



**DEPARTMENT OF POWER ENGINEERING
COURSE OUTLINE – WINTER 2018 POF 402 POWER ENGINEERING FOURTH
CLASS, PART A2 PE4A2 – 7.0(11/0/3)88**

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OFFICE HOURS: As Posted

PREREQUISITE(S)/COREQUISITE:

A high school diploma including at least:

- 70% in English 30, AND
- 70% in Math 30-2 or 65 % Math 30-1, AND
- 70% in Physics 30 or Chemistry 30, AND
- A Career Investigation (specified format)

OR

- Mature students not meeting the above requirements may request a review of their education and prior work skills by the Power Engineering Team at GPRC.

REQUIRED TEXT/RESOURCE MATERIALS:

- PE4A2 Learning Materials (PanGlobal)
- PE4A2 PanGlobal Workbook
- ASME 2007 Academic Extract
- CSA Academic Extract
- SOPEEC approved Academic supplement

CALENDAR DESCRIPTION:

This course along with the other 4th class courses will prepare the student to write the ABSA/SOPEEC Interprovincial examinations. The second book will cover the environment, materials/Piping/Welding, Boilers and Water Treatment

CREDIT/CONTACT HOURS:

Credits 7.0

Contact Hours 88 (11/0/3) 11 weeks

DELIVERY MODE(S):

Lectures and Labs

OBJECTIVES (OPTIONAL):

- Describe the interaction and interdependency between the various elements of the environment.

- Name gaseous pollutants related to power plants, describe their effect upon the environment, and discuss some methods used for their control as well as describe noise pollution related to power plants.
- Discuss methods of handling solid pollutants produced by power plants and the problems and solutions in regard to liquid thermal pollutants.
- Explain the impact of liquid waste on the environment.
- Explain the impact of gases and vapors on the environment.
- Explain the environmental impacts of industrial operating facilities.
- Describe the mechanical properties of engineering materials and the ability of alloying elements to change the mechanical properties of materials, and identify nonferrous materials used in engineering.
- Describe electric arc welding processes and weld inspection and testing methods.
- Describe welding terms, forge and oxyacetylene welding.
- Discuss the basic types of piping, piping connections, supports and drainage devices used in the industry.
- Discuss the design and uses of the valve designs most commonly used in industry and on boilers.
- By using common terms relating to boilers discuss the historical developments of, and the general requirements for proper boiler design.
- Discuss the design, components and characteristics of HRT, locomotive, firebox, Scotch and packaged firetube boilers.
- Describe various watertube boiler designs, including large generating units.
- Describe electric boilers in regard to their use and general design.
- Describe fabrication and general construction features of watertube and firetube boilers.
- Discuss draft and describe the basic equipment used to supply combustion to a boiler furnace.
- Discuss the basic theory of combustion in a boiler, and the equipment used to provide proper combustion conditions.
- Discuss the basic theory and design of a fluidized bed stream generator and describe the special operational and control aspects of fluidized bed combustion.
- Discuss the design and operation of safety valves for power and heating boilers.
- Describe different types of direct and inferential level gauges or indicators.
- Describe typical internal components of a boiler steam drum.
- Discuss the design and operation of sootblowers.

- Describe the purposes, equipment and operation of continuous and intermittent blowdown.
- Describe the basic preparation of a boiler for start-up and shutdown procedures.
- Discuss routine and emergency practices for operations of a packaged boiler.
- Discuss the general principles, methods and equipment used in preparing raw feedwater for steam production in a boiler.
- Discuss the general principles, methods and equipment used for the internal treatment of boiler water.

TRANSFERABILITY: As per ABSA requirements

** Grade of D or D+ may not be acceptable for transfer to other post-secondary institutions. Students are cautioned that it is their responsibility to contact the receiving institutions to ensure transferability

GRADING CRITERIA:

GRANDE PRAIRIE REGIONAL COLLEGE			
GRADING CONVERSION CHART			
Alpha Grade	4-point Equivalent	Percentage Guidelines	Designation
A+	4.0	90 – 100	EXCELLENT
A	4.0	85 – 89	
A–	3.7	80 – 84	FIRST CLASS STANDING
B+	3.3	77 – 79	
B	3.0	73 – 76	GOOD
B–	2.7	70 – 72	
C+	2.3	67 – 69	SATISFACTORY
F	0.0	0 – 66	FAIL
WF	0.0	0	FAIL, withdrawal after the deadline

EVALUATIONS:

Method	Percentage	Minimum
Course assignments	10%	67%
CML quizzes	10%	67%
Labs	10%	67%
Unit Exams	30%	67%
Final Exam	40%	67%
	100%	67%
		67% average, with no mark below 50%

STUDENT RESPONSIBILITIES:

*Students must complete all courses with no failing grades and a minimum of 67%, and attend a minimum of 80% of all classes and 100% of labs to successfully complete the program.

STATEMENT ON PLAGIARISM AND CHEATING:

Refer to the Student Conduct section of the College Admission Guide at <http://www.gprc.ab.ca/programs/calendar/> or the College Policy on Student Misconduct: Plagiarism and Cheating at www.gprc.ab.ca/about/administration/policies/**

**Note: all Academic and Administrative policies are available on the same page.

COURSE SCHEDULE/TENTATIVE TIMELINE:

First 11 weeks from the start of the course in August.

Tests and exams will be held during the course as Units are completed.

SOPEEC/ABSA exam for Fourth Class Part A will be held at the end of this 11 week period.