

WELDING TECHNOLOGY CERTIFICATE OF ACHIEVEMENT (CA)

Welding Technology offers an opportunity to learn cognitive and manipulative welding skills which prepare the student for employment in occupations that use welding applications.

CAREER OPPORTUNITIES:

Welding is a lead skill in many construction and manufacturing industries, including industrial maintenance, petroleum, cross-country gas transmission, fabrication of goods and equipment, aerospace, food manufacturing, and biotec. Job titles include both manual welders and welding support personnel, including ironworkers, pile drivers, mill wrights, fabricators, welding supplies and equipment sales, weld inspection and weld engineers.

COURSE SEQUENCE

Core Courses (15 units):

MACH 205	Engineering Drawings for Machinists, Welders and Industrial Maintenance Technician	3
WELD 203A	Beginning Gas Tungsten Arc Welding	3
WELD 204A	Wire Feed Welding	3
WELD 205	Introduction to Welding	3
WELD 211A	Arc Welding I	3

Select three courses from the following (9 units):

WELD 203B	Intermediate Gas Tungsten Arc Welding	3
WELD 203C	Advanced Gas Tungsten Arc Welding	3
WELD 204B	Wire Feed Welding	3
WELD 211B	Arc Welding II	3
WELD 221A	Beginning Oxygen-Acetylene Welding	3

TOTAL MAJOR UNITS:	24
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Recommended:
MATH 202

PROGRAM LEARNING OUTCOMES

Upon completion of this program a student will be able to:

- Students will recognize the value of wearing safety glasses in the lab by: 1) describing the dangers to the eyes in the welding lab, (such as UV rays, projectiles, chemicals and sparks/molten material); 2) complying consistently with the Department policy of always wearing safety glasses in the lab.
 - Students will determine several advantages and disadvantages of a given welding process, and differentiate between different welding processes.
 - Students will correctly list steps for setup and shut down of regulator and torch set for Oxy Acetylene welding. In the lab, they will perform these steps and correctly adjust for a neutral flame.
 - Students will set up an arc welding power supply and its related components for SMAW, GMAW and GTAW processes, strike an arc, and complete a weld in the flat position compliant with AWS D1.1 code standards.
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WELDING TECHNOLOGY ASSOCIATE OF SCIENCE (AS)

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WELDING TECHNOLOGY (WELD)

The Welding Technology Program introduces students to both the theoretical and manipulative skills necessary to perform in a broad range of welding careers. Students practice several different types of manual welding and learn the technical and scientific aspects of the welding process.

WELD 200

Special Projects Laboratory

1-3 units, 3-9 hours laboratory (GR or P/NP)

Course study under this section may be repeated three times.

Open laboratory for working on selected projects: Provides the opportunity for advanced laboratory practice with emphasis on skills upgrading in all phases of welding. 0956.50

WELD 203A

Beginning Gas Tungsten Arc Welding (TIG)

3 units, 2 hours lecture, 4 hours laboratory (GR or P/NP)

Students must provide their own personal protective equipment (PPE).

Introduction to Gas Tungsten Arc Welding GTAW (TIG): Safe welding practices, use of Personal Protective Equipment (PPE), Material Safety Data Sheets (MSDS) theory and equipment. 0956.50

WELD 203B

Intermediate Gas Tungsten Arc Welding (TIG)

3 units, 2 hours lecture, 4 hours laboratory (GR or P/NP)

Prerequisite(s): WELD 203A

Students must provide their own personal protective equipment (PPE).

Continuation of WELD 203A: Safe welding practices, personal protective equipment (PPE), material safety data sheets (MSDS) theory and equipment. 0956.50

WELD 203C

Advanced Gas Tungsten Arc Welding (TIG)

3 units, 2 hours lecture, 4 hours laboratory (GR or P/NP)

Prerequisite(s): WELD 203B or Instructor's Approval

Students must provide their own personal protective equipment (PPE).

