

| Course ID | Course Name | Course Outcome |
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| WELD 30 | Metal Sculpture | <p>Students will be able to differentiate between good and bad welds.</p> <p>Students will be able to identify a variety of welding processes that are used in effective bonding of metals</p> <p>Students will be able to solve problems related to building forms.</p> <p>Students will demonstrate skills on how to properly use and maintain tools used in polishing and finishing material.</p> |
| WELD 40 | Introduction to Welding | <p>Completers will be able to successfully identify and differentiate between various welding processes presented in the class.</p> <p>Completers will be able to successfully identify and differentiate between various welding processes presented in the class. (SLO)</p> <p>Define terms and conditions related to the welding industry. (MO)</p> <p>Demonstrate the use of Oxy-acetylene welding (OAW),Shielded Metal Arc Welding (SMAW), Gas Metal Arc Welding(GMAW),Gas Tungsten Arc Welding (GTAW),Flux Cored Arc Welding (FCAW), Plasma Arc Cutting (PAC),Carbon Arc Cutting(CAC) principles to join and cut metals. (MO)</p> <p>Discuss the different base metal compositions used to make metallurgical bonds. (MO)</p> <p>Identify the cost effectiveness of each welding process. (MO)</p> <p>Incorporate safety practices into all welding activities. (MO)</p> <p>Recognize and describe common welding processes used in bonding metals. (MO)</p> <p>Recognize and illustrate basic metallurgy related to the welding trades. (MO)</p> <p>students will be able to effectively operate the equipment for various welding processes .</p> <p>Students will be able to effectively operate the equipment for various welding processes. (SLO)</p> |
| WELD 50 | Oxyacetylene Welding | <p>Calculate the time required to complete quality welding used with the oxyacetylene process. (MO)</p> <p>Demonstrate appropriate maintenance of welding equipment in the work place. (MO)</p> <p>Demonstrate skill in oxyacetylene welding. (MO)</p> <p>Each student use proper names of equipment and supplies used in oxyfuel welding</p> <p>Explain and demonstrate safe and efficient operation of welding equipment. (MO)</p> <p>Students will be able to identify the characteristics of metals and their reaction to welding processes.</p> <p>Students will be able to recognize problems of gas fluctuation in welding and cutting operations.</p> |

Use and interpret charts to select filler material. (MO)

WELD 51 (VOC) Basic Electric Arc Welding

Apply safety principles in arc welding procedures. (MO)

Calculate times required to complete quality welding used with the electric arc welding processes. (MO)

Demonstrate and describe how to set electric arc welding machines using gas metal arc, shield metal arc, gas tungsten arc and the flux cored arc welding processes. (MO)

Demonstrate daily maintenance of a safe work place environment. (MO)

Each student will demonstrate knowledge of which process is most commonly used for different aspects of the welding and what advantage it will provide to that aspect of the industry

Explain and demonstrate safe and efficient operation of welding equipment. (SLO/MO)

Students will be able to demonstrate a variety of electric welding processes used in bonding metals.

Students will be able to use reference charts to select filler material

Students will demonstrate safe operation of welding equipment.

Use a vocabulary of terms and conditions related to the welding trades. (MO)

Use and interpret reference charts to select filler material. (SLO/MO)

Utilize different types of power sources used for welding in shield metal arc, gas metal arc, gas tungsten arc and flux cored arc welding processes. (MO)

WELD 53A (VOC) Welding Metallurgy

Compare and contrast the cause of deformation on welded metals. (MO)

Describe effects of alloying metals in relationship to a welding procedure. (MO)

Describe nature of metals and the relationship between their structural and mechanical properties. (MO)

Examine the purpose of pre- and post-heat treatments on welded metals. (MO)

Identify crystal structure of metals and their changes in heat treatment processes. (MO)

Interpret iron-carbon relationship and its effect on welding of ferrous metals. (MO)

Recognize effects of alloying materials in ferrous and non-ferrous metals. (MO)

Students will be able to explain the use of metallurgy tools and equipment as a means of determining weld soundness.

Students will explain the industrial processes of manufacturing ferrous and non-ferrous metals.

Students will run hardness tests and other assessments means to understand how grain structure relates to strength and ductility of metals.

Utilize metallurgy tools and equipment as a means of determining weld soundness. (SLO/MO)

**WELD 60 (VOC) Print Reading and
Computations for Welders**

Assess bills of materials, weights and lengths of materials. (MO)

Calculate with fractions, decimals, and metrics by converting and manipulating. (SLO/MO)

Create objects from print drawings. (MO)

Demonstrate concepts of views by sketching objects. (MO)

Identify and define print notes and specifications. (MO)

Identify welding symbols on prints and objects. (MO)

Illustrate revolved sections of objects. (MO)

Interpret detail and assembly prints. (MO)

Recognize and identify structural and pipe shapes and sizes. (MO)

Students will be able to calculate with fractions, decimals, and converting between metric and standard units of measure.

