

# WELDING TECHNOLOGY

## WELDING TECHNOLOGY COURSES

### WLDT 1 - Welding Camp

#### 1 unit

This course is designed to introduce the basics of shop safety, hand tools and welding. Fabrication of simple metal projects. Emphasis on practical uses and applications. 9 hours lecture, 27 hours laboratory. Transfer: CSU.

- Credit - Degree Applicable
- Grading Option: Pass/No Pass

### WLDT 10 - Machining for the Metal Trades

#### 4 units

This course is intended to show how machine tools are used in the metal trades and manufacturing, as well as how machine tools operate and when to use one particular machine instead of another. The advantage and disadvantage of various machining techniques as well as their application in the fabrication process are explored. Students will learn the use of drawings, hand tools, precision measuring tools, drilling machines, grinders, lathes, milling machines, and other specialized tools used to shape and finish metal and nonmetal parts. Additive and subtractive manufacturing techniques as well as related processes are explored. 36 hours lecture, 108 hours laboratory. Transfer: CSU.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

### WLDT 55 - Print Reading for Industry

#### 2 units

Interpreting and visualizing drawings and prints used in industrial settings. The role of prints in the digital age, geometric dimensioning and tolerancing to current standards. Foundational skills needed for print reading success, including basic mathematics, geometry principles, measurement tools, and the design process. Welding symbols and their use in manufacturing. 36 hours lecture. Transfer: CSU.

- Credit - Degree Applicable
- Grading Option: Letter Grade

### WLDT 61 - Welding Ferrous Metals

#### 3 units

Theory and safety of welding ferrous metals including steel, alloy steels, stainless steel, and cast iron for industrial applications. Welding processes SMAW, FCAW, GMAW, GTAW, as well as thermal cutting equipment, uses and applications will be covered. Discussion of American Welding Society Codes, nomenclature, terminology and welding symbols. Physical and mechanical properties of steels, numbering systems and filler metal selection will be discussed. Job opportunities, welder qualification testing and inspection, as well as welding procedure specifications will be explored. 54 hours lecture. Transfer: CSU.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

### WLDT 61A - Beginning SMAW and FCAW Theory

#### 1 unit

Theory and safety of Shielded Metal Arc (SMAW) and Flux-Core Arc (FCAW) welding of steel, flame cutting, plasma and carbon arc cutting. American Welding Society nomenclature, electrode and wire selection, job opportunities. Blueprint reading, welding symbols for welders and hazardous material regulation. 18 hours lecture.

**Corequisite:** WLDT 61AL or WLDT 61BL.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

### WLDT 61AL - SMAW Skills Laboratory

#### 2 units

Skills of Shielded Metal Arc (SMAW) welding in the flat, horizontal, vertical and overhead positions to American Welding Society code specifications. Oxy-fuel flame, plasma, and carbon arc cutting. Safe use and handling of welding equipment and consumables. 108 hours laboratory. Transfer: CSU.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

### WLDT 61B - Advanced SMAW and FCAW Theory

#### 1 unit

Theory and safety of Stick (SMAW) and Flux-core Arc (FCAW) welding of steel, flame cutting, plasma and carbon arc cutting. American Welding Society nomenclature, electrode and wire selection, job opportunities. Blueprint reading, welding symbols for welders and hazardous material regulations. 18 hours lecture. Transfer: CSU.

**Corequisite:** WLDT 61AL or WLDT 61BL.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

### WLDT 61BL - FCAW Skills Laboratory

#### 2 units

Flux Cored Arc (FCAW) welding in the flat, horizontal, vertical and overhead positions to American Welding Society code specifications. Oxy-fuel flame, plasma, and carbon arc cutting. Safe use and handling of welding equipment and consumables. 108 hours laboratory. Transfer: CSU.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

### WLDT 62 - Welding Nonferrous Metals

#### 3 units

Theory and safety of welding non ferrous metals including but not limited to Aluminum, Magnesium, Copper, Nickel, Titanium and their alloys for industrial applications. GMAW, GTAW, flame cutting, plasma and carbon arc cutting processes equipment, uses and applications will be covered. Discussion of American Welding Society Codes, nomenclature, electrode and wire selection will occur. Physical and mechanical properties of nonferrous metals, numbering systems and filler metal selection will be discussed. Job opportunities, welding symbols and hazardous material regulations. Welder qualification testing and inspection, as well as welding procedure specifications will be explored. 54 hours lecture. Transfer: CSU.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

