ELM COURSE STUDENT LEARNING OUTCOMES

ELM 110 - Electrical/Electronic Circuits

Students will be able to perform basic calculations related to electricity.

Students will be able to analyze basic electrical diagrams.

Students will be able to build, test, and troubleshoot circuits using industry standard diagnostic equipment.

ELM 127 - Introduction to AC Controls

Students will be able to demonstrate proper safety practices related to industrial motor control.

Students will be able to work as a team to build a variety of motor control systems and be able to operate them to their desired function.

Students will be able to analyze and interpret faults in a malfunctioning system and hypothesize and test potential solutions.

Students will be able to analyze and interpret different schematics, diagrams, and symbols related to motor control circuits.

ELM 134 - Programmable Logic Controllers I

Students will be able to perform calculations necessary to convert values across number systems used in PLC programming.

Students will be able to identify boolean truth tables.

Students will be able to identify different PLC sections and elements of logic processing.

Students will be able to interpret and analyze information from the PLC as a resource for troubleshooting.

ELM 140 - Industrial Robotics I

Students will be able to safely perform powerups, shutdowns, and emergency shutdowns.

Students will be able to operate the robotic arm in a variety of modes.

Students will be able to perform a variety of tests to demonstrate proper robotic functioning.

Students will be able to locate, load, test, and save a program.

ELM 198 - Special Topics in Electrical and Mechanical Technology

Students will be able to demonstrate specific knowledge, abilities and skills in Electrical and Mechanical Technology topics.

Students will be able to synthesize existing knowledge, abilities and skills with new practical skills on specific types of industrial equipment.

ELM 240 - Advanced Manufacturing and Robotic Systems

Students will collaborate in teams to plan, program, and operate robotic systems, demonstrating effective communication, problem-solving, and shared decision-making throughout the process.

Students will demonstrate their ability to integrate other automation devices with a robot.

Working in teams, students will create and refine robotic programs that demonstrate integration of peripheral components and incorporate basic error-handling strategies.

Students will utilize the geometric concepts such as the cartesian coordinate system to properly operate and program a robotic arm

ELM 340 - Robotic Programming Offline

Students will be able to create an off-line manufacturing work-cell utilizing robot simulation program.

Students will be able to define and utilize the relationship between "Tool" and "Part" in the design of a robotic work-cell.

Students will be able to calibrate a virtual world work-cell to the real world work-cell.

ELM 440 - Collaborative Robot Design and Operation

Students will be able to analyze the four types of collaborative robot operation.

Students will be able to create and utilize a Dual Check Safety (DCS) SIR and safety I/O for collaborative robot operation.

Students will be able to set up and trouble shoot a collaborative sensing DCS system.