PELM 3200, Plant Services

4 Credits, 6 months

Course Description

This course covers industrial legislation, codes, boiler calculations, fuels and combustion, piping, electro technology, electrical calculations, control instrumentation and fire prevention and plant safety as identified in the Alberta Boilers Safety Association Reference Syllabus for the second paper of 3rd Class Part A Power Engineering.

Pre and Co-requisites

ABSA Fourth Class Power Engineering Certificate

Course Learning Outcomes (CLOs)

Upon successful completion of the course, the student shall be able to:

CLO1 Explain the purpose of, general content of, and interaction with, the legislation and codes that pertain to the design and operation of boilers and related equipment.
CLO2 Given the tube material specification numbers, and other necessary parameters, use the formulae in PG-27.2.1 to calculate either the minimum required wall thickness or the maximum allowable working pressure for a boiler tube.
CLO3 Explain the properties and combustion of common fuels and the analysis of combustion flue gas
CLO4 Discuss the codes, designs, specifications, and connections for ferrous, non-ferrous and non-metallic piping and explain expansion and support devices common to piping systems.
LO5 Explain the designs and operation of steam trap systems, the causes and prevention of water ham Describe the designs, configurations and operation of the common valve designs that are used in power and process piping.
CLO6 Describe the designs, configurations and operation of the common valve designs that are used in power and process piping.
CLO7 Explain basic concepts in the production of electricity and the design, characteristics and operation of DC generators and motors.
CLO8 Explain formation and characteristics of AC power, and describe the design, construction and operating principles of AC generators, motors and transformers.
CLO9 Identify the components of typical AC systems and switchgear and discuss safety around electrical systems and equipment.
CLO10 Define terms and perform simple calculations involving DC and AC power circuits.
CLO11 Explain the operation and components of pneumatic, electronic and digital control loops, and discuss control modes and strategies.
CLO12 Design and explain the principles of common temperature, pressure, flow and level instruments.

CLO13 Explain the general purpose, design, components and operation of distributed and programmable logic control systems.

CLO14 Explain the intent, scope and purpose of safety management programs including Occupational Health & Safety, workplace safety, work permits, confined space entry, Workplace Hazards Material Information System and accident investigation procedures.
CLO15 Discuss the classes and extinguishing media of fires and explain systems that are used to detect and extinguish industrial fires.

Evaluation

Assessment Type	Percentage
Chapter and Unit Quizzes	15%
Section Test 1	10%
Section Test 2	10%
E2 – Final Exam	65%

Course Completion Requirements

Minimum passing mark of 65% or C is required.

Grading Scale

4.0 Grade Scale	Alpha Grade	Percentage Grade
4.0	A+	93-100
4.0	A	85-92.9
3.7	A-	80-84.9
3.3	B+	77-79.9
3.0	B	74-76.9
2.7	B-	70-73.9
2.3	C+	67-69.9
2.0	C	64-66.9
1.7	C-	60-63.9
1.3	D+	55-59.9
1.0	*D	50-54.9
0.0	F	0-49.9

Land Acknowledgement

We respectfully acknowledge that Keyano College is on Treaty No. 8 Territory, the ancestral and traditional territory of the Cree, Dene, and Métis people.

Review Date: March 4, 2024