



## DEPARTMENT OF POWER ENGINEERING

### COURSE OUTLINE – WINTER 2012

#### POF 420 ELECTRICITY – 1.5(24)

**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:**

#### **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:**

1.5 CREDITS, 24 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:**

**\*\* 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%

<b>GRANDE PRAIRIE REGIONAL COLLEGE</b>			
<b>GRADING CONVERSION CHART</b>			
<b>Alpha Grade</b>	<b>4-point Equivalent</b>	<b>Percentage Guidelines</b>	<b>Designation</b>
<b>A<sup>+</sup></b>	<b>4.0</b>	<b>90 – 100</b>	<b>EXCELLENT</b>
<b>A</b>	<b>4.0</b>	<b>85 – 89</b>	
<b>A<sup>-</sup></b>	<b>3.7</b>	<b>80 – 84</b>	<b>FIRST CLASS STANDING</b>
<b>B<sup>+</sup></b>	<b>3.3</b>	<b>77 – 79</b>	
<b>B</b>	<b>3.0</b>	<b>73 – 76</b>	<b>GOOD</b>
<b>B<sup>-</sup></b>	<b>2.7</b>	<b>70 – 72</b>	
<b>C<sup>+</sup></b>	<b>2.3</b>	<b>67 – 69</b>	<b>SATISFACTORY</b>
<b>C</b>	<b>2.0</b>	<b>63 – 66</b>	
<b>C<sup>-</sup></b>	<b>1.7</b>	<b>60 – 62</b>	
<b>D<sup>+</sup></b>	<b>1.3</b>	<b>55 – 59</b>	<b>MINIMAL PASS</b>
<b>D</b>	<b>1.0</b>	<b>50 – 54</b>	
<b>F</b>	<b>0.0</b>	<b>0 – 49</b>	<b>FAIL</b>
<b>WF</b>	<b>0.0</b>	<b>0</b>	<b>FAIL, withdrawal after the deadline</b>

**EVALUATIONS:**

**STUDENT RESPONSIBILITIES:**

**STATEMENT ON PLAGIARISM AND CHEATING:**

Please refer to pages 49-50 of the College calendar regarding plagiarism, cheating and the resultant penalties. These are serious issues and will be dealt with severely.

**COURSE SCHEDULE/TENTATIVE TIMELINE:**