NICOLET COLLEGE

Electromechanical Technology

Associates of Applied Science

Develop a wide variety of technical skills in electronics, fluid power, mechanical systems, computers and computer-controlled machines. Programmable logic controllers, robotics, motors and drives, servo hydraulic systems and closed loop positioning will be studied. A comprehensive understanding of how these technical skill areas are linked together to create automated systems is developed through a hands-on project course that allows the student to put together the various technologies in an integrated manufacturing system.

Program Outline

TERM 1

Course #	Course Title	Credits
1010311500	MS Word Beginning This course will cover creating a flyer, research paper, and business letter using Microsoft Word.	1.00
1010312600	MS Excel Beginning This course will cover creating a worksheet and chart; application of formulas, functions, and formatting; and working with large worksheets, charting, and what-if analysis using Microsoft Excel.	1.00
1044910000	Industrial Safety Fundamentals Introduces general safety for a manufacturing environment while raising the awareness of the worker to the hazards around them, and how to best protect themselves while working safely. Students will earn an OSHA 30 card and confined space certificate upon completion.	2.00
1046211500	Basic Electrical Circuits Students will learn how to measure voltage, current and resistance in an electrical circuit.	1.00
1046211700	Inductance and Capacitance Students will learn how to define and calculate incuctance and capacitance in an electrical circuit.	1.00
1046211900	Analyze Transformers Students will learn how to size a transformer and how to identify the step up and step down transformers.	1.00
1062010200	Hydraulic and Pneumatic Operation Students will learn basic hydraulic and pneumatic fundamentals with associated symbology.	1.00
1062010600	Ladder Logic Elements and Control Logic Students will learn the basics of sequencing and devices used in hydraulics and pneumatics machines.	1.00
1062010900	Analyze Directional Control Valves Students will utilize the DCV's to control sequencing , timing and pressure control in hydraulic and pneumatic systems.	1.00
1062011200	PLC Fundamentals and Basic Instructions Student will learn the components of the plc and beginning level programming.	1.00

Course #	Course Title	Credits
1080119500	Written Communication Develops writing skills which include prewriting, drafting, revising, and editing. A variety of writing assignments is designed to help the learner analyze audience and purpose, research and organize ideas, and format and design documents based on subject matter and content. Also develops critical reading and thinking skills through the analysis of a variety of written documents.	3.00
1044214000	Intro to Welding Techniques Students will explore and perform basic welding techniques.	1.00
1080916600	Intro to Ethics Theory and Application Provides a basic understanding of the theoretical foundations of ethical thought. Diverse ethical perspectives will be used to analyze and compare relevant issues. Students will critically evaluate individual, social and/or professional standards of behavior, and apply a systematic decision-making process to these situations.	3.00

TERM 2

Course #	Course Title	Credits
1046212100	Mechanical Drive Systems Students will learn how to install a drive and properly align a shoaft.	1.00
1046212400	Belt and Chain Drives Students will learn how to properly install and adjust drive components.	1.00
1062011600	Analyze the Use of Oscilloscopes Students will learn the use of the oscillope to test electronic circuits beginning with common power supply systems.	1.00
1062011800	Analyze Sensing Devices and Op Amps Students will learn the operation and troubleshooting of inductive, capacitive, optical and hall effect sensors.	1.00
1062012000	Analyze SSRs and Switching Circuits Students will learn about and troubleshoot solid state relays and switching circuits commonly used.	1.00
1062012300	Three Phase Electric Motor Control Students will learn about safety, 3 phase power transformation and manual control of three phase motor control systems.	1.00
1062012500	Investigate Troubleshooting Methods Students will learn about the types and methods of troubleshooting for 3 phase motor control systems.	1.00
1062012700	Troubleshooting Common Motor Circuits Students will examine the function and troubleshooting of reversing, automatic and timer controlled industrial motor control systems.	1.00
1062012900	PLC Timers Counters and Program Controls Students will learn the operation and the use of timer, counter, MCR and first scan program instructions	1.00
1062013300	PLC Sequencing and Data Function Blocks Students will learn the operation of event sequencing, addition, subtraction, multiplication and division function blocks.	1.00

Course #	Course Title	Credits
1080413400	Mathematical Reasoning An activity based approach is used to explore numerical relationships, graphs, proportional relationships, algebraic reasoning, and problem solving using linear, exponential and other mathematical models. Students will develop conceptual and procedural tools that support the use of key mathematical concepts in a variety of contexts. This course is not designed for Science, Technology, Engineering, or Math (STEM) students and/or others who require calculus. Prerequisite: 7785478000 Principles of College Math (C or better) or Accuplacer Algebra score >=35 or UW Math Placement Basic Math Skills score >=250 or ACT Mathematics score >=18 or Tailwind Math College Math Fund score >=16.	3.00
1080919900	Psychology of Human Relations Focuses on improving personal and job-related relationships through understanding and applying sound psychological principles. Topics include self-concept, motivation, emotions, stress management, conflict resolution, and human relation processes.	3.00

