

## ABOUT THE PROGRAM

Develop the skills you need to pursue a great career in metal fabrication and welding. In this program, the learner will discover the wonderful world of welding and fabrication through the use of the three major electrical welding processes: Shielded Metal Arc Welding (SMAW), Gas Metal Arc Welding (GMAW), and Gas Tungsten Arc Welding (GTAW). Learners will weld in all positions preparing you for a career in many fields of work, including manufacturing, shipbuilding, custom fabrication and pipe welding. Learners will perfect their welding technique on mild steel, stainless steel and aluminum with a thickness range of 16 gauge up to one inch thick. Learners will perfect their weld quality techniques by using visual inspection and destructive testing. Throughout this program, the learner will apply math and print reading to today's industry standards. In this technical diploma, learners will set up, program, and use metal cutting and forming equipment to produce steel fabrication to industry specifications. Learners will be introduced to Lean manufacturing by applying their welding and fabrication skills in an automated fabrication cell to include robotic welding.

## PROGRAM OUTCOMES

- Demonstrate industry recognized safety practices.
- Form materials to detailed drawings.
- Cut materials to detailed drawings.
- Join materials to detailed drawings.
- Layout components/assemblies.
- Inspect product.

## CAREER AND EDUCATION ADVANCEMENT OPPORTUNITIES

LTC credits transfer to over 30 universities. For more information visit [gotoltc.edu/future-students/transfer](http://gotoltc.edu/future-students/transfer).

## ADMISSIONS AND FIRST SEMESTER ENROLLMENT STEPS

- Submit online application.
- Complete the online Student Success Questionnaire.
- Schedule your First Time Program Counseling/Registration Session with your assigned program counselor to plan your first semester schedule, review your entire plan of study and discuss the results of the Student Success Questionnaire.

*\*Submit transcripts and test scores (optional, highly recommended): College transcripts, along with high school transcripts and test scores from within the last five years, used for course registration. Official transcripts needed for transferring college credit(s) and for financial aid purposes.*

## FUTURE SEMESTER ENROLLMENT STEPS

- Complete online Student Success Tutorial prior to registering for second semester.

## APPROXIMATE COSTS

- \$143.45 per credit tuition (WI resident) plus \$8.61 per credit student activity fee. Material fee varies depending on course. Other fees vary by program. Visit [gotoltc.edu/financial-aid/tuition-and-fees](http://gotoltc.edu/financial-aid/tuition-and-fees) for details.

## FINANCIAL AID

This program is eligible for financial aid. Visit [gotoltc.edu/Financial-Aid](http://gotoltc.edu/Financial-Aid) or talk with your Admissions Advisor about how to apply for aid.

## SPECIAL NOTE

Welding program course content prepares students for numerous state and national certifications. None are 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.

## CONTACT

LTC Admissions Advisor  
 920.693.1162 • [Admissions@gotoltc.edu](mailto:Admissions@gotoltc.edu)

Catalog No.	Class Title	Credit(s)
<b>Term 1</b>		
10442100	Safety and Welding Fundamentals	1
31442308	Weld Examination	1
31442350	Metal Manufacturing Processes	1
31442351	Precision Measurement and Layout	1
31442310	SMAW-Flat Position (Stick)	1
31442312	SMAW-Horizontal Position (Stick)	1
31442314	SMAW-Vertical Position (Stick)	1
31442316	SMAW-Overhead Position (Stick)	1
31442320	GMAW-Flat Position (Wire/Mig)	1
31442322	GMAW-Horizontal Position (Wire/Mig)	1
31442324	Flux Core Arc-Flat/Horizontal Position	1
31442326	Flux Core Arc-Vertical/Overhead Position	1
31442304	Welding Submerged Arc (SAW)	1
31442330	GTAW Mild Steel Flat/Horizontal Position	1
31442332	GTAW Mild Steel Out of Position (Heli-Arc/TIG)	1
31442334	GTAW Stainless/Aluminum Horizontal Positions	1
31442336	GTAW Stainless/Aluminum Out of Position	1
31442318	Pipe Welding Fundamentals	1
31442382	Welding Math Basics	1
31442385	Weld Print 1 Print Fundamentals	1
31442340	Welding Advance Process 1	1
31442342	Welding Advance Process 2	1
31442357	Welding Fabrication Introduction	2
31442343	Weld Print 2 Weld/Welding Symbols	1
31801361	Interpersonal Skills	1
31801360	Workplace Fundamentals	1

