

# Welding

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## Welding, Industrial Technician

### Program Description

Designed to upgrade the skills of persons employed as welders, providing advanced training in a variety of welding applications.

### Certificate of Achievement and Associate in Science Degree

A Certificate of Achievement can be obtained upon completion of the 24-unit major listed below. The Associate in Science Degree can be obtained by completing a total of 60 units, including the major, general education requirements, and electives. All courses for this major must be completed with a grade of C or better or a P if the course is taken on a Pass/No Pass basis. Certification of students as "Code Welders" is available at a nominal cost to the student.

### Program Outcomes

Students who complete the Welding, Industrial Technician Certificate of Achievement / Associate Degree will be able to:

1. Demonstrate competency in major welding processes used in industry.
2. Apply welding processes and the use of hand tools and shop equipment to fabricate projects.
3. Recognize and interpret technical drawings in the planning and fabrication of projects.
4. Demonstrate appropriate workplace safety policies and procedures during welding and fabrication operations.
5. Apply mathematical concepts to solve problems related to an industrial/technical environment.

REQUIRED COURSES	Units
DRFT 079 Blueprint Reading	3
IT 140 Industrial Materials	3
Electives selected from the list below	18
<b>Total Units</b>	<b>24</b>

### Recommended Electives:

ENGL 051 Technical Writing  
OCED 070 Occupational Soft Skills  
OCED 090 Occupational Work Experience  
OCED 091 General Work Experience  
WELD 175 Welding Fabrication

### Select 18 units from the following Units

WELD 120 Plate Welder (Basic)	3
WELD 121 Plate Code Welder (Advanced)	3
WELD 122 Pipe Welding (Basic)	3
WELD 123 Pipe Welding (Advanced)	3
WELD 124 Gas Tungsten Arc Welding (GTAW)	3
WELD 125 Gas Metal Arc Welding	3
WELD 126 Ornamental Iron Welding	3

This is a Gainful Employment Program. For additional information, please visit [http://www.solano.edu/gainful\\_employment/](http://www.solano.edu/gainful_employment/) and select "Welding, Industrial Technician."

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## Welding Technician

### Program Description

Designed to prepare the graduate for employment as a welder or a welder helper in the metal trades. The major types of welding covered are shielded arc, acetylene gas welding, metal inert gas, tungsten inert gas, automatic and semi-automatic welding machines.

### Certificate of Achievement and Associate in Science Degree

A Certificate of Achievement can be obtained upon completion of the 49-unit major listed below. The Associate in Science Degree can be obtained by completing a total of 69 units, including the major and the general education requirements. All courses for this major must be completed with a grade of C or better or a P if the course is taken on a Pass/No Pass basis. Certification of students as "Code Welders" is available at a nominal cost to the student.

### Program Outcomes

Students who complete the Welding Technician Certificate of Achievement / Associate Degree will be able to:

1. Demonstrate competency in major welding processes used in industry.
2. Apply welding processes and the use of hand tools and shop equipment to fabricate projects.
3. Recognize and interpret technical drawings in the planning and fabrication of projects.
4. Demonstrate appropriate workplace safety policies and procedures during welding and fabrication operations.
5. Apply mathematical concepts to solve problems related to an industrial/technical environment.

REQUIRED COURSES	Units
WELD 100 Welding Technology	10
WELD 101 Welding Technology	10
WELD 102 Welding Technology	10
WELD 103 Welding Technology	10
DRFT 079 Blueprint Reading	3
IT 140 Industrial Materials	3
IT 150 Industrial Processes	3
<b>Total Units</b>	<b>49</b>

### Recommended Electives:

IT 160 Electrical Fundamentals  
OCED 070 Occupational Soft Skills  
OCED 090 Occupational Work Experience  
OCED 091 General Work Experience  
WELD 175 Welding Fabrication

This is a Gainful Employment Program. For additional information, please visit [http://www.solano.edu/gainful\\_employment/](http://www.solano.edu/gainful_employment/) and select "Welding Technician."

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## Welding Equipment Operator Job-Direct Certificate

All courses must be completed with a grade of "C" or better.

REQUIRED COURSES	Units
WELD 175 Welding Fabrication	2
OCED 090 * Occupational Work Experience	1- 8
<b>Total Units</b>	<b>3-10</b>

\*Students will be required to complete 80 hours of cooperative supervised work experience to receive credit.

