REFERENCE SYLLABUS

For

Power Engineer (2nd Class)
Introduction

This Syllabus is intended to assist candidates studying for the Power Engineer (2nd 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.
Reference Syllabus for Power Engineer (2nd Class) Examination Candidates

Major Topic: Code Calculations and Legislation
Topic 1 A.S.M.E. Code Calculations - Cylindrical Components
Topic 2 ASME Code Calculations: Stayed Surfaces, Pressure Relief Valves and Furnaces
Topic 3 Boiler and Pressure Vessel Legislation
Topic 4 Plant Design and Installation
Topic 5 Management and Supervision
Topic 6 Plant Maintenance
Topic 7 Safety
Topic 8 Linear Motion
Topic 9 Angular Motion
Topic 10 Friction
Topic 11 Static and Dynamic Forces
Topic 12 Fluid Mechanics

Major Topic: Thermodynamics and Metallurgy
Topic 1 Heat, Expansion of Solids, and Heat Transfer
Topic 2 Thermodynamics of Gases
Topic 3 Thermodynamics of Steam
Topic 4 Practical Thermodynamic Cycles
Topic 5 Metallurgy
Topic 6 Testing of Metals
Topic 7 Corrosion of Metals
Topic 8 Introduction to Welding Symbols
Major Topic: **Boilers and Water Treatment**

- Topic 1 Boiler and Steam Generator Components and Design
- Topic 2 Specialized Boiler Designs
- Topic 3 Boiler and Steam Generator Operation
- Topic 4 Boiler and Steam Generator Maintenance and Inspection
- Topic 5 Pumps
- Topic 6 Water Chemistry and Analysis
- Topic 7 Water Pre-Treatment I
- Topic 8 Water Pre-Treatment II
- Topic 9 Internal Water Treatment
- Topic 10 Non-Boiler Water Treatment

Major Topic: **Prime Movers**

- Topic 1 Steam Turbine Theory and Construction
- Topic 2 Steam Turbine Auxiliaries and Control
- Topic 3 Steam Turbine Operation and Maintenance
- Topic 4 Steam Condensers
- Topic 5 Internal Combustion Engines: Components and Auxiliaries
- Topic 6 Internal Combustion Engines: Operation and Maintenance
- Topic 7 Gas Turbine Design and Auxiliaries
- Topic 8 Gas Turbine Operation and Control
- Topic 9 Lubrication
- Topic 10 Piping
- Topic 11 Mechanical Drawing

Major Topic: **Combustion and Plant Systems**

- Topic 1 Power Plant Fuel Systems
- Topic 2 Power Plant Water and Steam Systems
- Topic 3 Measurement and Control Components
- Topic 4 Control Instrumentation Systems
- Topic 5 Fuels and Combustion Calculations
- Topic 6 Firing and Draft Equipment
- Topic 7 Combustion Control and Safeguards
- Topic 8 Environmental Monitoring
- Topic 9 Environmental Control Methods
Major Topic: **Electricity and Refrigeration**

- **Topic 1** Alternating Current Theory
- **Topic 2** Direct Current Machines
- **Topic 3** Alternating Current Generators
- **Topic 4** Alternating Current Motors
- **Topic 5** Transformers
- **Topic 6** Electrical System Protection
- **Topic 7** Air and Gas Compression
- **Topic 8** Refrigeration Systems and Equipment
- **Topic 9** Refrigeration Safety, Control, and Operation
- **Topic 10** Refrigeration Calculations