PECO 4200, Plant Services

4 Credit, 4 Weeks

Course Description

Areas covered are Basic concepts of Electro technology, Energy plant instrumentation & controls, Fundamental communication skills, Introduction to boiler design and Elements of boiler systems as identified in the Alberta Boilers Safety Association Reference Syllabus for 4th Class Part A Power Engineering.

Pre and Co-requisites

PECO 4100

Course Learning Outcomes (CLOs)

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

CLO1 Apply the concepts of basic electricity while performing simple calculations using voltage, current, resistance and power.
CLO2 Describe the basic principles of magnetism.
CLO3 Described the design and application of electrical metering devices.
CLO4 Describe the operating principles of the various types of AC and DC motors and generators.
CLO5 Describe the operating principles of electrical Transformers.
CLO6 Describe an electrical distribution system.
CLO7 Describe the overall purpose and function of plant instrumentation systems.
CLO8 Describe the construction and operation of common devices used to measure pressure, level, flow, temperature, humidity, and composition.
CLO9 Describe the basic types and functions of transmitters, recorders, controllers, and control actuators.
CLO10 Describe the operation of programming controls for boilers, including applicable testing and maintenance procedures.
CLO11 Describe the design and operation of electronic control systems.
CLO12 Describe the design and operation of electrical control systems.
CLO13 Describe the Power Engineer profession.
CLO14 Describe the application of Jurisdictional Acts and Regulations with respect to boilers and pressure vessels.
CLO15 Describe the purpose of boiler and pressure vessel Codes and Standards.
CLO16 Describe the historical development of boilers, boiler design, components, and configuration.
CLO17 Describe the design, components, and characteristics of watertube boilers.
CLO18 Explain the general design and application of electric boilers.
CLO19 Describe the special design considerations of boilers used in heating plants.
CLO20 Differentiate between a ASME Section I and ASME Section IV boilers.
CLO21 Discuss the basic theory of combustion, and the equipment used to provide proper combustion conditions within a boiler.

CLO22 Describe common fuel systems found in boiler systems.
CLO23 Describe basic concepts and equipment used to supply combustion air to boiler furnaces.
CLO24 Describe feedwater systems used with boilers.
CLO25 Describe equipment, operation, and purpose of boiler blowoff and blowdown systems.
CLO26 Describe types of boiler fireside cleaning equipment, their purpose, and their operation.

Evaluation

Assessment Type	Percentage
Chapter and Unit Quizzes	10%
Section Test 1	20%
Section Test 2	20%
E1 - Final Exam	50%

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

Every effort has been made to ensure that information in this course outline is accurate at the time of publication. Keyano College reserves the right to change courses if it becomes necessary so that course content remains relevant. In such cases, the instructor will give the students clear and timely notice of the changes.