

Access Free Power Plant  
Engineering Pk Nag

# Power Plant Engineering Pk Nag

**This textbook has been designed for students of B.E./B.Tech Mechanical Engineering. It provides all the necessary information about power plants and steam power plants, nuclear and hydel power plants, diesel and gas turbine power plants, geothermal plants, ocean thermal plants, tidal power plants, and solar power plants, and the economics behind them. Key features: Each chapter includes a solved problem. The text is supplemented with illustrated diagrams, tables, flow charts,**

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**and graphs wherever required, for clear understanding. A summary at the end of each chapter helps students to review material presented. Review questions and exercise problems have been designed to enhance the engineering skills of the student.**

**Intended as a practical guide to the design, installation, operation and maintenance of the systems used for measuring and controlling boilers and heat-recovery steam-generators used in land and marine power plants and in process industries.**

**Power Plant Performance discusses the different procedures and practices**

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**involved in the operation of power plants. The book is divided into four parts. Part I covers general considerations such as steam cycles; the sampling, analysis, and assessment of coal; and pumping - its related terms, the different types of pumps, and the determination of sizes and efficiency. Part II tackles the important measurements in power plants such as temperature, pressure, and gas and water flow. Part III deals with the operation of power plant components such as the boiler, turbine, and condensers. Part IV tackles other related topics such as steam turbine heat consumption tests; plant-**

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**operating parameters; and the costs of outages. The text is recommended for professionals involved in the development, maintenance, and operation of power plants, especially those who would like to be familiar with the basics.**

**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**

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**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**

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**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.**

**This Text-Cum-Reference Book Has Been Written To Meet The Manifold Requirement And Achievement Of The Students And Researchers. The**

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**Objective Of This Book Is To Discuss, Analyses And Design The Various Power Plant Systems Serving The Society At Present And Will Serve In Coming Decades India In Particular And The World In General. The Issues Related To Energy With Stress And Environment Up To Some Extent And Finally Find Ways To Implement The Outcome.**

**Salient Features#**

- Utilization Of Non-Conventional Energy Resources#**
- Includes Green House Effect#**
- Gives Latest Information S In Power Plant Engineering#**
- Include Large Number Of Problems Of Both Indian And Foreign Universities#**
- Rich Contents,**

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**Lucid Manner**

**Design of Machine Elements**

**Thermal Engineering**

**Gas Turbines 3E**

**An Introduction to Thermal  
Power Plant Engineering and  
Operation**

**Industrial Boilers and Heat  
Recovery Steam Generators**

**A Text Book of Power Plant  
Engineering**

**NPTEL Notes**

**Applied Thermodynamics**

Information on contemporary topics in power plant technology such as super critical boiler technology Practical approach to delineate complex topics with visual aids and representational schemes Exhaustive coverage of power generation from non-conventional sources of energy



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Ample solved examples, multiple-choice and exercise questions for practice.

A combination of two texts authored by Patrick Dunn, this set covers sensor technology as well as basic measurement and data analysis subjects, a combination not covered together in other references. Written for junior-level mechanical and aerospace engineering students, the topic coverage allows for flexible approaches to using the combination book in courses. MATLAB® applications are included in all sections of the combination, and concise, applied coverage of sensor technology is offered. Numerous chapter examples and problems are included, with complete solutions

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available.

The fourth edition of the book is richer in contents presenting updated information on the fundamental aspects of various processes related to thermal power plants. The major thrust in the book is given on the hands-on procedure to deal with the normal and emergency situations during plant operation. Beginning from the fundamentals, the book, explores the vast concepts of boilers, steam turbines and other auxiliary systems. Following a simple text format and easy-to-grasp language, the book explicates various real-life situation-related topics involving operation, commissioning, maintenance, electrical and instrumentation of a power plant.

