

## DEPARTMENT OF INDUSTRY PARTNER TRAINING

### THINKBIG SERVICE TECHNICIAN COURSE OUTLINE – FALL 2024

SEPTEMBER 3, 2024- OCTOBER 25, 2024

#### HES131 VA11 ELECTRICAL FUNDAMENTALS – 1.5 (48 HOURS)

Northwestern Polytechnic acknowledges that our campuses are located on Treaty 8 territory, the ancestral and present-day home to many diverse First Nations, Metis, and Inuit people. We are grateful to work, live and learn on the traditional territory of Duncan's First Nation, Horse Lake First Nation and Sturgeon Lake Cree Nation, who are the original caretakers of this land.

We acknowledge the history of this land and we are thankful for the opportunity to walk together in friendship, where we will encourage and promote positive change for present and future generations.

**INSTRUCTOR:** Russell Hall

**PHONE:** 780-834-8788 CELL

**OFFICE:** FPS 110

**E-MAIL:** rhall@nwpolytech.ca

**OFFICE HOURS:** 8.00am to 4.30pm

**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.

**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

**DELIVERY MODE:**

In person – Onsite. This course is delivered in person at the NWP Fairview campus.

- NWP reserves the right to change the course delivery.

**LEARNING OUTCOMES:**

**TRANSFERABILITY:** None.

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

**GRADING CRITERIA:** 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 VA11 FINAL MARK = \_\_\_\_\_ %**

Grades for this course will be assigned as a percentage.

**COURSE SCHEDULE/TENTATIVE TIMELINE:**

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

**STUDENT RESPONSIBILITIES:**

This is an adult education environment. Enrolment at Northwestern Polytechnic 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 NWP College calendar assist us all in maintaining an adult learning environment. Please refer to the Student Rights and Responsibilities policy in the Northwestern Polytechnic Calendar or at [www.nwpolytech.ca/downloads/documents/StudentRightsandResponsibilities.pdf](http://www.nwpolytech.ca/downloads/documents/StudentRightsandResponsibilities.pdf).

Students are expected to attend all class and shop hours. Students who miss more than 21 hours or 3 days of classes may be removed from the course.

**STATEMENT ON PLAGIARISM AND CHEATING:**

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

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