



**DEPARTMENT OF HEAVY EQUIPMENT**  
**THINKBIG SERVICE TECHNICIAN COURSE OUTLINE – FALL 2014**  
**SEPTEMBER 2 – OCTOBER 24, 2014**  
**HES131 ELECTRICAL FUNDAMENTALS – 1.5 (48 HOURS)**

<b>INSTRUCTOR:</b>	Richard McGrail Richard Byam Rob Young	<b>PHONE:</b>	780.835.6778 780.835.6723 780.835.6730
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**OFFICE HOURS:** 8.00am to 4.30pm

**PREREQUISITE(S)/COREQUISITE:** None

**REQUIRED TEXT/RESOURCE MATERIALS:**

**Caterpillar Material**

***Electrical Fundamentals***

*Unit 1: Introduction to Electricity*

- Lesson 1 – Electricity, How It Works
- Lesson 2 – Magnetism

*Unit 2: Electrical Circuits*

- Lesson 1 – Ohm's Law
- Lesson 2 – Basic Circuit Theory
- Lesson 3 – Digital Multimeter
- Lesson 4 – Electrical Measurement
- Lesson 5 – Circuit Faults

*Unit 3: Electrical Components and Symbols*

- Lesson 1 – Basic Electrical Components
- Lesson 2 – Solid State Electrical Components
- Lesson 3 – Electrical Schematics

## Unit 4: Machine Electrical Systems

### Lesson 1 – Battery

#### Alberta Apprenticeship and Industry Training Individual Learning Modules Heavy Equipment Technician (HET)

- 190104a – Electrical Theory.
- 190104b – Electrical Circuits
- 190104c – Magnetism
- 190104d – Test Equipment
- 190104e – Battery Fundamentals and Service
- 190104f – Electrical Wiring, Lighting Circuits and Circuit Protection
- 190104g – Basic Electronics
- 190104h – Electronic Control Systems

**CALENDAR DESCRIPTION:** This course will introduce students to basic electrical and electronic fundamentals. Topics included are: electrical circuits; electrical components, schematics and symbols; the use of test equipment and battery service and testing.  
Delivery Option: Fairview Campus Only

**CREDIT/CONTACT HOURS:** Credits: 1.5 / Contact Hours: 48.

**DELIVERY MODE(S):** Lecture and lab.

**TRANSFERABILITY:** None.

**GRADING CRITERIA:** Students must complete all required courses with a grade point average of no less than 2.7 and no failing (F) grades. A passing grade in this course is a **minimum of 70%.**

**Electrical Fundamentals ..... 48 / 240 hours = 20 %  
of Semester 1 mark**

**Exams Average = \_\_\_\_\_ x 45%**

**Class Assignments/Quizzes = \_\_\_\_\_ x 30%**

**Shop Total \_\_\_\_\_ x 25%**

**HES 131 FINAL MARK = \_\_\_\_\_ %**

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

### STUDENT RESPONSIBILITIES:

This is an adult education environment. Enrolment at Grande Prairie Regional College assumes that the student will become a responsible citizen of the College. As such, each student will display a positive work ethic, take pride in and assist in the maintenance and preservation of Institute property, and assume responsibility for his/her education by researching academic requirements and policies, demonstrating courtesy and respect toward others; and respecting instructor expectations concerning attendance, classroom and shop rules, safety, assignments, deadlines and appointments. Students are learning skills to prepare them for the work environment.

Following the guidelines in “Student Rights and Responsibilities” in the GPRC College calendar assist us all in maintaining an adult learning environment. Please refer to the Student Rights and Responsibilities policy in the Grande Prairie Regional College Calendar or at [www.gprc.ab.ca/downloads/documents/StudentRightsandResponsibilities.pdf](http://www.gprc.ab.ca/downloads/documents/StudentRightsandResponsibilities.pdf).

### STATEMENT ON PLAGIARISM AND CHEATING:

Refer to the Student Conduct section of the GPRC Calendar at <http://www.gprc.ab.ca/programs/calendar/> Pages 44 to 46 or the College Policy on Student Misconduct: Plagiarism and Cheating at <http://www.gprc.ab.ca/about/administration/policies/>. \*\*

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

## **COURSE SCHEDULE/TENTATIVE TIMELINE:**

- Electrical Theory
- Electrical Circuits
- Magnetism
- Test Equipment
- Batteries Fundamentals and Service
- Wiring
- Basic Electronics
- Electronic Control Systems