

WELDING

Technical Diploma Program Code: 31-442-1 Total Credits: 28-30

The Welding program at Mid-State prepares graduates for a wide variety of welding jobs in production, maintenance, construction, manufacturing, and servicing industries. You will receive hands-on instruction and practice in a number of welding processes, including shielded metal arc, gas tungsten arc, gas metal arc, submerged arc, oxyacetylene cutting, plasma arc, and arc-air cutting. You will also become familiar with various types of metals, fabrication of metals, and welding under industry codes. Successful completion of this program prepares you to take welding certification tests.

Mid-State's Welding program courses prepare students for numerous state and national certifications. None is required to complete the program; there are additional costs for testing/certification. The College does not guarantee its curriculum matches the requirements for preparation, examinations, or licensure for other states.

To learn more about this program, visit mstc.edu/programs.

ACADEMIC ADVISOR

To schedule an appointment with an academic advisor, call 715-422-5300. Academic advisors will travel to other campuses as necessary to accommodate student needs. For more information about advising, visit mstc.edu/advising.

NEW STUDENT CHECKLIST

Complete the following steps to prepare for your New Student Advising appointment with your academic advisor:

- Submit a Mid-State application at mstc.edu/apply.
- Send official transcripts to:
Mid-State Technical College
Student Services
500 32nd Street North
Wisconsin Rapids, WI 54494
- Complete the Free Application for Federal Student Aid (FAFSA) at fafsa.gov. Mid-State's Financial Aid team is available to assist with your FAFSA application and to answer your financial aid questions. Contact Financial Aid or schedule an appointment at mstc.edu/financial-aid.
- Set up student MyCampus account at mstc.edu/mycampus-assistance.
- Schedule a New Student Advising appointment at mstc.edu/advising.

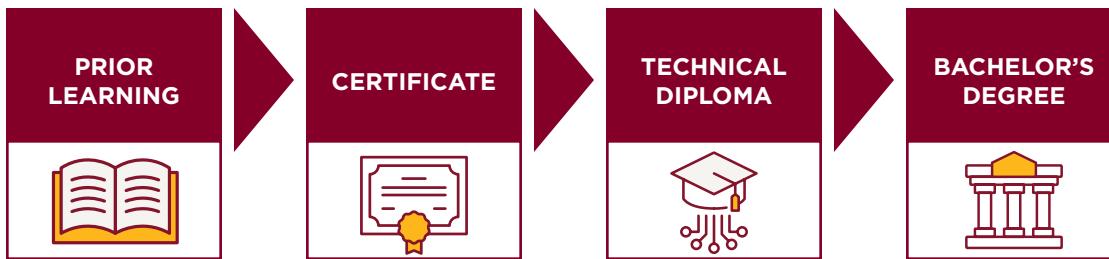
mstc.edu • 888-575-6782 • TTY: 711



Adams Campus • Marshfield Campus • Stevens Point Downtown Campus • Wisconsin Rapids Campus • Virtual Campus • AMETA® Center

Mid-State does not discriminate on the basis of race, color, national origin, sex, disability, or age in its program, activity, or employment. The following person has been designated to handle inquiries regarding the nondiscrimination policies: Vice President – Human Resources; 500 32nd Street North, Wisconsin Rapids, WI 54494; 715-422-5325 • AAEO@mstc.edu. 3/2026-AC

CAREER PATHWAY



Career pathways help you build your education step by step. Each stage offers one or more credentials that are recognized by employers and lead to real jobs—and you can keep building toward your career goals as you go.

Begin at any point.

Prior Learning

Credit for Prior Learning

- Certifications and Licenses
- Military Experience
- National/Standardized Exams
- Transfer Credit
- Work and Life Experience

Learn about Credit for Prior Learning at mstc.edu/cpl.

High School Credit

- High School Dual Credit
- Mid-State Fast Track

Learn about High School Credit at mstc.edu/dc.

Certificate

- Gas Metal Arc Welding (5 Credits)

Technical Diploma

- Welding (28-30 Credits)
Start Your Career: Fabricator Maintenance Welder, Production Line Welder, Welder

Bachelor's Degree

For those interested in continuing their education, Mid-State offers transfer guides with various four-year colleges and universities. For more information, visit mstc.edu/transfer.

