NORTHERN PENNSYLVANIA REGIONAL COLLEGE

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Mechatronics Training Courses

OSHA 30 + Power and Control Electronics (60 hrs)
OSHA 30
OSHA 30 covers a variety of safety subjects and in-depth, industry-specific training and is intended for supervisors and workers with safety and health responsibilities.
Power and Control Electronics
The programmable controller is considered by many to be the most important development ever in industrial automation because it is a prepackaged, industrially hardened computer that can be quickly programmed to control a wide range of industrial processes and machines. Typical applications include: robots, conveyors, electric motor controls, air conditioning, process control, plastics injection molding, and CNC machines. This course teaches how to program, operate, and interface programmable controllers in a variety of industrial applications.

Fundamentals of Industry 4.0 (60 hrs)
As an introduction to Industry 4.0, this industry recognized certification aims to relay foundational information about Industry 4.0 and help to establish a base upon which more detailed information regarding the topic can layered. The course will introduce the various industrial revolutions and how Industry 4.0, the internet of things, smart factories, and cyber-physical systems are a disruption to the manufacturing industry and discusses the impact and implications that these advancements introduce.

Fundamentals of Electricity AC/DC (60 hrs)
Decrease production downtime, improve efficiency, and increase output – All hinges on understanding electricity and how to work with it safely. These industry recognized certifications have been specifically developed to give students the knowledge and skills required to enable them to work safely and effectively with electricity. The lab components of the training offer the student the opportunity to build, test and troubleshoot AC/DC circuits and examine the operating voltages and currents related to proper circuit operation. Technicians will use various instruments to make circuit measurements and calculations.

Fundamentals of Fluid Power: Pneumatics/Hydraulics (60 hrs)
This pneumatic industry recognized certification training covers the use of compressed air for pneumatic control and as a signaling medium. A complete overview is given, covering compressors, storage, dryers and distribution as well as the design, construction and operation of a range of actuators, valves and ancillary equipment. The relevant ISO symbols are introduced and included in the circuit diagrams. This course ensures a sound competence the safe operation and maintenance of one of the most common automation elements in industry.

Applied Industrial Motor Controls (60 hrs)
This course builds knowledge and skills in the fundamentals of industrial electric motor controllers. The industry recognized certification is specially designed to develop soft skills in addition to technical skills. Equipment allows teachers to insert various faults to develop troubleshooting skills – a must to be well prepared for the workplace. The course first familiarizes students with the operation of individual components, then provides hands-on application opportunities to use them in realistic, industrial motor control circuits. Upon completion of this course, students will be able to install, commission and troubleshoot the most common electric motor controllers using contactors and relays.

Fundamentals and Applied PLCs (60 hrs)
Working with a PLC efficiently requires a strong familiarity with the specifics of the programming environment and languages. This is exactly the purpose of this industry recognized certification. The students will work with high-end products from Rockwell Automation/Allen Bradley. This training program allows students to acquire hands-on experience with industrial control equipment. Realistic examples are used to motivate students to gain the skills needs to work with PLC controlled systems – which surround us in our daily lives. As a Rockwell Encompass Partner, Festo's training is well suited for this environment. Students will go deeper into programming PLCs, incorporate HMI (Human Machine Interface) programming and modifying programs to include changes in the applications. This is a highly sought after skill in modern industry.

Fundamentals and Applied Robotics (60 hrs)
Today, and in the future, Robotics are becoming more and more common. From repetitive tasks to highly complex interaction with humans, robots can be found. This industry recognized certification is designed expose students to the various types of robots and the various ways they can increase productivity in industrial applications. While these robots can replace low skilled human tasks, they require people with technical skills to program, operate and maintain them. Upon completion of this industry recognized certification, students will have worked with various types and brands of robots – learning how to program, teach positions, and work safely with these critical elements of modern industry. Students will work more extensively with the CIROS software and real industrial robotic applications. Robots rarely do work in isolation. They interact with other manual and automated systems. The MPS Robot Cell allows students to learn about these topics and how to program and edit robot programs and positions to accomplish various tasks.

Fundamentals of Mechanical Systems (60 hrs)
The driving force behind most industrial applications is Mechanical Systems. Gears, drives, bearings, pulleys, and more are found in nearly everything that moves. The Mechanical Systems course covers the installation, use, maintenance, and troubleshooting of mechanical drive components and systems. The industry recognized certification is divided into various topics which deal with the components encountered in industry. The learning is based on practical, hands-on tasks to build know-how in operating and maintaining these vital systems.

Principles of Factory Automation (60 hrs)
Principles of factory automation introduces the types and uses of automation in manufacturing. Reviews the use of PLCs for material handling and movement, process control systems, workpiece handling, and conveyors.

Process Control (60 hrs)
Level and Flow Process Control teaches two of the most common types of process control systems, flow and liquid level. This course covers process control safety, instrument tags, piping and instrumentation diagrams, and level measurement, then moves into system control functions such as liquid level control, automatic control methods, basic flow measurement and control, and control loop performance.

Synergy in Manufacturing (60 hrs)
To ensure a seamless production and maintenance program, introductory skills are necessary to identify equipment concerns early before they shut down production. Due to the diversity of skills required an overview of the most common components of Mechatronic systems was developed to introduce employees to Industrial Maintenance. The course will introduce topics such Industrial Safety, Blueprint Reading, Commercial and Industrial Electricity, Motor Control, Programmable Logic Controllers, Robotics, Hydraulics and Pneumatics. Introducing troubleshooting and diagnostics procedures to safely and effectively repair common problems incurred.