### WLDT 62A - Beginning GTAW and GMAW Theory

#### 1 unit

Theory of fuel and inert gas welding of steel, stainless steel and aluminum alloys, Oxy-Fuel welding, Oxy fuel brazing, flame cutting, and plasma cutting. Gas Tungsten Arc (GTAW) and Gas Metal Arc (GMAW) welding equipment and supplies. Nomenclature and metallurgy of steel, stainless steel and aluminum alloys. Introduction to blueprint reading and welding symbols. Hazardous material regulations and safety data sheets. 18 hours lecture. Transfer: CSU.

**Corequisite:** WLDT 62AL or WLDT 62BL.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

### WLDT 62AL - GTAW Skills Laboratory

#### 2 units

Skills of Gas Tungsten Arc (GTAW) welding in the flat, horizontal, vertical and overhead positions to American Welding Society code specifications. Oxy-fuel flame, plasma, and carbon arc cutting. Safe use and handling of welding equipment and consumables. 108 hours laboratory. Transfer: CSU.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

## WLDT 62B - Advanced GTAW and GMAW Theory

1 unit

Theory of fuel and inert gas welding of Non-Ferrous alloys, Oxy-Fuel welding, Oxy fuel brazing, flame cutting, and plasma cutting. Gas Tungsten Arc (GTAW) and Gas Metal Arc (GMAW) welding equipment and supplies. Nomenclature and metallurgy of Non-Ferrous alloys. Introduction to blueprint reading and welding symbols. Hazardous material regulations and safety data sheets. 18 hours lecture. Transfer: CSU.

**Corequisite:** WLDT 62AL or WLDT 62BL.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

## WLDT 62BL - GMAW Skills Laboratory

2 units

Skills of Gas Tungsten Arc (GTAW) welding in the flat, horizontal, vertical and overhead positions to American Welding Society code specifications. Oxy-fuel flame, plasma, and carbon arc cutting. Safe use and handling of welding equipment and consumables. 108 hours laboratory. Transfer: CSU.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

## WLDT 63 - Welding Layout and Fitting

2 units

Interpretation of welding blueprints by making welding layouts and weldment fits. Current methods, practices, and recommended procedures. Use of jigs, fixtures, holding devices, and welding sequences. Methods of straightening and restoring dimensions to finished product. Laboratory includes SMAW, GMAW, GTAW, and/or FCAW welding, plasma and oxy-fuel cutting. 27 hours lecture, 27 hours laboratory. Transfer: CSU.

**Prerequisite:** WLDT 61AL with a minimum grade of C (May be taken concurrently); or WLDT 61BL with a minimum grade of C (May be taken concurrently); or WLDT 62AL with a minimum grade of C (May be taken concurrently); or WLDT 62BL with a minimum grade of C (May be taken concurrently).

**Recommended Course Preparation:** WLDT 55 with a minimum grade of C.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

## WLDT 66 - Welding Inspection and Testing

2 units

Theory and skills in performing inspections and tests using destructive and nondestructive methods. American Welding Society (AWS) codes and their role in welding inspection. The role and duties of the Certified Welding Inspector (CWI). 27 hours lecture, 27 hours laboratory. Transfer: CSU.

**Recommended Course Preparation:** WLDT 61AL with a minimum grade of C or WLDT 62AL with a minimum grade of C.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

## WLDT 67A - Elementary Welding Skills Laboratory

2 units

Development and improvement of skills in Shielded Metal Arc (SMAW), Flux Cored Arc (FCAW), Gas Metal Arc (GMAW), and/or Gas Tungsten Arc (GTAW) welding in the Flat (1G and 1F) positions. 108 hours laboratory. Transfer: CSU.

