POWER GENERATION: GAS TURBINES, STEAM POWER PLANT, CO-GENERATION AND COMBINED CYCLE PLANTS

COURSE OVERVIEW

This comprehensive 5-day training course is designed to provide participants with an in-depth understanding of various power generation technologies, including gas turbines, steam power plants, co-generation systems, and combined cycle plants. The course covers the principles of operation, design considerations, performance parameters, and integration of these systems for optimal efficiency and reliability. Participants will also explore practical case studies, efficiency enhancement techniques, maintenance strategies, and environmental considerations associated with modern power generation facilities. Emphasis will be placed on the interrelation of systems in combined and co-generation plants and their role in meeting energy demand sustainably.

DATES, VENUES AND FEES

10 – 14 August 2025 - Dubai

(5 Days)

Fees US$ 4500

Note: Fee is per participant + 5% VAT (if applicable).
Groups from the same company can enjoy a **discounted** price.

WHO SHOULD ATTEND?

This course is appropriate for a wide range of professionals but not limited to:

- Power Plant Engineers and Technicians
- Mechanical and Electrical Engineers
- Maintenance Engineers
- Utility Managers and Energy Professionals
- Project Engineers and Plant Designers
- Energy Auditors and Efficiency Consultants
- Professionals involved in planning, operating, or maintaining power generation systems

CONTACT US NOW

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ACCREDITATION

This training course is certified by CPD.

The CPD Certification Service is the leading independent CPD accreditation institution operating across industry sectors to complement the Continuing Professional Development policies of professional institutes and academic bodies. The CPD Certification Service provides support, advice, and recognised independent CPD accreditation compatible with global CPD principles. CPD is the term used to describe the learning activities professionals engage in to develop and enhance their abilities and keep skills and knowledge up to date. CPD Units are only awarded to programmes after each programme is scrutinised to ensure integrity and quality according to CPD standards and benchmarks.

COURSE CERTIFICATE

MSTC certificate will be issued to all attendees completing a minimum of 80% of the total tuition hours of the course.

CPD internationally recognized certificate will be issued for all participants who will meet the course requirements.
CPD certificates will be issued within a month of the successful completion of the course.

TRAINING METHODOLOGY

- Expert-led sessions with dynamic visual aids
- Comprehensive course manual to support practical application and reinforcement
- Interactive discussions addressing participants' real-world projects and challenges
- Insightful case studies and proven best practices to enhance learning

LEARNING OBJECTIVES

By the end of this course, participants should be able to:

- Understand the fundamental operating principles of gas turbines, steam turbines, co-generation, and combined cycle plants.
- Compare the performance, applications, and limitations of various power generation systems.
- Analyze system configurations for improving plant efficiency and reducing emissions.
- Interpret key design parameters and performance indicators.
- Identify best practices in operation, control, and maintenance of power generation equipment.
- Evaluate co-generation opportunities and the benefits of waste heat utilization.
- Enhance decision-making in selecting and managing power generation technologies.

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COURSE OUTLINE

DAY 1

Overview of Power Generation Technologies

- Pre test
- Introduction to Power Generation: History and Future Trends
- Types of Power Plants: Fossil Fuel, Nuclear, Renewable, Hybrid
- Energy Conversion Principles and Thermodynamic Cycles
- Efficiency Metrics and Heat Rate
- Environmental and Regulatory Considerations
- Power Generation Economics and Plant Load Factors

DAY 2

Gas Turbine Power Plants

- Operating Principles of Gas Turbines
- Brayton Cycle and Performance Characteristics
- Types of Gas Turbines and Their Applications
- Combustion Systems, Compressors, and Turbines
- Cooling and Emissions Control Techniques
- Gas Turbine Maintenance and Troubleshooting
- Case Study

DAY 3

Steam Power Plants and Rankine Cycle

- Steam Generation and Rankine Cycle Fundamentals
- Boiler Types, Steam Turbines, and Condensers
- Feedwater Systems and Turbine Bypass
- Superheating, Reheating, and Regeneration
- Heat Recovery and Efficiency Optimization
- Steam Plant Operation and Safety Procedures
- Group Exercise

DAY 4

Co-Generation Systems (CHP - Combined Heat and Power)

- Concept of Co-Generation and Its Advantages
- Types of Co-Generation Systems (Topping and Bottoming Cycles)
- Integration with Industrial and District Heating Systems
- Equipment Used: Gas Turbines, Engines, HRSGs
- Energy Savings and Environmental Benefits
- Economic Evaluation of Co-Generation Projects
- Case Study

DAY 5

Combined Cycle Power Plants

- Configuration and Operation of Combined Cycle Plants
- Integration of Brayton and Rankine Cycles
- Heat Recovery Steam Generators (HRSG)
- Startup and Shutdown Procedures
- Efficiency Enhancement and Load Following
- Operation Challenges and Maintenance Practices
- Group Exercise
- Post test

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