

WELDING

Natural and Applied Sciences Division

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Welding

Welding Technology is an integral part of all industries that require the fabrication, maintenance, and repair of metal structures. The Welding Technology program at Cabrillo is designed to prepare students for entry-level employment in welding and fabrication related industries, which include agriculture, construction, manufacturing, marine technology, and transportation. Interested students can pursue Skills Certificate options, continued education/re-training and qualification testing for those currently in welding related trades.

NOTES:

- A mandatory materials fee for each course taken will be due during the first two weeks of the semester.
- We strongly recommend completion of MATH 254 or equivalent knowledge before enrolling in Welding Technology courses.
- Students who want to take additional courses to enhance their knowledge are encouraged to select from the following electives: BUS 15B, BUS 18, CG 54, CG 208, ENGR 5, ETECH 24, FT 7, W 155, W 190AZ, W 199C.
- Due to safety concerns caused by the use of potentially hazardous equipment, students must be 18 years of age or older to enroll in any Welding course.

Basic Welding Skills Certificate

Learning Outcomes

- In SMAW, perform and pass a standardized AWS qualification test on 3/8" steel plate in the flat and one or more welding positions other than flat using an E7018 class electrode.
- In GMAW, perform and pass a standardized AWS qualification test on 3/8" steel plate in the flat position and demonstrate consistency in performing single pass welds on sheet steel all positions.
- In GTAW, perform and show consistency in welding of steel, stainless steel and aluminum sheet stock in all positions and the welding of steel tubing in the 2G and 5G positions.
- Students will demonstrate skills in joining sheet metal by means of soldering, riveting, spot welding, and forming metal locks. In addition students will be able to develop a variety of patterns to form sheet metal components and transitions.

Core Courses Semester #1:

| | | |
|-------|--|---|
| W 151 | TIG Welding | 2 |
| W 156 | Introduction to Sheet Metal Fabrication..... | 2 |

Semester #2:

| | | |
|-------|-------------------------|---|
| W 150 | Arc Welding | 2 |
| W 152 | *Advanced Welding | 2 |

Total Units

8

*Requires W 150 or 151 (or demonstrated skill equivalence)

Advanced Welding Skills Certificate

Learning Outcomes

- In SMAW, perform and pass a standardized AWS qualification test on 3/8" steel plate in the 2G, 3G, and 4G welding positions using an E7018 class electrode.
- In GMAW, perform and pass a standardized AWS qualification test on 3/8" steel plate in the 2G, 3G, and 4G positions.
- In GTAW, perform and show consistency in welding of purged steel, stainless steel, and aluminum pipe and tubing in all positions.
- Students will demonstrate consistency in welding of steel pipe with the SMAW and GTAW methods in all positions and pass standardized AWS qualification testing of pipe weld coupons.
- Students will demonstrate consistency in interpreting blue prints, selecting and cutting metal stock, drilling, forming and preparing of parts; assembling, tacking and welding of components, and finishing of projects.

Semester #1:

| | | |
|--------|------------------------------|---|
| W 152A | **Advanced Arc Welding | 1 |
| W 154 | **Pipe Welding..... | 2 |

Semester #2:

| | | |
|-------|---------------------------|---|
| W 158 | *Welding Fabrication..... | 2 |
|-------|---------------------------|---|

Semester #3:

| | | |
|--------|------------------------------|---|
| W 152B | **Advanced MIG Welding | 1 |
|--------|------------------------------|---|

Semester #4:

| | | |
|--------|-----------------------------|---|
| W 152C | *Advanced TIG Welding | 1 |
|--------|-----------------------------|---|

Total Units

7

*Requires W 150 or 151 (or demonstrated skill equivalence)

**Requires W 152 (or demonstrated skill equivalence)

Welding Courses

W 150

Arc Welding

2 units; 1 hour Lecture, 3 hours Laboratory

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Introduces basic arc welding skills with an emphasis on safety, oxy-acetylene cutting, shielded metal arc welding, and GMAW (MIG) welding techniques. Must be at least 18 years old. Materials fees apply.

