

DEPARTMENT OF TRANSPORTATION TRADES  
THINKBIG SERVICE TECHNICIAN COURSE OUTLINE – WINTER 2024  
MARCH 4<sup>TH</sup> 2024 – APRIL 26<sup>TH</sup> 2024  
HES141 VZ12 – HYDRAULIC FUNDAMENTALS – BASICS –  
2.0 (56 HOURS)

**INSTRUCTOR:** Richard McGrail

**PHONE:** 780.835.6778

**OFFICE:** FAC 119

**E-MAIL:** [rmcgrail@nwpolytech.ca](mailto:rmcgrail@nwpolytech.ca)

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

**CALENDAR DESCRIPTION:** Basic principles of hydraulics, hydraulic oil, contamination control principles, basic systems and components are examined in this course. As well, the students are introduced to ISO schematics and symbology.

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

**REQUIRED TEXT/RESOURCE MATERIALS:**

**Caterpillar Material**

***Hydraulic Fundamentals***

*Unit 1: Safety and Hydraulic Training Unit*

Lesson 1 – Safety and Hydraulic Training Unit

*Unit 2: Hydraulic Principles.*

Lesson 1 – Hydraulic Principles

*Unit 3: Hydraulic System Components*

Lesson 1 – Fluid Reservoirs and Hoses

Lesson 2 – Hydraulic Fluids and Fluid Conditioners

Lesson 3 – Hydraulic Pumps and Motors

- Lesson 4 – Pressure Control Valves
- Lesson 5 – Direction Control Valves
- Lesson 6 – Flow Control Valves
- Lesson 7 – Cylinders

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

- 190103g – Hydraulic Fundamentals
- 190103h – Hydraulic System Components: Reservoir, Filters, Hoses and Coolers
- 190103i – Hydraulic System Components: Pumps, Valves, and Cylinders

### FALL 2023 DELIVERY:

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

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

### LEARNING OUTCOMES:

**TRANSFERABILITY:** None.

**CREDIT/CONTACT HOURS:** Credits: 1.5 / Contact Hours: 56.

**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%**.

Hydraulic Fundamentals ..... 56 / 240 hours = 23 %  
of Semester 1 mark

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

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

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

HES 141 VB11 FINAL MARK = \_\_\_\_\_ %

Grades for this course will be assigned as a percentage

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

- Fundamentals
- Safety
- Components, Function and Nomenclature
- Hydraulic System and Operation
- Lines and Fittings
- Valves – Control and Safety
- Actuators
- Service

## **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:**

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.