

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

Course Title: Machine Automation Theory

Prefix and Course Number: IMMA 123

Course Learning Outcomes:

By the end of this course, a student should:

- Describe the function of various PLC components and hardware
- Interpret PLC programming diagrams and symbols
- Describe PLC software, file systems, and programming instructions, including timers and counters
- Describe various types of interface devices and explain when they are required in an electrical circuit
- Describe applications, installation, and troubleshooting procedures for analog input and output devices
- Describe procedures for PLC installation, startup, and maintenance
- Create wired electrical circuits that incorporate PLCs
- Create and run a PLC program using software, simulators, and/or PLC components
- Analyze a programmable logic controller system to determine troubleshooting and maintenance issues
- Demonstrate proper safety techniques when handling and operating electrical and PLC equipment
- Demonstrate professionalism, critical thinking, and teamwork during in-class discussions, presentations, and hands-on activities

Course Outline:

A. *NOTE:* This course schedule is subject to change at the discretion of the instructor.

<p>Week 1: Introduction to Programmable Logic Controllers PLC and Electrical Safety Electrical Principles Lab: PLC and Electrical Safety</p>	<p>Week 7: PLC Installations, Startup, Maintenance PLC Installations and Startup PLC and System Maintenance</p>
<p>Week 2: PLC Electrical Principles and Circuits Electrical Principles (continued) Electrical Circuits and PLCs</p>	<p>Week 8: Troubleshooting PLC Hardware Troubleshooting Principles Test Instruments Troubleshooting PLC Hardware</p>
<p>Week 3: PLC Hardware PLC Hardware</p>	<p>Week 9: Field trip Hydraulic, pneumatic, automated systems and PLCs</p>
<p>Week 4: PLC Programming PLC Programming Instructions</p>	<p>Week 10: Analog Principles Analog Principles Analog Device Installation and PLC Programming</p>
<p>Week 5: PLC Timers, Counters, and Interfacing Programming PLC Timers and Counters PLC and System Interfacing</p>	<p>Week 11: Troubleshooting with PLC Software Troubleshooting with PLC Software</p>
<p>Week 6: Midterm Exam</p>	<p>Week 12: Final Exam</p>

Print Date: 3/19/18

Midterm Exam covers skills learned in Weeks 1 thru 5

Final Exam covers skills learned in Weeks: 1 thru 11