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## Term 2

31442301	Advanced Pipe Welding 1	1
31442303	Advanced Pipe Welding 2	1
31442305	Advanced Pipe Welding 3	1
31442325	Advanced Pipe Welding Processes	1
31442307	Welding Measurement 2	1
31420336	Drills	1
31420350	Mill-Squaring	1
31420340	Lathes Facing and Turning	1
31442309	Weld Print 3 for Fabricators	1
31442337	Weld Inspection and Processes	1
31442339	Metal Finishing	1
10620167	Robotics-Teach Pendant/Controls	1
10620179	Robotics-Editing Programs	1
31442327	Robotic Welding 1	1
31442329	Robotic Welding 2	1
31457331	Fabrication 1	2
31457333	Fabrication 2	2
31457343	Fabrication 3	2
31457335	Fabrication Design and Application	2
31449301	Industrial Safety	1
31442384	Welding Geometry and Formulas	1
10606113	SolidWorks 1 - Modeling Fundamentals	2

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**TOTAL 54**

*Curriculum and Program Acceptance requirements are subject to change. Program start dates vary; check with your advisor for details. The tuition and fees are approximate based on 2022-2023 rates and are subject to change prior to the start of the academic year.*

Please see *Industrial Welding for Term 1 course descriptions.*

**ADVANCED PIPE WELDING 1**...will have learners producing quality pipe welds in the flat and horizontal positions. Pipe to Pipe and Socket welds will be made by using Gas Metal Arc Welding, Shielded Metal Arc Welding and the Gas Tungsten Arc Welding processes. Learners will use WPS's (welding procedure specifications sheet) of pipe welding for mild steel in accordance with various welding codes. COREQUISITES: 31442326 Flux Core Arc-Vertical/Overhead Position, 31442316 SMAW-Overhead Position (Stick), and 31442336 GTAW Stainless/Aluminum Out of Position

**ADVANCED PIPE WELDING 2**...will have learners weld pipe to pipe and socket welds in the 4F, 5F, and 5G positions. Pipe to Pipe and Socket welds will be made by using the Flux Core Arc Welding, Shield Metal Arc Welding and the Gas Tungsten Arc Welding processes. Learners will use WPS's (welding procedure specifications sheet) of pipe welding for mild steel in accordance with various welding codes. COREQUISITE: 31442301 Advanced Pipe Welding 1

**ADVANCED PIPE WELDING 3**...will teach learners to weld pipe to pipe and socket welds in the 6F and 6G positions. Pipe to Pipe and Socket welds will be made by using the Flux Core Arc Welding, Shield Metal Arc Welding and the Gas Tungsten Arc Welding processes. Learners will use WPS's (welding procedure specifications sheet) of pipe welding for mild steel in accordance with various welding codes. COREQUISITE: 31442303 Advanced Pipe Welding 2

**ADVANCED PIPE WELDING PROCESSES**...instructs the learner to weld a piping spool project. They will layout, cut, grind, bevel, fit and pressure test. The spool project will be welded using the GTAW, SMAW, GMAW and the FCAW processes. The learner will have the opportunity to test for the state certification in the 6G pipe position. The learner will choose either the SMAW or the GMAW/FCAW welding processes. All welding will be completed using welding practices and will be in accordance with the AWS and ANSI steel code. COREQUISITE: 31442305 Adv Pipe Welding 3

**DRILLS**...prepares the learner to interpret the attributes of hole-producing tools, follow drilling machine tool safety rules, identify drilling machine tool components, and operate sensitive drilling machine tools. COREQUISITE: 31420310 Shop Tools and Fasteners or 31420394 Ind Mtn Machine Tool Intro or 10420194 Machine Tool Introduction or CONDITION: 324571 Welding Fab Tech program requirements met

**FABRICATION 1**...teaches the basics of metal fabrication safety, production, measuring, hand tools, and layout. Learn how to use shears, forming, press brakes, box and pan brakes, and slip rollers. Learners will demonstrate proficiency in metal fabrication through related projects. COREQUISITE: 31442307 Welding Measurement 2 and 31442309 Weld Print 3 for Fabricators

**FABRICATION 2**...teaches the advanced process of forming product using automated and manual equipment. Demonstrate proficiency of forming by choice of tooling, calculations and sequence of forming. COREQUISITES: 10606101 AutoCAD-2D Computer Aided Design and 31457331 Fabrication 1 or PREREQUISITE: 31442331 Fabrication 1

**FABRICATION 3**...teaches the advanced processes of material processing using automated and manual equipment. Demonstrate proficiency of CNC programming for automated Laser cutting processes. Demonstrate proficiency in laser cutting by proper set-up and shutdown, cutting conditions, program processing and gas selection based on material. COREQUISITE: 31457333 Fabrication 2

