representation of the preferences of the decision maker for the outcomes and the decision alternatives are presented. 50 references

This revised text covers the fundamentals of thermodynamics required to understand electrical power generation systems and the application of these principles to nuclear reactor power plant systems. It starts with fundamental definitions of units and dimensions, thermodynamic variables and the Laws of Thermodynamics progressing to sections on specific applications of the Brayton and Rankine cycles for power plant systems and projected reactor systems design issues. It is not a traditional general thermodynamics text, per se, but a practical thermodynamics volume intended to explain the fundamentals and apply them to actual nuclear power plants systems, where thermal hydraulics comes to play. There have been significant new findings for intercooled systems since the previous edition published and they will be covered. New technology plans for using a Nuclear Air-Brayton as a storage system for a low carbon grid are presented along with updated component sizes and performance criteria for Small Modular Reactors. In a straight-forward style while retaining scientific rigor, the content is accessible to upper division undergraduate students and aimed at practicing engineers in nuclear power facilities and engineering technicians in industry, academic research groups, and national laboratories. The book is also a valuable resource for students and faculty in various engineering programs concerned with nuclear power.

Energy managers need to learn new and diverse ways to approach energy management in their company's assets as technology continues to evolve. Built into one cohesive and fundamental reference.

Essentials: Insight into Nuclear, Renewable, and Non-Renewable Energies delivers an informative tool to understand the main steps for introducing and maintaining an energy management system. After a high-level introduction, the reference then takes a structured approach and dives into different sources of energy along with their contribution to energy efficiency, focusing on nuclear power, renewable energies. Multiple options are further discussed including economic considerations and cost comparisons per energy source, energy storage technology, and how to introduce an energy management system in a company. More advanced topics include nuclear reactor power plant systems and their thermal hydraulic analysis as well as cyber resiliency for future electric power and well plant control systems.

Introduction to Energy Essentials: Insight into Nuclear, Renewable, and Non-Renewable Energies gives today's energy managers and engineers a solid starting point to meeting the energy demands of the future. Understand key concepts, techniques, and tools surrounding energy management Learn how to include smarter energy efficiency in your daily management decisions Gain the fundamental knowledge on renewable and non-renewable energy systems

The nuclear thermal hydraulic is the science providing knowledge about the physical processes occurring during the transferring the fission heat released in structural materials due to nuclear fission in the environment. Along its way to the environment the thermal energy is organized to provide useful mechanical work or useful heat or both. Chapter 1 contains introductory information about the nuclear core, the thermal power and thermal power density in the fuel, structures and moderator, the influence of the thermal power density on the coolant temperature, the spatial distribution of the thermal power density. Some measures are introduced for equalizing of the spatial distribution of the thermal power density. Chapter 2 gives the methods for describing of the steady and of the transient temperature fields. Some information is provided regarding influence of the cladding oxidation, hydrogen diffusion and of the corrosion product deposition on the temperature fields. Didactically the nuclear thermal hydraulic is introduced at different level of complexity by introducing step by step the new features after the previous are clearly presented. The followed two Chapters serve this purpose. Chapter 3 describes the "simple" steady boiling flow in a pipe. The steady mass-, momentum- and energy conservation equations are solved at different level of complexity by removing one after the other simplifying assumptions. Mechanical and thermodynamic equilibrium is introduced.

CENet2014

Systems in Mechanical Engineering

Systems of Units in Thermal Power Engineering with Introduction to SI

Monitoring and Modeling

Power Generation

An Introduction to Thermal Power Plant Engineering and Operation

Introductory technical guidance for civil, mechanical and electrical engineers interested in sizing of hydroelectric power plants. Here is what is discussed: 1. INTRODUCTION 2. PROCEDURE FOR SIZING POWERPLANTS 3. POWER SYSTEM REQUIREMENTS AND MARKETABILITY CONSIDERATIONS. 4. PHYSICAL CONSTRAINTS 5. ENVIRONMENTAL AND NON-POWER OPERATING CONSTRAINTS 6. SELECTION OF ALTERNATIVE POWER INSTALLATIONS 7. DEPENDABLE CAPACITY 8. INTERMITTENT CAPACITY 9. FLEXIBILITY 10. MEASURES FOR FIRING UP PEAKING CAPACITY 11. HOURLY OPERATION STUDIES.

