

## Course Objectives/Course Outline Spokane Community College

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**Course Title:** Heavy Equipment Hydraulic Theory

**Prefix and Course Number:** HEQ 241

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### Course Learning Outcomes:

**By the end of this course, a student should be able to:**

- describe the basic principles of hydraulic systems
- Identify various components of the hydraulic system
- explain the principles of operation for various components of the hydraulic system
- describe the principles of hydraulic system controls
- identify the various types of tubing, hoses, and accessories used with hydraulic systems

### Course Outline

- I. Basic Hydraulic Systems Theory and Operation
  - A. Types
  - B. Design
  - C. Construction
- II. Hydraulic System Components
  - A. Pumps
  - B. Motors
  - C. Cylinders
  - D. Hydrostatic Drive Units
- III. Hydraulic Controls
  - A. Pressure Control Valves
    1. limit pressure
    2. reduce pressure
    3. set pressure
    4. unload pumps
  - B. Directional Valves
    1. check valves
    2. open center system
    3. closed center system
  - C. Volume Control Valves
    1. flow control valves
    2. flow divider valves
  - D. Hookups
    1. series
    2. parallel
    3. closed loop
- IV. Tubing, Hoses, and Accessories
  - A. Types
  - B. Standards
    1. sizing
    2. pressure
  - C. Oil Reservoirs
  - D. Coolers
  - E. Accumulators
  - F. Requirements
    1. oil
    2. filtration