Module 1
Power Plant Basics (4)

Energy Conversion
501-02 Steam Turbine Basics
501-03 Combustion System Component Overview
501-04 Boiler Water and Steam Cycle Overview
501-05 Generator Overview

Module 2
Basic Electricity (6)

401-01 Electron Theory
401-02 Magnetism and Electromagnetism Explained
402-01 Introduction to Alternating Current (AC)
409-01 AC Induction Motors
409-02 AC Generators
415-01 Transformer Basic Operation and Theory

Module 3
Plant Instrumentation and Control Theory (6)

603-01 Instrumentation and Control Overview
603-06 Temperature Instruments
603-07 Pressure Measuring Devices
603-08 Level Measuring Devices
603-09 Flow Measuring Devices
613-01 Introduction to Automated Control

Module 4
Introduction to Plant Equipment (6)

219-01 Introduction to Centrifugal Pumps
215-01 Introduction to Valves and Their Components
223-01 Heat Exchanger Theory
223-02 Open Heat Exchanger Design and Operation
231-01 Introduction to Positive Displacement Pumps
243-01 Introduction to Hydraulics

Module 5
Plant Drawings (2)

611-01 P&ID Basics
611-02 Reading a P&ID

Module 6
Plant Systems (5)

521-01 Introduction to Combustion Air and Flue Gas Systems
521-02 Combustion Air and Flue Gas Flow Paths and Components
551-01 Introduction to the Circulating Water System
553-01 Introduction to the Condensate System
553-02 Introduction to the Feedwater System

Module 7
Turbines (3)

505-01 Steam Turbine Design
505-02 Steam Turbine Valves and Controls
505-03 Steam Turbine Auxiliaries
Module 8
Boilers & Boiler
Fuel Systems (16)
522-01 Coal Handling System
523-01 Boiler Fuel System Function
523-02 Process and Methods of Control for the Boiler Fuel System
523-03 Boiler Fuel System Start-up
523-04 Normal Operation of the Boiler Fuel Systems
523-05 Shutdown for the Boiler Fuel System
531-01 Combustion Theory
531-02 Basic Boiler Design
531-03 Boiler Valves and Fittings
531-04 Boiler Fuel and Air Systems
531-05 Boiler Water and Steam Cycle
531-06 Boiler Heat Recovery Systems
531-07 Boiler Environmental Controls
531-08 Boiler Operator Roles and Responsibilities
533-01 Fuel Combustion and Controls
533-02 Boiler Burner Controls and Management

Module 9
Power Generation (6)
507-01 Generator and Auxiliary Systems’ Functions
507-02 Generator and Auxiliary Systems’ Flow Paths and Major Components
507-03 Generator Construction and Process Control
507-04 Generator and Auxiliary Systems’ Start-up
507-05 Generator and Auxiliary Systems’ Normal Operations
507-06 Generator and Auxiliary Systems’ Shutdown

Module 10
Environmental Protection (6)
535-01 Flue Gas Desulfurization System
535-02 Flue Gas Desulfurization System (FGDS) Open Spray Design, Part 1
535-03 Flue Gas Desulfurization System (FGDS) Open Spray Design, Part 2
535-04 Dry Scrubber Operation
535-05 Selective Catalytic Reduction (SCR)
563-15 Environmentally Sensitive Operations

Module 11
Electrical Systems and Equipment (16)
411-04 Motor Control Centers
417-01 Switchgear
417-02 Low Voltage Breakers
417-03 Medium and High Voltage Switchgear
417-04 General Switchgear Maintenance
417-05 Switchgear Specific Maintenance Procedures
417-06 Circuit Breaker Time Travel
418-03 Protection Relays
418-04 Generator, Transformer, and Motor Protection
418-05 Grounding and Bonding
427-01 Electrical Freeze Protection Components and Application
560-01 Main Transformers
560-02 Station Service System
560-03 Fuses and Circuit Breakers
560-04 Protective Relays and Instrument Transformers
560-05 Equipment Disconnects and Grounding

Module 12
Plant Controls (4)
565-01 Distributed Control System Fundamentals
565-02 DCS Components
565-03 Using DCS Diagrams
565-04 Power Plant Unit Control

Module 13
Steam Tables (3)
567-01 Understanding the Basic Properties of Water and Steam
567-02 Saturated Steam Tables
567-03 Superheated Steam Tables

Module 14
Basic Water Chemistry and Treatment (11)
559-01 Molecular Chemistry of Water
559-02 Elements and the Periodic Table of Elements
559-03 Chemical Compounds
559-04 Corrosion Causes and Effects
559-05 Corrosion Control in a Power Plant
559-06 Steam Chemistry Control and Guidelines
559-07 Power Plant Water Treatment Systems
559-08 Introduction to Desalination
559-09 Desalination: Pre- and Post-treatment of Water
559-10 Reverse Osmosis
559-11 Thermal Desalination Technologies