TERM 3

Course #	Course Title	Credits
1015011100	Network Standards and Practices Students will learn how end user devices and local network devices communicate with each other and the global internet.	1.00
1015011300	Network Topology and Devices Students will learn the various network topologies and how the network devices connect in those topologies as well as they will explore wireless technologies and how they are used.	1.00
1015011600	Configure Network Devices Students will learn how to configure various network devices, apply security concepts to protect the network, and troubleshoot common issues with the network.	1.00
1062013700	Basic Robot Assemblies and Operations Students will learn about robot history, terminology, the components of a robot system, and design of their motion.	1.00
1062013900	Robot Programming and Instructions Students will learn beginning level operation, teach pendant and program storage methods.	1.00
1062014300	Analyze Robot Frames and Branching Students will learn advanced methods of robot programming including frames, program editing, postion registers and program branching.	1.00
1062014700	HMI Screen Development and Editing Students will learn to develop a Human Machine Interface (HMI) screen and edit features of an existing HMI program.	1.00
1062014900	Investigate PLC Troubleshooting Students will learn the basics of troubleshooting the components of a PLC.	1.00
1062015200	Analyze PLC Analog Inputs Students will learn to integrate and troubleshoot a varied input signal to a PLC.	1.00
1062015400	Analyze PLC Analog Outputs Students will learn to integrate and troubleshoot a varied output signal from a PLC.	1.00
1062015800	Analyze PLC Variable Output Applications Students will learn common variable output circuits and the troubleshooting techniques associated with them.	1.00

Course #	Course Title	Credits
1080613900	Survey of Physics Emphasizes understanding basic physics concepts through laboratory investigation and applications. Topics include kinematics, dynamics, work, energy, power, temperature, heat, waves, electricity, magnetism, electromagnetic waves, optics, and atomic and nuclear physics.	3.00

TERM 4

Course #	Course Title	Credits
1046218600	Tag System Used in Process Control Students will learn how to idenify circuit tags on the trainer as well as on a diagram.	1.00
1046218800	Loop Controller and Control Elements Students will learn how to install PID parameters.	1.00
1046219200	Sensors to Measure Liquid Level Students will change parameters in a program to maintain fluid levels.	1.00
1062016300	Analyze Automated System Students will learn about the common components of automated machines.	1.00
1062016700	Integrate Automated Systems Students will integrate the common components of an automated machine.	1.00
1062016900	Motor Control Starting and Braking Students will learn and troubleshoot circuits associated with starting and stopping industrial motor control systems.	1.00
1062017200	Analyze Motor Control Speed and Torque Students will learn and troubleshoot circuits associated with the control and torque of industrial motor control systems.	1.00
1062017600	Analyze Motion Control Software Students will learn about and navigate motion control software.	1.00
1062017800	Configure Motion Control Systems Students will learn how to set-up, configure and deploy a motion control project.	1.00
1062018000	Design Motion Control Projects Students will learn about and design motion control projects to control position, velocity and current.	1.00
1080119600	Oral Interpersonal Communication Focuses upon developing speaking, verbal and nonverbal communications, and listening skills through individual presentations, groups activities, and other projects.	3.00

Total Credits: 61.00

Talk with a Success Coach about the program outline. Together, you will determine if credits you've already earned satisfy any requirements, discuss possible alternative courses, and choose the best classes if you're thinking of transferring.

At A Glance

How You'll Learn

How You'll Learn

Spring 2025 Start Dates

January 13 - 16-Week Spring Term Start
March 10 - Additional 8-Week Term Start for Select Courses

Summer 2025 Start Date

May 19 - 12-Week Summer Term Start

Fall 2025 Start Dates

August 25 - 16-Week Fall Term Start
October 20 - Additional 8-Week Term Start for Select Courses

VIEW FULL ACADEMIC CALENDAR

Program Tuition*

$10,515

Books & Supplies*

$1,099

*Total cost for degree completion is estimated by current course requirements, books, and supplies. Tuition and fees are set by the Wisconsin Technical College System and subject to change.

Financial Aid Eligible

▸ **Potential Indirect Costs**

What You'll Learn

- Perform work safely
- Troubleshoot electrical and mechanical systems and devices
- Repair electrical and mechanical systems
- Communicate technical information
- Integrate electrical and mechanical systems and devices

Your Potential Careers

- Electromechanical Technician
- Industrial Automation Technici
- Research and Development Techn
- Robotics Technician
- Industrial Maintenance Technic
- Field Service Technician

Median Annual Salary

Local	State	National
$53,586	$53,608	$56,338

EMSI 2022.1

Get Started

Your application can be submitted online, it takes just a few minutes to complete.

APPLY NOW