

Combination Welding



The mission of the Combination Welding Program is to streamline the entry process so that students can acquire those skills necessary to successfully pass the AWS-D1.1 structural and ASME 6G pipe certification tests so they are able to become successfully employed in the welding industry.

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Length of Course: 1080 (includes 45 hours for Math) clock hours, (630 in Structural Section and 450 Pipe Section) 172 training days

Enrollment: August and January

Training Hours: 8:30 a.m. to 3:30 p.m., Monday through Friday

Certificate Level: Combination Welding

Occupational Levels:

Certified Combination Welder
Combination Entry Level Welder

Industry Certifications:

National certification is available through an independent agency. This testing is an additional cost, and is performed in Anchorage. It is the student's responsibility to make transportation arrangements to the testing site. Contact the instructor for exact costs. In addition to earning the AVTEC Combination Welding Program certificate, students can also prepare for and earn the following industry certification:

Structural Certification to AWS structural steel code D1.1
Pipe Certification to ASME section IX, 6G Pipe

Entry Requirements:

For specific information on entry guidelines in reading and mathematics for this program, contact the Admissions Office at (800) 478-5389.

Physical requirements of the occupation are the ability to lift 100 pounds, carry 50 pounds, stoop, kneel, crawl, walk, and stand continuously. The student must have the ability to manipulate various types of welding equipment and welding processes, which require the ability to feed filler metal and manipulate the torch head for temperature or arc length. Have the ability to manipulate welding fixtures, place material in fixtures above your head and weld in various positions for extended periods. Welding requires good hand-eye coordination and eyesight corrected to 20/20 with excellent depth perception. We strongly recommend an eye examination prior to enrollment, so that corrective lenses or glasses may be obtained prior to the start of class.

Combination Welding

The future for welding careers looks bright. Certified, skilled welders continue to be in demand in the construction industry, and in all petroleum-related and heavy equipment industries. Graduates of AVTEC's Combination Welding Program hold good jobs in a wide variety of working settings. In short, Alaskan employers are always looking for highly trained welders—especially for those who are willing to work under occasionally adverse conditions.

Certified pipe welders continue to be in demand in the petroleum industry. Not only do pipes transport commodities in Alaska, they are also used to build structures, affording pipe welders the opportunity to apply their skills in a variety of work settings. With the Alaska Gas Pipeline on the horizon trained welders will be in even greater demand.

The Combination Welding Program emphasizes steel welding; however, all students are expected to become proficient welders on nonferrous materials such as aluminum. Primary focus is on stick electrode welding: students train on S.M.A.W. (stick electrode), G.M.A.W. and F.C.A.W. (wire feed processes), G.T.A.W. (TIG), plasma arc and air arc cutting, oxyacetylene welding, and cutting machines. Destructive tests are performed on groove welds in both the stick and wire feed processes.

The AVTEC Welding shops are equipped with state-of-the-art cutting and welding equipment, including computerized plasma cutting machines for plate and pipe.

Earn University of Alaska Credit While Attending AVTEC

Welding Technology graduates may earn up to 24 University of Alaska college credits (depending on coursework completed) while attending AVTEC.



Structural Section

Occupational levels of Structural Welder, Structural Welder SMAW, and Structural Welder Helper will be assigned upon successful completion of this section of the program. To advance to the Pipe section of the program students must earn the Structural Welder certificate level.

To achieve a Structural Welding certificate, students must complete the following requirements: Related Studies, O.A.W. - Oxyacetylene Welding, S.M.A.W. - Stick Electrode, G.M.A.W. - MIG, F.C.A.W - Flux Core, and G.T.A.W. - TIG. This is a total of 630 contact hours.

Related Studies

Contact Hours: 75

Participate in school safety orientation, complete achievement tests, obtain First Aid & CPR card, complete Welders Math, participate in resume writing and job search training, and in interview and communications training.

O.A.W. – Oxyacetylene Welding

Contact Hours: 40

Show knowledge of safety and operation of oxyacetylene welding and cutting equipment; describe and identify physical and mechanical properties as they relate to the weldability of metals; identify, demonstrate proper care of,

and correctly use common and specific tools used in the welding trades; identify and describe various AWS weld symbols.

S.M.A.W. – Stick Electrode

Contact Hours: 385

Demonstrate proficiency in stick electrode welding to the American Welding Society D1.1 standard; describe and demonstrate air carbon arc cutting and gouging; identify hard surfacing electrodes and produce acceptable welds in three positions using proper technique.

G.M.A.W. – MIG

Contact Hours: 40

Demonstrate basic skills in MIG welding technique.

F.C.A.W. – Flux Core

Contact Hours: 40

Demonstrate basic skills in flux cored arc welding technique.

G.T.A.W. – TIG

Contact Hours: 50

Demonstrate basic skills in TIG welding technique.

Pipe Welding Section

Occupational level of Certified Combination Welder will be assigned upon successful completion of this section of the program. If all of the Pipe Welding Section requirements are not completed, then a Combination Entry Level Welder Certificate will be earned. Emphasis is on making X-ray quality welds. Pipe welding students spend 90 percent of the day in welding lab and 10 percent in classroom instruction.

To achieve a Pipe Welding certificate, students must complete the following requirements: O.A.W. – as Pertains to Pipe, and S.M.A.W. – Pipe Welding. This is a total of 450 contact hours.

O.A.W. –as Pertains to Pipe

Contact Hours: 25

Use oxyacetylene cutting equipment to prepare pipe for welding.

S.M.A.W. – Pipe Welding

Contact Hours: 425

Perform open root plate welding in the 3G and 4G positions with sufficient quality to pass the AWS guided bend test. Perform open root pipe welding in the 2G, 5G, and 6G positions with sufficient quality to pass the ASME guided bend test. Perform downhill pipe welding in the 2G, 5G, and 6G position with sufficient quality to pass the API 1104 guided bend test. Prepare, tack weld and weld pipe in the 6G position using a backing ring; demonstrate basic skills in pipe layout and pipefitting fabrication; fabricate fittings from pipe; demonstrate basic pipe welding skills using the Gas Tungsten Arc welding process. Also, includes exposure to Flux core welding and blueprint reading.