

WELDING TECHNOLOGY

AWS S.E.N.S.E. Advanced Welder Associate of Applied Science Degree

Welders are in greater demand today than at any time during the past 30 years, and the job outlook is expected to remain excellent throughout the foreseeable future. They are needed in energy exploration and production and are required in virtually every field or industry that uses parts made of metal.

Simply stated, welders are people who join metals such as steel, stainless steel, aluminum, titanium, brass, bronze, copper, and nickel. Welding processes vary depending on the application. Extremely delicate and precise items, such as aerospace components and jewelry, may be welded using electron beams, lasers, and plasma, while huge structures for buildings and bridges are typically welded using submerged arc and flux core. Welding may take place in almost any setting: in a laboratory, out-of-doors, or even underwater, as in the case of offshore, oil-and-gas platform construction.

According to the US Department of Labor, job prospects for welders are excellent, with projected job growth in New Mexico estimated at 25.5 percent over the next six years, and 5 percent nationally through 2014, translating to 264,000 additional jobs. Increases in welder wages have kept pace with or exceeded those of other occupations since 2002.

The DACC Welding Technology program is nationally accredited by the American Welding Society (AWS), and is taught by nationally qualified instructors. DACC welding instructors have extensive welding experience (nuclear, pressure vessels, aerospace, etc.), numerous welding certifications (SMAW, GTAW, GMAW, FCAW, SAW), and extensive experience teaching welding technology. Several DACC welding instructors are AWS Certified Welding Educators (CWE), several of which are also AWS Certified Welding Inspectors (CWI).

The DACC Welding Technology program performs hundreds of welder performance qualification tests every year. DACC welding instructors hold AWS national endorsements for six welding/fabrication codes.

The program is competency and performance based, consisting of lectures and hands-on laboratory exercises. Students learn to weld steels, stainless steels, and aluminum alloy plate and pipe with five welding processes. They also learn basic fabrication skills, oxy-fuel cutting, plasma cutting, and air-carbon arc cutting. The DACC Welding Technology Program is one of a handful of programs, nationwide, that has an orbital TIG unit that allows students to join tubing as small as one-quarter inch in diameter. Students are also exposed to heat treating of steel and its effects with a heat-treating oven.

Students are eligible to join SkillsUSA, an organization for high school and postsecondary students that promotes leadership and sponsors skills and leadership competitions at the state and national levels. In addition, students may become members of the American Welding Society (AWS) and participate in the activities of the new AWS El Paso Section, of which two DACC welding instructors are founding members and three have served as officers.

All students who complete the certificate or associate degree will graduate as certified welders in one or more welding processes on steel, stainless steel, and/or aluminum. (It is important to note that, although some local welding jobs may not currently require certification, nearly all

welding jobs nationwide do require it.) DACC welding instructors are well known nationally and have many job contacts in the United States.

Since the technical requirements for the certificate are the same as those for the associate degree, a student may complete the certificate program first and then later apply all the credits earned in the certificate program toward the associate degree. This associate degree then may be applied in its entirety toward the bachelor of applied studies degree offered by NMSU. Alternatively, those planning to teach at the secondary level may apply up to 36 credits earned in the Welding Technology associate degree program toward a bachelor of science degree in Agricultural and Extension Education.

To enter the Welding Technology program, a high school diploma or GED is required, along with good overall health, eyesight, and hand-eye coordination. Students must purchase tools and personal safety equipment, usually costing about \$1000.

Whether taking classes or working on a job site, students enrolled in this program will be required to perform the same job duties and meet the same physical requirements that they will as a graduate in the field. These requirements include the ability to achieve performance qualifications using a variety of processes while welding materials in different positions. Depending where they find employment, graduates may be required to work in extreme temperatures, to lift and safely move 50 pounds, to have good eye-hand coordination, to work safely around compressed gasses and electrical equipment, to ascend and descend ladders, to work safely in confined spaces and awkward welding positions, and to tolerate a noisy working environment.

Additional Graduation Requirements

To receive either an associate degree or a certificate of completion, students are required to obtain a Career Readiness Certificate in the areas of Applied Math, Workplace Documents, and Graphic Literacy at the appropriate level for their respective degree option. OETS 102 Career Readiness Certification Preparation, is a course offered to assist the student in their preparation to attain the required Career Readiness Certificates. A program advisor can provide additional information.

Welding Technology - Associate of Applied Science

Welding Technology - Certificate of Completion

WELD 100. Structural Welding I

6 Credits (3+6P)

Development of basic skills in SMAW, OFC, and OFW in accordance with the AWS entry-level welder program.

WELD 102. Welding Fundamentals

3 Credits (2+2P)

Survey of welding and cutting processes for nonmajors. Classroom instruction and laboratory work with OFC/OFW, SMAW, GMAW, FCAW, and plasma arc cutting.

WELD 110. Blueprint Reading (Welding)

3 Credits

Interpretation of prints related to welding. Emphasis on AWS standard symbols for welding, brazing, and nondestructive examination.

