

**TRANSPORTATION TRADES DEPARTMENT**  
**THINKBIG SERVICE TECHNICIAN COURSE OUTLINE – WINTER 2023**  
**FEBRUARY 27 – APRIL 21, 2023**  
**HES562 VA53 – 1.5 CREDIT (48 HOURS)**  
**ON HIGHWAY MACHINE SYSTEM DIAGNOSTICS/REPAIR**

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:** Jeremy Parker                      **PHONE:** 780.835.6795  
**OFFICE:** FPS 112                                      **E-MAIL:** jparker@nwpolytech.ca  
**OFFICE HOURS:** 8.30am to 4.30pm

**CALENDAR DESCRIPTION:** Primarily a lab-based course where the student's knowledge will be challenged and troubleshooting skills developed. Students will be required to successfully diagnose and repair On Highway machine systems in a real-world setting.  
Delivery Option: Fairview Campus Only

**PREREQUISITE(S)/COREQUISITE:** Successful completion of courses for Block 1-4.  
Please read all modules before they are presented in class.

## **RESOURCE MATERIALS:**

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

- 190403cA – Air Conditioning Testing and Service – Part A
- 190403cB – Air Conditioning Testing and Service – Part B
- 190401a – Clutch Fundamentals and Service (On-Road)
- 190401b – Driveline Fundamentals and Service
- 190401dA – Transmission Fundamentals – Part A
- 190401dB – Transmission Fundamentals – Part B
- 190401e – Transmission Shifting

### **Caterpillar Material**

#### ***Machine Diagnostics:***

*Unit 4: Electrical Systems Diagnostics.*

Electrical Systems Diagnostic Principles.

#### ***Air Conditioning Fundamentals:***

*Unit 1: Fundamentals of AC*

Lesson 2: Machine AC System Operation

*Unit 3: Service Procedures*

Lesson 1: Machine AC Service

*Unit 4: Troubleshooting*

Lesson 1: Machine AC Troubleshooting

Lesson 2: AC Repair

#### ***Power Train I:***

*Unit 2: Couplings*

Lesson 1: Flywheel Clutch

*Unit 3: Transmissions*

Lesson 1: Manual Shift Transmissions

#### ***Machine Specific:***

As per available units.

**DELIVERY MODE(S):**

In person delivery. Primarily lab based.

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

**COURSE OBJECTIVES:**

**LEARNING OUTCOMES:**

**TRANSFERABILITY:** None.

**EVALUATIONS:**

**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%**.

**HES562 Air Conditioning / Powertrain Diagnostics / Repair ..... 48/240 hours = 20 %  
of Semester 5 mark**

Exams Average = \_\_\_\_\_ x 30%

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

Shop Total \_\_\_\_\_ x 40%

**HES 562 VA53 FINAL MARK = \_\_\_\_\_ %**

Alpha Grade	4-point Equivalent	Percentage Guidelines	Alpha Grade	4-point Equivalent	Percentage Guidelines
A+	4.0	90-100	C+	2.3	67-69
A	4.0	85-89	C	2.0	63-66
A-	3.7	80-84	C-	1.7	60-62
B+	3.3	77-79	D+	1.3	55-59
B	3.0	73-76	D	1.0	50-54
B-	2.7	70-72	F	0.0	00-49

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

### **Machine Diagnostics**

- Electrical System Diagnostics

### **Machine Specific**

- 980K Wheel Loader - Electrohydraulic Control System.
- Compact Construction Equipment.
- 320E Excavator.
- D5H Crawler
- D7E Crawler
- Articulated Dump Truck.
- Skid Steers
- M Series Motor Graders.
- Challenger Tractor
- IT Integrated Tool Carrier
- 426 Backhoe
- CP-54B Vibratory Compactor

**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).

### **STATEMENT ON PLAGIARISM AND CHEATING:**

Cheating and plagiarism will not be tolerated and there will be penalties. For a more precise definition of plagiarism and its consequences, refer to the Student Conduct section of the Northwestern Polytechnic Calendar at <https://www.nwpolytech.ca/programs/calendar/> or the Student Rights and Responsibilities policy which can be found at <https://www.nwpolytech.ca/about/administration/policies/index.html>.

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

## **Additional Information (Optional):**