



Electrical Maintenance & Troubleshooting Course (PMMI)

Electrical Troubleshooting Course: This is a 3 day course on electrical systems. At the completion of the course the students take the PMMI Electrical Level 1 Certificate Test.

Course Length: 3 Days

Day	Module	Module Objective	Summary of Task/Actions	Hands On	Time (Hours)	Quiz
1	Electrical Schematics	Provides knowledge on electrical schematics and symbols including PLC systems. Additionally, students will learn about the use of Digital Multi Meters (DMM) for measuring opens, shorts and continuity	<ul style="list-style-type: none"> Lecture Hands on – meters 	Hands on – Digital Multi Meter	1	Yes
	Wiring Basics	Provide an understanding of wire color codes, NEC and wire stripping tools and wiring techniques	<ul style="list-style-type: none"> Lecture Hands on - Wiring 	Hands on wiring lab. Wire and troubleshoot panel (wiring lab is 3.5 hours). Lab includes: color codes, NEC, NFPA, wire stripping, schematic interpretation and wiring techniques	4	Yes
	Basic Circuits	Provides students with an understanding of basic components of an electrical circuit and their associated symbols, labeling and functions	<ul style="list-style-type: none"> Lecture Hands on - Circuits 	Hands on components measurements	1	Yes
	Voltage and Current	Provides students with an understanding Ohm’s Law and Kirchoff’s equation and their use in parallel and series circuits. Students will learn about circuit layout and the	<ul style="list-style-type: none"> Lecture Hands on – Voltage and Current 	Measurement and validation of voltage and current	2	Yes

		use of both linear and switch mode power supplies				
2	Introduction to Forward Looking Infra-Red FLIR	Provide students with an introduction to non-invasive troubleshooting of electronic circuits	<ul style="list-style-type: none"> • Lecture 		1	Yes
	Non-Invasive Troubleshooting	Provide students with an understanding of non-invasive troubleshooting of mechanical and electrical systems using FLIR i7 Camera	<ul style="list-style-type: none"> • Lecture • Demonstration • Lab – troubleshooting 	Hands on - Troubleshooting	4	Yes
	Power Protection Circuits	Provides students with an understanding of how to calculate power at both the board level and system level	<ul style="list-style-type: none"> • Lecture • Hands on – Protection Circuits 	Hands on – Power dissipation and thermal signature	1	Yes
	Electro-magnetism and Transformers	Provide students with an understanding of the theory of electromagnetism, transformers construction, their uses and troubleshooting techniques and tools	<ul style="list-style-type: none"> • Lecture • Hands on - troubleshooting 	Hands on - Troubleshooting	1	Yes
3	AC and DC Motors and Drives	Provide students with an overview of the internal construction and troubleshooting of AC and DC Motors. Provide students with an understanding of starting capacitors, rotor sensors and the various types of drives	<ul style="list-style-type: none"> • Lecture • Hands on – Motor troubleshooting 	Wiring and troubleshooting of AC motor	2	Yes
	Switches and Encoders	Provide students with an understanding on the uses and troubleshooting of control relays, pilot devices, limit switches and cam switches	<ul style="list-style-type: none"> • Lecture • Hands on – troubleshooting 	Hands on - Troubleshooting	2	Yes
	PMMI Test	Electrical Level 1 Test			3	