Professional/Technical Programs

Counseling & Career Services | 360.416.7654 | www.skagit.edu

Shield Metal Arc Welding (WT 111, 114, & 115)
Inert Gas and Aluminum Welding (WT 113, 117, & 211)

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Welding Technology (WT)

Program Description

The Welding Technology (WT) program prepares students to work as entry-level welders, fitters, or metal fabricators in a variety of industries including boatbuilding, construction, industrial maintenance, and manufacturing. Students study a variety of layout, fabrication, and metal joining techniques using steel, stainless steel, and aluminum. Processes include oxyfuel cutting, shielded metal arc welding, gas metal arc welding, flux cored arc welding, and gas tungsten arc welding. Instructional facilities include individual welding practice booths and a large metal fabrication area.

The Welding Program stays current with industry needs through an active Advisory Committee made up of representatives from local businesses that regularly seek our graduates for employment. SVC is an accredited through the American Welding Society entry-level welder training program. SVC is also a certified Washington Association of Building Officials (WABO) testing site. Students will move from theory to application to certification in all common manual and semi-automatic welding processes.

Students may enter at any quarter. Depending on the degree or certificate specialty, program completion time averages four to seven quarters. 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 contacting Michael Baker at michael.baker@skagit.edu or 360 416-7703.

Entry into the Program

Please apply to the Admissions Office. Welding is a precision craft that demands good eyesight, hand-eye coordination, manual dexterity, and the ability to work in awkward positions. The ability to read English at the 8th grade level is highly recommended. 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.

Program Options

The Welding Program offers a wide variety of classes with morning, afternoon, evening, and Saturday options. Students may choose brief skills enhancing classes, any of several specialized Micro-Certificates, Program Certificates, or a 2-year ATA Degree. See details below.

Associate in Technical Arts Degree

Graduates of the two-year Welding Technology Associate in Technical Arts degree program (ATA) become proficient in all of the common industrial welding and cutting processes used in the boatbuilding, industrial maintenance, construction, and manufacturing, industries. Students receive advanced training in diverse topics ranging from welding metallurgy to computer-numerical-controlled (CNC) metalworking operations.

An Associate in Technical Arts degree (ATA) is awarded upon completion of a minimum of 90 credits in courses numbered 100 or above with an accumulated grade point average of 2.0. Courses must include completion of the technical major and general education requirements.

SUGGESTED SCHEDULE

ATA WELDING TECHNOLOGY
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

Fall Winter Spring
WT 113 .............. 5 WT 115 .............. 5 WT 111 .............. 5
WT 117 .............. 3 WT 213 .............. 9 WT 114 .............. 3
CSS 100 .............. 2 *MANF 120 .............. 3 WT 223 .............. 9
*ENGL 170 .............. 3 MANF 140 .............. 3 SOSC 125 .............. 2
†WMTW 100 .............. 5 ........................................ 5
Total .............. 18 Total .............. 20 Total .............. 19

Second Year

Fall Winter Spring
WT 116 .............. 5 WT 112 .............. 5 WT 190 .............. 1-15
WT 211 .............. 9 WT 221 .............. 9 WT 212 .............. 9
OMST 125 .............. 3 *LC/GE .............. 5-10 WT 222 .............. 9
SOSC 113 .............. 1 ........................................ 1
Total .............. 18 Total .............. 19+ Total .............. 19+

* Learning Community (5-10 credits) or 5 credits of General Education (social sciences, natural sciences or humanities). 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.

Replaces PE 200.

Program Certificates

A Professional Technical Certificate prepares students for entry into a technical field of employment. Certificates include completion of the technical major required courses and related instruction in communication, math, and human relation skills. Students must maintain a 2.0 GPA or above in all required course work.

WELDING TECHNOLOGY (66+ CREDITS)
Training and certification in two of the three most commonly used manual welding processes. Credits earned will depend on the training sequence selected. Required Courses (select any two of the following WT sequences):

- Shield Metal Arc Welding (WT 111, 114, 211, & 221), or
- Flux Cored Arc Welding (WT 112, 114, 212, & 222), or
- Inert Gas and Aluminum Welding (WT 113, 117, 213, & 223),
- Plus related instruction in ENGL 170, WMATH 100, MANF 120, and 140, SOSC 113, SOSC 125 or WT 199.

