# WELDING TECHNOLOGY (WT)

## Program Description

The Welding Technology (WT) program prepares students for entry into a variety of careers in welding, aluminum boatbuilding and general metal fabrication. Graduates will be qualified to work as entry-level welders, fitters, burners, layout persons, or metal fabricators. Students study a variety of layout, fabrication, and metal joining techniques including oxyfuel cutting, shielded metal arc welding, gas metal arc welding, flux cored arc welding, and gas tungsten arc welding of steel, stainless steel, and aluminum. Instructional facilities include individual welding practice booths and a large metal fabrication area.

Students may enter at any quarter. Program completion time averages six quarters, but because the program is performance-based, students may complete the program in a shorter or longer time period, depending on their individual progress. Experienced welders may upgrade their skills through special coursework.

Students are required to supply various tools, protective clothing, and welding consumables. A complete list can be obtained by calling the Welding program at 360.416.7702 or 360.416.7906, or by visiting the weld shop in Reeves Hall.

## Entry into the Program

Please apply to the Admissions Office. Students may enter the program at the beginning of any quarter. People considering enrollment in this program should have good eyesight, hand-eye coordination, and mechanical aptitude. Advanced standing may be requested. For more information, contact the Department Chair or the Admissions Office.

## Tech Prep

Skagit Valley College will grant credits toward a Professional/Technical degree based on competencies gained in high school. The competencies must be agreed upon by the appropriate teachers from the high school and the college. Credit will be transcripted after verification of successful completion of the agreed upon competencies. If you are interested in taking steps to begin work in the professional/technical workplace of the future, please contact your high school counselor.

## Work-Based Learning

Students will integrate classroom learning with work-based learning experience in Cooperative Education (WT 199) at a supervised work site. Department Chair approval is required. Credits and grades are based on job-hours worked, work performance, and completion of the learning objectives specified in the learning contract. Concurrent enrollment in a Cooperative Education Seminar or equivalent is required.

## Associate in Technical Arts Degree

An Associate in Technical Arts degree (ATA) is awarded upon completion of a minimum of 90 credits of specified technical and related education coursework above 100 level with both an overall 2.0 grade point average and a 2.0 grade point average in the technical major.

## SUGGESTED SCHEDULE

### ATA WELDING TECHNOLOGY

*Generalist Emphasis*

*Includes required ATA courses. Student schedule may vary based on entry point, credit load, and prerequisites. Consult with department chair or SVC counselor for scheduling options.*

**First Year**

| First Qtr ....Cr | Second ..... Cr | Third Qtr .. Cr |
|---|---|---|
| WT 101 or ..... 16 | WT 101 or ..... 16 | WT 103 ..... 16 |
| WT 102 ..... | WT 102 ..... | WT 104 ..... 1 |
| †MATH 100 ..... 5 | CMST 125 ..... 3 | WT 105 ..... 1 |
| ..... | PE 200 ..... 2 | †ENGL 170 ..... 3 |
| **Total ..... 21** | **Total ..... 21** | **Total ..... 21** |

**Second Year**

| Fourth .....Cr | Fifth Qtr.... Cr | Sixth Qtr... Cr |
|---|---|---|
| WT 201 ..... 16 | WT 202 ..... 16 | WT 203 ..... 16 |
| *LC/GE ..... 5-10 | SOSC 113 ..... 1 | WT 199 ..... 1-15 |
| ..... | SOSC 125 ..... 2 | ..... |
| **Total ..... 21+** | **Total ..... 19** | **Total ..... 17+** |

* Learning Community (5-10 credits) or 5 credits of General Education (culture, natural world or arts). Must be outside of technical area, approved by Department Chair. Please see INDEX regarding Learning Communities.

† Students who do not receive an appropriate test score will require additional coursework to develop necessary skills for entry into class.

## Program Certificates

A Certificate in Welding is granted upon completion of the following requirements with a 2.0 grade point average or above:

### BASIC ARC WELDING

Completion of WT 101, 102, and 103; ENGL 170; MATH 100; PE 200 or 205; SOSC 113; SOSC 125 or WT 199.

