

## 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. Students 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).

## ADMISSION AND PROGRAM ENROLLMENT STEPS

- Submit online application.
- Submit transcripts (high school & other colleges). NOTE: Official transcripts required for acceptance of transfer credits; Financial Aid may require.
- Complete the online Student Success Questionnaire.
- Schedule a Program Advising Session with your assigned advisor to plan your first semester schedule, review your entire plan of study, discuss the results of the Student Success Questionnaire.

## APPROXIMATE COSTS

- \$136.50 per credit tuition (WI resident) plus \$8.10 per credit student activity fee. \$10 per credit online or hybrid 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 Career Coach 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 Career Coach  
920.693.1162 • [CareerCoach@gotoltc.edu](mailto:CareerCoach@gotoltc.edu)

Catalog No.	Class Title	Credit(s)
<b>Term 1</b>		
31442300	Welding Introduction	1
31442308	Welding Metallurgy	1
31442350	Welding Hand/Power Tools	1
31442351	Welding Measurement 1	1
31442310	Welding Shielded Metal Arc 1 (Stick)	1
31442312	Welding Shielded Metal Arc 2 (Stick)	1
31442314	Welding Shielded Metal Arc 3 (Stick)	1
31442316	Welding Shielded Metal Arc 4 (Stick)	1
31442320	Welding Gas Metal Arc 1 (Wire/Mig)	1
31442322	Welding Gas Metal Arc 2 (Wire/Mig)	1
31442324	Welding Gas Metal Arc 3 (Wire/Mig)	1
31442326	Welding Gas Metal Arc 4 (Wire/Mig)	1
31442304	Welding Submerged Arc (SAW)	1
31442330	Welding Gas Tungsten Arc 1 (Heli-Arc/TIG)	1
31442332	Welding Gas Tungsten Arc 2 (Heli-Arc/TIG)	1
31442334	Welding Gas Tungsten Arc 3 (Heli-Arc/TIG)	1
31442336	Welding Gas Tungsten Arc 4 (Heli-Arc/TIG)	1
31442318	Pipe Welding Fundamentals	1
31442382	Welding Math 1	1
31442385	Welding Print Reading	1
31442340	Welding Advance Process 1	1
31442342	Welding Advance Process 2	1
31442357	Welding Fabrication Introduction	2
10106116	Computer Essentials	1
31801359	Communication Skills for the Workplace	2

**27**

## 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	Welding Print Reading 2	1
31442337	Weld Inspection and Processes	1
31442339	Stainless Steel Polishing and 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	Weld Math 2	1
10606101	Basic Mechanical Drafting	2

**27**

**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 2019-2020 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 Wldg Gas Metal Arc 4, 31442316 Wldg Shielded Metal Arc 4, and 31442336 Wldg Gas Tungsten Arc 4

**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

**BASIC MECHANICAL DRAFTING USING AUTOCAD**...provides the learner with the skills to utilize AutoCAD's drawing editor, viewing commands; apply coordinate entry methods, AutoCAD file commands; utilize draw commands, modify commands; create and edit text, prints & plots; apply geometric construction to solve a drawing problem; utilize selection sets, duplicating modify commands, layers & objects properties, blocks; apply principles of orthographic and multi view projection.

**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 Machine Tool Hand Tools or 31420394 Ind Mtn Machine Tool Intro or 10420194 Machine Tool Introduction

**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. COREQUISITES: 31442307 Welding Measurement 2 and 31442309 Welding Print Reading 2

**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 Basic Mechanical Drafting and 31457331 Fabrication 1 or PREREQUISITE: 31442333 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 3

**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.

**MILL-SQUARING**...prepares the learner to square a part using a vertical mill machine safely.

**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. COREQUISITE: 31620335 Introduction to Robotics 2

**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

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

**ROBOTICS-TEACH PENDANT/CONTROL**...instructs students on using a teach pendant to control a robot. COREQUISITE: 10620169 Robotics-Editing Programs

**STAINLESS STEEL POLISHING AND FINISHING**...provides learning so that the student will develop and demonstrate skills needed to properly finish food grade weldments. Surface finish is an important element in any specification of stainless steel or steel regardless of the intended use. Students will demonstrate proficiency in welding projects using purging and backing techniques. Students will demonstrate proficiency in grinding within given tolerances for surface finish and flatness.

**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. COREQUISITES: 31442307 Welding Measurement 2 and Welding Print Reading 2

**WELDING MATH 2**...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 Weld Math 1 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.

**WELDING PRINT READING 2**...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.