After decades of research and development, concentrating solar thermal (CST) power plants (also known as concentrating solar power (CSP) and as Solar Thermal Electricity or STE systems) are now starting to be widely commercialized. Indeed, the IEA predicts that by 2050, with sufficient support over ten percent of global electricity could be produced by concentrating solar thermal power plants. However, CSP plants are just but one of the many possible applications of CST systems. Advances in Concentrating Solar Thermal Research and Technology provides detailed information on the latest advances in CST systems research and technology. It promotes a deep understanding of the challenges the different CST technologies are confronted with, of the research that is taking place worldwide to address those challenges, and of the impact that the innovation that this research is fostering could have on the emergence of new CST components and concepts. It is anticipated that these developments will substantially increase the cost-competitiveness of commercial CST solutions and reshape the technological landscape of both CST technologies and the CST industry. After an introductory chapter, the next three parts of the book focus on key CST plant components, from mirrors and receivers to thermal storage. The final two parts of the book address operation and control and innovative CST system concepts. Contains authoritative reviews of CST research taking place around the world Discusses the impact this research is fostering on the emergence of new CST components and concepts that will substantially increase the cost-competitiveness of CST power Covers both major CST plant components and system-wide issues

Thermal physics deals with collections of large numbers of particles - typically 10 to the 23 rd power or so. Examples include the air in a balloon, the water in a lake, the electrons in a chunk of metal, and the photons given off by the sun. We can't possibly follow every detail of the motions of so many particles. So in thermal physics we assume that these motions are random, and we use the laws of probability to predict how the material as a whole ought to behave. Alternatively, we can measure the bulk properties of a material, and from these infer something about the particles it is made of. This book will give you a working understanding of thermal physics, assuming that you have already studied introductory physics and calculus. You will learn to apply the general laws of energy and entropy to engines, refrigerators, chemical reactions, phase transformations, and mixtures. You will also learn to use basic quantum physics and powerful statistical methods to predict in detail how temperature affects molecular speeds, vibrations of solids, electrical and magnetic behaviors, emission of light, and exotic low-temperature phenomena. The problems and worked examples explore applications not just within physics but also to engineering, chemistry, biology, geology, atmospheric science, astrophysics, cosmology, and everyday life.

Now in dynamic full color, ENGINEERING FUNDAMENTALS: AN INTRODUCTION TO ENGINEERING, 5e helps students develop the strong problem-solving skills and solid foundation in fundamental principles they will need to become analytical, detail-oriented, and creative engineers. The book opens with an overview of what engineers do, an inside glimpse of the various areas of specialization, and a straightforward look at what it takes to succeed. It then covers the basic physical concepts and laws that students will encounter on the job. Professional Profiles throughout the text highlight the work of practicing engineers from around the globe, tying in the fundamental principles and applying them to professional engineering. Using a flexible, modular format, the book demonstrates how engineers apply physical and chemical laws and principles, as well as mathematics, to design, test, and supervise the production of millions of parts, products, and services that people use every day. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Introduction to the Variational Formulation in Mechanics

Decision Analysis for Evaluating and Ranking Small Solar Thermal Power System Technologies. Volume I.A Brief Introduction to Multiattribute Decision Analysis

An Introduction to Hydroelectric Power Plant Sizing

Thermal Power Plant Performance Analysis

A Survey of Thermal Power Plant Cooling Facilities

Thermal Engineering

"Erosion-corrosion is a generic name of degradation phenomena which occur on the chemical plant composing metallic materials under the conditions of various flowing liquids. For example, it occurs on heat transfer pipes of seawater heat exchangers (made of" An exploration of how advances in computing technology and research can be combined to extend the capabilities and economics of modern power plants. The contributors, from academia as well as practising engineers, illustrate how the various methodologies can be applied to power plant operation.

