

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

Course Title: HPAT Fundamentals

Prefix and Course Number: FLPT 104

Course Learning Outcomes:

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

- Learn to identify basic characteristics of hydraulic and pneumatic systems.
- Understand hydraulic and pneumatic actuators.
- Learn and identify hydraulic and pneumatic directional control valves
- Learn and identify hydraulic pressure controls
- Learn to identify and apply pneumatic air prep
- Learn, identify and understand basic hydraulic pumps

Course Outline

- I. Hydraulic/Pneumatic differences
 - A. Basic Characteristics
 - B. Basic hydraulic and pneumatic symbols
 - C. Series circuit
 - D. Parallel circuit
- II. Hydraulic and Pneumatic Actuators
 - A. Sizing pneumatic actuators
 - B. Sizing hydraulic actuators
 - C. Schematic symbols of actuators
 - D. Rotary actuators, hydraulic and pneumatic
 - E. Motors, hydraulic and pneumatic
 - F. Linear actuators, hydraulic and pneumatic
- III. Hydraulic and Pneumatic Directional Control Valves
 - A. Sizing pneumatic directional control valves
 - B. Sizing hydraulic directional control valves
 - C. Directional valve schematic symbols
 - D. Mounting styles
 - E. Operators of a pneumatic directional valve
 - F. Operators of a hydraulic directional valve
- IV. Hydraulic Pressure Controls
 - A. Identify schematic symbols of 5 hydraulic pressure controls
 1. Simple relief
 2. Counterbalance valve
 3. PSI reducing
 4. PSI sequence
 5. Unloading relief
 - B. Apply and set pressure control for application
- V. Hydraulic Pressure Controls
 - A. Identification of schematic symbols of 5 hydraulic pressure controls
 1. Simple relief
 2. Counterbalance valve
 3. PSI reducing

- 4. PSI sequencing
 - 5. Unloading relief
 - B. Apply and set pressure control for application
- VI. Pneumatic Air Prep – Identify and apply
 - A. Pneumatic regulators
 - B. Pneumatic lubricators
 - C. Pneumatic filters
- VII. Hydraulic Pumps
 - A. Basic Pump construction
 - B. Identifying pump construction
 - 1. Gear
 - 2. Vane
 - 3. Piston
 - C. Size and application
 - D. Pump symbols