REFERENCE SYLLABUS

For

International Power Engineer (3rd Class)
Introduction

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

Major Topic: Applied Mechanics, Thermodynamics and Chemistry

**Topic 1** Algebraic Operations, Logarithms and Problem Solving
**Topic 2** Trigonometry
**Topic 3** Mensuration
**Topic 4** Forces and Friction
**Topic 5** Work, Power, Energy: Linear and Angular Motion
**Topic 6** Strength of Materials; Bending of Beams
**Topic 7** Simple Machines; Pressure, Density, Flow
**Topic 8** Heat, State Change, Calorimetry
**Topic 9** Thermal Expansion and Heat Transfer
**Topic 10** Steam Properties and Calculations
**Topic 11** Gas Laws and Calculations
**Topic 12** Chemistry Fundamentals
**Topic 13** Metallurgy and Materials
**Topic 14** Corrosion Principles
**Topic 15** Industrial Drawings

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** Electrical Theory and DC Machines
**Topic 8** AC Theory and Machines
**Topic 9** AC Systems, Switchgear, Safety
**Topic 10** Electrical Calculations
**Topic 11** Control Loops and Strategies
**Topic 12** Instrument and Control Devices
**Topic 13** Distributed and Logic Control
**Topic 14** Safety Management Systems
**Topic 15** Fire Protection Systems
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 Pump Designs and Operation
- Topic 13 Pump Head Calculations
- Topic 14 Welding Procedures and Inspection
- Topic 15 Pressure Vessels

Major Topic: **Prime Movers and Refrigeration**

- Topic 1 Steam Turbine Principles and Design
- Topic 2 Steam Turbine Auxiliaries and Operation
- Topic 3 Turbine Condenser Systems
- Topic 4 Gas Turbine Principles and Designs
- Topic 5 Gas Turbine Auxiliaries and Operation
- Topic 6 Internal Combustion Engines
- Topic 7 Cogeneration Systems and Operation
- Topic 8 Compressor Theory and Designs
- Topic 9 Compressor Auxiliaries and Operation
- Topic 10 Refrigeration Principles and Systems
- Topic 11 Refrigeration Auxiliaries and Operation
- Topic 12 Heat Exchangers and Cooling Towers
- Topic 13 Fired Heaters
- Topic 14 Wastewater Treatment
- Topic 15 Plant Maintenance and Administration