

STEAM ENGINEERING INSTITUTE

THIRD CLASS ENGINEER CORRESPONDENCE COURSE

- Length of course: Twenty Eight Lessons
- Completion time: Twenty Two Weeks. Students are expected to complete all assignments of this course in twenty two weeks. Extensions of this time will be granted for legitimate reasons in writing to the President.
- Diploma requirements: Students are required to complete all lessons, assignments, quizzes and tests. A diploma will be granted to all students with a final grade of 70% or above.
- Text: STEAM PLANT OPERATIONS, by Woodruff & Lammers, Eighth Ed. Pub. McGraw-Hill.
- Handouts: Mass. Gen Laws Ch. 146 and additional handouts compiled by the Steam Engineering Institute.
- Video tapes: Three

Course outline

Lesson 1.

Steam Fundamentals, properties of steam. Video: **What is Steam**

Lesson 2.

Steam and its importance. Video: **Water Hammer**

Lesson 3.

Heat transfer, fire and water tube boilers. Superheaters: types and purpose. Heat recovery equipment: economizers and air preheaters.

Lesson 4.

Tensile strength, factor of safety, heating surface, boiler openings, joint efficiency.

Lesson 5.

The combustion process. Products of combustion. Video: **Fuels & Combustion**

Lesson 6.

Fuels

Lesson 7.

Boiler settings, combustion systems.

Lesson 8

Course review.

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Lesson 9.

Boiler accessories Video: **Low Water Safeguards**

Lesson 10.

Boiler accessories.

Lesson 11.

Review.

Lesson 12.

Boiler operation and maintenance.

Lesson 13.

Boiler operation and maintenance. Video: **Boiler Entry**

Lesson 14.

Injectors, duplex pump operation and parts.

Lesson 15.

Centrifugal pumps: types, parts and operation.

Lesson 16.

Turbine fundamentals: impulse and reaction. Turbine design and construction. Video: **Co-Gen & other Turbine Cycles**

Lesson 17.

Turbines & condensers.

Lesson 18.

Turbine governors.

Lesson 19.

Turbine operation

Lesson 20.

Surface condensers: construction, purpose, operation, leaks, operating problems, cleaning.

Lesson 21.

Auxiliary plant equipment. Water heaters, water softeners.

Lesson 22.

Steam traps, lubrication. Video: **Lets Talk Steam Traps**

Lesson 23.

Environmental control systems, flue gas emissions, precipitators.

Lesson 24.

Heating systems: steam Video: **Humidity**

Lesson 25.

Heating systems: outside air. Video: **Outside Air Systems**

Lesson 26.

MGL Chapter 146 & ASME Code Video: **ASME** Video: **National Board**

Lesson 27.

ASME Code. Course review.

Lesson 28

Course review. Gas Turbines. Video: **Gas Turbines-Major Components, Design & Construction plus Student Workbook.**