

Welding

Technical Diploma

Learn welding at your own pace, through hands-on learning, and with your instructor and success coach to guide you. The Welding program is designed to give students entry-level skills required in fabrication, construction, maintenance and other metal working industries. You'll also experience robotic welding, computerized cutting, safe overhead crane operation, and will learn blueprint reading, layout and fabrication techniques, and math and communication skills.

Requirements for welder certification will be explained, and simulated certification tests will be offered. Upon successfully completing the program, you'll have the skills needed to take a welding certification test or job-entry performance test.

Program Outline

TERM 1		
Course #	Course Title	Credits
1044210300	Print Reading Students will develop print interpretation skills needed in metal fabrication. Learners study orthographic projection, dimensioning, and bill of materials. Learners apply concepts in hands-on activities, practicing basic layout skills and safe operation of saws, shears and drills. Corequisites: 3180410100 Math Skills, 3180410200 Geometry Skills.	3.00
1044215700	Thermal Cutting Develops skill in thermal cutting and gouging processes. Learners practice manual and machine oxy-fuel cutting, plasma cutting and gouging and air carbon arc gouging. Prerequisite: 1044217200 Safety in Manufacturing (C or better).	2.00
1044215800	Shielded Metal Arc Welding on Carbon Steel Develop skills in shielded metal arc welding. Learners use 6010 and 7018 stick electrodes to complete fillet and groove welds in all positions. Weld quality is assessed per AWS D1.1 Structural Steel Code. Prerequisite: 1044217200 Safety in Manufacturing (C or better).	2.00
1044215900	Gas Metal Arc Welding on Carbon Steel Develop skills in gas metal arc welding. Learners use the "mig" process in all positions on carbon steel. Required welds include fillet and groove welds with short circuit, spray and pulsed spray transfer. Weld quality is assessed per AWS D1.1 Structural Steel Code. Prerequisite: 1044217200 Safety in Manufacturing (C or better).	3.00
1044216300	Weld Inspection and Testing Emphasizes measurement of weld defects and assessment of weld quality conformance to common welding codes. Learners conduct etch tests, bend tests and break tests on welds. The process of procedure and welder qualification is explored through group activities.	1.00
1044217200	Safety in Manufacturing Prepares learners for safe operation of work site equipment. Procedures regarding welding machines, band saws, shears, drill presses, punches, grinders, oxy fuel equipment and an array of hand tools are practiced. Crane and forklift operation are introduced. Corequisite: 3144215600 Welding Metallurgy.	1.00
3144210100	Weld Symbols Students will develop print interpretation skills needed in metal fabrication. Learners study prints containing section views, detail views, and weld symbols. Learners apply concepts in hands-on activities, print interpretation skills, calculating dimensions, identifying and interpreting weld symbols.	1.00

