

DEPARTMENT OF INDUSTRY PARTNER TRAINING
THINKBIG SERVICE TECHNICIAN COURSE OUTLINE – FALL 2025
HES131 VA11 ELECTRICAL FUNDAMENTALS – 1.5 CREDITS
(48 HOURS) 8 WEEKS (3-0-3)

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:	Rob Young	PHONE:	780 836 8253
OFFICE:	FPS 108	E-MAIL:	Robyoung@nwpolytech.ca
OFFICE HOURS:	8:30 AM to 4:30 PM		

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:

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 delivery. Fairview Campus Only

Note: NWP reserves the right to change the course delivery.

LEARNING OUTCOMES:

TRANSFERABILITY:

None.

GRADING CRITERIA:

Students must complete all required courses with no failing (F) grades. A passing grade in this course is a **minimum of 70%**. Grades for this course will be assigned as a percentage. Failure to achieve a minimum grade of 70% will result in removal from the Think BIG program.

EVALUATION:

Electrical Fundamentals

48 hours

Exams Average = _____ *x 45%*

Class Assignments / Quizzes = _____ *x 30%*

Shop Total _____ *x 25%*

FINAL MARK = _____ %

COURSE SCHEDULE/TENTATIVE TIMELINE:

Will be posted in the classroom.

- 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 NWP. 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. Non-academic misconduct, including the possession, use, or distribution of intoxicants, will be addressed through the Student Rights and Responsibilities policy.

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.

Absences will be monitored and recorded by the instructors.

- Upon reaching 7 hours missed time in a single semester the student will be required to meet with the program instructor.
- Upon reaching 14 hours missed time in a single semester the student will be required to meet with the instructor and program Chair.
- Upon reaching 21 hours missed time in a single semester the student will be required to meet with the instructor, program chair and the Dean to evaluate the students' ability successfully continue in the Think BIG program.

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.

STATEMENT ON ACADEMIC MISCONDUCT:

Academic Misconduct will not be tolerated. For a more precise definition of academic misconduct and its consequences, refer to the Student Rights and Responsibilities policy available at <https://www.nwpolytech.ca/about/administration/policies/index.html>

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