

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

Course Title: Electrical Systems

Prefix and Course Number: IMMA 122

Course Learning Outcomes:

By the end of this course, a student should:

- Describe and interpret electrical symbols, schematic diagrams, and line (ladder) diagrams
- Measure and calculate electrical quantities such as current, voltage, and resistance
- Identify the components found in industrial electrical systems
- Describe how factors such as impedance, inductance, and capacitance affect circuits
- Describe how AC and DC electricity is generated and how it operates
- Demonstrate proper and safe use of electrical test equipment
- Describe electric motor operation, controls, and relays
- Describe circuits connected in series, parallel, and series/parallel combinations
- Explain electrical wiring materials and methods
- Troubleshoot electrical problems in electrical circuits and systems
- Describe digital electronic circuits, and related components, logic, and programming
- Create and test electrical circuits using various component types
- Demonstrate proper safety techniques when handling electrical devices
- 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 Electricity Introduction and Overview Basic Principles of Electricity Measuring Electricity Electrical Safety Lab: Safety Overview</p>	<p>Week 7: Electric Motors Electric Motor Principles Electric Motor Types Lab: Testing, Troubleshooting Electric Motors</p>
<p>Week 2: Ohm's Law & Test Equipment Ohm's Law and the Power Formula Electrical Test Equipment Lab: Electrical Test Equipment</p>	<p>Week 8: Complex Circuits Resistance, Inductance, Capacitance, Impedance Circuit Requirements Lab: Control Relays</p>
<p>Week 3: Electrical Components & Wiring Electrical Components Print Reading Conductors Lab: Print Reading Activities</p>	<p>Week 9: Industrial Circuits Industrial Circuits Line/Ladder Diagrams Motor Drives and Controls Programmable Logic Controllers (PLCs) Lab: Motor Controls Demonstration</p>
<p>Week 4: Series & Parallel Circuits Series Circuits Parallel Circuits Lab: Build and Test Series and Parallel Circuits</p>	<p>Week 10: Industrial Electronics Electronic Control Devices Lab: Industrial Electronics</p>

Week 5: Series/Parallel Circuits & Transformers Series/Parallel Combination Circuits Magnetism Transformers Distribution Systems Lab: Series/Parallel Circuits Lab: Transformers	Week 11: Digital Electronic Circuits Digital Electronic Circuits Logic Gates Lab: Circuit Logic and Programming
Week 6: Midterm Exam Midterm Exam covers skills learned in Weeks 1 thru 5	Week 12: Final Exam Final Exam covers skills learned in Weeks: 1 thru 11