

**Program Number 31-442-1
 Technical Diploma**

ABOUT THE PROGRAM

Evidence of welders' work is all around us—everything from battleships, cars, and piping to the amazing dome on the U.S. Capitol Building. If you like hands-on work, have solid math and reading skills, are dedicated to accuracy, and have an eye for detail, welding is the perfect career for you.

PROGRAM OUTCOMES

- Demonstrate industry-recongnized 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 thermal cutting.

CAREER AND EDUCATION ADVANCEMENT OPPORTUNITIES

LTC credits transfer to over 30 universities. For more information visit gotoltc.edu/future-students/transfer.

ADMISSION TO DO'S

- Work with Career Coach to:
 - Submit application and \$30 fee.
 - Submit official transcripts (high school and other colleges).

PROGRAM TO DO'S

- Work with Academic Advisor to:
 - Complete Functional Abilities Statement of Understanding form.
 - Meet to plan your first semester schedule, review your entire plan of study, and complete Program To Do's.

APPROXIMATE COSTS

- \$136.50 per credit tuition (WI resident) plus \$7.38 per credit student activity fee. \$10 per credit online fee. Material fee varies depending on course. Other fees vary by program. Visit gotoltc.edu/financial-aid/tuition-and-fees for details.

FINANCIAL AID

This program is eligible for financial aid. Visit gotoltc.edu/Financial-Aid or talk with your Career Coach about how to apply for aid.

SPECIAL NOTE

This program is available in a part-time evening and full-time day offering. All classes meet the American Welding Society requirements.

CONTACT

LTC Career Coach
 920.693.1162 • CareerCoach@gotoltc.edu

Catalog No.	Class Title	Credit(s)
Fall 2019 - Quarter 1		
31442300	Welding Introduction	1
31442351	Welding Measurement	1
Fall 2019 - Quarter 2		
31442320	Welding Gas Metal Arc 1 (Wire/Mig)	1
31442310	Welding Shielded Metal Arc 1 (Stick)	1
31442385	Welding Print Reading	1
Spring 2020 - Quarter 3		
31442322	Welding Gas Metal Arc 2 (Wire/Mig)	1
31442312	Welding Shielded Metal Arc 2 (Stick)	1
31442308	Welding Metallurgy	1
31442350	Welding Hand/Power Tools	1
Spring 2020 - Quarter 4		
31442324	Welding Gas Metal Arc 3 (Wire/Mig)	1
31442314	Welding Shielded Metal Arc 3 (Stick)	1
31442382	Welding Math 1	1
Summer 2020		
31442330	Welding Gas Tungsten Arc 1 (Heli-Arc/TIG)	1
10106116	Computer Essentials	1
Fall 2020 - Quarter 1		
31442326	Welding Gas Metal Arc 4 (Wire/Mig)	1
31442316	Welding Shielded Metal Arc 4 (Stick)	1
31801359	Communication Skills for the Workplace	2
Fall 2020 - Quarter 2		
31442304	Welding Submerged Arc (SAW)	1
31442332	Welding Gas Tungsten Arc 2 (Heli-Arc/TIG)	1
<i>continued</i>	Communication Skills for the Workplace	
Spring 2021 - Quarter 3		
31442334	Welding Gas Tungsten Arc 3 (Heli-Arc/TIG)	1
Spring 2021 - Quarter 4		
31442336	Welding Gas Tungsten Arc 4 (Heli-Arc/TIG)	1
31442318	Pipe Welding Fundamentals	1
31442340	Welding Advance Process 1	1
31442342	Welding Advance Process 2	1
Summer 2021		
Fall 2021- Quarter 1		
31442357	Welding Fabrication Introduction	2
		TOTAL 27



COMMUNICATION SKILLS FOR THE WORKPLACE...prepares the student to develop paper job-search tools and job-related writing skills to increase job stability; introduces the students to team-building skills to resolve organizational problems; introduces the student to the skills of effective listening; prepares the student to respond to workplace criticism and praise; and introduces the student to interpersonal relationship skills, including effective interviewing skills, customer relations, and management/employee relations.

COMPUTER ESSENTIALS...covers computer technology and basic computer skills for the student who is just starting classes at LTC. This course will include topics related to uses of computer hardware and software, internet searching, e-mail, MyLTC, online courses, and an introduction to documents and presentations.