Students will be able to identify print views, lines and dimensioning methods

WELD 70A (VOC) Beginning Arc Welding

Differentiate between welding processes and where industry applies them in the workforce. (MO)

Select different types of filler materials with the SMAW, FCAW and GMAW processes on plate steel. (MO)

Solve problems as related to cutting, preparing and fitting up materials prior to welding. (SLO/MO)

Students will be able to perform the required practical projects in the flat and horizontal positions.

Students will demonstrate safe usage of welding equipment

Students will solve problems as related to cutting materials prior to welding.

Students will solve problems as related to preparing materials prior to welding.

WELD 70B (VOC) Intermediate Arc Welding

Explain safe and efficient operation of welding equipment. (SLO/MO)

Interpret charts as a reference to select filler materials for welding. (MO)

Students will be able to utilize different welding processing for welding in flat, horizontal, vertical and overhead positions for quality products.

Students will demonstrate machine setups for SMAW & FCAW processes.

Students will demonstrate safe operation of welding equipment.

Use vocabulary of terms and conditions related to the welding trades. (MO)

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| WELD 70C (VOC) Certification for Welders | <p>75% of students will pass the L.A. City Department of Building and Safety written exam for Structural Steel Welder certification with a score of 70% or better.</p> <p>Demonstrate proper and safe usage of welding equipment and practices by written and practical tests. (MO)</p> <p>Identify modern welding practices. (MO)</p> <p>Read and interpret welding and building codes in the area of light gauge and heavy material of the construction industry. (MO)</p> <p>Students will be able to compare SMAW and FCAW processes for appropriateness of code welding.</p> <p>Students will evaluate finished welds for defects by visual and bend inspections.</p> |
| WELD 80 (VOC) Fabrication and Construction | <p>Accurately measure to one sixteenth of an inch. (MO)</p> <p>Anticipate and solve problems in project fabrication. (MO)</p> <p>Apply principles of identifying base metals and carbon contents of materials used in welding. (MO)</p> <p>Apply welding skills in required practical projects. (MO)</p> <p>Demonstrate proper and safe usage of welding equipment. (MO)</p> <p>Differentiate the theoretical knowledge necessary to run various electrodes and filler metals using the welding processes presented in the class. (MO)</p> <p>Identify materials used in construction and fabrication industry and select the correct filler metals for welding and joining. (MO)</p> <p>Student will be able to select the correct welding applications and processes.</p> <p>Student will be able to select the correct welding applications and processes. (SLO)</p> <p>Students will be able to apply the principles of layout and blueprint reading</p> <p>Students will be able to apply the principles of layout and blueprint reading. (SLO)</p> <p>Students will demonstrate welding skills to industry standards.</p> <p>Students will demonstrate welding skills to industry standards. (SLO)</p> |
| WELD 81 (VOC) Pipe and Tube Welding | <p>Demonstrate proper and safe usage of welding equipment and practices. (MO)</p> <p>Differentiate the positions necessary to run various electrodes and filler metals using welding processes on pipes and/or tubing. (MO)</p> <p>Identify materials used in pipe and tubing industry and select the correct filler materials for joining. (MO)</p> <p>Solve problems as related to preparing, layout and fitting up materials prior to welding. (SLO/MO)</p> <p>Students will be able to apply pipe welding skills in required practical projects.</p> |

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| | | Students will solve problems as related to preparing materials prior to welding. |
| WELD 90A (VOC) | Gas Tungsten Arc Welding | <p>Demonstrate the application of theoretical knowledge necessary to run different types of filler materials with the GTAW processes on different types of metals. (MO)</p> <p>Recognize differences between welding processes and their industry applications. (MO)</p> <p>Students will be able to perform the required practical projects used in GTAW</p> <p>Students will demonstrate safe usage of welding equipment.</p> <p>Students will solve problems as related to preparing materials prior to welding</p> |
| WELD 90B (VOC) | Semiautomatic Arc Welding Process | <p>Students will be able to perform the required practical projects used in FCAW.</p> <p>Students will demonstrate safe usage of welding equipment.</p> <p>Students will recognize differences between welding processes and their industry applications.</p> |
| WELD 96 | Work Experience in Welding | <p>Employers of Welding Work Experience Students will rate the technical skills of their students as above average.</p> <p>Employers of Welding Work Experience Students will rate the work habits of their students as above average.</p> |