DEPARTMENT OF POWER ENGINEERING

COURSE OUTLINE – WINTER 2013

POF 420 ELECTRICITY – 3.0 (25/0/20)

INSTRUCTOR: Augustine Ebinu **PHONE:** 780-835-6692
OFFICE: PS 130 **E-MAIL:** AEbinu@GPRC.ab.ca
OFFICE HOURS: 8:00 am – 4:30 pm

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 TEXT/RESOURCE MATERIALS:

- PE4B TEXT (BOOK 1)
- PE4B WORKBOOK
- PE3 Section 2 Chapters 7-10

CALENDAR DESCRIPTION:

This course covers the fundamental principles of direct current and alternating current circuits and machines. Topics include: Ohm's Law, series and parallel circuits, circuit protection, electromagnetism, operation of dc motors and generators, operation of ac motors and alternators, transformers, and electrical distribution systems.

CREDIT/CONTACT HOURS:

3.0 Credits
44 Hours

DELIVERY MODE(S):
Theory and Lab

OBJECTIVES (OPTIONAL):

Chapter 79(11): Basic Electricity
Describe the concepts of basic electricity and perform simple calculations using voltage, current, resistance and power.
Describe the atomic structure of matter and its relationship to electricity.
Describe basic electric circuits.
State Ohm's law, and apply it to single resistor circuits.
Apply Ohm's law to series resistance circuits.
Apply Ohm's law to parallel resistance circuits.
List the factors affecting resistance.
Calculate the power developed in an electric circuit.

Chapter 80(12): Magnetism and Electromagnetism
Describe the basic principles of magnetism.
Describe magnetism and the relationship between magnetism and electricity.
Describe the relationship between electricity and magnetism in an electrical generator.
Describe the relationship between electricity and magnetism in an electric motor.

Chapter 81(13): Electrical Metering Devices
Explain the use of electrical metering devices.
Describe how voltage, current, and resistance are measured in an electric circuit.
Describe the construction and operation of a Kilowatt Hour meter.

Chapter 82(14): Motors and Generators
Describe the operating principles of the various types of ac and dc motors or generators.
Describe the construction and operation of DC generators and motors.
Describe the construction and operation of AC generators (alternators) and motors.
Interpret the information on a motor nameplate.
Discuss and perform basic calculations relating to power factor and power factor correction.

Chapter 83(15): Transformers

Describe the operating principles, construction and maintenance of transformers.
Describe the principle of operation of transformers.
Describe the construction and operation of single phase transformers, and perform basic transformer calculations.
Describe the construction and operation of three-phase transformers.
Discuss transformer maintenance and cooling.

Chapter 84(16): Electrical Distribution Circuits

Describe an electrical distribution system.
List and describe the standard types of electrical voltage systems.
Interpret electrical circuit symbols as used in building systems.
Describe the major components of an electrical distribution system.
Describe the function and operation of alternate power supply system equipment.

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:

Method	Percentage	Minimum
Course assignments/workbooks	15%	50%
CML quizzes	15%	50%
Unit Exams	30%	50%
Final Exam	40%	50%
	100%	50%
		65% average, with no mark below 50%

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**	
C^{-}	**1.7**	**60 – 62**	
D^{+}	**1.3**	**55 – 59**	**MINIMAL PASS**
D	**1.0**	**50 – 54**	
F	**0.0**	**0 – 49**	**FAIL**
WF	**0.0**	**0**	**FAIL, withdrawal after the deadline**

EXAMINATIONS: As per Power Engineering Student Manual

STUDENT RESPONSIBILITIES: As per Power Engineering Student Manual

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: