

# SLO Presentation

WELD

Date: 09/11/2019

<b>TECHNOLOGY</b>
<b>WELD</b>
<b>Arc Welding--AA</b> <ul style="list-style-type: none"><li>• Students will correctly setup plasma arc cutting equipment and perform manual plasma arc cutting operations with an acceptable appearance.</li><li>• Students will correctly setup oxyacetylene flame cutting equipment and perform manual oxyacetylene flame cutting operations with and acceptable appearance.</li><li>• Students will use the shielded metal arc welding process with E7018 and E6010 arc welding electrodes to produce fillet welded tee joint and lap joint projects with an acceptable appearance.</li><li>• Students will assemble and weld various projects using a standard tape measure to make accurate measurements using the fractional measurement system.</li><li>• Students will fabricate and weld various projects by converting decimal measurements into the fractional measurement system..</li><li>• Students will interpret fillet weld symbols used on blueprints to assemble and weld various structural joint designs.</li><li>• Students will interpret groove weld symbols used on blueprints to assemble and weld various structural joint designs.</li></ul>
<b>Arc Welding--Cert</b> <ul style="list-style-type: none"><li>• Students will correctly setup plasma arc cutting equipment and perform manual plasma arc cutting operations with an acceptable appearance.</li><li>• Students will correctly setup oxyacetylene flame cutting equipment and perform manual oxyacetylene flame cutting operations with and acceptable appearance.</li><li>• Students will use the shielded metal arc welding process with E7018 and E6010 arc welding electrodes to produce fillet welded tee joint and lap joint projects with an acceptable appearance.</li><li>• Students will assemble and weld various projects using a standard tape measure to make accurate measurements using the fractional measurement system.</li><li>• Students will fabricate and weld various projects by converting decimal measurements into the fractional measurement system.</li><li>• Students will interpret fillet weld symbols used on blueprints to assemble and weld various structural joint designs.</li><li>• Students will interpret groove weld symbols used on blueprints to assemble and weld various structural joint designs.</li></ul>
<b>Gas Tungsten Arc Welding--AA</b> <ul style="list-style-type: none"><li>• Students will fillet weld aluminum lap and tee joint projects using various sizes of ER5356 and ER4043 aluminum filler wires with an acceptable appearance.</li><li>• Students will fillet weld steel lap and tee joint projects using various sizes of ER70S-2 steel filler wires with an acceptable appearance.</li><li>• Students will use the shielded metal arc welding process with E7018 and E6010 arc welding electrodes to produce fillet welded tee joint and lap joint projects with an acceptable appearance.</li><li>• Students will assemble and weld various projects using a standard tape measure to make accurate measurements using the fractional measurement system.</li><li>• Students will fabricate and weld various projects by converting decimal measurements into the fractional measurement system.</li><li>• Students will interpret fillet weld symbols used on blueprints to assemble and weld various structural joint designs.</li><li>• Students will interpret groove weld symbols used on blueprints to assemble and weld various structural joint designs.</li></ul>
<b>Gas Tungsten Arc Welding--Cert</b> <ul style="list-style-type: none"><li>• Students will assemble and weld various projects using a standard tape measure to make accurate measurements using the fractional measurement system.</li><li>• Students will fabricate and weld various projects by converting decimal measurements into the fractional measurement system.</li><li>• Students will fillet weld aluminum lap and tee joint projects using various sizes of ER5356 and ER4043 aluminum filler wires with an acceptable appearance.</li><li>• Students will fillet weld steel lap and tee joint projects using various sizes of ER70S-2 steel filler wires with an acceptable appearance.</li><li>• Students will interpret fillet weld symbols used on blueprints to assemble and weld various structural joint designs.</li><li>• Students will interpret groove weld symbols used on blueprints to assemble and weld various structural joint designs.</li></ul>

- Students will use the shielded metal arc welding process with E7018 and E6010 arc welding electrodes to produce fillet welded tee joint and lap joint projects with an acceptable appearance.

### **Pipe Welding--AA**

- Students will use oxyacetylene flame cutting equipment and plasma arc cutting equipment to prepare groove welding and pipe welding joint geometry with and acceptable appearance.
- Students will make measurements on pipe using templates, pipe wraparounds, and layout tooling to accurately cut pipe with and acceptable appearance.
- Students will use the shielded metal arc welding process with E7018 and E6010 arc welding electrodes to produce fillet welded tee joint and lap joint projects with an acceptable appearance.
- Students will assemble and weld various projects using a standard tape measure to make accurate measurements using the fractional measurement system.
- Students will fabricate and weld various projects by converting decimal measurements into the fractional measurement system.
- Students will interpret fillet weld symbols used on blueprints to assemble and weld various structural joint designs.
- Students will interpret groove weld symbols used on blueprints to assemble and weld various structural joint designs.

### **Pipe Welding--Cert**

- Students will assemble and weld various projects using a standard tape measure to make accurate measurements using the fractional measurement system.
- Students will fabricate and weld various projects by converting decimal measurements into the fractional measurement system.
- Students will interpret fillet weld symbols used on blueprints to assemble and weld various structural joint designs.
- Students will interpret groove weld symbols used on blueprints to assemble and weld various structural joint designs.
- Students will make measurements on pipe using templates, pipe wraparounds, and layout tooling to accurately cut pipe with and acceptable appearance.
- Students will use oxyacetylene flame cutting equipment and plasma arc cutting equipment to prepare groove welding and pipe welding joint geometry with and acceptable appearance.
- Students will use the shielded metal arc welding process with E7018 and E6010 arc welding electrodes to produce fillet welded tee joint and lap joint projects with an acceptable appearance.

### **Structural Fabrication--AA**

- Students will use industrial metal fabrication equipment to cut, cope, miter, and fabricate various structural steel parts to specific dimensions.
- Students will use oxyacetylene flame cutting and plasma arc cutting equipment to cut, cope, miter, and fabricate various structural steel parts to specific dimensions.
- Students will use the shielded metal arc welding process with E7018 and E6010 arc welding electrodes to produce fillet welded tee joint and lap joint projects with an acceptable appearance.
- Students will assemble and weld various projects using a standard tape measure to make accurate measurements using the fractional measurement system.
- Students will fabricate and weld various projects by converting decimal measurements into the fractional measurement system.
- Students will interpret fillet weld symbols used on blueprints to assemble and weld various structural joint designs.
- Students will interpret groove weld symbols used on blueprints to assemble and weld various structural joint designs.

### **Structural Fabrication--Cert**

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- Students will use oxyacetylene flame cutting and plasma arc cutting equipment to cut, cope, miter, and fabricate various structural steel parts to specific dimensions.
- Students will use the shielded metal arc welding process with E7018 and E6010 arc welding electrodes to produce fillet welded tee joint and lap joint projects with an acceptable appearance.
- Students will assemble and weld various projects using a standard tape measure to make accurate measurements using the fractional measurement system.
- Students will fabricate and weld various projects by converting decimal measurements into the fractional measurement system.
- Students will interpret fillet weld symbols used on blueprints to assemble and weld various structural joint designs.
- Students will interpret groove weld symbols used on blueprints to assemble and weld various structural joint designs.

### **CSLO**

WELD43 - Welding Occupational Work Experience

- Have completed an up to date resume.

#### WELD44 - Welding Occupational Work Experience

- Have completed an up to date resume.

#### WELD49 - Welding Shop Math

- Students use a standard tape measure to make accurate measurements using the fractional measurement system.
- Students use a dial caliper to accurately measure parts according to the decimal system.
- Students convert fractional measurements into the decimal measurement system.
- Students convert decimal measurements into the fractional measurement system.
- Students convert standard measurements into the metric measurement system.
- Students convert metric measurements into the standard measurement system.

#### WELD51L - Advanced ARC Welding Specialty Lab

- Upon completion of this course, one hundred percent (100%) of the students will have improved their motor skills on their chosen welding process by forty percent (40%).
- Students weld a vertical position 6 pass tee joint project using E7018 arc welding electrodes with an acceptable appearance.
- Students weld a vertical position 6 pass tee joint project using E6010 arc welding electrodes with an acceptable appearance.
- Students weld an overhead position 6 pass tee joint project using E7018 arc welding electrodes with an acceptable appearance.
- Students weld an overhead position 6 pass tee joint project using E6010 arc welding electrodes with an acceptable appearance.

#### WELD52 - Pipe Welding Fundamentals

- Students will have the ability to weld open root vee-groove joints in the horizontal (2G), vertical (3G) and overhead (4G) positions using E6010 electrodes with acceptable tolerances and appearance.
- Students will use oxyacetylene flame cutting equipment to accurately prepare groove weld joint geometry.
- Students will have the ability to weld open root vee-groove joints in the horizontal (2G), vertical (3G) and overhead (4G) positions using E7018 electrodes with acceptable tolerances and appearance.
- Students will use plasma arc cutting equipment to accurately prepare groove weld joint geometry.
- Students weld a vertical position open root vee groove project using E6010 arc welding electrodes with an acceptable reinforcement and appearance.
- Students weld a horizontal position open root vee groove project using E6010 arc welding electrodes with an acceptable reinforcement and appearance.
- Students weld an overhead position open root vee groove project using E6010 arc welding electrodes with an acceptable reinforcement and appearance.
- Students weld a flat position open root vee groove project using E6010 Arc Welding Electrodes with an acceptable reinforcement and appearance.
- Students will weld a pipe to pipe connection in the flat rolling position with an acceptable reinforcement and appearance.

#### WELD53 - Pipe Layout

- Students setup and adjust an oxyacetylene cutting torch assembly for pipe cutting operations.
- Students measure piping using templates, wrap around, and layout tooling to accurately flame cut pipe.
- Students layout, fabricate, and tack weld a pipe to flange assembly project to detailed dimensions.
- Students tack weld a pipe flange assembly to a pre-fabricated butt welded tee joint connection.

#### WELD54L - Advanced Pipe Welding

- Students weld a vertical position open root vee groove project using E6010 electrodes for the root pass and E7018 electrodes for the hot & cover passes with an acceptable reinforcement and appearance.
- Students weld a horizontal position open root vee groove project using E6010 electrodes for the root pass and E7018 electrodes for the hot & cover passes with an acceptable reinforcement and appearance.
- Students weld an overhead position open root vee groove project using E6010 electrodes for the root pass and E7018 electrodes for the hot & cover passes with an acceptable reinforcement and appearance.
- Students weld a flat position open root vee groove project using E6010 electrodes for the root pass and E7018 electrodes for the hot & cover passes with an acceptable reinforcement and appearance.

#### WELD56L - Arc Welding 6" Pipe Certification Laboratory

- Weld 6" Schedule 40 piping in the 1G position using E6010 and E7018 electrodes with acceptable penetration and appearance

- Weld 6" Schedule 40 piping in the 6G position using E6010 and E7018 electrodes with acceptable penetration and appearance
- Weld 6" Schedule 80 piping in the 6G position using E6010 and E7018 electrodes with acceptable penetration and appearance
- Weld 6" Schedule 80 pipe connections in the 45 degree fixed position, adhering to the American Society of Mechanical Engineers (ASME) Pressure Vessel Code

#### **WELD58L - Arc Welding 2" Pipe Certification Laboratory**

- Weld 2" Schedule 80 piping, in the 5G position using E6010 and E7018 electrodes with acceptable penetration and appearance
- Weld 2" Schedule 160 piping, in the 6G position using E6010 and E7018 electrodes with acceptable penetration and appearance
- Weld 2" Schedule 160 pipe connections in the 45 degree fixed position, adhering to the American Society of Mechanical Engineers (ASME) Pressure Vessel Code

#### **WELD59 - Blueprint Reading for the Welding Trades**

- Students identify the six orthographic views of a structural part.
- Students illustrate orthographically the front, top and right side views of a structural part.
- Students interpret the various alphabet of lines commonly found on a blueprint.
- Students interpret fillet weld symbols used on a structural steel blueprint.
- Students interpret groove weld symbols used on a structural steel blueprint.
- Students identify parts and components listed on a structural steel blueprint bill of material.

#### **WELD60 - Welding and Metal Fabrication Safety**

- Students identify the four classifications of fires as classified by the National Fire Protection Association.
- Students identify the four types of portable fire extinguishers.
- Students identify the approved eye and face protection specifications under the ANSI 87.1 code.
- Students identify the specifications for headwear protection under the ANSI 89.1 code.

#### **WELD81L - Shielded Metal Arc Welding (SMAW) Specialty Laboratory**

- Improve motor skills in the SMAW welding process
- Enhance welding skills in order to achieve a personal goal
- Learn proper safety procedures to set up and operate a manual and mechanical oxy-acetylene outfit
- Learn proper techniques and skills in the vertical and overhead positions using the SMAW process

#### **WELD82L - Semiautomatic Welding Process Specialty Laboratory**

- Improve motor skills in the semi automatic welding processes
- Enhance the necessary welding skills in order to achieve a personal goal
- Learn proper safety procedures to set up and operate a manual and mechanical oxy-acetylene cutting outfit
- Learn proper safety procedures to set up and operate a manual and mechanical oxy-acetylene cutting outfit
- Learn proper techniques and skills in the vertical and overhead positions using the FCAW process