Continuation of WELD 203B: Advanced applications of GTAW (TIG) welding including safe welding practices, personal protective equipment (PPE), material safety data sheets (MSDS) theory, equipment and advanced processes. 0956.50

WELD 203D

Certification Gas Tungsten Arc Welding (TIG)

3 units, 2 hours lecture, 4 hours laboratory (GR or P/NP)

Prerequisite(s): WELD 203A

A fee will be charged for third-party laboratory testing. Students must provide their own personal protective equipment (PPE).

Gas Tungsten Arc Welding (GTAW): Safe welding practices, personal protective equipment (PPE), material safety data sheets (MSDS), defects, equipment and weld procedures. Laboratory includes certification testing and practice. 0956.50

WELD 204A

Wire Feed Welding I (GMAW/MIG)

3 units, 2 hours lecture, 4 hours laboratory (GR or P/NP)

Students must provide their own personal protective equipment (PPE).

Wire Feed Welding I: Wire feed welding at an introductory level, welding safety, plasma cutting, pre/post heating, welding symbols, and closed-root welding on steel plates with Gas-Shielded Flux-Cored wire. Students will have the opportunity to take American Welding Society (AWS) Certification tests. 0956.50

WELD 204B

Wire Feed Welding II (FCAW w/gas)

3 units, 2 hours lecture, 4 hours laboratory (GR or P/NP)

Prerequisite(s): WELD 204A or Instructor's Approval

Students must provide their own personal protective equipment (PPE).

Wire Feed Welding II: Increased proficiency in high quality welds at an intermediate level, welding safety, plasma cutting, pre/post heating, welding symbols, and closed-root welding on steel plates with Gas-Shielded Flux-Cored wire. Students will have the opportunity to take American Welding Society (AWS) Certification tests. 0956.50

WELD 204C

Wire Feed Welding III (FCAW/no Gas)

3 units, 2 hours lecture, 4 hours laboratory (GR or P/NP)

Prerequisite(s): WELD 204B or Instructor's Approval

Students must provide their own personal protective equipment (PPE).

Wire Feed Welding III: Increased proficiency in high quality welds at an advanced level, Welding Safety, Carbon Arc cutting, Weld Quality, physical characteristics of metals, and Closed-Root welding on Steel Plates with Self-Shielded Flux-Cored wire. Students will have the opportunity to take American Welding Society (AWS) Certification tests. 0956.50

WELD 205**Introduction to Welding**

3 units, 2 hours lecture, 4 hours laboratory (GR or P/NP)
Students must provide their own personal protective equipment (PPE).

Introduction to welding: Survey of manual processes (SMAW, GTAW, Oxygen-acetylene welding and cutting) and semi-automatic welding processes (wire feed, e.g. GMAW and FCAW), personal protective equipment (PPE), hazards associated with welding, identification of safe welding practices, and understanding a safety data sheets (SDS). 0956.50

WELD 211A**Shielded Metal Arc Welding I (SMAW/E7018)**

3 units, 2 hours lecture, 4 hours laboratory (GR or P/NP)
Recommended Preparation: For Safety reasons, Students must speak and understand the Spoken and Written English Language
Students must provide their own personal protective equipment (PPE).

Shielded Metal Arc Welding (Stick) I: Introductory level SMAW including welding safety, Oxy-Fuel cutting, equipment setup, bead welds, fillet welds, and welding on steel plates with E7018 electrodes. Students will have the opportunity to take American Welding Society (AWS) Certification tests.v0956.50

WELD 211B**Shielded Metal Arc Welding II (Stick/E6010)**

3 units, 2 hours lecture, 4 hours laboratory (GR or P/NP)
Prerequisite(s): WELD 211A or Instructor's Approval
Students must provide their own personal protective equipment (PPE).

Shielded Metal Arc Welding II (Stick): Intermediate level application of SMAW, including Welding Safety, Plasma Cutting, Metal Preparation, Electrodes, and Closed-Root welding on Steel Plates with E6010 electrodes. Students will have the opportunity to take American Welding Society (AWS) Certification tests. 0956.50

WELD 211C**Shielded Metal Arc Welding III, (Open Root)**

3 units, 2 hours lecture, 4 hours laboratory (GR or P/NP)
Prerequisite(s): WELD 211B or Instructor's Approval
Students must provide their own personal protective equipment (PPE).

Shielded Metal Arc Welding III (Stick): Advanced SMAW including welding safety, Carbon Arc cutting, proficiency in weld quality, joint fit-up, and Open-Root welding on steel plates with E6010 and 7018 electrodes. Students will have the opportunity to take American Welding Society (AWS) Certification tests. 0956.50

WELD 211D**Arc Welding IV**

3 units, 2 hours lecture, 4 hours laboratory (GR or P/NP)
Prerequisite(s): WELD 211C
Students must provide their own personal protective equipment (PPE).

Continuation of WELD 211C: Advanced skill level in all welding positions of open vee butts, pipe, and sheet metal; industrial alloys; oxyacetylene method of metal. 0956.50

WELD 215**Welding for ECT Technicians**

1.5 units, 1 hour lecture, 1.5 hours laboratory (GR)
Corequisite(s): ECT 13

Basic theory and manipulative practices of using various welding and brazing methods related to Environmental Control Technology: Electric welding, brazing and soldering using oxy-acetylene and gas cutting equipment. 0956.50

WELD 221A**Beginning Oxygen-Acetylene Welding (OAW)**

3 units, 2 hours lecture, 4 hours laboratory (GR or P/NP)
Students must provide their own personal protective equipment (PPE).

Basic principles and skills for Oxygen Acetylene Welding OAW (Gas Welding): Safe welding practices, use of Personal Protective Equipment (PPE), and Material Safety Data Sheets (MSDS); and hands-on welding practice. 0956.50

WELD 221B**Intermediate Oxygen-Acetylene Welding (OAW)**

3 units, 2 hours lecture, 4 hours laboratory (GR or P/NP)
Prerequisite(s): WELD 221A
Students must provide their own personal protective equipment (PPE).

Continuation of WELD 221A: Expansion of out-of-position welding. 0956.50

WELD 230**Introduction to Welding Metallurgy**

2 units, 2 hours lecture (GR or P/NP)
Students must provide their own personal protective equipment (PPE).

Welding metallurgy theory: Bonding, crystalline structures, phase diagram (Thermodynamics), kinetics, solidification, defects, strength, strengthening mechanisms. 0956.50

WELD 231A**Pipe Welding with SMAW**

3 units, 2 hours lecture, 4 hours laboratory (GR)

Prerequisite(s): WELD 211A

Students must provide their own personal protective equipment (PPE).

Procedures for setting up SMAW equipment for open-root V-groove welds: Preparation for and performing open-root V-groove welds on Carbon steel pipe. Procedures for making open-groove welds with SMAW equipment on pipe in the 1G-Rotated, 2G, 5G, and 6G positions. 0956.50

WELD 240**Introduction to Weld Inspection**

2 units, 2 hours lecture (GR or P/NP)

Students must provide their own personal protective equipment (PPE).

Basic code interpretation and nondestructive test methods theory: Ultrasonic Testing (UT) Magnetic Particle (MAG) Die Penetrant Visual Inspection. 0956.50

WELD 255**Survey Course for the Skilled Trades**

0.5 units, 1.5 hours laboratory (P/NP)

Corequisite(s): MACH 255, CARP 255, WDTEC 255

Introduction to the skilled trades Carpentry: Topics include safety, career opportunities, and hands on experience. Part of a four part series survey class including CARP 255, MACH 255, WDTEC 255. 0956.50

WELD 466M**Occupational Work Experience in Welding Technology**

1-4 units, 3.43-17.15 hours laboratory (GR)

Course study under this section may be repeated three times

Acceptable for credit: CSU

Supervised employment providing opportunities in welding or a related field: Develop desirable work habits, become a productive, responsible individual, and extend education experience with on the job training. Students may reenroll for a maximum of 16 units for occupational or a combination of general and occupational work experience education (including Regular and Alternate Plan and General/Occupational/Apprentice Work Experience). 0956.50

