LAKESHORE COLLEGE

ELECTRO-MECHANICAL MAINTENANCE TECHNICIAN

Program Number 10-462-2
Associate Degree in Applied Science • Four Terms

ABOUT THE PROGRAM

Times are changing in the field of maintenance. Facilities are running with both manual and automated equipment and both need to be maintained and repaired. If you enjoy troubleshooting, working with your hands, and have an interest in electrical and mechanical processes, this career path is for you. The program prepares students to maintain and repair both manual and automated equipment. It covers areas like mechanical power, hydraulics, and motor controls.

PROGRAM OUTCOMES

- Demonstrate safe work procedures.
- Install industrial and robotic equipment and systems.
- Maintain industrial and robotic equipment and systems.
- Troubleshoot industrial and robotic equipment and systems.
- Repair industrial and robotic equipment and systems.
- Communicate technical information.

CAREER AND EDUCATION ADVANCEMENT OPPORTUNITIES

Lakeshore credits transfer to over 30 universities. For more information visit lakeshore.edu/future-students/transfer.

ADMISSIONS AND FIRST SEMESTER ENROLLMENT STEPS

- Submit online application.
- Complete the online Student Success Questionnaire.
- Complete Get Started at Lakeshore appointment:
  - Application Check-in
  - College Orientation Overview
  - 1st Time Program Registration

**Submit high school transcripts, college transcripts, and test scores (optional, highly recommended). Official transcripts will be needed for transferring college credit(s) and for financial aid purposes.*

ACADEMIC PREPAREDNESS/FUTURE SEMESTER ENROLLMENT STEPS

If applicable, complete program-specific academic preparedness requirements and enrollment steps prior to enrolling in occupational or core courses. Students will be notified if there is a program waitlist. View the college's program webpage for details: https://lakeshore.edu/programs-and-courses/career-areas/manufacturing/electro-mechanical-maintenance-technician.

APPROXIMATE COSTS

$152.85 per credit tuition (WI resident) plus $9.17 per credit student activity fee. Material fee varies depending on course. Other fees vary by program. Visit lakeshore.edu/Financial-Aid/tuition-and-fees for details.

FINANCIAL AID

This program is eligible for financial aid. Visit lakeshore.edu/Financial-Aid for more information.

SPECIAL NOTE

- Students may need to supply their own safety glasses and welding gloves.
- Learn when you want. Progress at your own pace. Receive personalized coaching and support. The full CBE definition may be found at lakeshore.edu/cbe.

RELATED PROGRAMS

- Electro-Mechanical Automation Technology
- Millwright Apprenticeship
- Industrial Electrician Apprenticeship
- Maintenance Technician Apprenticeship

CONTACT

Lakeshore College Recruiter
920.693.1366 • Recruitment@lakeshore.edu

Catalog No.	Class Title	Credit(s)
	Term 1	
10804113	College Technical Math 1A OR 10804198 Calculus 1** (4 cr)	3
10462207	Tools and Measurement*	1
10462209	Maintenance Introduction*	1
10462211	Maintenance Print Reading*	2
10462127	Bearings and Lubrication	2
10420294	Machine Tool Introduction*	2
10442100	Safety and Welding Fundamentals*	1
10457203	Maintenance Fabrication*	1
10462215	Layout and Rigging*	1
		14
	Term 2	
10620255	Hydraulics and Pneumatics*	3
10462117	Power Transmission	3
10462123	Pumps, Fluid/Air Handling	2
10462121	Troubleshooting and Machine Repair	3
31420340	Manual Lathe Operation*	1
31420350	Manual Mill Operation*	1
10801196	Oral/Interpersonal Communication	3
		16
	Term 3	
10620122	Industrial Wiring	2
10620105	DC Fundamentals	2
10620169	Robotic Mechanical Maintenance	1
10620224	Microcontroller Programming*	1
10620168	Robotics Introduction	2
10809198	Introduction to Psychology	3
10801136	English Composition 1	3
		14
	Term 4	
10620151	Electrical Robotic Maintenance	2
10620110	AC Fundamentals	2
10620164	Electromechanical Systems	2
10620238	Programmable Controllers - Allen Bradley*	3
10620141	Industrial Controls and Motors	3
10620195	Industrial Troubleshooting	1
10809144	Macroeconomics OR 10809143 Microeconomics	3
		16
		TOTAL 60

*CBE delivery only
**Calculus 1 is designed for students planning to transition to a 4-year college following Lakeshore program completion.

Curriculum and program acceptance requirements are subject to change. Program start dates vary; check with your academic counselor for details. The tuition and fees are approximate based on 2025-2026 rates and are subject to change prior to the start of the academic year.