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<b>WELD 100</b> <b>Welding Technology</b> <i>Course Advisory: SCC minimum English standard.</i> Development of manual skills and related technical knowledge in arc and acetylene welding and burning; flat, horizontal, vertical and overhead positions; machine adjustments, rod identification and characteristics; joints metal expansion and contraction. <i>Five hours lecture, fifteen hours lab.</i>	<b>10.0 Units</b>	<b>WELD 112</b> <b>Carpentry Apprentice Welding</b> <i>Course Advisory: SCC minimum English and Math standards.</i> Provides introductory safety instruction and manipulative practice in the setup and use of oxy-acetylene and arc welding and cutting equipment. Manipulative and written tests are used to give students practice and to evaluate performance in applying techniques learned. <i>Twelve hours lecture, twenty-four hours lab (1-week course).</i>	<b>1.0 Unit</b>
<b>WELD 101</b> <b>Welding Technology</b> <i>Prerequisite: WELD 100 or comparable industry experience or training. Course Advisory: SCC minimum English standard.</i> Designed to present the theory, procedures, and manipulative skills required to weld mild steel plate to code certification levels with the shielded metal arc and flux cored arc welding processes. A basic understanding of metallurgy, metals identification, layout, and welding of other metals is also presented. <i>Five hours lecture, fifteen hours lab.</i>	<b>10.0 Units</b>	<b>WELD 120</b> <b>Plate Welder (Basic)</b> <i>Course Advisory: Successful completion of IT 110 or prior welding experience; SCC minimum English standard.</i> Presents the theory, procedure and manipulative skills required to meet certification standards on one-inch plate using low hydrogen electrodes in the vertical position. Manipulative and written tests are used to give students practice and to evaluate performance in applying techniques earned. <i>Two hours lecture, three hours lab.</i>	<b>3.0 Units</b>
<b>WELD 102</b> <b>Welding Technology</b> <i>Prerequisite: WELD 101 or comparable industry experience or training. Course Advisory: SCC minimum English and Math standards.</i> Designed to present the theory, procedures, and manipulative skills required to weld metals of various thicknesses with the gas metal arc welding process. Introduces the student to the theory, procedures, and manipulative skills required to weld mild steel pipe to industrial standards. <i>Five hours lecture, fifteen hours lab.</i>	<b>10.0 Units</b>	<b>WELD 121</b> <b>Plate Code Welder (Advanced)</b> <i>Course Advisory: Successful completion of IT 110 or prior welding experience; SCC minimum English standard.</i> Develops the principles taught in WELD 120, expanding the student's ability to weld one-inch thick certification plates in all positions with low hydrogen electrodes. Manipulative and written tests are used to give students practice and to evaluate performance in applying techniques learned. <i>Two hours lecture, three hours lab.</i>	<b>3.0 Units</b>
<b>WELD 103</b> <b>Welding Technology</b> <i>Prerequisite: WELD 102 or comparable industry experience or training. Course Advisory: SCC minimum English standard.</i> Designed to present the theory, procedures and manipulative skills required to weld metals of various thicknesses with the gas tungsten arc process, as well as the theory, procedures and manipulative skills required to weld and fit pipe in all positions. <i>Five hours lecture, fifteen hours lab.</i>	<b>10.0 Units</b>	<b>WELD 122</b> <b>Pipe Welding (Basic)</b> <i>Course Advisory: Successful completion of IT 110 or prior welding experience; SCC minimum English standard.</i> Presents the theory, procedure, and manipulative skills required to meet certification standards on schedule 80 steel pipe in the horizontal fixed position. Manipulative and written tests are used to give students practice and to evaluate performance in applying techniques learned. <i>Two hours lecture, three hours lab.</i>	<b>3.0 Units</b>

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**WELD 123** **3.0 Units**  
**Pipe Welding (Advanced)**

*Course Advisory: Successful completion of IT 110 or prior welding experience; SCC minimum English standard.*

Develops the principles taught in WELD 122, expanding the student's ability to weld pipe in all positions. Manipulative and written tests are used to give students practice and to evaluate performance in applying techniques learned. *Two hours lecture, three hours lab.*

**WELD 124** **3.0 Units**  
**Gas Tungsten Arc Welding (GTAW)**

*Course Advisory: Successful completion of IT 110 or prior welding experience; SCC minimum English standard.*

Presents the theory, procedures, and manipulative skills required to weld aluminum steel and stainless steel with the Gas Tungsten Arc process. Manipulative and written tests are used to give students practice and to evaluate performance in applying techniques learned. *Two hours lecture, three hours lab.*

**WELD 125** **3.0 Units**  
**Gas Metal Arc Welding**

*Course Advisory: Successful completion of IT 110 or prior welding experience; SCC minimum English standard.*

Presents the theory, procedures, and manipulative skills required to weld steel and aluminum with the gas metal arc process. Includes the manipulative skills required to weld with the flux cored arc process. Manipulative and written tests are used to give students practice and to evaluate performance in applying techniques learned. *Two hours lecture, three hours lab.*

**WELD 126** **3.0 Units**  
**Ornamental Iron Welding**

*Course Advisory: Successful completion of IT 110 or prior welding experience; SCC minimum English standard.*

Presents the theory, procedures, and manipulative skills required to fabricate and weld ornamental iron projects. Manipulative and written tests are used to give students practice and to evaluate performance in applying techniques learned. *Two hours lecture, three hours lab.*

**WELD 175** **2.0 Units**  
**Welding Fabrication**

*Course Advisory: SCC minimum English and Math standards.* Designed to increase student knowledge and tactile skills with welding processes and related metal working equipment. *Four hours lecture, sixteen hours lab (4-week course).*

**WELD 500** **Non-Credit**  
**Special Welding Problems**

*Prerequisite: Permission of the instructor to verify room for special problems students.* Designed to assist with vocational placement for advanced welding students who have sufficient background in welding fundamentals to pursue more independent studying in the area of their choice. The student works by arrangement with the instructor on an outlined program of study to achieve independent objectives. *This is an Open Entry/Open Exit course. Hours by arrangement as required.*