PIPE WELDING FUNDAMENTALS...demonstrates safe shop working practices. The learner will weld pipe to plate in the 2F, 5F and 6F positions while using the SMAW, GMAW, FCAW and GTAW welding processes. Students will weld pipe groove welds in the 1G, 2G, 5G and 6G positions while using the SMAW, GMAW, FCAW and GTAW welding processes. COREQUISITES: 31442326 Wldg Gas Metal Arc 4, 31442316 Wldg Shielded Metal Arc 4, and 31442336 Wldg Gas Tungsten Arc 4

WELDING ADVANCE PROCESS 1...is a student selected welding process. Student will begin to use that process to weld in all positions including pipe. Learner will prepare to become a certified welder. COREQUISITE: 31442326 Welding Gas Metal Arc 4 or 31442316 Welding Shielded Metal Arc 4 or 31442336 Welding Gas Tungsten Arc 4

WELDING ADVANCE PROCESS 2...is a student selected welding process. In it the student will learn to use that process to weld in all positions including pipe. The learner will have the opportunity to become a certified welder in the chosen welding process. COREQUISITE: 31442340 Welding Advance Process 1

WELDING FABRICATION INTRODUCTION...introduces the learner to various methods of steel fabrication. The learner will produce steel fabrications from drawings which includes the learner's ability to read and interpret drawings, sketches using appropriate welding symbols, follow written procedures, and cut parts to proper size. The learner will fit simple assemblies, and will pass workmanship tests using GMAW, FCAW and GTAW welding processes. COREQUISITE: 31442385 Welding Print Reading and 31442342 Welding Advance Process 2 or 31442342S3 Welding Advance Process 1B (Stick) or 31442342M3 Welding Advance Process 1B (Mig) or 31442342T3 Welding Advance Process 1B (Heli-Arc/Tig)

WELDING GAS METAL ARC 1...prepares the learner to demonstrate safe shop work practices; learners will perform set up and shut down of GMAW and FCAW equipment; weld mild steel using the GMAW and FCAW welding processes, and weld in all positions using the GMAW process. COREQUISITE: 31442300 Welding Intro or 31442346 Industrial Maint Welding Intro or 31442345 Auto Servicing Welding

WELDING GAS METAL ARC 2...will use safe shop work practices while producing 3/4" fillet welds using the FCAW and MCAW welding processes and 1/4" fillet welds while welding tube to plate in the horizontal position. Learners will produce V-groove weldments in all four positions, using .035 hard wire, .052 Flux Core and Metal electrode wires. COREQUISITE: 31442320 Welding Gas Metal Arc 1

WELDING GAS METAL ARC 3...will have learners demonstrate safe shop working practices while welding fillet welds in all positions using the FCAW and MCAW welding process. Learners will perform single bevel groove welds and V-groove welds in all positions using the multiple GMAW welding process, and will perform groove welds with and without backing material. COREQUISITE: 31442322 Welding Gas Metal Arc 2

WELDING GAS METAL ARC 4...demonstrates safe shop working practices, while welding fillet welds in all positions using the FCAW and MCAW welding process. Students will perform single bevel groove welds and V-groove welds in all positions using the multiple GMAW welding process. Students will weld pipe to plate in the 5 and 6F position using the FCAW welding process. COREQUISITE: 31442324 Welding Gas Metal Arc 3

WELDING GAS TUNGSTEN ARC 1...prepares the learner to demonstrate safe shop work practices, weld mild steel, stainless steel and aluminum in the flat position or horizontal positions using the GTAW process. COREQUISITE: 31442300 Welding Intro or 31442346 Industrial Maint Welding Intro or 31442345 Auto Servicing Welding

WELDING GAS TUNGSTEN ARC 2...prepares the learner to demonstrate safe shop work practices while welding mild steel, stainless steel and aluminum in the horizontal and vertical up positions using the GTAW process. The learner will be introduced to the GTAW Pulse welding process while welding mild steel in the 2F position. COREQUISITE: 31442330 Welding Gas Tungsten Arc 1

WELDING GAS TUNGSTEN ARC 3...demonstrates safe shop work practices while welding square butt joints on mild steel in the 2F, 3F and 4F positions; weld lap joints on mild steel in the 2F, 3F, and 4F positions using the weld tee joints on mild steel in the 2F, 3F, and 4F positions using the GTAWP/GTAW process. The learner will also learn how to minimize oxidation in stainless steel during the welding process, welding thin SST in the 1G & 2G positions and proper food grade post weld cleanup to these joints. COREQUISITE: 31442332 Welding Gas Tungsten Arc 2

WELDING GAS TUNGSTEN ARC 4...prepares the learner to demonstrate safe shop work practices while welding V-grooves in all positions on 1/4" mild steel plate using either the GTAW or GTAWP welding processes. Learners will make 2-piece and 3-piece corner joints in the 1F, 2F and the 3F positions on 11 ga. HRS and 14 ga. SST. Learners will be introduced to a welding technique called "walking the cup" and will make fillet welds in the 1F position on 1/4" mild steel. COREQUISITE: 31442334 Welding Gas Tungsten Arc 3

