MANUFACTURING AND INDUSTRIAL PRINCIPLES

Program Number 30-462-8
Technical Diploma • Two Terms

ABOUT THE PROGRAM

Manufacturing powers our region—and your future! This program delivers a broad foundation in the essential skills modern industry demands. Master fundamentals like welding, CNC, robotics, design, and maintenance. Explore multiple career paths and build credits toward advanced programs. Start here to step confidently into the largest industry in our district.

PROGRAM OUTCOMES

- Demonstrate safe work procedures.
- Demonstrate professionalism appropriate for the industry.
- Interpret industrial/engineering drawings.
- Apply precision measuring methods to part inspection.

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.

**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/maintenance-mechanic.

APPROXIMATE COSTS

$157.45 per credit tuition (WI resident) plus $9.45 per credit student activity fee. Material fee varies depending on course. Other fees vary by program. Visit https://lakeshore.edu/paying-for-college/tuition-and-fees for details.

FINANCIAL AID

This program is eligible for financial aid. Visit lakeshore.edu/Financial-Aid or talk with your College Recruiter about how to apply for aid.

SPECIAL NOTE

Accelerate your learning, earn credit for what you know, and get personalized support to reach your goals. The full CBE definition may be found at lakeshore.edu/CBE. Many courses are also offered in Manitowoc.

RELATED PROGRAMS

- Precision Machining
- Welding - Industrial
- Welding Fabrication Technician
- Maintenance Mechanic

CONTACT

Lakeshore College Recruiter
920.693.1366 • Recruitment@lakeshore.edu

Catalog No.	Class Title	Credit(s)
	Term 1	
10442215	Manufacturing Measurement*	1
10462220	Maintenance Introduction*	1
31420325	Manufacturing Math*	1
10420230	Manufacturing Print Reading*	1
10620168	Robotics Introduction	2
31420340	Manual Lathe Operation*	1
31420350	Manual Mill Operation*	1
31801360	Workplace Fundamentals*	1
		9
	Term 2	
10620122	Industrial Wiring	2
10606208	3D Design-SolidWorks 1*	2
10606202	Product Design & Rapid Prototyping*	2
31404200	Auto Orientation and Safety*	1
10601201	HVAC Foundations*	1
10442100	Safety & Welding Fundamentals*	1
10457203	Maintenance Fabrication*	1
		10
		TOTAL 19

*CBE delivery only

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 2026-2027 rates and are subject to change prior to the start of the academic year.

3D DESIGN-SOLIDWORKS 1…introduces the students to the concepts and commands of parametric solid modeling. Students create sketches and add relationships to the sketch segments, extrude the sketches to create models, and add features such as fillets, cut extrude, chamfers, holes, draft, shell, lofts and sweeps. Emphasis is placed on the design intent of the parametric solid models and best practices to ensure robust engineering designs.

AUTO ORIENTATION AND SAFETY...prepares the learner to work effectively and efficiently in the automotive lab. Shop safety and proper procedures are emphasized.
HVAC Foundations…provides students with the foundations of HVAC. Students will learn about the HVAC industry, the fundamentals of HVAC installation and service techniques, basic tools and, as well as trade mathematics. Professional licensure, certification, and various HVAC career paths will also be discussed.

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.

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 or 10442215 Manufacturing Measurement

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.

MANUFACTURING MATH…prepares the learner to use scientific calculators for the applications of common fraction and mixed number problems, decimal problems, inch and metric conversion problems, basic percentage problems, powers and roots, and pre-algebra problems.

MANUFACTURING MEASUREMENT...prepares the learner to communicate using proper measurement terminology; develop safety practices while using measuring equipment; use and interpret values from semi-precision and precision measuring equipment; demonstrate the use of layout instruments and techniques to make accurate layout of steel fabrications.

MANUFACTURING PRINT READING...prepares learners to read and interpret industrial drawings by identifying multiple drawing views, understanding dimensioning styles, recognizing common line types, and creating orthographic and isometric sketches.

PRODUCT DESIGN AND RAPID PROTOTYPING...introduces students to product design and rapid prototyping methods. Students will discover the product design process, then utilizing the various equipment available in the MDET program's Fab Lab, produce an actual product they designed. PREREQUISITE: 10606108 SolidWorks 1-Parametric Modeling or COREQUISITE: 10606208 3D Design-SolidWorks 1

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.

WORKPLACE FUNDAMENTALS…prepares the learner to incorporate problem solving, creativity and communication skills into daily workplace habits.