#### **WELD83L - Gas Tungsten Arc Welding Specialty Laboratory**

- Improve their motor skills on the GTAW welding process
- Students weld a horizontal aluminum padding project using ER5356 size 3/32" filler wire with an acceptable appearance.
- Weld a horizontal fillet welded project using ER 5356 with an acceptable appearance
- Students weld a horizontal aluminum tee joint project using ER5356 size 1/16" filler wire with an acceptable appearance.
- Weld a horizontal fillet welded tee joint project using ER 308 with an acceptable appearance
- Students weld a horizontal aluminum tee joint project using ER5356 size 3/32" filler wire with an acceptable appearance.
- Students weld a horizontal stainless steel lap joint project using ER308 size 1/16" filler wire with an acceptable appearance.

#### **WELD100 - Welding Fundamentals**

- Student weld a flat position padding project using E6013 arc welding electrodes with an acceptable appearance.
- Student weld a flat position padding project using E7018 arc welding electrodes with an acceptable appearance.

- Student Gas Metal Arc Weld a horizontal fillet welded lap joint project with an acceptable appearance.
- Student Gas Metal Arc Weld a flat fillet welded tee joint project with an acceptable appearance.
- Students have the ability to setup and adjust an oxyacetylene cutting system to ANSI Z49.1 safety standards and successfully perform manual flame cutting with acceptable tolerances and appearances.

### WELD120 - Beginning Arc Welding

- Students weld a flat position padding project using E6013 arc welding electrodes with an acceptable appearance.
- Students weld a flat position padding project using E7018 arc welding electrodes with an acceptable appearance.
- Students weld a 6 pass fillet welded tee joint project using E7018 Arc Welding Electrodes with an acceptable appearance.
- Students weld a 6 pass fillet welded tee joint project using E6010 Arc Welding Electrodes with an acceptable appearance.
- Students manually oxyacetylene flame cut steel plate with an acceptable appearance.
- Students manually plasma arc cut steel plate with an acceptable appearance.
- Students fillet weld a horizontal lap joint project using E7018 electrodes with an acceptable appearance.
- Students fillet weld a horizontal lap joint project using E6010 electrodes with an acceptable appearance.

### WELD130 - Gas Tungsten Arc Welding Fundamentals

- Students fillet weld a flat position aluminum padding project with an acceptable appearance.
- Student fillet weld a horizontal aluminum lap joint project using ER5356 size 3/32 diameter filler wire with an acceptable appearance.
- Students fillet weld a horizontal aluminum lap joint project with ER4043 size 3/32 diameter filler wire with an acceptable appearance.
- Students fillet weld a horizontal aluminum lap joint project using ER5356 1/16 diameter filler with an acceptable appearance.
- Students fillet weld a horizontal aluminum lap joint project using ER4043 size 1/16 diameter filler wire with an acceptable appearance.
- Student fillet weld a horizontal steel lap joint project using ER70S-2 size 1/16 diameter filler wire with an acceptable appearance.
- Students fillet weld a horizontal steel tee joint project using ER70S-2 size 1/16 diameter filler wire with an acceptable appearance.
- Students weld steel square tubing connections with fillet and groove welds with an acceptable appearance.

### WELD170 - Structural Fabrication

- Students will manually oxyacetylene flame cut miter joints on angle iron to construct a square frame with an acceptable appearance.
- Students will manually plasma arc cut cope joints on angle iron to construct a square frame with an acceptable appearance.
- Students will manually oxyacetylene flame cut and construct a square frame using cope joints on structural steel channel with an acceptable appearance.
- Students will manually plasma arc cut and construct a square frame using miter joints on structural steel channel with an acceptable appearance.
- students will use the plasma arc cutting process to manually cut and fabricate steel shapes to specific dimensions.
- Students will use industrial metal fabrication equipment to cut, cope, miter, and fabricate steel plate, sheet metal, and structural shapes to specific dimensions.

### WELD172L - Advanced Structural Fabrication Laboratory

- Lay out, fit up, and fabricate a reinforced girder type of assembly
- Cut, bevel, and miter various structural steel members using a manual oxyacetylene flame cutting outfit
- Fabricate advanced projects using hydraulic, electric, and pneumatic types of fabrication equipment

### WELD200 - Intermediate Arc Welding

- Students weld a horizontal fillet project using E7018 arc welding electrodes with an acceptable appearance.
- Students weld a horizontal fillet project using E6010 arc welding electrodes with an acceptable appearance.
- Students weld a vertical fillet project using E7018 arc welding electrodes with an acceptable appearance.
- Students weld a vertical fillet project using E6010 arc welding electrodes with an acceptable appearance.
- students will set up ACA equipment and perform flat position air carbon arc cutting with and acceptable appearance.
- students will set up PAC equipment and perform flat position plasma arc cutting with and acceptable appearance.