Other Options

Related Programs: Advanced Manufacturing Technology, Industrial Mechanical Technician, Manufacturing Operations Management, Metal Fabrication, Precision Machining Technician, Stainless Steel Welding

Apprenticeship Opportunity: Ironworker

OUTCOMES

Employers will expect you, as a Welding graduate, to be able to:

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

TECHNICAL SKILLS ATTAINMENT

The Wisconsin Technical College System (WTCS) has implemented a requirement that all technical colleges measure outcomes attained by students. This requirement is called Technical Skills Attainment (TSA). The main objective of TSA is to ensure graduates have the technical skills needed by employers. Faculty will let students know when and how the TSA is being assessed in the program.

PROTECTIVE CLOTHING

Students are required to provide their own protective clothing and equipment including welding gloves, jacket, and helmet. Details of the requirements and where they may be purchased are provided by the program instructor at the beginning of each semester.

STUDENT HANDBOOK

Visit mstc.edu/studenthandbook to view Mid-State's student handbook, which contains information about admissions, enrollment, appeals processes, services for people with disabilities, financial aid, graduation, privacy, Mid-State's Student Code of Conduct, and technology.

GRADUATION REQUIREMENT

The GPS for Student Success course is required for all Mid-State program students and is recommended to be completed before obtaining 12 credits. Some students are exempt from this requirement. Please see your academic advisor for more information.

ADDITIONAL COURSES AS NEEDED

The following courses may be recommended or required if the student does not achieve minimum placement scores.

College Reading and Writing 1

10831104

3 credits

Provides learners with opportunities to develop and expand reading and writing skills to prepare for college-level academic work. Students will employ critical reading strategies to improve comprehension, analysis, and retention of texts. Students will apply the writing process to produce well-developed, coherent, and unified written work.

Pre-Algebra

10834109

3 credits

Provides an introduction to algebra. Includes operations on real numbers, solving linear equations, percent and proportion, and an introduction to polynomials and statistics. Prepares students for elementary algebra and subsequent algebra-related courses.

MULTIPLE MEASURES

Students can place into courses using high school GPA and completed classes. Placement can be determined in the following ways:

- **Multiple Measures Writing (MMW)**
High school GPA of 2.6 & successful completion of 2.0 credits of high school writing courses with a "C" or better
- **Multiple Measures Reading (MMR)**
High school GPA of 2.6 & successful completion of 2.0 credits of high school literature courses with a "C" or better
- **Multiple Measures Math 1 (MMM_1)**
High school GPA of 2.6 & successful completion of 1.0 credit of high school math (Algebra 1 or equivalent) with a "C" or better
- **Multiple Measures Math 2 (MMM_2)**
High school GPA of 2.6 & successful completion of 2.0 credits of high school math including Algebra 1 and Algebra 2 with a "C" or better
- **Multiple Measures Science 1 (MMS_1)**
High school GPA of 2.6 & successful completion of 1.0 credit of high school lab science course with a "C" or better
- **Multiple Measures Science 2 (MMS_2)**
High school GPA of 2.6 & successful completion of 1.0 credit of high school chemistry with a "C" or better

Past high school and college transcripts are used in making course placement decisions.

SAMPLE FULL-TIME CURRICULUM OPTION

Welding • 28-30 Total Credits

Term 14-16 Credits	Course Number	Course Name	CPL	Credits
	10457119	Fabrication Fundamentals 1	No	1
	31442311	Weld Testing for GMAW & FCAW	No	1
	31442315	Inspections and Testing in Welding	No	1
	31442317	Print Reading for Welding	No	1
	31442320	Welding Foundations 1	Yes	1
	31442323	GMAW: Introduction	No	2
	31442324	GMAW: Stainless & Aluminum	No	2
	31442325	FCAW: Introduction	No	2
	31442413 or 10804107	Technical Math for Welding and Fabrication or College Mathematics	No or Yes	1 or 3
	31462318	Safety for Industrial Trades	Yes	1
	10890102	GPS for Student Success	Yes	1