**Recommended Course Preparation:** WLDT 61AL with a minimum grade of C or WLDT 62AL with a minimum grade of C or WLDT 70 with a minimum grade of C or WLDT 71 with a minimum grade of C.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

## WLDT 67B - Basic Welding Skills Laboratory

2 units

Development and improvement of skills in Shielded Metal Arc (SMAW), Flux Cored Arc (FCAW), Gas Metal Arc (GMAW), and/or Gas Tungsten Arc (GTAW) welding in the Horizontal (2G and 2F) positions. 108 hours laboratory. Transfer: CSU.

**Recommended Course Preparation:** WLDT 67A with a minimum grade of C.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

## WLDT 67C - Intermediate Welding Skills Laboratory

2 units

Development and improvement of skills in Shielded Metal Arc (SMAW), Flux Cored Arc (FCAW), Gas Metal Arc (GMAW), and Gas Tungsten Arc (GTAW) welding in the Vertical (3G and 3F) positions. 108 hours laboratory. Transfer: CSU.

**Prerequisite:** WLDT 67B with a minimum grade of C.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

## WLDT 67D - Advanced Welding Skills Laboratory

2 units

Development and improvement of skills in Shielded Metal Arc (SMAW), Flux Cored Arc (FCAW), Gas Metal Arc (GMAW), and Gas Tungsten Arc (GTAW) welding in the Overhead (4G and 4F) positions. 108 hours laboratory. Transfer: CSU.

**Prerequisite:** WLDT 67C with a minimum grade of C.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

## WLDT 67L - Welding Skills Laboratory

2 units

Development and improvement of skills in Shielded Metal Arc (SMAW), Flux Cored Arc (FCAW), Gas Metal Arc (GMAW), and/or Gas Tungsten Arc (GTAW) welding, or other welding related skills. 108 hours laboratory. Transfer: CSU.

**Recommended Course Preparation:** WLDT 61AL with a minimum grade of C or WLDT 61BL with a minimum grade of C or WLDT 62AL with a minimum grade of C or WLDT 62BL with a minimum grade of C.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

## WLDT 68 - Certification Preparation

2 units

Welding skills preparation for certification testing. Application of American Welding Society D1.1, American Society of Mechanical Engineers Section IX and American Petroleum Institute 1104 as it relates to welder certification. 108 hours laboratory. Transfer: CSU.

**Prerequisite:** WLDT 61AL with a minimum grade of C or WLDT 61BL with a minimum grade of C or WLDT 62AL with a minimum grade of C or WLDT 62BL with a minimum grade of C or WLDT 69A with a minimum grade of C or WLDT 69B with a minimum grade of C.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

## WLDT 69A - Beginning Pipe Welding

3 units

Theory and practical application of: pipe joint preparation and design, API (American Petroleum Institute) and AWS (American Welding Society) welding codes specification for pipe and pipe fittings, analysis of joint configuration,

plasma and flame cutting of pipes, wire and electrodes selections, beginning of pipe welding blue print and welding symbols, SMAW, GMAW, FCAW and GTAW of pipe joints, non-destructive and destructive test and qualitative concepts of evaluation. Welding in the 1G and 2G positions. 18 hours lecture, 108 hours laboratory. Transfer: CSU.

**Prerequisite:** WLDT 61BL with a minimum grade of C or WLDT 62BL with a minimum grade of C.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

## WLDT 69AL - Beginning Pipe Welding Skills Laboratory

### 2 units

Practical application of skills with respect to; pipe joint preparation and design, API (American Petroleum Institute) ASME (American Society of Mechanical Engineering) and AWS (American Welding Society) welding codes specification for pipe, tubing and pipe fittings, analysis of joint configuration, plasma and flame cutting of pipes, wire and electrodes selections, beginning of pipe welding blue prints, SMAW, GMAW, FCAW and/or GTAW of pipe joints, non-destructive and destructive test and qualitative concepts of evaluation. Welding in the 1G and 2G positions. 108 hours lecture. Transfer: CSU.