### WELDING TECHNOLOGY

Completion of WT 101, 102, 103, and 201; ENGL 170; MATH 100; PE 200 or 205; SOSC 113; SOSC 125 or WT 199.

### INDIVIDUAL TECHNICAL CERTIFICATE

An Individual Technical Certificate may be developed in conjunction with other programs to meet marketable objectives and goals with Department Chair approval.

### AMERICAN WELDING SOCIETY CERTIFICATE

The SVC Welding program is an approved participant in the American Welding Society Entry-Level Welder Training program. Students who complete coursework requirements and pass written and performance exams will earn a certificate from the AWS (nominal fee required).

### WELDER CERTIFICATION

The SVC Welding program is an approved test lab for the Washington Association of Building Officials (WABO) welder certification program. Students completing certificate or degree programs will have the opportunity to earn this important credential (nominal fee required). Special coursework is available to prepare experienced welders for this test.

## Micro-Certificates

These certificates focus on a specific skill within this program. A certificate is awarded to students who complete the following with a 2.0 grade point average or above:

### ALUMINUM GMAW

Completion of WT 160.

### ALUMINUM GTAW

Completion of WT 161.

### FLUX-CORED ARC WELDING (FCAW)

Completion of WT 105 and a minimum of 14 credits from any of the following: WT 102, 103, 131, 132, 133, 200, 231, 232, 233 or 234.

### GAS METAL ARC WELDING (GMAW)

Completion of WT 205 and a minimum of 14 credits from any of the following: WT 102, 103, 131, 132, 133, 160, 200, 231, 232, 233 or 234.

### GAS TUNGSTEN ARC WELDING (GTAW)

Completion of WT 204 and a minimum of 14 credits from any of the following: WT 201, 131, 132, 133, 160, 200, 231, 232, 233 or 234.

### SHIELDED METAL ARC WELDING (SMAW)

Completion of WT 104 and a minimum of 14 credits from any of the following: WT 101, 103, 131, 132, 133, 200, 231, 232, 233 or 234.

## Course Descriptions

**WT 101 Introduction to Shield Metal Arc Welding (16)**
Fillet welds on carbon steel using the SMAW process in the flat, horizontal, vertical and overhead positions. Covers SMAW electrode selection and the AWS electrode classification system. Introduction and/or review of general shop safety and procedures, oxy-fuel and air-carbon arc cutting and gouging. Selected topics from blueprint reading, layout, or applied science.

**WT 102 Introduction to Wire Welding (16)**
Fillet welds on carbon steel using semiautomatic wire-feed FCAW and GMAW processes. Covers shielding gas selection and the AWS electrode classification system. Introduction and/or review of general shop safety and procedures, oxy-fuel and air-carbon arc cutting and gouging. Selected topics from blueprint reading, layout, and applied science.

**WT 103 Groove Welding (16)**
All position groove welding of carbon steel using the manual SMAW and FCAW processes. Covers edge preparation, joint fitup, and weld technique. Selected topics from blueprint reading, layout, or applied science. Prerequisite: WT 101 and 102, or Department Chair permission.

**WT 104 Shield Metal Arc Welding Welder Certification (1)**
Principles and practices relating to weld procedure qualification and welder certification. Unlimited thickness, all-position SMAW welder qualification test on carbon steel in conformity with AWS and WABO standards. Prerequisite: 2 credits from any WT course or Department Chair permission.

**WT 105 Flux-Cored Arc Welding Welder Certification (1)**
Principles and practices relating to weld procedure qualification and welder certification. Unlimited thickness, all-position FCAW welder qualification test on carbon steel in conformity with AWS and WABO standards. Prerequisite: 2 credits from any WT course or Department Chair permission.

**WT 131 Introduction to Welding (2)**
Introduces shielded metal arc welding (SMAW) of steel plate in the flat position using E6010 and E7018 electrodes. Shop safety and procedures. Open to non-welding majors.

**WT 132 Low Hydrogen Electrodes (2)**
Out of position shielded metal arc welding (SMAW) of carbon steel plates using E7018 (low hydrogen) electrodes. Open to non-welding majors. Prerequisite: WT 131 or concurrently or Department Chair permission.

