



Welding (WDT)

Program Information

Welding is the technology of using various methods to join, cut, scrape, or finish metal by applying intense heat and/or pressure to melt the edges of metal so they fuse permanently.

The Welding Program at Trenholm State Community College is designed to give technical knowledge and experience in six different welding and cutting processes. The student will attain hands-on experience in pipe welding, brazing, manual and machine cutting, blueprint reading, and welding processes used by industry in the fabrication of steel components. Through practical application, a student is taken through a series of welds and processes, using different joints and weld structures duplicated as closely as possible to an actual on-the-job situation.

Occupational Choices

Qualified welders are being employed in increasing numbers for repair and maintenance in the manufacturing, services, construction and wholesale trades. In certain industries, manual welders, especially those with a wide variety of skills, will be needed for the maintenance, repair, and other work in manufacturing that cannot be automated. Welding is used to construct and repair thousands of manufactured products. A welder uses all types of welding equipment in a variety of positions. Welders can use various types of devices to obtain the necessary heat, with or without the aid of pressure, to melt the metal's edges in a controlled fashion. These procedures are used in the manufacturing and repairing of many different products ranging from water faucets, refrigerators, cars, and trains to electrical equipment, airplanes, ships, and missiles.

Source: Bureau of Labor and Statistics Occupational Outlook Handbook, 2016-2017 Edition, 2015 Survey.

Average Full-Time Wage

The median annual wage for welders, cutters, solderers, and brazers was \$38,150 in May 2015.

Source: Bureau of Labor and Statistics Occupational Outlook Handbook, 2016-2017 Edition, 2015 Survey

Additional Requirements

1. Must be at least 16 years of age;
2. Must demonstrate adequate hand-eye coordination;
3. Must be oriented to reality and not be mentally impaired by mind altering substances.

Awards Available

Certificate
Welding

Short Term Certificate
Welding

Construction SMAW Plate Welding
Manufacturing Welding
Pipe Welding

Program Contact

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Program Coordinator/Instructor
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Location: Patterson Campus - Bldg. H

As part of ongoing planning and evaluation, the College regularly evaluates student learning outcomes for each program.

Estimated Program Length & Cost *

Award	Length	Credit Hours	Tuition Fees	Books	Tools	Supplies
Certificate	4 Terms	60	\$8,700	\$400	\$250	\$0
Short Term Certificates	1 Term	13	\$1,885	\$150	\$230	\$0

* Tax not included. Prices are subject to change without prior notice; cost of books may vary considerably among suppliers. Cost of general education books is in addition to the total listed above. The length of the program is based on full-time status of 12-15 credit hours per term. Enrollment in transitional level general education courses will alter the length of the program.

Certificate Welding

Required Technical Courses (47 credit hours)

Course	Title	Hrs
WDT-108	SMAW Fillet/OFC	3
WDT-109	SMAW Fillet/PAC/CAC	3
WDT-110	Industrial Blueprint Reading	3
WDT-119	Gas Metal Arc/Flux Cored Arc Wldg	3
WDT-120	SMAW Groove Theory	3
WDT-122	SMAW Fillet/OFC Lab	3
WDT-123	SMAW Fillet/PAC/CAC Lab	3
WDT-124	Gas Metal Arc/Flux Cored Arc Wldg Lab	3
WDT-125	SMAW Groove Lab	3
WDT-155	GTAW Carbon Pipe Lab	3
WDT-156	GTAW Stainless Pipe Lab	3
WDT-158	Consumable Welding Processes Lab	3
WDT-167	FCAW Lab	3
WDT-183	Special Topics	2
WDT-257	SMAW Carbon Pipe Lab	3
	*Technical Electives	3

Electives:

*WDT-157	Consumable Welding Processes	3
WDT-182	Special Topics	3
WDT-218	Certification Theory	3
WDT-219	Welding Inspection & Testing Theory	3
WDT-221	Pipefitting and Fabrication	3
WDT-223	Blueprint Reading for Fabrication	3
WDT-228	GTAW Theory	3
WDT-268	GTAW Lab	3
WDT-280	Special Topics	3
WDT-281	Special Topics	3
WDT-282	Special Topics	3

*WDT-157 - This course was used to calculate contact hours which may vary, depending on the elective course selected.

