

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

---

---

**Course Title: Advanced AC Controls**

**Prefix and Course Number: ELMT 242**

---

**Course Learning Outcomes:**

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

- wire and troubleshoot a forward and reversing circuit using multiple push buttons.
- wire and troubleshoot a forward and reversing circuit with flip-flop and delay.
- wire and troubleshoot a plug braking with control voltage.
- wire and troubleshoot an automatic reversing circuit using pneumatic timers (flip-flop).

**Course Outline:**

- I. Forward and Reversing Motors
  - A. Changing Direction of a Single-Phase Motor
  - B. Changing Direction of a Three-Phase Motor
  - C. Control Circuits
    1. development
    2. troubleshooting
  - D. Interlocking
    1. mechanical
    2. electrical
    3. push button
- II. Reduced Voltage Starting
  - A. Auto-Transformer
  - B. Part Winding
  - C. Primary Resistors
  - D. Reactor Starting
  - E. Wye-Delta
- III. Motor Deceleration and Braking
  - A. Mechanical Braking
  - B. Plug Braking
  - C. Anti-plugging
  - D. Zero Speed Switches
- IV. Sequence Control Circuits
  - A. Designing Control Circuits
  - B. Understanding Relay Ladder Logic
- V. Advanced Timers
  - A. Complex Timer Logic
  - B. Using Timers in Motor Control Circuits
  - C. Flip-Flops