WELDING IN MANUFACTURING (40 CREDITS)
Program designed for students who want to develop the skills necessary to obtain entry-level welding employment in a manufacturing-related industry. Earning this particular credential indicates to employers you have mastered the core skills and knowledge that manufacturing employers want to see in any new applicant or current worker, plus the trade specific skills and certification needed for entry-level welding employment. Students enrolled in this program will complete the Manufacturing Fundamentals (14 cr), plus a Welding Specialty Sequence (26 cr). There are three Welding Specialty options to choose from: Shielded Metal Arc Welding (SMAW), Wirefeed Welding (FCAW), or Inert Gas and Aluminum Welding. Each welding option culminates with an industry certification component. Individuals having the welding skills necessary to weld to the standards required by the Washington
Association of Building Officials (WABO) may participate in SVC’s certification testing service. A 2.0 or better GPA must be maintained in all required course work.

REQUARED COURSES
1. Manufacturing Fundamentals (14 credits)
   • MANF 110, 120, 122, 125, and 140
2. Welding Sequence (26 credits) – choose one:
   • Wirefeed Welding: WT 112, 114, 212, and 222
   • Inert Gas & Aluminum Welding: WT 113, 117, 213, and 223
   • Shielded Metal Arc Welding: WT 111, 114, 211, and 221

Welding Specialty Certificates
These certificates focus on specific welding process skills. Each certificate culminates with the passing of a standard welder qualification test using the covered process. These are strictly skills-based certificates. The training time needed to pass the culminating welder qualification test will vary based on past experience and pace of learning. To qualify for certification, students must maintain a 2.0 GPA or above in all required course work.

SHIELDED METAL ARC WELDING SPECIALTY CERTIFICATE (32 CREDITS)
WT 111, 114, 211, 221, MANF 120 & 140
FLUX-CORED ARC WELDING SPECIALTY CERTIFICATE (32 CREDITS)
WT 112, 114, 212, 222, MANF 120 & 140
ALUMINUM WELDING SPECIALTY CERTIFICATE (32 CREDITS)
WT 113, 117, 213, 223, MANF 120 & 140
ADVANCED WELDING SPECIALTY CERTIFICATE (42 CREDITS)
Students who want to advance their skills in the above welding specialties can add the following two courses to any of the three specialty certificates listed above: WT 115 or WT 116, and WMATH 100.

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).

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

Micro-Certificates
Micro-Certificates of Completion are designed for taking courses over a short period of time focusing on enhancement or development of a specific skill or set of skills. Micro-Certificate courses can help enhance employability skills or provide preparation for continuing education in the program area. The Welding Program offers several Micro-Certificate options. Students must maintain a 2.0 GPA or above in all required course work.

WELDING FUNDAMENTAL MICRO-CERTIFICATES (14-19 CREDITS)
This program is designed to familiarize students with the SVC Welding program and to provide an introduction to the manual and semiautomatic welding processes used in industry today. Students will learn the basic theory of operation and safety requirements for each of the covered processes and be introduced to hands-on welding techniques in the shop setting. To earn the certificate, students must maintain a 2.0 or better GPA in all required courses. There are two Welding Fundamentals specialty options to choose from as follows:
1. Welding Fundamentals-Steel (19 credits): WT 111, 112, 114, MANF 120, 140
2. Welding Fundamentals-Aluminum (14 credits): WT 113, 117, MANF 120, 140

Course Descriptions

WT 111 Introduction to Shielded Metal Arc Welding (5)
Basic Shielded Metal Arc Welding (SMAW) theory of operation and safety requirements. Covers SMAW electrode selection based on the AWS electrode classification system and includes an introduction to hands-on welding techniques in the shop setting. CSS 100 and MATH 96 or concurrent enrollment or department chair permission.

WT 112 Introduction to Wirefeed Welding (5)
Basic Wirefeed Welding theory of operation and safety requirements. Covers Gas Metal Arc Welding (GMAW) and Flux Cored Arc Welding (FCAW) processes, shielding gas selection, and electrode selection based on the AWS electrode classification system. Safety procedures are also covered. Includes an introduction to hands-on welding techniques in the shop setting. CSS 100 and MATH 96 or concurrent enrollment or department chair permission.

WT 113 Introduction to Inert Gas and Aluminum Welding (5)
Basic inert gas welding theory of operation and safety requirements. Introduction to Gas Metal Arc Welding (GMAW) and Gas Tungsten Arc Welding (GTAW) processes and electrode selection based on the AWS electrode classification system. Includes an introduction to hands-on welding techniques in the shop setting. CSS 100 and MATH 96 or concurrent enrollment or department chair permission.

