



**DEPARTMENT OF POWER ENGINEERING  
COURSE OUTLINE -FALL 2014  
POF 403 PE4A POWER LAB -1.0(0/0/4/44)**

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OFFICE HOURS:	As Posted		

**PREREQUISITE(S)/COREQUISITE:**

A high school diploma including at least:

- 65% in English 20-1 or 20 -2, AND
- 65% in Math 20-1 or 20-2, AND
- 65% in any Science (Physics, Chemistry, Biology or Science) in the 20 stream, 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 PPE/RESOURCE MATERIALS:**

- Clipboard
- CSA class 3 steel toe boots
- Flame resistant coveralls
- Gloves
- Safety glasses
- PE4A2 Learning Materials (PanGlobal)

**CALENDAR DESCRIPTION:**

This is an introduction to power plant and heating plant layout and equipment. Students learn to start up and shut down boilers, test and maintain boiler water quality, and open/dismantle, and inspect plant equipment. Plant tours will also be included in this course.

**CREDIT/CONTACT HOURS:**

Credits 1.0

Contact Hours 44 (0/0/4) 11 weeks

**DELIVERY MODE(S):**

Labs

## **OBJECTIVES (OPTIONAL):**

- Power Lab
- Discuss the importance of safety in the Power Lab and Chemistry Lab
- Discuss the parts of the Firetube boiler, prestart up checks, start up sequence, and shut down sequence
- Demonstrate the prestart checks and start up procedures for the Firetube boiler
- Discuss the parts of the water tube boiler, prestart up checks, start up sequence, and shut down sequence
- Demonstrate the prestart up checks and start up procedures for the Watertube boiler
- Discuss the safety loops for the burner management systems.
- Demonstrate how to check each safety device
- Discuss proper water treatment for high pressure boilers. Demonstrate water tests using the drop method, titration method and electronic methods. Discuss how to calculate addition of chemicals to the boiler water and systems
- Demonstrate how to thread steel pipe using hand threaders and machine threaders. Practice threading by piping in a steam trap station
- Tour the campus building heating systems
- Tour Industrial plants, Pulp and Paper, High pressure heating, hog fuelled Power Producer, High Pressure steam Gas Plant, High Pressure steam insitu oil recovery plant

## Auxiliary Power Lab

- Water treatment
  - Composition of water
    - Test different sources of water
- Drip method of water tests
  - SO<sub>3</sub>
  - Molybdate
  - Hardness
  - pH
  - P M and OH alkalinity
- Electronic methods
  - pH
  - TDS
  - Hach meters (2800 and ???)
- Gage Glass cutting lab
  - Demonstrate different methods of cutting glass tubing
  - Measure and cut a gage glass
  - Install a gage glass
- Valve inspection and packing
- Steam trap inspection and disassembly/reassembly

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
Safety	10	
Boiler start up procedures FT	10	
Boiler operation WT	10	
Tours	10	
Gage glass	10	
Water testing	10	
BMS safety loop checks	10	
Piping Steam Trap Station	10	
Valve and steam trap identification	10	
Operation of Lab heating system	10	
Overall Grade	100%	67%

**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/](http://www.gprc.ab.ca/about/administration/policies/)\*\*

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

**COURSE SCHEDULE/TENTATIVE TIMELINE:**

September to November