**WT 133 Oxy-Fuel Processes (2)**
Introduction to oxy-fuel cutting, welding and brazing. Open to non-welding majors.

**WT 134 Artistic Welding Basics (2)**
Introduction to basic welding and metalworking techniques for the metal artist. Emphasis on general shop safety. Prerequisite: 2 credits from any WT course or Department Chair permission.

**WT 160 Aluminum Welding/ Fabrication for Marine Industry I (16)**
Introduction to aluminum fabrication and manufacturing techniques for marine application. Emphasizes usage of hand and power tools, metal cutting and gouging, forming and bending, and safe handling of materials forming/shearing/cutting/welding operations and Gas Metal Arc Welding (GMAW) on aluminum plate in the 1F and 2F positions. Introduction to Pulsed GMAW and Gas Tungsten Arc Welding (GTAW) of aluminum and selected topics from blueprint reading and layout. Safety emphasized.

**WT 161 Aluminum Welding/ Fabrication for Marine Industry II (16)**
Continuation of WT 160. Advanced usage of hand and power tools, metal cutting and gouging, forming and bending, and safe handling of materials forming/shearing/cutting/welding operations and Pulsed Gas Metal Arc Welding (GMAW) on aluminum plate in the 3F, 4F positions. Demonstrate industry standard GTAW in the 1F, 2F, positions. Selected topics from blueprint reading and layout. Safety emphasized. Prerequisite: WT 160.

**WT 199 Cooperative Education Experience (1-15)**
Supervised work experience in the field. Includes a weekly seminar. Instructor permission required.

**WT 200 Weld Skill Upgrading (1-14)**
Skill upgrading in the areas of stick, wire, or tig welding. Course content to be arranged with instructor prior to registration. Prerequisite: Department Chair permission.

**WT 201 Advanced Welding (16)**
Welding of carbon steel, stainless steel, and aluminum using the GTAW process. Spray-arc welding of carbon steel and aluminum plate using the GMAW process. Covers electrode and shielding gas selection along with the AWS electrode classification system. Selected topics from blueprint reading, layout, or applied science. Prerequisite: WT 101 and 102 or Department Chair permission.

**WT 202 Metal Fabrication I (16)**
Introduction to metal fabrication and manufacturing techniques. Emphasizes safe mechanized handling of materials, heavy shearing/forming/welding operations, teamwork, and communication in cooperative enterprise. Selected topics from blueprint reading, layout, or applied science. Prerequisite: WT 104 & 105 or Department Chair permission.

**WT 203 Metal Fabrication II (16)**
Planning, supervising, and executing metal fabrication projects and related quality control functions in a simulated manufacturing environment. Selected topics from blueprint reading, layout, or applied science. Prerequisite: WT 202 or Department Chair permission.

**WT 204 Gas Tungsten Arc Welding Welder Certification (1)**
Principles and practices relating to weld procedure qualification and welder certification. Limited thickness, all-position GTAW welder qualification test on carbon steel in conformity with AWS and WABO standards. Prerequisite: 2 credits from any WT course or Department Chair permission.

**WT 205 Gas Metal Arc Welding Welder Certification (1)**
Principles and practices relating to weld procedure qualification and welder certification. Limited thickness, all-position GMAW welder qualification test on carbon steel in conformity with AWS and WABO standards. Prerequisite: 2 credits from any WT course or Department Chair permission.

**WT 231 Gas Metal Arc Welding (2)**
Gas metal arc (MIG) welding of carbon steel plate in all positions. Also air-carbon-arc cutting and gouging. Open to non-welding majors.

**WT 232 Flux-Cored Arc Welding (2)**
Introduction to flux-cored arc welding of carbon steel in all positions using the self-shielded (FCAW-S) and gas-shielded (FCAW-G) processes. Open to non-welding majors.

**WT 233 Welded Project (2)**
Plan and complete a welded project using previously learned welding techniques. Open to non-welding majors. Prerequisite: WT 131 or concurrently or Department Chair permission.

**WT 234 Welding Skill Building (2)**
Skill upgrading in the areas of stick, wire, or tig welding for experienced welders. Course content to be arranged with instructor.