Required General Education (13 credit hours)

Course	Title	Hrs
DPT-103	Intro Computer Skills or higher	3
ENG-100	Vocational Tech English or higher	3
MAH-101	Introductory Mathematics I or higher	3
ORI-101	Orientation to College	1
SPC-103	Oral Communication Skills	3

Total Hours: 60 Credit Hours; 1,520 Contact Hours

Short Term Certificate Welding Construction SMAW Plate Welding Concentration

Required Technical Courses (12 credit hours)

Course	Title	Hrs
WDT-108	SMAW Fillet/OFC	3
WDT-109	SMAW Fillet/PAC/CAC	3
WDT-122	SMAW Fillet/OFC Lab	3
WDT-123	SMAW Fillet/PAC/CAC Lab	3

Required General Education (1 credit hours)

ORI-101	Orientation to College	1
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Total Hours: 13 Credit Hours; 336 Contact Hours

Short Term Certificate Welding Manufacturing Welding Concentration

Required Technical Courses (12 credit hours)

Course	Title	Hrs
WDT-110	Industrial Blueprint Reading	3
WDT-119	Gas Metal Arc/Flux Cored Arc Welding	3
WDT-124	Gas Metal Arc/Flux Cored Arc Welding Lab	3
WDT-167	FCAW Lab	3

Required General Education (1 credit hours)

ORI-101	Orientation to College	1
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Total Hours: 13 Credit Hours; 320 Contact Hours

Short Term Certificate Welding Pipe Welding Concentration

Required Technical Courses (12 credit hours)

Course	Title	Hrs
WDT-155	GTAW Carbon Pipe Lab	3
WDT-156	GTAW Stainless Pipe Lab	3
WDT-158	Consumable Welding Processes Lab	3
WDT-257	SMAW Carbon Pipe Lab	3

Required General Education (1 credit hours)

ORI-101	Orientation to College	1
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Total Hours: 13 Credit Hours; 400 Contact Hours

Course Descriptions for Welding (WDT)

Course #	Course Title	Theory Contact Hours/Wk	Lab Contact Hours/Wk	Credit Hours
WDT-108	SMAW FILLET/OFC PREREQUISITE: None This course provides the student with instruction on safety practices and terminology in the Shielded Metal Arc Welding (SMAW) process. Emphasis is placed on safety, welding terminology, equipment identification, set-up and operation, and related information in the SMAW process. This course also covers the rules of basic safety and identification of shop equipment and provides the student with the skills and knowledge necessary for the safe operation of oxy-fuel cutting. This is a CORE course.	2	2	3
WDT-109	SMAW FILLET/PAC/CAC PREREQUISITE: None This course provides the student with instruction on safety practices and terminology in the Shielded Metal Arc Welding (SMAW) process. Emphasis is placed on safety, welding terminology, equipment identification, set-up and operation, and related information in the SMAW process. This course also covers the rules of basic safety and identification of shop equipment and provides the student with the skills and knowledge necessary for the safe operation of carbon arc cutting and plasma arc cutting. This is a CORE course.	2	2	3
WDT-110	INDUSTRIAL BLUEPRINT READING PREREQUISITE: None This course provides students with the understanding and fundamentals of industrial blueprint reading. Emphasis is placed on reading and interpreting lines, views, dimensions, weld joint configurations and weld symbols. Upon completion students should be able to interpret welding symbols and blueprints as they apply to welding and fabrication. This is a CORE course	3	0	3
WDT-119	GAS METAL ARC/FLUX CORED ARC WELDING PREREQUISITE: None This course introduces the student to the gas metal arc and flux cored arc welding process. Emphasis is placed on safe operating practices, handling and storage of compressed gasses, process principles, component identification, various welding techniques and base and filler metal identification. This is a CORE course.	2	2	3
WDT-120	SMAW GROOVE THEORY PREREQUISITE: None This course provides the student with instruction on joint design, joint preparation, and fit-up of groove welds in accordance with applicable welding codes. Emphasis is placed on safe operation, joint design, joint preparation, and fit-up. Upon completion, students should be able to identify the proper joint design, joint preparation and fit-up of groove welds in accordance with applicable welding codes. This is a CORE course.	2	2	3
WDT-122	SMAW FILLET/OFC LAB PREREQUISITE: None This course is designed introduce the student to the proper set-up and operation of the shielded metal arc welding equipment. Emphasis is placed on striking and controlling the arc, and proper fit-up of fillet joints. This course is also designed to instruct students in the safe operation of oxy-fuel cutting. Upon completion, students should be able to make fillet welds in all positions using electrodes in the F-3 groups in accordance with applicable welding code and be able to safely operate oxy-fuel equipment and perform those operations as per the applicable welding code.	0	6	3
WDT-123	SMAW FILLET/PAC/CAC LAB PREREQUISITE: None This course is designed introduce the student to the proper set-up and operation of the shielded metal arc welding equipment. Emphasis is placed on striking and controlling the arc, and proper fit-up of fillet joints. This course is also designed to instruct students in the safe operation of plasma arc and carbon arc cutting. Upon completion, students should be able to make fillet welds in all positions using electrodes in the F-4 groups in accordance with applicable welding code and be able to safely operate plasma arc and carbon arc equipment and perform those operations as per applicable welding code.	0	6	3