Course #	Course Title	Credits
3180410100	Math Skills Develops skills in using mathematics principles, essential to the technical service and production workplace, through applied learning contexts. Content includes whole numbers, fractions, percent, graphs, and fundamentals of algebra. Corequisite: 1044210300 Print Reading.	1.00
3180410200	Geometry Skills Develops skills in using mathematics principles, essential to the technical service and production workplace, through applied learning contexts. Content includes geometry and trigonometry, and tools and techniques for precision measurement. Corequisite: 1044210300 Print Reading.	1.00
TERM 2		
Course #	Course Title	Credits
1044212000	GTAW on Carbon Steel Develops skills in gas tungsten arc welding. Learners weld carbon steel sheet and plate in the flat, horizontal, and vertical positions. Prerequisite: 1044217200 Safety in Manufacturing (C or better) (concurrent enrollment allowed).	2.00
1044212300	GTAW on Stainless Steel Develops skills in gas tungsten arc welding. Learners weld stainless steel sheet and plate in the flat, horizontal, and vertical positions. Prerequisite: 1044217200 Safety in Manufacturing (C or better) (concurrent enrollment allowed).	1.00
1044212600	GTAW on Aluminum Develop skills in gas tungsten arc welding on aluminum. Learners use the "tig" process in flat, horizontal, and vertical positions on aluminum. Required welds include fillet and groove welds with gas tungsten arc welding. Weld quality is assessed per AWS standards. Prerequisite: 1044217200 Safety in Manufacturing (C or better) (concurrent enrollment allowed).	1.00
1044213000	Introduction to Machine Operations Introduces students to basic machine operations. The students will also work with basic machine tools used in manufacturing and maintenance to develop skills using the lathe, drill press, band saw, and grinders. Prerequisite: 1044217200 Safety in Manufacturing (C or better).	2.00
1044215000	Gas Metal Arc Welding on Stainless Steel Builds on skills developed in Gas Metal Arc Welding on stainless steel. Learners use the "mig" process in the flat, horizontal and vertical positions on steel, stainless steel and aluminum. Required welds include fillet and groove welds with spray and pulsed spray transfer. Prerequisite: 1044217200 Safety in Manufacturing (C or better).	1.00
1044215300	GMAW on Aluminum Develop skills in gas metal arc pulse welding on aluminum. Learners use the "mig" process in flat, horizontal, and vertical positions on aluminum. Required welds include fillet and groove welds with pulsed spray transfer. Weld quality is assessed per AWS standards. Prerequisite: 1044217200 Safety in Manufacturing (C or better).	1.00
1044216700	Intro to Fabrication Expands on skills developed in Weld Print Reading. Learners study groove and projection welding symbols, geometric tolerances, and international prints. Learners apply concepts through individual and group fabrication activities. Prerequisite: 1044217200 Safety in Manufacturing (C or better).	1.00
1044216900	Flux Core Arc Welding on Carbon Steel Develops skill in flux cored arc welding. Learners make fillet and groove welds in all positions on steel. Weld quality is assessed per AWS D1.1 - Structural Steel Code. Required work also includes basic welds with the SAW process and backgouging with the air arc process. Prerequisite: 1044217200 Safety in Manufacturing (C or better).	3.00

Course #	Course Title	Credits
3144215600	Welding Metallurgy Designed to educate students on metallurgy fundamentals. Explores the production of both ferrous and nonferrous metals. Students will experience rockwell testing procedures, heat-treating applications, determining stresses or strengths, and many other procedures to determine material properties. Corequisite: 1044217200 Safety in Manufacturing.	1.00
3189010400	Professional Skills for Success This course provides the opportunity to develop the knowledge, skills, and understanding of what it takes to become a professional employee. This course will focus on the development the interpersonal skills of emotional intelligence, communication, teamwork, negotiation, conflict resolution, problem solving, and decision making in a professional setting.	1.00
3189010700	Ethics for the Workplace This course offers the opportunity to develop your ability to recognize and make ethical decisions in the workplace. The focus will be on the recognition and development of values. Expansion of ethical values will focus on demonstrating respect through dignity, diversity, and equality while enhancing guiding actions with the principles of confidentiality, honesty, and transparency in business and in conduct towards others.	1.00

Total Credits: 30.00

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

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

Spring 2026 Start Dates

January 12 - 16-Week Spring Term Start

March 9 - Additional 8-Week Term Start for Select Courses

[VIEW FULL ACADEMIC CALENDAR](#)

What is Competency-Based Education?

Competency-Based Education (CBE) is learning at your own pace by mastering competencies through demonstration. Once all competencies for a program have been assessed and mastered, students will earn a certificate, diploma, or degree.

[LEARN MORE ABOUT CBE](#)

Program Tuition*

\$7,855

Books & Supplies*

\$987

*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](#)

Student Equipment

Students are required to purchase welding kits through the college bookstore or obtain the minimum tools and equipment listed to be able to successfully complete coursework and performance assessments in the welding lab.

- Safety glasses
- Welders gloves MIG and TIG
- Chipping hammer
- Welding beanie
- 8-way welder pliers
- Soapstone holder
- Triple flint spark lighter
- Tape measure
- Weld fillet gauge
- Mag tool
- Material handling gloves
- Backhand pad
- Tool bag
- Welder pencils
- Auto darkening helmet
- Lens cover
- Welding jacket

What You'll Learn

- Demonstrate industry-recognized safety practices
- Interpret welding drawings
- Produce gas metal arc welds (GMAW)
- Produce shielded metal arc welds (SMAW)
- Produce flux core arc welds (FCAW)
- Produce gas tungsten arc welds (GTAW)
- Perform cutting operations

Your Potential Careers

- Production Welder
- Maintenance Welder
- Job Shop Layout Welder
- Welding Sales and Service
- Self-employment

Median Annual Salary

\$41,739	\$46,044	\$43,508
Local	State	National

EMSI 2022.1

Get Started

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

[APPLY NOW](#)