Term 14 Credits	Course Number	Course Name	CPL	Credits
	10442102 or 30442105	Intermediate GTAW (TIG) or Intermediate TIG (Stainless)	No	2
	10442103 or 30442106 or 10442115	Advanced GTAW (TIG) or Advanced TIG (Stainless) or Welding Fabrication Techniques	No	2
	10457120	Fabrication Fundamentals 2	No	1
	31442314 or 30442104	Gas Tungsten Arc Welding: Intro or Basic TIG (Stainless)	No	2
	31442316	Metallurgy for Welding	No	1
	31442319	Shielded Metal Arc Welding: Introduction	No	2
	31442321	Welding Foundations 2	No	1
	31442322	Robotic Welding	No	2
	31442412	Weld Testing for SMAW & GTAW	No	1

Please Note

- Credit for Prior Learning (CPL) options are available for some courses. You can visit mstc.edu/cpl or contact your academic advisor for details.
- This curriculum sequence is only for student planning. Actual student schedules will vary depending on course availability.
- Program completion time may vary based on student scheduling and course availability. For details, go to mstc.edu/schedule.
- Get the latest updates online at mstc.edu.

SAMPLE PART-TIME CURRICULUM OPTION**Welding • 28-30 Total Credits**

Term 8 Credits	Course Number	Course Name	CPL	Credits
	10457119	Fabrication Fundamentals 1	No	1
	31442320	Welding Foundations 1	Yes	1
	31442323	GMAW: Introduction	No	2
	31442324	GMAW: Stainless & Aluminum	No	2
	31462318	Safety for Industrial Trades	Yes	1
10890102	GPS for Student Success	Yes	1	
Term 7 Credits	Course Number	Course Name	CPL	Credits
	10442102 or 30442105	Intermediate GTAW (TIG) or Intermediate TIG (Stainless)	No	2
	10457120	Fabrication Fundamentals 2	No	1
	31442314 or 30442104	Gas Tungsten Arc Welding: Intro or Basic TIG (Stainless)	No	2
	31442316	Metallurgy for Welding	No	1
31442321	Welding Foundations 2	No	1	
Term 6-8 Credits	Course Number	Course Name	CPL	Credits
	31442311	Weld Testing for GMAW & FCAW	No	1
	31442315	Inspections and Testing in Welding	No	1
	31442317	Print Reading for Welding	No	1
	31442325	FCAW: Introduction	No	2
31442413 or 10804107	Technical Math for Welding and Fabrication or College Mathematics	No or Yes	1 or 3	
Term 7 Credits	Course Number	Course Name	CPL	Credits
	10442103 or 30442106 or 10442115	Advanced GTAW (TIG) or Advanced TIG (Stainless) or Welding Fabrication Techniques	No	2
	31442319	Shielded Metal Arc Welding: Introduction	No	2
	31442322	Robotic Welding	No	2
31442412	Weld Testing for SMAW & GTAW	No	1	

Advanced GTAW (TIG)

10442103

2 credits

Students learn complete penetration stainless steel pipe welds in the 5G and 6G positions.

Corequisite: Intermediate GTAW (TIG) 10442102

Advanced TIG (Stainless)

30442106

2 credits

Students learn advanced GTAW processes through the completion of stainless steel pipe weldments in the 5G and 6G positions.

Corequisite: Intermediate TIG (Stainless) 30442105

Basic TIG (Stainless)

30442104

2 credits

An introduction to the gas tungsten arc welding (GTAW) process commonly known as TIG. Topics include study and application of necessary safety and care of equipment and supplies. The student develops skills with the common production welding joints and materials all completed on stainless steel.

College Mathematics

10804107

3 credits

This course is designed to review and develop fundamental concepts of mathematics in the areas of algebra, geometry, trigonometry, measurement and data. Algebra topics emphasize simplifying algebraic expressions, solving linear equations and inequalities with one variable, solving proportions and percent applications. Geometry and trigonometry topics include; finding areas and volumes of geometric figures, applying similar and congruent triangles, applying Pythagorean Theorem, and solving right triangles using trigonometric ratios. Measurement topics emphasize the application of measurement concepts and conversion techniques within and between U.S. customary and metric system to solve problems. Data topics emphasize data organization and summarization skills, including: frequency distributions, central tendency, relative position and measures of dispersion. Special emphasis is placed on problem solving, critical thinking and logical reasoning, making connections, and using calculators.