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NEW TO THE FOURTH EDITION □  
The text now incorporates a new chapter on Environmental and Safety Aspects of Thermal Power Plants. □ New sections on Softener, Water Treatment of Supercritical Boiler, Wet Mode and Dry Mode Operation of Supercritical Boiler, Electromatic Pressure Relief Valve, Pressure Reducing and Desuperheating (PRDS) System, Orsat Apparatus, and Safety Interlocks and Auto Control Logics in Boiler have been added in related chapters. □ Several sections have been updated to provide the reader with the latest information. □ A new appendix on Important Information on Power Generation has been incorporated into the text. Dealing with all the latest

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coverage, the book is written to address the requirements of the undergraduate students of power plant engineering. Besides this, the text would also cater to the needs of those candidates who are preparing for Boiler Operation Engineers (BOE) Examination and the undergraduate/postgraduate students who are pursuing courses in various power training institutes. The book will also be of immense use to the students of postgraduate diploma course in thermal power plant engineering.

**KEY FEATURES** □ Covers almost all the functional areas of thermal power plants in its systematically arranged topics. □ Incorporates more than 500 self-test questions in chapter-end exercises to test the student's grasp of the

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fundamental concepts and BOE Examination preparation. □  
Involves numerous well-labelled diagrams throughout the book leading to easy learning. □  
Provides several solved numerical problems that generally arise during the functioning of thermal power plants.

OVERVIEWS : Meant for the undergraduate course on Power Plant Engineering studied by the mechanical engineering students, this book is a comprehensive and up-to-date offering on the subject. It has detailed coverage on hydro-electric, diesel engine and g.  
The book will serve as a useful design resource and as a practice kit to the agricultural engineering graduates, post graduates in farm power and machinery and for the

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students appearing for various competitive exams such as ARS, NET, GATE, JRF/SRF etc. The technology & improved designs of farm equipment and technical know how associated with it, is going to be quite useful to establish techno-economic viability for the staff engaged in R&D in farm machinery. This will also be quite useful reference book for the design engineers engaged in design and development of improved machinery in the modern agricultural mechanization. This is the first text book of its kind to address systematically the design problems involved in farm machinery. It offers comprehensive coverage of design principles and practices

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[Bond and structure models  
Design, Applications, and  
Calculations](#)

[Power Plant Performance](#)

[Nuclear Power Plant Engineering](#)

[Power Plant Engineering](#)

[Engineering Thermodynamics, 5e  
Steam Tables](#)

[Power Generation Technologies](#)

*This comprehensive volume provides a complete, authoritative, up-to-date reference for all aspects of power plant engineering. Coverage ranges from engineering economics to coal and limestone handling, from design processes to plant thermal heat balances. Both theory and practical applications are covered, giving engineers the*

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*information needed to plan, design, construct, upgrade, and operate power plants. Power Plant Engineering is the culmination of experience of hundreds of engineers from Black & Veatch, a leading firm in the field for more than 80 years. The authors review all major power generating technologies, giving particular emphasis to current approaches. Special features of the book include: \* More than 1000 figures and lines drawings that illustrate all aspects of the subject. \* Coverage of related components and systems in power plants such as turbine-generators,*



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*feedwater heaters, condenser, and cooling towers. \* Definitions and analyses of the features of various plant systems. \* Discussions of promising future technologies. Power Plant Engineering will be the standard reference in the professional engineer's library as the source of information on steam power plant generation. In addition, the clear presentation of the material will make this book suitable for use by students preparing to enter the field.*

*Filled with over 225 boiler/HRSG operation and design problems, this book*

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*covers steam generators and related systems used in process plants, refineries, chemical plants, electrical utilities, and other industrial settings.*

*Emphasizing the thermal engineering aspects, the author provides information on the design and performance of steam generators*

*An introduction to the overall design of power plant systems, focusing on system rather than component design. Examines thermal aspects of systems and the decisions necessary to produce optimal power plant design. Includes appropriate computer methodology.*

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*Suitable for introductory courses in mechanical engineering.*

*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.*

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*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*

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*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.*

*Revised extensively and updated with several new topics, this book discusses the principles and applications of "Heat and Mass Transfer". It is written with extensive pedagogy, clear explanations and examples throughout to*

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*elucidate the concepts and  
facilitate problem solving.*

*Questions and Answers*

*Turbines Compressors and*

*Fans*

*Basic Mechanical Engineering*

*(Be 204)*

*POWER PLANT ENGINEERING*

*Power System Engineering*

*Steam Power Engineering*

*Basic And Applied*

*Thermodynamics 2/E*

*Power Plant System Design*

A steam/thermal power station uses heat energy generated from burning coal to produce electrical energy. ... From the turbine the steam is cooled back to water in the Condenser, the resulting water is fed back into the boiler to repeat the cycle.

