Combined Cycle Series - 2.4 CEUs*

The combined cycle series provides an introduction to the combined cycle process as well as a basic through advanced understanding of the systems and major equipment that make up a combined cycle power plant.

Combined Cycle Fundamentals - 0.2 CEUs

Combined Cycle Plant Overview
- Combined Cycle Plant
- Major Plant Components
- Auxiliary Systems

Combined Cycle Theory of Operations
- Combined Cycle Configurations
- Brayton and Rankie Cycles
- Normal Plant Operation

Combined Cycle Major Components
- Gas Turbines
- Heat Recovery Steam Generators
- Steam Turbines
- Balance of Plant Systems

Introduction to Power Plants
- Industry Beginnings
- The National Electric Power Grid
- Generating Electricity
- Types of Fuel
- Transmission

Gas Turbine - 0.6 CEUs

Gas Turbine Basics
- Introduction and Terminology
- Major Components
- Theory of Operation

Air Inlet Systems
- Introduction and Terminology
- Major Components
- Theory of Operation

Compressor Section
- Introduction and Terminology
- Major Components
- Theory of Operation
- Compressor Extraction System

Combustion Section
- Introduction and Terminology
- Major Components
- Theory of Operation

Turbine Section
- Introduction and Terminology
- Major Components
- Theory of Operation

Gas Turbine Bearings
- Introduction and Terminology
- Major Components
- Theory of Operation

Starting Packages
- Introduction and Terminology
- Major Components
- Theory of Operation

Fuel Systems
- Fuel Gas Systems
- Fuel Gas System Major Components
- Fuel Oil Systems
- Fuel Oil System Major Components

**CEUs are calculated and awarded at the subject area level. Series level totals are to show the available amount of CEUs that can be earned for completing all subject areas in a particular series.*

Combustion Controls and Continuous Emissions Monitoring
- Introduction and Terminology
- Major Components
- Theory of Operation
- Continuous Emission Monitoring Systems

Gas Turbine Lubricating and Lift Oil Systems
- Introduction and Terminology
- Major Components
- Theory of Operation

Gas Turbine Hydraulic Oil Systems
- Introduction and Terminology
- Major Components
- Theory of Operation

Fuel Support Systems
- Introduction
- Atomizing Air Systems
- Water Injection System

Water Wash Systems
- Introduction and Terminology
- Major Components
- Theory of Operation

Heat Recovery Steam Generator - 0.2 CEUs

Heat Recovery Steam Generator Drums and Blowdown Systems
- Introduction and Terminology
- Major Components
- Theory of Operation

Boiler Water Chemistry
- Introduction and Terminology
- Monitored Parameters
- Maintaining Parameters

Heat Recovery Steam Generator Basics
- Introduction and Terminology
- Major Components
- Theory of Operation

Duct Burners and Selective Catalytic Reduction Systems
- Introduction and Terminology
- Duct Burners
- Selective Catalytic Reduction Systems

Balance of Plant - 0.8 CEUs

Balance of Plant Basics
- Introduction and Terminology
- Balance of Plant Systems
- System Interrelationships

High-Pressure Steam Systems
- Introduction and Terminology
- Major Components
- Theory of Operation

Reheat and Intermediate-Pressure Steam Systems
- Introduction and Terminology
- Major Components
- Theory of Operation

Condensers
- Introduction and Terminology
- Major Components
- Theory of Operation

Steam Plant Water Systems
- Steam Plant Water Systems
- Condensate Systems
- Feedwater Systems

Cooling Water Systems
- Cooling Water Systems
- Circulating Water Systems
- Closed-Loop Cooling Water Systems

Processed Water Systems
- Introduction and Terminology
- Major Components
- Theory of Operation

Demineralized Water Systems
- Introduction and Terminology
- Major Components
- Theory of Operation

Reverse Osmosis Water Systems
- Introduction and Terminology
- Major Components
- Theory of Operation

Low-Pressure Steam Systems
- Introduction and Terminology
- Major Components
- Theory of Operation

Auxiliary Steam Systems
- Introduction and Terminology
- Major Components
- Theory of Operation

Wastewater Systems
- Introduction and Terminology
- Major Components
- Theory of Operation

Compressed Gas Systems
- Major Components and Terminology
- Nitrogen Systems
- Hydrogen Systems
- Carbon Dioxide Systems

Compressed Air Systems
- Introduction and Terminology
- Major Components
- Theory of Operation

Fire Protection Systems
- Introduction and Terminology
- Major Components
- Theory of Operation

Steam Turbine - 0.3 CEUs

Steam Turbine Basics
- Introduction and Terminology
- Major Components
- Theory of Operation

Steam Turbine Bearings
- Introduction and Terminology
- Major Components
- Theory of Operation

Gland Seal Steam Systems
- Introduction and Terminology
- Major Components
- Theory of Operation

Steam Turbine Lubricating Oil Systems
- Introduction and Terminology
- Major Components
- Theory of Operation

Steam Turbine Hydraulic Oil Systems
- Introduction and Terminology
- Major Components
- Theory of Operation

Electrical Power Generation and Distribution - 0.2 CEUs

Generator Basics
- Introduction and Terminology
- Major Components
- Theory of Operation
- Generator Protection
- Industry Beginnings
- The National Electric Power Grid
- Generating Electricity
- Types of Fuel

Generator Cooling Systems
- Introduction and Terminology
- Air Cooling Systems
- Hydrogen Cooling Systems

Seal Oil Systems
- Introduction and Terminology
- Major Components
- Theory of Operation

Switchyards and Power Distribution Lines
- Introduction and Terminology
- Major Components
- Theory of Operation
- Relay Types

Power Plant Efficiency - 0.1 CEUs

Heat Rate Basics
- Introduction and Terminology
- Formulas and Conversion Factors
- Importance of Heat Rate

Major Components Effect on Heat Rate
- Gas Turbines
- Heat Recovery Steam Generators
- Steam Turbines
- Condensers
- Miscellaneous Equipment