Prerequisite: High School GPA of 2.6 and MMM_1 or Accuplacer Arithmetic of 250 and QAS 234 or ACT Math score of 17 or Pre-Algebra 10834109 with a "C" or better

Fabrication Fundamentals 1

10457119

1 credit

An introduction to structural shapes and sheet metal fabrication. Presents fabrication techniques, metal selection, and layout, cutting, bending, drilling, threading, and joining using manual equipment and techniques. Information is presented to the student and followed up with lab activities to provide a hands-on experience. Emphasizes developing an understanding of the tools, techniques, safe work habits, and application of sheet metal fabrication skills.

Fabrication Fundamentals 2

10457120

1 credit

An introduction to plate steel and heavy fabrication. Presents fabrication techniques using heavy fabrication equipment. CNC Cutting, Plate and Tube bending, Sawing and Shearing equipment will be presented and followed up with lab activities to provide a hands-on experience. Emphasizes developing an understanding of the equipment, techniques, safe work habits, and application of heavy metal fabrication skills.

FCAW: Introduction

31442325

2 credits

In this course, learners will develop skills in the flux core arc welding (FCAW) process by creating weldments across various welding positions. They will gain a thorough understanding of electrode types, flux compositions, and shielding gases suitable for different materials. Additionally, learners will practice reading weld symbols and interpreting written welding procedures, enhancing their technical comprehension and hands-on abilities in FCAW techniques. This course prepares students with foundational knowledge and skills for effectively working with flux core welding in real-world applications.

Corequisite: GMAW: Stainless & Aluminum 31442324

Gas Tungsten Arc Welding: Introduction

31442314

2 credits

An introduction to the gas tungsten arc welding (GTAW) process commonly known as TIG, including the necessary safety and care of equipment and supplies. The student develops skills with the common production welding joints and materials.

Corequisite: Welding Foundations 2 31442321

GMAW: Introduction

31442323

2 credits

Learners will focus on the gas metal arc welding (GMAW) process to create weldments on mild steel sheet metals and plates. They will work in various welding positions, applying axial spray, pulse spray, and short circuit transfer modes. Emphasis will be placed on interpreting written welding procedures and understanding weld symbols, ensuring learners develop a foundational grasp of essential welding techniques and standards used in the industry.

Corequisite: Welding Foundations 1 31442320

GMAW: Stainless & Aluminum

31442324

2 credits

In this advanced gas metal arc welding (GMAW) course, learners will concentrate on welding stainless steel and aluminum sheet metals and plates, using specialized techniques. They will learn to differentiate and select appropriate electrodes and shielding gases for different base metals, as well as accurately adjust parameters for optimal results. The course emphasizes mastery of axial spray, pulse spray, and short circuit transfer modes, tailored to the specific properties of stainless steel and aluminum. Through hands-on practice, learners will deepen their understanding of advanced GMAW processes and their applications in diverse welding scenarios.

Corequisite: GMAW: Introduction 31442323

GPS for Student Success

10890102

1 credit

Integrate necessary skills for student success by developing an academic plan, identifying interpersonal attributes for success, adopting efficient and effective learning strategies, and utilizing Mid-State resources, policies, and processes. This course is recommended to be completed prior to obtaining 12 credits and is a graduation requirement unless you receive an exemption from your program advisor.

Inspections and Testing in Welding

31442315

1 credit

Learners will administer various tests to measure weld quality and conformance to welding codes. In addition to administering etch, bend and break tests on welds, students will implement visual inspection, dye penetrant testing and magnetic particle testing.

Intermediate GTAW (TIG)

10442102

2 credits

In this course students weld in the horizontal and vertical positions on stainless steel and aluminum. Pulsed current is applied to stainless steel weldments. Complete penetration groove welds in stainless steel are practiced and evaluated.

