

Program Number 31-442-3 Technical Diploma • Two Terms

ABOUT THE PROGRAM

Metal fabrication is a highly valued industrial process that involves manipulating metal from one form into another by the use of forming, cutting, and joining. Metal fabrication is a skill that is self-rewarding and impacts everyone on a daily basis. If you like hands-on work, have an eye for detail, good math skills, are able to follow and develop detailed work procedures, and enjoy problem solving dedicated to accuracy, a career as a fabrication technician may be your key to success offering lifelong opportunities.

PROGRAM OUTCOMES

- Recognize and apply safety practices that are used in manufacturing processes.
- Interpret fabrication prints that include NDT symbols, GD&T, and pipe welding symbols.
- Apply basic math, algebra, geometry, and trigonometry concepts to fabrication projects.
- Set up and operate manual metal-cutting machine tools in a safe and efficient manner.
- Perform part, weldment, or assembly inspection using hand-held precision measuring instruments in accordance with AWS D1.1 Structural Steel Code.
- Perform pipe welding in all positions using the three major electrical processes in accordance with local and national codes.
- Apply knowledge of CAD, CNC programming, and CNC operations to produce steel fabrications.

ADMISSIONS STEPS

- Work with Admissions Specialist to:
 - Submit application and \$30 fee.
 - Complete an assessment for placement (Accuplacer or ACT).
 - Submit official transcripts (high school and other colleges).
- Meet with program advisor/counselor to discuss program details.

APPROXIMATE COSTS

- \$132 per credit (resident)
- \$198 per credit (out-of-state resident)
- Other fees vary by program (books, supplies, materials, tools, uniforms, health-related exams, etc.) Visit gotoltc.edu/financial-aid/tuition-and-fees for details.

PLACEMENT SCORES

Accuplacer/ACT scores will be used to develop your educational plan. Contact your program advisor/counselor for details.

SPECIAL NOTE

Fabrication Technician prerequisites for all classes in the program: applicants must be a graduate of the Welding Industrial program (31-442-1) after 2005 or must meet the following criteria:

- Welding Industrial program graduates prior to 2005 must show prior industrial welding work experience (minimally 2500 hours of welding and/or metal fab), meet with the Weld Instructional Review Panel, and perform a written and hands-on assessment.
- Potential students who have not graduated with an Industrial Welding diploma must show prior industrial welding work experience (minimally 4000 hours of welding and/or metal fab), meet with the Weld Instructional Review Panel, and perform a written and hands-on assessment.

CAREER AND EDUCATION ADVANCEMENT OPPORTUNITIES

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

CONTACT

Chou Yang, Admissions Specialist
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Catalog No.	Class Title	Credit(s)
Term 1		
31442301	Advanced Pipe Welding 1A	1
31442303	Advanced Pipe Welding 1B	1
31442305	Advanced Pipe Welding 1C	1
31442307	Measurement for Fabricators	1
31420337	Drills for Fabricators	1
31420348	Machine Tool 1 Mills for Fabricators	1
31420349	Machine Tool Lathes 1 for Fabricators	1
31442309	Print Reading for Fabricators	1
31442311	Weld Quality 1A	1
31442313	Weld Quality 1B	1
31442315	Weld Quality 2A	1
31442317	Weld Quality 2B	1
31442321	Introduction to CAD Design for Fabricators	1
31442323	CNC Programming for Fabricators	1
		14
Term 2		
31620333	Introduction to Robotics 1A	1
31620335	Introduction to Robotics 1B	1
31442327	Robotics Welding 1A	1
31442329	Robotics Welding 1B	1
31442331	Fabrication 1A	2
31442333	Fabrication 1B	2
31442335	Fabrication Design and Application	2
31449301	OSHA 30	1
31801359	Communication Skills for the Workplace	2
31809362	Psychology for Life	1
		14
		TOTAL 28

Curriculum and Program Acceptance requirements are subject to change. Program start dates vary; check with your advisor/counselor for details.



ADVANCED PIPE WELDING 1A...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.

ADVANCED PIPE WELDING 1B...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: 31442304 Advanced Pipe Welding 1A

ADVANCED PIPE WELDING 1C...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 1B

CNC PROGRAMMING FOR FABRICATORS...prepares the learner to interpret positions in the coordinate systems, prepare a sequence of machining operations, use G/M programming codes, and prepare G/M part programs for machining and cutting operations. COREQUISITE: 31442307 Measurement for Fabricators or PREREQUISITE: 31420330 Machine Tool Measuring or 31420394 Industrial Maintenance Measurement and Drills

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.