WELDING HAND/POWER TOOLS...prepares the learner to communicate proper measurement terminology used in industry; will develop safety practices for the work place; proper use of measuring equipment and obtain measurement readings from measuring equipment; layout steel fabrication using hand measuring devices and layout equipment. The learner will inspect a variety of steel fabrications and how to classify industrial fasteners. Learners will have the opportunity to receive up to three NC3/Starrett measuring certifications. COREQUISITE: 31442351 Welding Measurement and 31442300 Welding Intro or 31442346 Industrial Maint Welding Intro or 31442345 Auto Servicing Welding

WELDING INTRO...introduces 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 3 major welding processes: SMAW, GMAW, & GTAW and will build skills welding with each process in the flat, and horizontal positions while using the common welding joints found in industry. Learner will process material by using the two major hand held cutting processes-the Oxyfuel & PAC cutting processes.

WELDING MATH 1...provides the learner with the necessary skills to solve problems involving whole numbers, fractions, and decimal numbers using pad and pencil and calculator. The course is designed for individualized student needs. This is credit one of the twomath credits need for the Welding program.

WELDING MEASUREMENT...prepares the learner to communicate proper measurement terminology used in industry; will develop safety practices for the work place; proper use of measuring equipment and obtain measurement readings from measuring equipment; layout steel fabrication using hand measuring devices and layout equipment. The learner will inspect a variety of steel fabrications and how to classify industrial fasteners. Learners will have the opportunity to receive up to three NC3/Starrett measuring certifications.

WELDING METALLURGY.....prepares learner to interpret properties of ferrous materials, heat treat ferrous metals; and test the hardness of ferrous materials. Learner will interpret weld discontinuities and how heat of the weld affects base metal properties.

WELDING PRINT READING...prepares the learner to apply orthographic projection principles and AWS welding symbols as they relate to welding fabrications. Students will learn the basics of print reading including alphabet lines, tolerances, bill of materials, title blocks, and revision blocks.

WELDING SHIELDED METAL ARC 2...will have the learner demonstrate safe shop work practices; make horizontal padding plate welds on 1/2" mild steel with E7018 electrode; 1/4", 3/8" and 3/4" fillet welds in the horizontal position, 1/4" fillet welds on round and square tubing; open root groove welds with a 3/32" root opening in mild steel in the 1G position; groove welds with 1/4" root opening and 1/4" backup bar on mild steel in the 2G position using E7018 electrode; padding plates and fillet welds in the vertical position. COREQUISITE: 31442310 Welding Shielded Metal Arc 1

WELDING SHIELDED METAL ARC 3...teaches the learner to use safe shop work practices; Students will experience the art of welding in the vertical and overhead position. To better understand the vertical and overhead positions, students will perform padding plate welds on mild steel with E7018 electrode; Perform fillet welds in the vertical and overhead positions; Groove welds will also be performed in the vertical and overhead position. Groove welds will be with and without backing.. COREQUISITE: 31442312 Welding Shielded Metal Arc 2

WELDING SHIELDED METAL ARC 4...prepares the learner to demonstrate safe shop work practices while making multi pass groove welds in the 1G, 3G, and 4G positions using E7018 electrodes. Students will make multi pass fillet welds to pipe to plate in the 2F, 5F and 6F positions, and will be introduced to pipe welding in the 1G position. COREQUISITE: 31442314 Welding Shielded Metal Arc 3

WELDING SHIELDED METAL ARC 1...prepares the learner to demonstrate safe shop work practices; make bead on plate welds on mild steel; make padding plate welds on mild steel; make fillet welds in 3/8" mild steel plate in the flat and horizontal positions; and make groove welds in mild steel plate. COREQUISITE: 31442300 Welding Intro or 31442346 Industrial Maint Welding Intro or 31442345 Auto Servicing Welding

WELDING SUBMERGED ARC (SAW)...is a common arc welding process. It requires a continuously fed consumable electrode. The molten weld and the arc zone are protected from atmospheric contamination by being "submerged" under a blanket of granular fusible flux. The learner will interpret SAW terminology, setup and shut down of SAW equipment, SAW weld safety; and perform SAW welds in the flat position. COREQUISITES: 31442326 Welding Gas Metal Arc 2B and 31442300 Welding Intro or 31442346 Industrial Maint Welding Intro or 31442345 Auto Servicing Welding