WELD 112. Professional Development and Leadership

1 Credit

As members and/or officers of various student professional organizations, students gain experience in leadership, team building, and community service. Students competing or participating in Skills USA are required to register for the course. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: WELD majors. S/U Grading (S/U, Audit). Restricted to: Community Colleges only.

WELD 120. Basic Metallurgy

3 Credits

Properties of ferrous and nonferrous materials. Service conditions and heat treatment of metals related to welding trade.

Prerequisites: WELD 100 or consent of instructor.

WELD 125. Introduction to Pipe Welding

3 Credits (2+2P)

Pipe fit-up and welding techniques for pipe fitting and pipe weld joint using SMAW, GMAW, GTAW, and FCAW, 2G welding of pipe. Restricted to: Community Colleges only.

Prerequisite(s): WELD 100, WELD 130, and WELD 140, or consent of instructor.

WELD 130. Introduction to GMAW MIG)

3 Credits (2+2P)

Development of basic skills with gas metal arc welding (MIG) in accordance with AWS entry-level welder objectives. Wire electrodes, shielding/purge gases, and modes of metal transfer.

WELD 140. Introduction to GTAW TIG)

3 Credits (2+2P)

Development for basic skills with gas tungsten arc welding (TIG) in accordance with AWS entry/advanced welder objectives. Welding mild steel, tungsten electrode preparation, filler wire selection, and equipment set-up.

WELD 150. Pipe Welding II

3 Credits (2+2P)

Continuation of WELD 125; with fillet and groove welded joints in a horizontal fixed and 45-degree fixed positions (5-F, 5-G, 6-F, 6-G).

Prerequisite: WELD 125.

WELD 160. Introduction to SAW and FCAW

3 Credits (2+2P)

Submerged arc and flux-cored arc welding. Demonstrations and practice with machine travel submerged arc welding (SAW), flux-cored arc welding (FCAW-G, FCAW-S) on mild steel plate and pipe. Restricted to: Community Colleges only.

WELD 170. Welded Fabrication

3 Credits (1+4P)

Development of fabrication skills including basic layout, measuring, and utilization of various welding processes including out-of-position welding. Use of common shop tools.

Prerequisites: WELD 100, WELD 110, WELD 130, and OETS 104 or OETS 118.

WELD 180. GTAW II

3 Credits (2+2P)

Continuation of WELD 140. Development of more advanced GTAW skills. Emphasis on pipe welding with mild steel, stainless steel, and aluminum.

Prerequisite: WELD 140 or consent of instructor.

WELD 190. Welded Art

3 Credits (1+4P)

Students explore the possibilities of welded art in the form of sculpture, jewelry, furniture and as a framework to support other art media. Offered as an elective for students who wish to create art using welding.

Prerequisite: WELD 102 or consent of instructor.

WELD 205. Welding Equipment Maintenance

3 Credits (2+2P)

Hands-on experience in the maintenance and repair of welding equipment, including welding machines and associate shop equipment, as well as the development of preventative maintenance programs. Basic safety, including MSDS and Right-to-Know will be introduced. Restricted to: Community Colleges only.

Prerequisite(s): WELD 100, WELD 130, WELD 140, WELD 160.

WELD 211. Welder Qualification

6 Credits (3+6P)

Laboratory and classroom instruction on AWS and ASME Welder Performance Qualification Tests. All position plate and pipe techniques and tests for SMAW, GMAW, GTAW, FCAW, and SAW. Nondestructive and destructive examination methods. Basics of welding codes. Restricted to majors.

Prerequisites: OETS 104 or OETS 118; and WELD 100, WELD 110, WELD 120, WELD 130, WELD 140, WELD 160 and WELD 180 or consent of instructor.

WELD 221. Cooperative Experience I

1-6 Credits

Supervised cooperative work program. Student is employed in an approved occupation and supervised and rated by the employer and instructor. Student will meet in a weekly class. Graded S/U. Restricted to majors.

Prerequisites: WELD 100 or WELD 101 and consent of instructor.

WELD 230. Weld Testing

3 Credits (2+2P)

Covers destructive and nondestructive examination methods used to test welds. Tensile, compression, bend, hardness, impact, visual, dye-penetrant, magnetic particle, ultrasound, and radiographic methods of testing/examination. Restricted to: Community Colleges only.

Prerequisite(s): WELD 100, WELD 130, WELD 140, WELD 211, and OETS 104, or consent of instructor.

WELD 255. Special Problems in Welding Technology

1-6 Credits

Individual studies in areas of welding technology. May be repeated for a maximum of 12 credits.

Prerequisite: consent of instructor.

WELD 295. Special Topics

1-4 Credits

Topics to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

Name: Terry Mount, Department Chair

Office Location: DATS 155A

Phone: (575) 527-7593, 528-7018 or 527-7597

Website: <https://dacc.nmsu.edu/weld/>