REAL EXPERIENCE FOR THE REAL WORLD

2025-26

LAKESHORE COLLEGE

AC FUNDAMENTALS...prepares the student to analyze electrical circuits using AC math, analyze AC waveforms, measure and analyze AC power, analyze capacitors and inductors in DC and AC circuits, analyze AC circuits containing reactance and calculate resonance, apply the elements and properties of basic measuring circuits, and describe transformer characteristics. PREREQUISITE: 10620105 DC Fundmntls or 10660105 DC Fundamentals

BEARINGS AND LUBRICATION...prepares the learner to properly identify, remove, install, and maintain both plain and rolling element bearings used with either a radial or axial load, including ball, cylindrical roller, tapered roller, linear, and thrust bearings; use manufacturers' resources for proper usage and life of bearings; and look at proper types, properties, and application methods of lubrication. PREREQUISITE: 10462109 Maintenance Intro or 31462309 Industrial Maintenance Intro or COREQUISITES: 10804113 College Tech Math 1A and 10462209 Maintenance Intro

COLLEGE TECHNICAL MATHEMATICS 1A...prepares student to solve linear, quadratic, and relational equations; graph; formula rearrangement; solve systems of equations; percent; proportions; and operations on polynomials. Emphasis will be on the application of skills to technical problems. Discuss math academic course support with your Counselor.

DC FUNDAMENTALS...prepares the student to convert values to scientific and engineering notations; calculate math quantities; describe basic atomic theory; identify basic electrical terms; use established symbols standards; describe DC voltage characteristics and current sources and electrical resistance; measure and analyze electrical quantities in series and parallel circuits; and desolder/solder single lead components. COREQUISITE: 10804113 College Tech Math 1A or 10804115 College Tech Math 1 or 10804198 Calculus 1 or 10804118 Interm Algebra with Apps

ELECTRICAL ROBOTIC MAINTENANCE…introduces students to causes of error codes and their repair with Fanuc R30iB controller. Students will also be trained in DCS, Ethernet communication and I/O. PREREQUISITES: 10620169 Robotic Mechanical Maintenance, 10620122 Industrial Wiring and 10620168 Robotics Introduction

ELECTROMECHANICAL SYSTEMS...prepares the student to communicate with, tune, run, and troubleshoot Allen-Bradley servos; utilize electrical control of hydraulic systems, explore PID control of motor speed; and investigate open and closed loop control systems. PREREQUISITE: 10620104 Fluid Power 2 or 10620155 or 10620255 Hydraulics and Pneumatics and COREQUISITE: 10620110 or 10660110 AC Fundamentals

ENGLISH COMPOSITION 1…is designed for learners to develop knowledge and skills in all aspects of the writing process. Planning, organizing, writing, editing and revising are applied through a variety of activities. Students will analyze audience and purpose, use elements of research, and format documents using standard guidelines. Individuals will develop critical reading skills through analysis of various written documents. Discuss reading and writing academic course support with your Counselor.

HYDRAULICS AND PNEUMATICS...prepares the learner to identify hydraulic and pneumatic component symbols and terms, adjust a pressure relief valve, analyze the operation of a pilot operated relief valve; analyze Pascal's law; evaluate flow, velocity, work and power in industrial hydraulic and pneumatic circuits; analyze meter-in, meter-out, and bypass flow control circuits; identify basic hydraulic and pneumatic control valves; and assemble hydraulic circuits. COREQUISITE: 10804113 College Tech Math 1A

INDUSTRIAL CONTROLS AND MOTORS...prepares the learner to select control devices by function and operation; illustrate electrical circuits using symbols, diagrams, and abbreviations; explain the operation of magnetic solenoids and apply motor control techniques and introduces the student to three-phase power motor circuits for industrial applications. PREREQUISITE: 10620122 Industrial Wiring and COREQUISITE: 10620110 AC Fundamentals or PREREQUISITE: 10660110 AC Fundamentals

INDUSTRIAL TROUBLESHOOTING…prepares the learner to conduct effective machine control troubleshooting techniques with an understanding of preventive maintenance methods designed to minimize motor and controls issues between preventive maintenance measures. COREQUISITE: 10620141 Industrial Controls and Motors

INDUSTRIAL WIRING...prepares the learner to follow safety procedures; maintain a safe and healthy work environment; construct electrical circuits; measure electrical quantities using a VOM and/or DVM; analyze measured values using electrical circuit laws; construct typical industrial control circuits; and analyze typical industrial control circuits.

INTRODUCTION TO PSYCHOLOGY...introduces students to a survey of the multiple aspects of human behavior. It involves a survey of the theoretical foundations of human functioning in such areas as learning, motivation, emotions, personality, deviance and pathology, physiological factors, and social influences. It directs the student to an insightful understanding of the complexities of human relationships in personal, social, and vocational settings. Discuss reading academic course support with your Counselor.

LAYOUT AND RIGGING…prepares the learner to perform layout skills for industrial maintenance to include machine layout, proper rigging, installation, and leveling with emphasis on baseline layout, machine rigging and installation, machine leveling, and alignment procedures. PREREQUISITE: 10462109 Maintenance Introduction or COREQUISITE: 10462209 Maintenance Introduction

MACHINE TOOL INTRODUCTION...prepares the learner with the skills to identify basic types of machining processes, follow standard shop safety rules, use semi-precision and precision measuring tools, perform workpiece layout procedures, identify metal composition and classification, follow cutoff machine safety rules, operate vertical and horizontal cutoff machines, follow sensitive drill press safety rules, identify drill press components, interpret attributes of hole-producing tools, and operate a sensitive drill press.