WT 114 Thermal Cutting Processes (3)
Introduction to the plasma arc and oxy-fuel cutting processes. Covers process safety and theory of operation. Course includes an introduction to hands-on thermal cutting techniques in the shop setting. CSS 100 and MATH 96 or concurrent enrollment or department chair permission.

WT 115 Intro to Computer Numeric Controlled (CNC) Operations (5)
Introduction to Computer Numeric Controlled (CNC) machine operation theory and practice. Covers basic G&M codes needed to program and operate CNC machinery. Course includes an introduction to hands-on CNC machine operations in the shop setting. Prerequisite: WMATH 100.

WT 116 Introduction to Welding Metallurgy (5)
Metallurgical theory as it applies to the welding of ferrous and nonferrous metals. Covers properties of metals, melting and solidification, phase changes, weld bead chemistry, and heat affected zones. Effects of alloying elements and heat treatments will be investigated along with welding-induced distortion and methods for distortion control. Prerequisite: WMATH 100.

WT 117 Hand and Power Tools (3)
Introduction to the safe and proper use of hand and power tools commonly used in the welding and fabrication trades. Covers set-up, operation, troubleshooting, and maintenance of saws, grinders, drill press, roller, sheet metal brake, and planer. CSS 100 and MATH 96 or concurrent enrollment or department chair permission.

WT 131 Shielded Metal Arc Welding for Mechanics (2)
Shielded metal arc welding (SMAW) for auto/diesel mechanics. Welding of steel plate in the flat position using E6010 and E7018 electrodes with emphasis on shop safety.

WT 133 Oxy-Fuel Processes for Mechanics (2)
Introduction to oxy-fuel cutting and welding for auto/diesel mechanics. Welding of steel plate in the flat position with emphasis on shop safety. Also covers air-carbon arc gouging.

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

WT 200 Weld Skill Upgrading (1-16)
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 211  Intermediate Shielded Metal Arc Welding  (9)
Fillet welds on carbon steel using the SMAW process in the flat, horizontal, vertical and overhead positions. Introduction and/or review of shop safety, metal cutting, fitting, and gouging procedures. Prerequisite: WT 111, 114, CSS 100, MATH 96, and MANF 140, or concurrent enrollment.

WT 212  Intermediate Wirefeed Welding  (9)
Fillet welds on carbon steel using the semi-automatic wirefeed FCAW and GMAW processes in the flat, horizontal, vertical and overhead positions. Introduction and/or review of shop safety, metal cutting, fitting, and gouging procedures. Prerequisite: WT 112, CSS 100, MATH 96, and MANF 140, or concurrent enrollment.

WT 213  Intermediate Inert Gas and Aluminum Welding  (9)
Fillet welds on aluminum and steel using GTAW and GMAW inert gas processes in the flat, horizontal, vertical and overhead positions. Introduction and/or review of shop safety, metal cutting, fitting, and gouging procedures. Prerequisite: WT 113, 117, CSS 100, MATH 96 and MANF 140, or concurrent enrollment.

WT 221  Shielded Metal Arc Welding Applications and Certification  (9)
Shield Metal Arc Welding (SMAW) certification and application. Covers all-position groove welding and general fabrication using the SMAW process. Covers techniques for passing a standard AWS welder qualification test. Includes trade math, blueprint reading, and layout techniques. Prerequisite: WT 211, CSS 100 and MATH 96 or concurrent enrollment.

WT 222  Wirefeed Welding Applications and Certification  (9)
All-position groove welding and general fabrication using wirefeed processes. Covers techniques for passing a standard AWS welder qualification test. Includes trade math, blueprint reading, and layout techniques. Prerequisite: WT 212, CSS 100, and MATH 96 or concurrent enrollment.

WT 223  Inert Gas and Aluminum Welding Applications & Certification  (9)
Gas Metal (GMAW) and Gas Tungsten Arc Welding (GTAW) certification and application. All-position groove welding and general fabrication of steel and aluminum using the GMAW and GTAW processes. Covers techniques for passing standard AWS welder qualification test. Includes trade math, blueprint reading, and layout techniques. Prerequisite: WT 213, CSS 100 and MATH 96 or concurrent enrollment.

WT 224  Shielded Metal Arc Welding 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 225  Flux-Cored Arc Welding 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 226  Gas Metal Arc Welding 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 227  Gas Tungsten Arc Welding 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 228  Gas Metal Arc Welding for Mechanics  (2)
Gas metal arc (MIG) welding for auto/diesel mechanics. Welding of steel plate in the flat position with emphasis on shop safety.

WT 229  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.