Corequisite: Gas Tungsten Arc Welding: Introduction 31442314

Intermediate TIG (Stainless)

30442105

2 credits

Intermediate GTAW weldments created in the horizontal and vertical positions on stainless steel. Pulsed current is applied to stainless steel weldments. Complete penetration groove welds in stainless steel are practiced and evaluated.

Corequisite: Basic TIG (Stainless) 30442104

Metallurgy for Welding

31442316

1 credit

Investigates the effects of welding on the mechanical properties of metals. Learners explore hardness, strength, and weldability of various metals. Concepts are applied in various activities including heat treating, hardness testing, and tensile testing.

Print Reading for Welding

31442317

1 credit

Learners will view, interpret, and create multi-view orthographic projection drawings, print symbols and dimensioning standards.

Robotic Welding

31442322

2 credits

An introduction into the operation, set-up and uses for robots in the welding industry. Students will learn simple teach pendant techniques, perform CNC basics for making programs and utilizing welding knowledge for proper set-up of the robots, students will perform multiple functions to produce quality weldments performed by the robot.

Safety for Industrial Trades

31462318

1 credit

This course introduces basic concepts of safety, health, and environmental issues. Hazards and harm reduction protocols are covered, and completion of Occupational Safety and Health Administration (OSHA) 10-hour general industry certification is included in the course.

Shielded Metal Arc Welding: Introduction

31442319

2 credits

Begins to build the knowledge and skills of the SMAW process commonly known as stick welding. Students are able to weld in several positions, read some basic weld symbols, and have a basic understanding of written welding procedures.

Corequisite: Welding Foundations 2 31442321

Technical Math for Welding and Fabrication

31442413

1 credit

In this course, students will gain essential math skills tailored for welding and fabrication applications, enhancing their accuracy and efficiency in real-world settings. Students will develop proficiency in working with whole numbers, fractions, and decimals, and will perform conversions and calculations in both the imperial and metric systems. They will learn to use common welding measurement tools and calculate important dimensions such as perimeter, circumference, area, and volume for standard shapes like triangles, squares, and circles. Additionally, students will perform calculations for project estimation, design, production analysis, and metal forming processes.

Welding Fabrication Techniques

10442115

2 credits

Students fabricate parts from prints and weld assemblies with a specified welding process. Cutting and forming may be required prior to assembly. Depending on the size and complexity of the project, students may be asked to work in a team to complete an assignment.

Prerequisite: GMAW: Introduction 31442323; Corequisites: Metal Fabrication for Pipe 31457401, Metal Fabrication for Plate 31457402

Weld Testing for GMAW & FCAW

31442311

1 credit

Learners will execute weldments, in multiple positions, leading to bend tests for the GMAW and FCAW processes. Weldments will be certified and conducted to AWS (American Welding Society) standards, meeting requirements for Wisconsin Department of Safety and Professional Services certification. Upon successful completion of bend tests, learners will choose one process to submit for certification.

Prerequisite: GMAW: Introduction 31442323, FCAW: Introduction 31442325

Weld Testing for SMAW & GTAW

31442312

1 credit

Learners will execute weldments, in multiple positions, leading to bend tests for the SMAW and GTAW processes. Weldments will be certified and conducted to AWS (American Welding Society) standards, meeting requirements for Wisconsin Department of Safety and Professional Services certification. Upon successful completion of bend tests, learners will choose one process to submit for certification.

Prerequisite: Gas Tungsten Arc Welding: Introduction 31442314, Shielded Metal Arc Welding: Introduction 31442319

Welding Foundations 1

31442320

1 credit

An introduction to fundamental welding techniques with an emphasis on safe work habits that covers the processes of FCAW, GMAW, and OXY-Fuel cutting. Classroom instruction paired with lab activities are designed to provide fundamental skills in each of the welding processes covered in the class.

Welding Foundations 2

31442321

1 credit

An introduction to fundamental welding techniques with an emphasis on safe work habits that covers the processes of GTAW, SMAW and Plasma cutting. Classroom instruction paired with lab activities are designed to provide fundamental skills in each of the welding processes covered in the class.