**Prerequisite:** WLDT 61AL with a minimum grade of C or WLDT 61BL with a minimum grade of C or WLDT 62AL with a minimum grade of C or WLDT 62BL with a minimum grade of C.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

## WLDT 69B - Advanced Pipe Welding

### 3 units

Theory and practical application of: pipe joint preparation and design, API (American Petroleum Institute) and AWS (American Welding Society) welding codes specification for pipe and pipe fittings, analysis of joint configuration, plasma and flame cutting of pipes, wire and electrodes selections, beginning of pipe welding blue print and welding symbols, SMAW, GMAW, FCAW and GTAW of pipe joints, non-destructive and destructive test and qualitative concepts of evaluation. Welding in the 5G and 6G positions. 18 hours lecture, 108 hours laboratory. Transfer: CSU.

**Prerequisite:** WLDT 69A with a minimum grade of C.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

## WLDT 69BL - Advanced Pipe Welding Skills Laboratory

### 2 units

Practical application of skills with respect to pipe joint preparation and design, API (American Petroleum Institute) and AWS (American Welding Society) welding codes specification for pipe and pipe fittings, analysis of joint configuration, plasma and flame cutting of pipes, wire and electrodes selection, additional pipe welding blueprint and welding symbols, SMAW, GMAW, FCAW and GTAW of pipe joints, non-destructive and destructive test and qualitative concepts of evaluation. Welding in the 5G and 6G positions. 108 hours lecture. Transfer: CSU.

**Prerequisite:** WLDT 69AL with a minimum grade of C.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

## WLDT 70 - Introduction to Welding

### 2 units

Basic skills in Shielded Metal Arc (SMAW), Gas Tungsten Arc (GTAW), Gas Metal Arc (GTAW) and Flux Core Arc (FCAW) welding. Oxy-fuel welding and thermal cutting. Emphasis on safety, proper usage, theory and care of welding equipment. 18 hours lecture, 54 hours laboratory. Transfer: CSU.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

## WLDT 71 - Welding for the Arts

### 3 units

Provides basic welding, shop skills and instruction that artistically inclined individuals should know in order to be effective in the process of creating metal art and sculpture. Provides instruction on types of metals (aluminum, iron, steel, cast iron, bronze, stainless steel, etc.), mechanical fastenings, cutting and permanent joining together of metals and alloys through welding processes such as SMAW, GMAW, GTAW, FCAW, oxyacetylene and braze welding, plasma and fuel gas cutting. Instruction includes general shop safety, equipment use, finishing, welding electricity fundamentals, welding consumable identification, and hazardous materials regulation. 36 hours lecture, 54 hours laboratory. AA/AS GE: III. Transfer: CSU; CSUGE: C1.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

## WLDT 72 - Laser Welding and Cutting

### 3 units

This course will cover the theory and concepts associated with modern laser welding and cutting of metals and materials. The use of the laser in the manufacturing environment will be shown along with typical applications. The different types of lasers available for welding. The advantages and disadvantages of continuous power laser welding, pulsed laser welding and laser cutting. 36 hours lecture, 54 hours laboratory.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

## WLDT 73 - Welding Workplace Safety

### 1 unit

This course provides the safety knowledge required to operate safely in a welding or construction workplace environment. This course will emphasize hazard identification, avoidance and control as a means to proactively create a safe workplace environment. OSHA safety standards will be emphasized throughout to maintain consistency with workplace environment. This course meets the 10 hour OSHA construction safety training requirements. 18 hours lecture. Transfer: CSU.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

## WLDT 75 - Measurements and Calculations

### 4 units

Math calculations based on manufacturing applications. Precision and semi-precision measuring tools used in manufacturing and the role they play in generating numerical data used in shop floor calculations. Use of the calculator to simplify shop floor math applications relevant to the skilled trades. 72 hours lecture. Transfer: CSU.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass

## WLDT 79 - Manufacturing Processes

### 2 units

This course examines the processes and equipment used in modern manufacturing. This course provides an excellent introduction to today's manufacturing processes, as well as an overview of the processes and equipment used in modern manufacturing. The course concentrates on the five major types of industrial materials; metals, plastics, ceramics, woods, and composites. It provides thorough coverage of the forming, separating, fabricating, conditioning, and finishing processes related to each material. Understanding the relationship between manufacturing processes, materials properties, materials processing and design. 36 hours lecture. Transfer: CSU.

- Credit - Degree Applicable
- Grading Option: Letter or Pass/No Pass