DEPARTMENT OF POWER ENGINEERING
COURSE OUTLINE – WINTER 2017
POF 408 POWER ENGINEERING, FOURTH CLASS PART B2
(PE4B2) – 6.0(23-0-4)135

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OFFICE HOURS: As Posted

PREREQUISITE(S)/COREQUISITE:

REQUIRED TEXT/RESOURCE MATERIALS:

- PE4B2 Learning Materials (PanGlobal)
- PE4B2 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 in Part B will cover heating systems and building systems - . vapor refrigeration and air-conditioning systems – Boiler maintenance and types of plants.

CREDIT/CONTACT HOURS:

Credits: 6.0
Contact Hours: (23-0-4)135 5 weeks

DELIVERY MODE(S):

Lectures and Labs

OBJECTIVES (OPTIONAL):

- Describe the various feedwater control methods and devices used on low-pressure steam boilers.
- Name and describe the various operating controls found on low-pressures heating boilers.
- Explain the design and operation of various combustion controls on heating boilers.

- Explain the purpose of the various components found in a pneumatic control system.
- Describe and explain the various components of an electric control circuit.
- Describe and explain the function of the various components of an electronic control circuit.
- Explain the various lighting systems and some of the basic design considerations for lighting a space.
- Explain the various water supply systems used in buildings.
- Describe the design and components of various sanitary drainage systems used in buildings.
- Explain the terms and principles associated with the thermodynamics of refrigeration.
- Describe the different refrigerants and explain the classification and various properties of each refrigerant.
- Describe the operating principles of compression refrigeration systems.
- Describe the operating principles and the components of refrigeration compressors.
- Describe the different types of heat exchangers used in refrigeration systems.
- Describe the purposes and operating principles of the operational and safety controls on a refrigeration system.
- Describe the operating principles of refrigeration metering devices and capacity controls.
- Describe the various accessories used in refrigeration systems.
- Describe the various pre-startup procedures used on compression refrigeration systems.
- Describe the various operation and maintenance procedures used on compression refrigeration systems.
- Describe the operating principle of absorption refrigeration systems.
- Describe the various operation and maintenance procedures used on absorption refrigeration systems.
- Describe the psychometric properties of air.
- Solve problems using a psychometric chart.
- Describe the air flow behavior and movement of air through distribution systems.
- Describe the designs and components of duct systems used in air conditioning.
- Describe the various types of coils used in air conditioning systems.
- Describe the operation of the various types of coils used in air conditioning systems.
- Explain the equipment and principles of humidification.
- Describe the operation of various air conditioning systems.
- Describe the design and operation of combined air conditioning systems and explain the factors to consider when selecting an air conditioning system.
- Explain the purpose, design and operation of heat recovery in air conditioning systems.
- Describe the control systems used in air conditioning.
- Describe the various ways a building gains and loses heat.
- Describe the safe use of common hand tools in the powerhouse.

- Discuss and describe the safe and proper setup of equipment for hoisting and working above ground.
- Discuss the designs and safe applications and attachment of lifting cables and ropes, and the design and uses of metal fasteners.
- Describe the service and maintenance required for boilers.
    - Discuss the procedure for preparing a boiler for inspection and cleaning, and describe mechanical and chemical boiler cleaning methods.
    - Discuss the basic design of a hot oil system and the requirements for the safe operation of a direct fired heater.
    - Describe the basic equipment and processes used in the treatment of natural gas and in the production of pulp and paper.
    - Identify steam-related processes in food processing plants, sawmills, and oil refineries.

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
C	2.0	63 – 66	FAIL
C–	1.7	60 – 62	FAIL
D+	1.3	55 – 59	FAIL
D	1.0	50 – 54	
F	0.0	0 – 49	FAIL
WF	0.0	0	FAIL, withdrawal after the deadline

*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.

EVALUATIONS: As per Power Engineering Student Manual

Method	Percentage	Minimum
Course assignments	15%	50%
CML quizzes	15%	50%
Unit Exams	30%	50%
Final Exam	40%	50%
Overall Grade	100%	67%
		67% average, with no mark below 50%

STUDENT RESPONSIBILITIES:

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:
April-May (weeks 13-17 of the GPRC Semester 2 Calendar)