Course #	Course Title	Theory Contact Hours/Wk	Lab Contact Hours/Wk	Credit Hours
WDT-124	GAS METAL ARC/FLUX CORED ARC WELDING LAB PREREQUISITE: None This course provides instruction and demonstration using the various transfer methods and techniques to gas metal arc and flux cored arc welds. Topics included are safety, equipment set-up, joint design and preparation, and gases.	0	6	3
WDT-125	SMAW GROOVE LAB PREREQUISITE: None This course provides instruction and demonstration in the shielded metal arc welding process on carbon steel plate with various size F-3 and F-4 group electrodes in all positions. Emphasis is placed on welding groove joints and using various F-3 and F-4 group electrodes in all positions. Upon completion, the student should be able to make visually acceptable groove weld joints in accordance with applicable welding codes.	0	6	3
WDT-155	GTAW CARBON PIPE LAB PREREQUISITE: None This course is designed to provide the student with the skills in welding carbon steel pipe with gas tungsten arc welding techniques in various pipe weld positions. Upon completion, students should be able to perform gas tungsten arc welding on carbon steel pipe with the prescribed filler metals in various positions in accordance with the applicable code.	0	6	3
WDT-156	GTAW STAINLESS PIPE LAB PREREQUISITE: None This course is designed to provide the student with the skills in welding stainless steel pipe with gas tungsten arc welding techniques in various pipe weld positions. Upon completion, students should be able to perform gas tungsten arc welding on stainless steel pipe with the prescribed filler metals in various positions in accordance with the applicable code.	0	6	3
WDT-157	CONSUMABLE WELDING PROCESSES PREREQUISITE: None This course provides instruction and demonstration with the consumable welding processes to produce groove and fillet welds in all positions, according to applicable welding codes. Topics include safe operating practices, equipment identification, equipment set-up, correct selection of electrode, current/polarity, shielding gas and base metals.	1	4	3
WDT-158	CONSUMABLE WELDING PROCESSES LAB PREREQUISITE: None This course provides instruction and demonstration with the consumable welding processes to produce groove and fillet welds in all positions, according to applicable welding codes. Topics include safe operating practices, equipment identification, equipment set-up, correct selection of electrode, current/polarity, shielding gas and base metals. Upon completion, the student should be able to produce groove and fillet welds using consumable welding processes according to AWS Codes and standards. This course supports CIP Code 48.0508	0	6	3
WDT-167	FLUX CORE ARC WELDING LAB PREREQUISITE: None This course provides instruction and demonstration with the flux core arc welding process to produce groove and fillet welds in all positions, according to applicable welding codes. Topics include safe operating practices, equipment identification, equipment set-up, correct selection of filler metals, current/polarity, shielding gas and base metals. Upon completion, the student should be able to produce groove and fillet welds using the FCAW welding process, according to AWS Codes and Standards.	0	6	3
WDT-182	SPECIAL TOPICS PREREQUISITE: None This course allows the student to plan, execute, and present results of individual projects in welding. Emphasis is placed on enhancing skill attainment in the welding field. The student will be able to demonstrate and apply competencies identified and agreed upon between the student and instructor.	1	4	3
WDT-183	SPECIAL TOPICS PREREQUISITE: None This course allows the student to plan, execute, and present results of individual projects in welding. Emphasis is placed on enhancing skill attainment in the welding field. The student will be able to demonstrate and apply competencies identified and agreed upon between the student and instructor.	1	2	2

