

# ELM - ELECTRICAL AND MECHANICAL TECHNOLOGY

## **ELM 110 - Electrical/Electronic Circuits** **Units: 3**

This course will cover basic principles of AC/DC electrical circuits. Topics will include foundational mathematical calculations, use of diagnostic equipment to perform troubleshooting, and introductory electrical circuit diagrams. This course satisfies 15 embedded hours toward specified programs and certificates for AAS Math/Quantitative Reasoning General Education requirements.

*Term Offered: Summer and Fall*

## **ELM 127 - Introduction to AC Controls** **Units: 3**

This course is an introduction to motor control and control logic. Students will work with a variety of industry-standard dynamics related to the application of motors in a manufacturing setting. This course satisfies 5 embedded hours toward specified programs and certificates for AAS Human Relations and 10 embedded hours toward specified programs and certificates for AAS Science General Education requirements.

*Transferability: May not transfer towards an NSHE bachelor's degree*

## **ELM 129 - Electric Motors and Drives** **Units: 3**

This course is an introduction to electric motor drives. Topics will include how to connect, configure, adjust and operate different drives for motor operation.

*Transferability: May not transfer towards an NSHE bachelor's degree*

*Enrollment Requirements: Prerequisite: ELM 127 or instructor approval.*

## **ELM 134 - Programmable Logic Controllers I** **Units: 3**

This course is an introduction to Programmable Logic Controllers (PLC) and related topics. Programming, troubleshooting, and theory will all be covered. This course satisfies 10 embedded hours toward specified programs and certificates for AAS Math/Quantitative Reasoning as well as 10 embedded hours toward specified programs and certificates for AAS Science General Education requirements.

*Transferability: May not transfer towards an NSHE bachelor's degree*

## **ELM 136 - Programmable Logic Controllers II** **Units: 3**

This is a continuation of ELM 134 and designed to provide students intermediate level skills in Programmable Logic Control (PLC) programming instruction and control concepts. Emphasis will be placed on programming structure, instructions, and execution for Controllogix platforms. Additional focus will be on network and network protocols throughout the course. Students will utilize advanced simulation software to develop and execute various PLC programs.

*Transferability: May not transfer towards an NSHE bachelor's degree*

*Enrollment Requirements: Prerequisite: ELM 127, ELM 134 and MPT 120 or by Instructor Approval.*

## **ELM 140 - Industrial Robotics I** **Units: 3**

This is an introductory course for industrial robotics. Students will learn how to safely test and operate various elements of industrial robots. This course satisfies 10 embedded hours toward specified programs and certificates for AAS Math/Quantitative Reasoning General Education requirements.

*Transferability: May not transfer towards an NSHE bachelor's degree*

## **ELM 198 - Special Topics in Electrical and Mechanical Technology** **Units: 0.5-4**

This course is designed to give students a basic understanding and hands-on experience of current theories in electrical and mechanical technologies. As local manufacturers begin to utilize advanced technologies in their processes, this course will provide a hands on approach to learning the technology in these areas necessary for students to succeed in the new economy.

*Transferability: May not transfer towards an NSHE bachelor's degree*

*Term Offered: AS NEEDED*

## **ELM 233 - Introduction to Instrumentation** **Units: 3**

An introduction to the fundamentals of instrumentation and process control. Concepts and measurement of physical variables and brief descriptions of individual processes and combination of processes used in industry. Theory of operation and application of associated process instruments covered.

*Transferability: May not transfer towards an NSHE bachelor's degree*

*Enrollment Requirements: Prerequisite: ELM 134 or instructor approval.*

## **ELM 240 - Advanced Manufacturing and Robotic Systems** **Units: 3**

This course is an introduction to programming for industrial robots. Students will learn various aspects of robotic programming, how peripheral components can be integrated, and how to troubleshoot faulty programs. This course satisfies 5 embedded hours toward specified programs and certificates for AAS Human Relations, 10 Embedded hours toward specified programs and certificates for AAS Math, and 5 embedded hours toward specified programs and certificates for AAS Science General Education requirements.

*Transferability: May not transfer towards an NSHE bachelor's degree*

## **ELM 340 - Robotic Programming Offline** **Units: 3**

This course provides a comprehensive look into robot simulation programming software utilized for offline programming of Fanuc and Kuka robots. Students will gain first hand knowledge of Fanuc and Kuka robotic programming software for the design and setup of a robotic work-cell.

*Enrollment Requirements: Prerequisite: Admissions to the Bachelor of Applied Science, Cyber-Physical Manufacturing program.*

## **ELM 440 - Collaborative Robot Design and Operation** **Units: 3**

This course provides an in-depth look into the programming, design, and application of collaborative robots. Students will study the history and evolution of collaborative robots within the manufacturing environment, existing limitations, advanced safety system requirements, and the future of collaborative robots.

*Enrollment Requirements: Prerequisite: Admissions to the Bachelor of Applied Science, Cyber-Physical Manufacturing program and ELM 340.*