

PELM 3400, Prime Movers & Auxiliaries

4 Credits, 6 months

Course Description

This course covers prime movers, air compressors, refrigeration, and lubrication as identified in the Alberta Boilers Safety Association Reference Syllabus for the second paper of 3rd Class Part B 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 Describe the support auxiliaries for a gas turbine and explain common operational, control and maintenance procedures.

CLO2 Describe auxiliary support and control systems for steam turbines and explain start-up and shutdown procedures.

CLO3 Explain typical designs, components, and operating principles of steam turbine condensers.

LO4 Explain common designs, major components, operating principles, and arrangements for industrial gas turbines.

CLO5 Explain the operating principles, designs, support systems, and operation of industrial internal combustion engines (ICE).

CLO6 Explain cogeneration and describe common configurations, components, and applications.

CLO7 Explain the classification, designs, and operating principles of industrial air and gas compressors.

CLO8 Explain the control and system auxiliaries for a typical instrument air system and explain startup procedures for air compressors.

CLO9 Explain the classification and properties of refrigerants and describe the operating principles and components of compression and absorption systems.

CLO10 Explain control and safety devices on a compression refrigeration system and explain procedures and equipment to control oil, non-condensables, moisture, refrigerant, and brine.

CLO11 Describe the design, operation, and applications of various types of industrial heat exchangers.

CLO12 Describe the design, components, operation, and applications of direct-fired and indirect-fired natural draft process heaters.

CLO13 Explain start-up and shutdown procedures for an indirect-fired heater.

CLO14 Explain typical components of maintenance and administration programs for utilities and process facilities.

CLO15 Describe designs, operating principles, and major components of steam turbines.

Evaluation

Assessment Type	Percentage
Chapter and Unit Quizzes	15%
Section Test 7	10%
Section Test 8	10%
E4 – 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

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.

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