The ongoing search for renewable energy, the societal impact of blackouts, the environmental impact of generating electricity, along with the new ABET criterion have contributed to renewed interest in electric energy as a core subject. Emphasizing modeling, analysis, and real-world issues, this new edition of Electric Energy provides a refreshed overview of this increasingly important field. New in the Second Edition- · Expanded coverage of the mathematical modeling of renewable systems, power electronics, and electric safety · A chapter on power quality · An expanded chapter on machines that includes dc machines and single phase motors · A chapter on future power systems Along with the standard topics of power electronics and electromechanical conversion, the text also covers energy resources, power plants, environmental impacts of power generation, power system operation, renewable energy, and electrical safety. Most of the topics are related to issues encountered daily in practice, and most of the examples are from real systems and use real data. With a flexible structure and exceptional relevance to real-life issues, Electric Energy, Second Edition brings together all the topics needed to build the broad-based background today's engineers need.

The analysis of the reliability and availability of power plants is frequently based on simple indexes that do not take into account the criticality of some failures used for availability analysis. This criticality should be evaluated based on concepts of reliability which consider the effect of a component failure on the performance of the entire plant. System reliability analysis tools provide a root-cause analysis leading to the improvement of the plant maintenance plan. Taking in view that the power plant performance can be evaluated not only based on thermodynamic related indexes, such as heat-rate, Thermal Power Plant Performance Analysis focuses on the presentation of reliability-based tools used to define performance of complex systems and introduces the basic concepts of reliability, maintainability and risk analysis aiming at their application as tools for power plant performance improvement, including: · selection of critical equipment and components, · definition of maintenance plans, mainly for auxiliary systems, and · execution of decision analysis based on risk concepts. The comprehensive presentation of each analysis allows future application of the methodology making Thermal Power Plant Performance Analysis a key resource for undergraduate and postgraduate students in mechanical and nuclear engineering.

Modeling and Simulation of Thermal Power Plants with ThermoSysPro

Thermal-Hydraulic Analysis of Nuclear Reactors

An Overview

Practical Guide to Thermal Power Station Chemistry

Thermal Physics

Nuclear Thermal Hydraulics

This book deals with the entire gamut of work which chemistry department of a power plant does. The book covers water chemistry, steam-water cycle chemistry, cooling water cycle chemistry, condensate polishing, stator water conditioning, coal analysis, water analysis procedures in great details. It is for all kinds of intake water and all types of boilers like Drum/Once-through for subcritical and supercritical technologies in different operating conditions including layup. It has also covered nuances of different cycle chemistry treatments like All Volatile / Oxygenated. One of the major reasons of generation loss in a thermal plant is because of boiler tube leakage. There is illustration and elucidation on this which will definitely make people more aware of the importance of adherence to strict quality

parameters required for the adopted technology prescribed by well researched organization like EPRI. The other important coverage in this book is determination of quality of primary and secondary fuel which is very important to understand combustion in Boiler, apart from its commercial implication. The health analysis of Lubricants and hydraulic oil have also been adequately covered. I am very much impressed with the detailing of each and every issue. Though Soumitra refers the book as "Practical Guide", the reader will find complete theoretical background of suggested action and the rational of monitoring each parameter. He has detailed out the process, parameters, sampling points, sample frequency & collection methods, measurement techniques, laboratory set up and record keeping very meticulously and there is adequate emphasis on trouble shooting too. There is a nice blending of theory and practice in such a way that the reader at the end will not only learn what to do and how to do, he will also know why to do. I hope this book will be invaluable and a primer to every power plant chemist and the station management shall find it a bankable document to ensure best chemistry practices.

This text is the first to provide an integrated introduction to basic engineering topics and the social implications of engineering practice. Aimed at beginning engineering students, the book presents the basic ideas of thermodynamics, fluid mechanics, heat transfer, and combustion through a real-world engineering situation. It relates the engine to the atmosphere in which it moves and exhausts its waste products. The book also discusses the greenhouse effect and atmospheric inversions, and the social implications of engineering in a crowded world with increasing energy demands. Students in mechanical, civil, agricultural, environmental, aerospace, and chemical engineering will welcome this engaging, well-illustrated introduction to thermal-fluid engineering.