MACROECONOMICS...is an introductory course. Basic social choices regarding economic systems, basic economic aggregates, fiscal policy, the banking system, monetary policy, and international trade are the principle topics discussed in the course. Balance is drawn between theory, analysis, and a critique of the institutions that characterize modern mixed-capitalist economies. Conflicting social goals, economic constraints, and environmental concerns provide the framework through which the macroeconomy is analyzed. Discuss reading academic course support with your Counselor.

MAINTENANCE FABRICATION...introduces the learner to various types of structural steel, sheet metal, and pipe, and prepares the learner to perform fabrication from assembly prints, including cutting, welding, bending, straightening, and repair. PREREQUISITE: 31442346 Industrial Maintenance Intro to Welding or 31442300 Welding Intro or COREQUISITE: 10442100 Safety and Welding Fundamentals

MAINTENANCE INTRODUCTION…prepares the learner to apply basic safety, mechanics, force, friction, work, and energy; learn terminology related to maintenance; introduction to threaded and non-threaded fasteners and concrete anchoring; learn to use precision measuring tools; introduction to single-phase and three-phase motor wiring. PREREQUISITE: 31462325 Maintenance Tools and Measurement or 10462107 Tools and Measurement or COREQUISITE: 10462207 Tools and Measurement

MAINTENANCE PRINT READING…prepares the learner to read prints; make isometric sketches; interpret orthographic projection drawings, to include sections, surface finishes, and tolerancing.

MANUAL LATHE OPERATION…prepares the learner to perform lathe facing, turning, hole producing and threading operations safely.

MANUAL MILL OPERATION…prepares the learner to perform squaring, slot milling and hole producing using a vertical mill machine safely.

MICROCONTROLLER PROGRAMMING…introduces the learner to concepts in basic digital programming, programming logic, electronic components, and Digital and Analog I/O.

ORAL/INTERPERSONAL COMMUNICATION...provides students with the skills to develop speaking, verbal and nonverbal communication, and listening skills through individual speeches, group activities, and other projects. Discuss reading academic course support with your Counselor.

POWER TRANSMISSION...introduces the learner to belt, chain, and gear drives used in industrial maintenance applications, including v-belts, flat belts, timing belts, conveyor chains, roller chains, bevel gears, worm gears, helical gears, spur gears, couplings, and alignment with emphasis on identification, installation, repair, and maintenance. COREQUISITE: 10462127 Bearings and Lubrication or PREREQUISITE: 10462125 Bearings and Lubrication

PROGRAMMABLE CONTROLLERS - ALLEN BRADLEY…prepares the learner to understand basic PLC structure and terminology; learn to create and troubleshoot basic PLC programs using the RSLOGIX 500 software and the RSLINX communication software; become familiar with communicating with programming SLC-500 PLCs. This course is highly computer based. Class may qualify for 64 hours of Continuing Education Units (CEUs) for Electricians.

PUMPS, FLUID/AIR HANDLING...prepares the learner to identify, install, repair, and maintain common pumps and plumbing applications, including centrifugal pumps, diaphragm pumps, packing and seals, tubing, and installing hose and piping used with fluid and air handling. PREREQUISITES: 10620155 Hydraulics and Pneumatics and 10462119 Power Transmission or COREQUISITES: 10620255 Hydraulics and Pneumatics and 10462117 Power Transmission and 10804113 College Technical Math 1A

ROBOTIC MECHANICAL MAINTENANCE...introduces the students to the robot teach pendant and robot jogging. Students will be taught to replace servo motors, recalibrate the robot and back up robot software and programs.

ROBOTICS INTRODUCTION...introduces the student to robotic axes, movement control, navigating the teach pendant, robotic frames, basic programming commands such as conditional branching, wait and call instructions. Class may qualify for 48 hours of Continuing Education Units (CEUs) for Electricians.

SAFETY AND WELDING FUNDAMENTALS...introduces the learner to the world of welding, weld shop safety practices, welding terminology, and welding machine setup to industry standards. Learners will be introduced to the three major welding processes: SMAW, GMAW, and GTAW and will build skills welding with each process in the flat and horizontal positions while using the common welding joints found in industry. The learner will process material using the two major handheld cutting processes - Oxyfuel and PAC.

TOOLS AND MEASUREMENT...prepares the learner to use hand tools, precision measuring instruments, and torque tools.

TROUBLESHOOTING AND MACHINE REPAIR...prepares the learner to perform essential troubleshooting, repair, and preventive maintenance of various machine tools and installations used in industrial maintenance and to integrate the skills learned in the other maintenance courses to perform complete repair of machine tools. PREREQUISITE: 10462119 Power Transmission or COREQUISITES: 10462117 Power Transmission and 10462123 Pumps, Fluid/Air Handling and PREREQUISITE: 10462115 Layout and Rigging or COREQUISITE: 10462125 Layout and Rigging