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# **REFERENCE SYLLABUS**

For

**Power Engineer (3rd Class)**



# POWER ENGINEER (3RD CLASS)

## SYLLABUS

### Introduction

This Syllabus is intended to assist candidates studying for the Power Engineer (3rd Class) Examination.

#### **Recommended Study Program:**

It is recommended that, before undertaking this examination, the candidate completes Power Engineering Course of study, offered through a recognized and approved technical institute or training provider which addresses the Syllabus Outline.



# POWER ENGINEER (3RD CLASS)

## SYLLABUS

Reference Syllabus for Power Engineer (3rd Class) Examination Candidates

### **Major Topic: Applied Mechanics, Thermodynamics, and Chemistry**

Topic 1 Forces and Friction

Topic 2 Work, Power, Energy: Linear and Angular Motion

Topic 3 Heat, State Change, Calorimetry

Topic 4 Thermal Expansion and Heat Transfer

Topic 5 Steam Properties and Calculations

Topic 6 Gas Laws and Calculations

Topic 7 Chemistry Fundamentals

Topic 8 Metallurgy and Materials

Topic 9 Corrosion Principles

### **Major Topic: Boiler Codes, Electrical and Instrumentation Theory**

Topic 1 Legislation and Codes for Power Engineers

Topic 2 Code Calculations - ASME Section I

Topic 3 Fuels, Combustion, and Flue Gas Analysis

Topic 4 Piping Design, Connections, Support

Topic 5 Steam Traps, Water Hammer, Insulation

Topic 6 Valves and Actuators

Topic 7 AC Theory and Machines

Topic 8 AC Systems, Switchgear, Safety

Topic 9 Electrical Calculations

Topic 10 Control Loops and Strategies



# POWER ENGINEER (3RD CLASS)

## SYLLABUS

### **Major Topic: Pumps and Boilers**

Topic 1 Watertube Boiler Designs

Topic 2 Special Boiler Designs

Topic 3 Boiler Construction

Topic 4 Boiler Heat Transfer Components

Topic 5 High Pressure Boiler Fittings

Topic 6 Burner Designs and Supply Systems

Topic 7 Boiler Draft and Flue Gas Equipment

Topic 8 Boiler Control Systems

Topic 9 Boiler Procedures

Topic 10 Internal Water Treatment for Boilers

Topic 11 Boiler Water Pretreatment

Topic 12 Pressure Vessels

### **Major Topic: Prime Movers and Refrigeration**

Topic 1 Steam Turbine Auxiliaries and Operation

Topic 2 Turbine Condenser Systems

Topic 3 Gas Turbine Principles and Designs

Topic 4 Gas Turbine Auxiliaries and Operation

Topic 5 Cogeneration Systems and Operation

Topic 6 Compressor Theory and Designs

Topic 7 Compressor Auxiliaries and Operation

Topic 8 Refrigeration Principles and Systems

Topic 9 Refrigeration Auxiliaries and Operation

Topic 10 Heat Exchangers and Cooling Towers

Topic 11 Fired Heaters

Topic 12 Wastewater Treatment

Topic 13 Plant Maintenance and Administration