This textbook has been designed for a one-semester course on Power Plant Engineering studied by both degree and diploma students of mechanical and electrical engineering. It effectively exposes the students to the basics of power generation involved in several energy conversion systems so that they gain comprehensive knowledge of the operation of various types of power plants in use today. After a brief introduction to energy fundamentals including the environmental impacts of power generation, the book acquaints the students with the working principles, design and operation of five conventional power plant systems, namely thermal, nuclear, hydroelectric, diesel and gas turbine. The economic factors of power generation with regard to estimation and prediction of load, plant design, plant operation, tariffs and so on, are discussed and illustrated with the help of several solved numerical problems. The generation of electric power using renewable energy sources such as solar, wind, biomass, geothermal, tidal, fuel cells, magneto hydrodynamic, thermoelectric and thermionic systems, is discussed elaborately. The book is interspersed with solved problems for a sound understanding of the various aspects of power plant engineering. The chapter-end questions are intended to provide the students with a thorough reinforcement of the concepts discussed.

EBSILON®Professional is a powerful modeling system developed for the simulation of thermodynamic cycles. It is suitable as a tool for plant planning, design and optimization of thermal power plants with a steam process or a gas turbine process as well as plants with renewable energies (biomass, wind energy, solar energy and geothermal energy). The introduction describes the basic principles and the working steps to create a model of the plant. Furthermore, the work with the intern programming environment EbsScript and the handling of the calculation of time series is presented.

POWER PLANT ENGINEERING

Electric Energy

Advances in Concentrating Solar Thermal Research and Technology

A Solar Manifesto

Design of Solar Thermal Power Plants

The authors have tried to strike a balance between a short book chapter and a very detailed book for subject experts. There are three prime reasons behind for doing so: first, the field is quite interdisciplinary and requires simplified presentation for a person from non-parent discipline. The second reason for this short-version of a full book is that both the authors have seen students and technically oriented people, who were searching for this type of book on hydro energy. The third reason and motivation was considering engineers who are starting their career in hydro energy sector. This book is targeted to present a good starting background and basic understanding for such professionals.

This book explains the modelling and simulation of thermal power plants, and introduces readers to the equations needed to model a wide range of industrial energy processes. Also featuring a wealth of illustrative, real-world examples, it covers all types of power plants, including nuclear, fossil-fuel, solar and biomass. The book is based on the authors' expertise and experience in the theory of power plant modelling and simulation, developed over many years of service with EDF. In more than forty examples, they demonstrate the component elements involved in a broad range of energy production systems, with detailed test cases for each chemical, thermodynamic and thermo-hydraulic model. Each of the test cases includes the following information: • component description and parameterization data; • modelling hypotheses and simulation results; • fundamental equations and correlations, with their validity domains; • model validation, and in some cases, experimental validation; and • single-phase flow and two-phase flow modelling equations, which cover all water and steam phases. A practical volume that is intended for a broad readership, from students and researchers, to professional engineers, this book offers the ideal handbook for the modelling and simulation of thermal power plants. It is also a valuable aid in understanding the physical and chemical phenomena that govern the operation of power plants and energy processes.

A comprehensive book presenting the introduction of air pollutants and their impacts. The coverage includes a literature review of air quality monitoring and modeling. Also discussed the methodology for dispersion modeling of air pollutants in thermal power plants. An attempt has been made for the development of Emissions inventory, the Emissions inventory provided all the basic information and data required for air pollution modeling, and clearly described the details of site specific conditions. Also the book covered the prediction of primary pollutants using Gaussian formulae with worst case input data, the prediction of primary pollutants using ISCST3 model with site-specific data and the development of Artificial Neural Network model for forecasting of ground level ozone in the vicinity of a Thermal power plant. ANN model was used to resolve the complex correlation between ozone and other input parameters particularly Nitrogen oxides and temperature. With its systematic approach, unified presentation and comprehensive coverage, including data pertaining to Thermal power plant conditions, the book would be immensely useful to practicing environmental engineers.

Fundamentals and Applications

Scientific and Technical Aerospace Reports

Carbon Dioxide Emission Management in Power Generation

Thermal Power Plant Simulation and Control

Multiphase Flow Dynamics 4

The Engine and the Atmosphere