

**Course Objectives/Course Outline**  
**Spokane Community College**

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**Course Title:** Principles of Power Train Theory

**Prefix and Course Number:** HEQ 131

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**Course Learning Outcomes:**

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

- differentiate between the types and functions of brake systems
- identify the types and functions of clutches
- differentiate between the purposes of air, hydraulic, and electric controls
- understand the function of auxiliary transmissions, transfer cases, and power take-off units

**Course Outline**

- I. Brake Theory
  - A. Hydraulic
  - B. Vacuum
  - C. Air and Power Hydraulics
  - D. Air Brakes
  - E. Retarders
  - F. Accumulators
- II. Clutches
  - A. Wet and Dry Clutches
  - B. Friction Materials
  - C. Controls
    - 1. air
    - 2. hydraulic
    - 3. electrical
- III. Manual Shift Transmissions
  - A. Principles of Operation
  - B. Auxiliary Transmissions
  - C. Transfer Cases
  - D. Power Take-Off Units
- IV. Differentials and Final Drive Units
  - A. Differentials
  - B. Axles
  - C. Final Drives
  - D. Multiple Axles
  - E. Drive Arrangements
  - F. Suspension Systems
- V. Fluid Couplings and Automatic Transmissions
  - A. Fluid Couplings
  - B. Torque Converters
  - C. Hydraulic Circuits
- VII. Safety
  - A. Shop Safety
  - B. Tool Safety
  - C. Safety Awareness