DRILLS FOR FABRICATORS...prepares the learner to calculate drill speeds and feed rates to match specific material types, identify attributes of hole-producing cutting tools, follow drilling machine tool safety rules, identify drilling machine tool components, and operate sensitive drilling equipment. COREQUISITE: 31442307 Measurement for Fabricators or PREREQUISITE: 31420330 Machine Tool Measuring or 31420394 Industrial Maintenance Measurement and Drills

FABRICATION 1A...will teach the advanced process of forming product using automated and manual equipment. Demonstrate proficiency of forming by choice of tooling, calculations and sequence of forming. COREQUISITE: 31442317 Weld Quality 2B

FABRICATION 1B...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: 31442331 Fabrication 1A

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 while providing written documentation for machine safety to prove comprehension. COREQUISITE: 31442333 Fabrication 1B

INTRODUCTION TO CAD DESIGN FOR FABRICATORS...provides the learner with the skills to use AutoCAD's drawing editor, viewing commands; apply coordinate entry methods, AutoCAD file commands; utilize draw commands, modify commands; create and edit text, prints & plots; utilize selection sets, duplicating modify commands, layers & objects properties, blocks; apply principles of orthographic and multi-projection. COREQUISITE: 31442309 Print Reading for Fabricators

INTRODUCTION TO ROBOTICS 1A...prepares the learner to identify the component parts of a robot; describe teach pendant and robot functions; power up the robot control in proper sequence; jog in Joint and Cartesian movement; establish robot axis soft limits; identify axis movements; navigate the teach pendant to set up the robot for desired movement; demonstrate working knowledge of arm speed and inching control.

INTRODUCTION TO ROBOTICS 1B...prepares the learner to define the Frames of reference used by the coordinate system; create multiple Tool Frames; create a program file; write a functional motion instruction; edit an existing program; demonstrate the use of a wait statement; demonstrate the use of a Call statement; demonstrate the use of an Output statement; and upload and download program memory files. COREQUISITE: 31620335 Introduction to Robotics 1A

MACHINE TOOL LATHES 1 FOR FABRICATORS...prepares the learner to follow engine lathe safety rules, identify engine lathe components, and operate engine lathe machine tools, perform facing and center drilling operations, perform turning operations between centers, and perform hole-producing operations. COREQUISITE: 31442307 Measurement for Fabricators or PREREQUISITE: 31420330 Machine Tool Measuring or 31420394 Industrial Maintenance Measurement and Drills

MACHINE TOOL MILLS 1 FOR FABRICATORS...provides the learner with the skills to: Apply safety rules, identify machine components, select cutting tools, set up the milling machine for work, mill square surfaces, mill precision steps and slots, and mill keyways on shafts. COREQUISITE: 31442307 Measurement for Fabricators or PREREQUISITE: 31420330 Machine Tool Measuring or 31420394 Industrial Maintenance Measurement and Drills

MEASUREMENT FOR FABRICATORS...provides the learner with the skills to: Use precision hand held measuring tools and the use semi-precision measuring tools, use of layout and measurement tools to fabricate steel projects.

OSHA 30...gives a basic overview of OSHA's role in prevention and elimination of work-related illnesses and injuries. It includes information about employer and employee rights and responsibilities, and a brief look at safety on the job site in relation to cranes, electrical, excavation, fall protection, materials handling, personal protection equipment, stairs-ladders-scaffolds, and power tools.

PRINT READING 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: 31442307 Measurement for Fabricators or PREREQUISITE: 31420330 Machine Tool Measuring or 31420394 Industrial Maintenance Measurement and Drills

PSYCHOLOGY FOR LIFE...prepares the learner to select behavior modification techniques, demonstrate techniques for enhancing memory, analyze expressions of emotion, use conflict for common good, employ techniques to reduce conflict/frustration, use several methods to reduce stress, interpret personality types, ascertain contributors to perception, and apply methods of problem-solving.

ROBOTIC WELDING 1A...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 1B

ROBOTIC WELDING 1B...builds upon learner's knowledge and skills on the five major welding joints, to weld v-grooves in the flat and horizontal positions, perform basic trouble shooting skills in the program and in the work cell, learn how to edit the weld program and re-teach the robot to maintain good weld quality throughout the welding process. COREQUISITE: 31442327 Robotic Welding 1A

WELD QUALITY 1A...prepares the learner with information on nondestructive examination methods applicable to common welding processes. It will assist welding inspectors and welding educators with knowledge of welding and inspection fundamentals useful on the jobsite. It will prepare exam candidates for Part A (Fundamentals) of the AWS-CWI exam. Students will be exposed to safe practices, metric practices, and metal joining and cutting processes, terminology weld joint geometry, welding and inspection symbols. COREQUISITE: 31442309 Print Reading for Fabricators

WELD QUALITY 1B...will teach the learner the application of documents governing welding inspection and qualification. Welding metallurgy, metal properties and destructive testing will be taught. The learner will demonstrate proper evaluation of weld and base metal discontinuities. The learner will be introduced to VT and other NDE methods. COREQUISITE: 31442311 Weld Quality 1A

WELD QUALITY 2A...provides hands-on training in the use of weld measurement tools and weld replicas to determine the sizes of various weld discontinuities and compare their findings to the codebook to determine the acceptability or rejection criteria; sample practical examination to prepare test candidates for Part B (Practical Applications) of the AWS-CWI exam; use inspection tools, ensure compliance with the code, proper documentation, and why visual inspection can be the most effective NDE techniques. COREQUISITE: 31442313 Weld Quality 1B

WELD QUALITY 2B...prepares the learner for proper navigation of the AWS D1.1 code, including qualification of welding procedures for welds containing filler-metal additions, design and preparation of the joint for production welding, nondestructive testing and acceptance standards, and automatic welding with and without filler-metal additions, attendees will practice open codebook testing under time constraints. COREQUISITE: 31442315 Weld Quality 2A