**FABRICATION DESIGN AND APPLICATION**...will have learners set-up, program, operate, weld, assemble, inspect, and finish/coat to complete metal fabrication projects and provide shop routings to demonstrate comprehension of process control in a manufacturing facility. Maintain safety in the shop for all operations with hand tools and machinery. COREQUISITE: 31457343 Fabrication

**INDUSTRIAL SAFETY**...utilizes advanced, lab-based, hands-on, and table-top interaction. Competencies focus on recognizing and promoting safe work programs. It is 'deep dive' training on; OSHA, forklift, personal protective equipment, hazards communication, hazardous materials, lockout/tagout, fall protection/confined space, emergency planning, fire prevention and suppression, CPR/AED/First-Aid, and electronic technology. You receive an OSHA 10-Hour and American Heart Association certification.

**LATHE FACING AND TURNING**...prepares the learner to perform lathe facing and turning operations safely. COREQUISITE: 31420310 Shop Tools and Fasteners or 31420394 Ind Mtn Machine Tool Introduction or 10420194 Machine Tool Introduction or CONDITION: 324571 Welding Fabrication Technician, 104622 Electro-Mech Maintenance Technician, or 314622 Maintenance Mechanic program requirements met

**METAL FINISHING**...provides learning so that the student will develop and demonstrate skills needed to properly finish weldments. Surface finish is an important element in any specification of steel or alloys regardless of the intended use. Students will demonstrate proficiency in grinding and finishing procedures within given tolerances for surface finish and flatness.

**MILL-SQUARING**...prepares the learner to square a part using a vertical mill machine safely. COREQUISITE: 31420310 Shop Tools and Fasteners or 31420394 Ind Mtn Machine Tool Intro or 10420194 Machine Tool Intro or CONDITION: 324571 Welding Fabrication Technician, 104622 Electro-Mech Maintenance Technician, or 314622 Maintenance Mechanic program requirements met

**ROBOTIC WELDING 1**...prepares the learner to perform basic robotic welding skills on the five major joints used in industry, how to load weld programs for their welding joints, and demonstrate safety practices associated with robotic welding. PREREQUISITE: 31620335 Introduction to Robotics 2 or COREQUISITE: 10620167 Robotics-Teach Pendant/Controls

**ROBOTIC WELDING 2**...builds upon learner's knowledge and skill of the world of robotic welding. In this course, students will learn how to weld around pipe that is 2" in diameter and larger, V-grooves and creating fixtures for different welding joints that will be used during this credit. COREQUISITE: 31442327 Robotic Welding 1 and 10620179 Robotics-Editing Programs

**ROBOTICS-EDITING PROGRAMS**...teaches troubleshooting and repairing issues in a robot program. COREQUISITE: 10620167 Robotics-Teach Pendant/Controls

**ROBOTICS-TEACH PENDANT/CONTROL**...instructs students on using a teach pendant to control a robot. COREQUISITE: 10620179 Robotics-Editing Programs

**SOLIDWORKS 1-MODELING FUNDAMENTALS**...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.

**WELD INSPECTION AND PROCESSES**...will teach welding metallurgy, metal properties and destructive testing/ The learner will demonstrate proper evaluation of weld and base metal discontinuities. The learner will be introduced to VT and other NDE methods. COREQUISITE: 31442307 Welding Measurement 2

**WELD PRINT 3 FOR FABRICATORS**...prepares the learner to recognize and use pipe welding symbols, dual dimensioning, analyze metric units and how they can impact print reading, Inspection and Testing by the use of destructive testing symbols, and non-destructive testing symbols, understanding the International Standards symbols for welding, interpret Geometric Dimensioning and Tolerancing characteristic and symbols. COREQUISITE: 31442343 Weld Print 2 Weld/Welding Symbols

**WELDING GEOMETRY AND FORMULAS**...prepares the learner with the necessary skills to use scientific calculators for the application of solving problems of ratio and proportion, precision, and accuracy in measurements, unit conversions, direct-length measurements, pre-algebra, and simple and complex equations using algebra concepts. The class is designed for individualized student needs. This is credit two of the two-credits needed for the Welding program. COREQUISITE: 31442382 Welding Math Basics or CONDITION: Welding Math 1 Testout or equivalent

**WELDING MEASUREMENT 2**...provides the learner with the skills to: Use precision hand held measuring tools and the use of semi-precision measuring tools, and use of layout and measurement tools to fabricate steel projects. COREQUISITE: 31442351 Precision Measurement and Layout