Transfer Credit: Non-transferable.

W 151 TIG Welding

2 units; 1 hour Lecture, 3 hours Laboratory

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Presents basic training in the flat and out-of-position welding of steels, aluminum, and stainless steel with the GTAW process. Must be at least 18 years old. Materials fees apply.

Transfer Credit: Non-transferable.

W 152 Advanced Welding

2 units; 1 hour Lecture, 3 hours Laboratory

Prerequisite: W 150 or W 151 or equivalent skills.

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Continues training in arc and gas welding in various positions; introduces MIG welding, TIG welding, flux cored arc welding and flame cutting. Must be at least 18 years old. Materials fees apply.

Transfer Credit: Non-transferable.

W 152A Advanced Arc Welding

1 unit; 3 hours Laboratory

Prerequisite: W 152 or equivalent skills.

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Presents continued advanced training in SMAW (Stick) welding techniques, focusing on the 3G and 4G positions with low hydrogen electrodes, enabling students to pass sample AWS welding code tests. Must be at least 18 years old. Materials fees apply.

Transfer Credit: Non-transferable.

W 152B Advanced MIG Welding

1 unit; 3 hours Laboratory

Prerequisite: W 152 or equivalent skills.

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Continues advanced training in GMAW (MIG) welding techniques, focusing on all positions and sheet steel gages, in preparation for light gage fabrication and body-fender repair applications. Must be at least 18 years old. Materials fees apply.

Transfer Credit: Non-transferable.

W 152C Advanced TIG Welding

1 unit; 3 hours Laboratory

Prerequisite: W 152 or equivalent skills.

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Continues advanced training in GTAW (TIG) welding techniques, focusing on all position welding of sheet gauge materials in steel, aluminum, and stainless steels. Must be at least 18 years old. Materials fees apply.

Transfer Credit: Non-transferable.

W 154 Pipe Welding

2 units; 1 hour Lecture, 3 hours Laboratory

Prerequisite: W 152 or equivalent skills.

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Continues advanced training in SMAW and GTAW welding with emphasis on out-of-position pipe and tube welding techniques. Must be at least 18 years old. Materials fees apply.

Transfer Credit: Non-transferable.

W 155 Ornamental Ironwork

2 units; 1 hour Lecture, 3 hours Laboratory

Prerequisite: W 150

Recommended Preparation: W 152; Eligibility for ENGL 100 or ESL 100 and READ 100.

Repeatability: May be taken a total of 1 time.

Introduces the practical applications of traditional and modern metal-working techniques focusing on the history, development, and present-day practices used in the fabrication of architectural ornamental ironwork. Applied safety, MIG welding, oxy-fuel welding, plasma cutting, metal forming and traditional hot forging practices are included. Must be at least 18 years old. Materials fees apply.

Transfer Credit: Non-transferable.

W 156 Introduction to Sheet Metal Fabrication

2 units; 1 hour Lecture, 3 hours Laboratory

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Presents an introduction to and basic training in metal forming, fastening, and blueprint reading skills. Develops thorough knowledge of use and application of related equipment. Must be at least 18 years old. Materials fees apply.

Transfer Credit: Non-transferable.

W 158 Welding Fabrication

2 units; 1 hour Lecture, 3 hours Laboratory

Prerequisite: W 150 or W 151.

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Presents advanced training in steel fabrication utilizing state-of-the-art welding processes with emphasis on blueprint interpretation and welding codes. Must be at least 18 years old. Materials fees apply.

Transfer Credit: Non-transferable.

W 190AZ Special Topics in Welding

0.5 – 5 units; 0.5 – 5 hours Lecture or 1.5 – 15 hours Laboratory

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100.

Repeatability: May be taken a total of 1 time.

Selected topics in Welding not covered by regular catalog offerings. Each special topic course will be announced, described, and given its own title and letter designation in the *Schedule of Classes*. The structure and format of the classes will vary depending on the subject matter.

Transfer Credit: Non-transferable.