Course #	Course Title	Theory Contact Hours/Wk	Lab Contact Hours/Wk	Credit Hours
WDT-218	CERTIFICATION THEORY PREREQUISITE: None This course is designed to provide the student with the knowledge needed to perform welds using the prescribed welding process. Emphasis is placed on the welding test joints in accordance with the prescribed welding code. Upon completion, students should be able to pass an industry standard welding test in accordance with various applicable welding code requirements.	1	4	3
WDT-219	WELDING INSPECTION AND TESTING THEORY PREREQUISITE: None This course provides the student with inspection skills and knowledge necessary to evaluate welded joints and apply quality control measures as needed. Emphasis is placed on interpreting welding codes, welding procedures, and visual inspection methods. Upon completion, students should be able to visually identify visual acceptable weldments as prescribed by the code or welding specification report.	3	0	3
WDT-221	PIPEFITTING AND FABRICATION PREREQUISITE: None This course provides the student with skills and practices necessary for fabricating pipe plans using pipe and fittings. Emphasis is placed on various pipe fittings to include various degree angles. Upon completion, students should be able to fit various pipe fittings, and cut and fabricate tees, and assorted angles.	1	4	3
WDT-223	BLUEPRINT READING FOR FABRICATION PREREQUISITE: WDT-110 This course provides a student with advanced skills in identifying and interpreting lines, views, dimensions, notes, bill of materials, and the use of tools of the trade. Emphasis is placed on figuring dimensional tolerances, layout and fitting of different component parts. Upon course completion, a student should be able to interpret, layout, and fabricate from blueprints to given tolerances.	1	4	3
WDT-228	GAS TUNGSTEN ARC WELDING PREREQUISITE: None This course provides a student with the knowledge needed to perform gas tungsten arc welds using ferrous and/or non-ferrous metals, according to applicable welding codes. Topics include safe operating practices, equipment identification and set-up, correct selection of tungsten type, polarity, shielding gas and filler metals. Upon completion, a student should be able to identify safe operating practices, equipment identification and setup, correct selection of tungsten type, polarity, shielding gas, filler metals, and various welds on ferrous and/or non-ferrous metals, using the gas tungsten arc welding process according to applicable welding codes.	2	2	3
WDT-257	SMAW CARBON PIPE LAB PREREQUISITE: None This course is designed to provide the student with the skills in welding carbon steel pipe with shielded metal arc welding techniques in various pipe weld positions. Upon completion, students should be able to perform shielded metal arc welding on carbon steel pipe with the prescribed electrodes in various positions in accordance with the applicable code.	0	6	3
WDT-268	GTAW LAB PREREQUISITE: None This course provides student with skills needed to perform gas tungsten arc welds using ferrous and/or non-ferrous metals, according to applicable welding codes. Topics include safe operating practices, equipment identification and set-up, correct selection of tungsten type, polarity, shielding gas and filler metals. Upon completion, a student should be able to identify safe operating practices, equipment identification and setup, correct selection of tungsten type, polarity, shielding gas, filler metals, and various welds on ferrous and/or non-ferrous metals, using the gas tungsten arc welding process according to applicable welding codes.	0	6	3
WDT-280	SPECIAL TOPICS PREREQUISITE: None This course provides specialized instruction in various areas related to the welding industry. Emphasis is placed on meeting students' needs.	0	6	3

Course #	Course Title	Theory Contact Hours/Wk	Lab Contact Hours/Wk	Credit Hours
WDT-281	SPECIAL TOPICS IN WELDING TECHNOLOGY	0	6	3
PREREQUISITE: None				
This course provides specialized instruction in various areas related to the welding industry. Emphasis is placed on meeting students' needs.				
WDT-282	SPECIAL TOPICS	0	6	3
PREREQUISITE: None				
This course provides specialized instruction in various areas related to the welding industry. Emphasis is placed on meeting students' needs.				