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This book makes intelligible the wide range of electricity generating technologies available today, as well as some closely allied technologies such as energy storage. The book opens by setting the many power generation technologies in the context of global energy consumption, the development of the electricity generation industry and the economics involved in this sector. A series of chapters are each devoted to assessing the environmental and economic impact of a single technology, including conventional technologies, nuclear and renewable (such as solar, wind and hydropower). The technologies are presented in an easily digestible

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form. Different power generation technologies have different greenhouse gas emissions and the link between greenhouse gases and global warming is a highly topical environmental and political issue. With developed nations worldwide looking to reduce their emissions of carbon dioxide, it is becoming increasingly important to explore the effectiveness of a mix of energy generation technologies. Power Generation Technologies gives a clear, unbiased review and comparison of the different types of power generation technologies available. In the light of the Kyoto protocol and OSPAR updates, Power Generation Technologies will provide an invaluable reference



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text for power generation planners, facility managers, consultants, policy makers and economists, as well as students and lecturers of related Engineering courses. ·

Provides a unique comparison of a wide range of power generation technologies - conventional, nuclear and renewable · Describes the workings and environmental impact of each technology · Evaluates the economic viability of each different power generation system

This hallmark text on Gas Turbines covers all aspects of the subject. The topics have been explained right from the fundamentals so that even a beginner can comprehend the exposition. Various chapters

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such as Inlets and Nozzles, Blades, Environmental Considerations and Applications and Rocket Propulsion make the book complete.

Theoretical descriptions of the topics is crisp and well organized without the presence of any superfluous content which is supported really well with the help of pedagogical features. This edition is a thoroughly revised and updated one. All in all a must read for the readers of Gas Turbines.

Revised extensively, the new edition of this text conforms to the syllabi of all Indian Universities in India. This text strictly focuses on the undergraduate syllabus of Design of Machine Elements I and II , offered over two semesters.

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Turbomachines, which comprise turbines, compressors and fans, are used in electric power generation, aircraft propulsion and a wide variety of medium and heavy industries. The importance of this class of machines can be understood by the examples of 2000 MW steam turbines, turbojet engines, etc. This book is a self-contained treatise in the theory, design and application of turbomachines. The book deals with the use of turbomachines in air handling, power generation, aircraft propulsion and several industrial applications. It covers the basic theory and working of all kinds of turbomachines. In addition, the book discusses:\*

- \* The role of

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individual turbomachines in a plant\*  
Dimensional analysis and flow  
through cascades\* Fans, blowers,  
high-temperature turbine stages  
and aerospace engineering\*  
Problems on hydraulic turbines and  
pumps

[Steam Power Plant Engineering](#)  
[Farm Machinery Design : Principles](#)  
[And Problems, 1/e](#)  
[For Power Plant Professionals](#)  
[Power-plant Control and](#)  
[Instrumentation](#)  
[Boiler Operation Engineering](#)  
[Engineering Thermodynamics](#)  
[Thermal Power Plant Performance](#)  
[Analysis](#)

This book is intended to meet the  
requirements of the fresh engineers

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on the field to endow them with indispensable information, technical know-how to work in the power plant industries and its associated plants. The book provides a thorough understanding and the operating principles to solve the elementary and the difficult problems faced by the 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 authors during 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 language.

The Favourable and warm reception, which the previous

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editions and reprints of this booklet have enjoyed at home and abroad, has been a matter of great satisfaction to me.

Meant for the undergraduate course on Power Plant Engineering studied by the mechanical engineering students, this book is a comprehensive and up-to-date offering on the subject. It has detailed coverage on hydro-electric, diesel engine and gas turbine power plants. Plenty of solved examples, exercise questions and illustrations make this a very student friendly text.

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[ENGINEERING AND POWER](#)  
[PLANT, FOURTH EDITION](#)

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Systems](#)

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[Pow Plant Engg](#)

[Heat & Mass Transfer 2E](#)