### WELD210L - Advanced Arc Welding Laboratory

- Students weld a overhead position 6 pass tee joint project using E6010 arc welding electrodes with an acceptable appearance.

- Students weld a overhead position 6 pass tee joint project using E7018 arc welding electrodes with an acceptable appearance.
- Students weld a vertical position 6 pass tee joint project using E6010 arc welding electrodes with an acceptable appearance.
- Students weld a vertical position 6 pass tee joint project using E7018 arc welding electrodes with an acceptable appearance.

#### **WELD212L - Shielded Metal Arc Welding (SMAW) Certification Laboratory**

- Students weld a vertical position 6 pass tee joint project using E7018 size 1/8" arc welding electrodes with an acceptable appearance.
- Students weld a vertical position 6 pass tee joint project using E6010 size 5/32" arc welding electrodes with an acceptable appearance.
- Students weld a overhead position 6 pass tee joint project using E7018 size 1/8" arc welding electrodes with an acceptable appearance.
- Students weld a overhead position 6 pass tee joint project using E6010 size 5/32" arc welding electrodes with an acceptable appearance.

#### **WELD214L - Flux Cored Arc Welding (FCAW) Certification Laboratory**

- Students weld a vertical position 6 pass tee joint project using E7018 size 1/8" arc welding electrodes with an acceptable appearance.
- Students weld a vertical position 6 pass tee joint project using E6010 size 5/32" arc welding electrodes with an acceptable appearance.
- Students weld a overhead position 6 pass tee joint project with E7018 size 1/8" arc welding electrodes with an acceptable appearance.
- Students weld a overhead position 6 pass tee joint project using E6010 size 5/32" arc welding electrodes with an acceptable appearance.

#### **WELD220 - Certification and Licensing for Welders**

1. Interpret the Shielded Metal Arc Welding Electrodes Identification System to the AWS standard
2. Interpret the Gas Metal Arc Welding Electrodes Identification System to the AWS standard
3. Interpret the Flux Cored Arc Welding Electrodes Identification System to the AWS standard
4. Interpret various structural members utilizing the ASTM Identification System

#### **WELD240L - Intermediate Gas Tungsten Arc Welding Laboratory**

- Students weld a horizontal aluminum padding project with an acceptable appearance.
- Students weld a horizontal aluminum padding project with an acceptable appearance.
- Students weld a horizontal aluminum tee joint project using ER5356 size 3/32" filler wire with an acceptable appearance.
- Students weld a horizontal aluminum tee joint project using ER5356 size 3/32" filler wire with an acceptable appearance.
- Students weld a horizontal aluminum tee joint project using ER5356 size 1/16" filler wire with an acceptable appearance.
- Students weld a horizontal aluminum tee joint project using ER5356 size 1/16" filler wire with an acceptable appearance.
- Students weld a horizontal stainless steel lap joint project using ER308 size 1/16" filler wire with an acceptable appearance.
- Students weld a horizontal stainless steel lap joint project using ER308 size 1/16" filler wire with an acceptable appearance.

#### **WELD250L - Advanced Gas Tungsten Arc Welding Lab**

- Students weld a vertical position aluminum padding project with an acceptable appearance.
- Students weld a vertical position aluminum tee joint project using ER5356 size 3/32" filler wire with an acceptable appearance.
- students weld a vertical position tee joint project using ER5356 size 1/16" filler wire with an acceptable appearance.
- students weld a horizontal stainless steel lap joint project using ER308L size 1/16" filler wire with an acceptable appearance.

#### **WELD260L - Gas Tungsten Arc Welding Aerospace Certification Lab**

- Students weld a horizontal aluminum groove project using ER5356 size 3/32" diameter filler wire with an acceptable appearance.
- Students weld a vertical aluminum groove project using ER5356 size 1/16" diameter filler wire with an acceptable appearance.
- Students weld a horizontal stainless steel groove project using ER308L size 1/16" diameter filler wire with an acceptable appearance.
- Students weld a vertical stainless steel groove project using ER308L size 1/16" diameter filler wire with an acceptable appearance.