

312 Welding

Definition

Welding is the most common way of permanently joining metal parts. Because of its strength, welding is used to construct and repair parts of ships, automobiles, spacecraft, and thousands of other products. Welding is also used to join beams and steel reinforcing rods in buildings, bridges, and highways. The program is designed to prepare students for employment in the welding field and related areas.

Staff

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Program Description

The welding curriculum provides training in manipulative skills, technical knowledge and related trade information.

Students must receive a minimum grade of "C" or better in all required core courses and the specific courses listed as program electives in order to qualify for the degree or certificate.

Distinctive Features

This program provides training that leads to Welding Certification—Los Angeles City Building Code.

Career Options

Assembly Worker
Auto Body Worker
Machine Tool Operator
Sheet Metal Worker
Tool and Die Maker
Welder

Certificate Program

The following courses (24 units) are required for the certificate.

Required Courses:	units
WELD, 110 Oxyacetylene Welding, Cutting and Brazing	2
WELD 120, Basic Shielded Metal Arc Welding	2
WELD 130, Advanced Shielded Metal Arc Welding	2
WELD 145, Advanced Welding Processes	4
WELD 211, Performance Welding-Oxy Welding Processes	2
WELD 212, Performance Welding-Arc Welding Processes	2
WELD 230, Welding Symbols and Print Reading	3
WELD 240, Welding Layout	3
WELD 260, Certification Welding-L.A. City Building Code	4
Total	24

For a recommended plan of study for the certificate, please refer to the Associate Degree plan minus the general education requirements.

Associate Degree

The requirements for an associate degree in Welding may be satisfied by completing 24 units of required courses, 21 units of general education requirements, and sufficient elective credits to total 60 units. (See Graduation/Associate Degree Requirements.)

Students who complete the associate degree have enhanced employability in the field of Welding Technology. They are well prepared for employment in a wide variety of welding applications including but not limited to, Shielded Metal Arc Welding (SMAW "Stick"), Gas Metal Arc Welding (GMAW "Mig"), Gas Tungsten Arc Welding (GTAW "Tig or Heliarc"). Students will also be able to read and interpret welding symbols and blue prints relating to welding application. Students will also have the experience and skills needed for welding inspection and management positions. The associate degree will also provide students with a broad range of knowledge with which to evaluate and appreciate the

physical environment, the culture, and the society in which they live and with the ability to think and communicate clearly and effectively.

Except in cases of a prerequisite requirement, it is not required to take courses in exactly this sequence; they are recommended in this order to facilitate success.

Recommended Plan of Study

First Semester	units
WELD, 110 Oxyacetylene Welding, Cutting and Brazing	2
WELD 120, Basic Shielded Metal Arc Welding	2
Course from GE requirement Area A	3
Course from GE requirement Area B	3
Course from GE requirement Area D1	3
Elective	3
Total	16

Second Semester	units
WELD 130, Advanced Shielded Metal Arc Welding	2
WELD 145, Advanced Welding Processes	4
Course from GE requirement Area C	3
Course from GE requirement Area D2	3
Elective	3
Total	15

Third Semester	units
WELD 212, Performance Welding-Arc Welding Processes	2
WELD 230, Welding Symbols and Print Reading	3
Course from GE requirement Area E	3
Course from GE requirement Area F	3
Elective	3
Total	14

Fourth Semester	units
WELD 211, Performance Welding-Oxy Welding Processes	2
WELD 240, Welding Layout	3
WELD 260, Certification Welding-L.A. City Building Code	4
Elective	6
Total	15

Degree Total 60

Transfer

Not a transfer major.

Prerequisite Completion

If a course is listed as a prerequisite for another course, that prerequisite course must be completed with a satisfactory grade in order to enroll in the next course. According to Title 5, Section 55200(d), a satisfactory grade is a grade of "A," "B," "C" or "P". Classes in which the Pass/No Pass option is available are indicated with an asterisk (*) before the course title. See "Pass/No Pass Option" in the catalog for full explanation.

Welding Courses

WELD 101 WELDING FUNDAMENTALS

2 units

4 hours weekly

Advisory: Eligibility for ENGL 099 and READ 099.

Designed for the student who does not intend to become employed in the welding industry but desires a background in welding for general education purposes and/or as a supportive course for his/her studies such as automotive mechanics, auto body repair, air conditioning and refrigeration, artistic sculpturing, etc. Instruction is given in the basic techniques of safely operating the Shielded Metal Arc Welding (SMAW) and oxyacetylene welding processes. (AVC)

WELD 110 *OXYACETYLENE WELDING, CUTTING AND BRAZING

2 units

4 hours weekly

Advisory: Eligibility for ENGL 099, READ 099 and MATH 070.

Designed for the student who seeks employment in the welding industry. Instruction given in the selection and use of Oxyacetylene Welding (OAW) equipment and in the basic techniques of safely welding light gage ferrous metal in the five American Welding Society defined joint configurations and in the flat and horizontal positions. Instruction is also provided for braze welding

procedures as well as hand and machine flame cutting. (AVC)

WELD 120 *BASIC SHIELDED METAL ARC WELDING

2 units

4 hours weekly

Advisory: Completion of WELD 110.

Designed for the student who seeks employment in the welding industry. Instruction given in the selection and use of Shielded Metal Arc Welding (SMAW) equipment and in the basic techniques of safely welding ferrous metal in the five American Welding Society defined joint configurations and in the flat, horizontal, vertical and overhead positions. Included is the selection and use of mild steel electrodes. (AVC)

WELD 130 *ADVANCED SHIELDED METAL ARC WELDING

2 units

4 hours weekly

Advisory: Completion of WELD 110 and WELD 120.

Continuation of WELD 120 in which the student will develop his/her manipulative welding skills to greater proficiency. Emphasis placed on the use of low hydrogen type shielded metal arc welding (SMAW) electrodes and welding in the vertical and overhead positions. Upon successful completion the student will be able to produce welds acceptable to meet the qualification requirements of welding operator set forth by the American Welding Society code book D1.1 Structural Steel. (AVC)

WELD 145 *ADVANCED WELDING PROCESSES

4 units

8 hours weekly

Advisory: Completion of WELD 130, and Eligibility for ENGL 099, READ 099 and MATH 070.

Designed for the student who seeks employment in the welding industry. Instruction is given in the basic techniques of safely welding steel and aluminum in the five American Welding Society defined joint configurations of flat,

horizontal, and vertical positions using the process of Gas Tungsten Arc Welding (GTAW) and Gas Metal Arc Welding (GMAW). The student will make fillet and groove welds in the flat, horizontal, vertical and overhead positions using the Flux Cored Arc Welding (FCAW) process. (AVC)

WELD 199 *OCCUPATIONAL WORK EXPERIENCE

1–8 units

hours vary

Prerequisite: To participate in work experience, students must have a job or internship which is either paid or voluntary and have the approval of the supervisor and instructor supervising work experience in the specific subject area. PRIOR TO ENROLLING, students must attend a scheduled orientation or meet individually with the supervising instructor for an individual orientation.

Occupational Work Experience Education is supervised employment designed to provide students a realistic learning experience through work. The ultimate goal is to teach students those skills and attitudes that will equip them to function and adapt as an employee in a variety of situations and jobs. Occupational Work Experience Education is supervised employment extending classroom-based occupational learning at an on-the-job learning station related to the students' educational major or occupational goal. Credit may be accrued at the rate of one to eight units per semester. For the satisfactory completion of all types of Cooperative Work Experience Education (WE 197 and WE 199), students may earn up to a total of sixteen semester credit hours. (CSU, AVC) (R3)

WELD 211 *PERFORMANCE WELDING–OXYACETYLENE WELDING PROCESSES

2 units

4 hours weekly

Advisory: Completion of WELD 110, and Eligibility for ENGL 099, READ 099 and MATH 070.

This course is designed for the student that seeks employment in the welding industry. Designed to provide additional

training to improve skills in all aspects of oxyacetylene welding and cutting. Advanced techniques will be introduced including welding in the vertical up and overhead positions. Advanced cutting techniques will focus on precision cutting on material to a predetermined size. (AVC) (R1)

WELD 212 *PERFORMANCE WELDING—ARC WELDING PROCESSES

2 units

4 hours weekly

Advisory: Completion of WELD 145, and Eligibility for ENGL 099, READ 099 and MATH 070.

This course is designed for the student that seeks employment in the welding industry. Provides additional training to improve skills in all aspects of the different arc welding processes. Advanced techniques will be covered more in-depth than in previous classes. The student can improve their skills in one or all of the following processes: Shielded Metal Arc Welding (SMAW), Flux Cored Arc Welding (FCAW), Gas Metal Arc welding (GMAW) and Gas Tungsten Arc Welding (GTAW). (AVC) (R3)

WELD 230 *WELDING SYMBOLS AND PRINT READING

3 units

3 hours weekly

Advisory: Completion of WELD 145, and Eligibility for ENGL 099, READ 099 and MATH 070.

Designed to give the student an introduction to the basic concepts of industrial drawing systems used in the fabrication and erection of welded components. Emphasis is placed upon the application and interpretation of welding symbols to drawings. Students will be given instruction in the basic use and techniques of drafting tools used to produce industry acceptable draws or prints. (AVC)

WELD 240 *WELDING LAYOUT

3 units

3 hours weekly

Advisory: Completion of WELD 230 or previous welding experience, and Eligibility for ENGL 099, READ 099 and MATH 070.

Designed to give the student an introduction to the techniques of applying shop mathematics for the purpose of fabricating welded structures. A study of standard material shapes, cutting procedures, joint design, and layout tools and their application is included. (AVC)

WELD 260 *CERTIFICATION WELDING—L.A. CITY BUILDING CODE

4 units

8 hours weekly

Advisory: Completion of WELD 145, and Eligibility for ENGL 099, READ 099 and MATH 070.

Designed for students who seek employment in the welding industry as an L.A. City certified structural steel welder. Provides preparation for the written and performance portions of the Welder Certification Test administered by the L.A. City Department of Building and Safety. The students' welding skills are tested in the same manner as when they take the welding performance test for the L.A. City certification. **NOTE:** The cost of the L.A. City Welder Certification is approximately \$350 per certification. (AVC)