Texas CTE

Welding II Lab

General requirements. This lab course is recommended for students in Grades 11 and 12. Prerequisite: Welding I. Corequisite: Welding II. This course must be taken concurrently with Welding II and may not be taken as a stand-alone course. Districts are encouraged to offer this course in a consecutive block with Welding II to allow students sufficient time to master the content of both courses. Students shall be awarded one credit for successful completion of this course. W2L.A

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Introduction W2L.B

1 **Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.** W2L.B.1

2 **The Manufacturing Career Cluster focuses on planning, managing, and performing the processing of materials into intermediate or final products and related professional and technical support activities such as production planning and control, maintenance, and manufacturing/process engineering** W2L.B.2

3 **Welding II Lab provides an introduction to welding technology with an emphasis on basic welding laboratory principles and operating procedures. Topics include: industrial safety and health practices, hand tool and power machine use, measurement, laboratory operating procedures, welding power sources, welding career potentials, and introduction to welding codes and standards. This course provides knowledge, skills, and technologies required for employment in welding industries. Students will develop knowledge and skills related to this system and apply them to personal career development. This course supports integration of academic and technical knowledge and skills. Students will reinforce, apply, and transfer knowledge and skills to a variety of settings and problems. Knowledge about career opportunities, requirements, and expectations and the development of workplace skills prepare students for future success.** W2L.B.3

4 **Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.** W2L.B.4

5 **Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.** W2L.B.5

Knowledge and skills. W2L.C

1 **The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:** W2L.C.1

a express ideas to others in a clear, concise, and effective manner through written and verbal communication; W2L.C.1.A

b convey written information that is easily understandable to others; W2L.C.1.B

c demonstrate acceptable work ethics in reporting for duty and performing assigned tasks as directed; W2L.C.1.C

d conduct oneself in a manner acceptable for the profession and work site such as suitable dress and polite speech; W2L.C.1.D

e choose the ethical course of action and comply with all applicable rules, laws, and regulations; W2L.C.1.E

f review the fine, detailed aspects of both quantitative and qualitative work process and end products; W2L.C.1.F

g evaluate systems and operations; identify causes, problems, patterns, or issues; and explore workable solutions or remedies to improve situations; W2L.C.1.G

h follow written and oral instructions and adhere to established business practices, policies, and procedures, including health and safety rules; W2L.C.1.H

i prioritize tasks, follow schedules, and work toward goal-relevant activities in an effective, efficient manner. W2L.C.1.I

2 **The student demonstrates the functions and applications of the tools, equipment, technologies, and metals used in code welding. The student is expected to:** W2L.C.2

- a use welding equipment according to safety standards; W2L.C.2.A
- b identify and properly dispose of environmentally hazardous materials used in welding; W2L.C.2.B
- c explain the importance of recycling materials used in welding; W2L.C.2.C
- d use appropriate personal protective equipment. W2L.C.2.D

3 **The student applies the concepts and skills of welding of actual work situations. The student is expected to:** W2L.C.3

- a work independently to fabricate welded projects with minimal assistance; W2L.C.3.A
- b work collaboratively with other students to complete relevant projects; W2L.C.3.B
- c troubleshoot equipment. W2L.C.3.C

4 **The student analyzes the concepts and intricacies of inspections and related codes. The student is expected to:** W2L.C.4

- a explain weld inspection processes; W2L.C.4.A
- b produce acceptable weldments to standards related to industry codes such as the American Welding Society (AWS), American National Standards Institute, and Canadian Welding Bureau. W2L.C.4.B

5 **The student performs oxy-fuel cutting processes. The student is expected to:** W2L.C.5

- a use safe operating practices; W2L.C.5.A
- b perform safe handling of compressed gases; W2L.C.5.B
- c assemble components involved in setting up for oxy-fuel gas cutting processes; W2L.C.5.C
- d demonstrate proper set-up for cutting techniques such as piercing, straight line, and bevel; W2L.C.5.D
- e evaluate acceptable and unacceptable cuts W2L.C.5.E

6 **The student performs plasma arc cutting on metals. The student is expected to:** W2L.C.6

- a use safe operating practices; W2L.C.6.A
- b explain the difference between safe and unsafe storage and handling of compressed gas supply; W2L.C.6.B
- c employ proper set-up procedures for plasma arc cutting; W2L.C.6.C
- d demonstrate proper cutting techniques, including straight line, piercing, and bevels. W2L.C.6.D

7 **The student performs shielded metal arc welding principles and practices on metals. The student is expected to:** W2L.C.7

- a use safe operating practices; W2L.C.7.A
- b demonstrate shielded metal arc welding principles; W2L.C.7.B
- c demonstrate proper set-up procedures for shielded metal arc welding; W2L.C.7.C
- d select appropriate electrodes for base metal in shielded metal arc welding; W2L.C.7.
- e perform welds such as fillet and groove according to industry-accepted welding standards; W2L.C.7.E
- f perform multiple pass welds; W2L.C.7.F
- g prepare joints for welding; W2L.C.7.G
- h explain heating processes such as pre-heating and post-heating. W2L.C.7.H

8 **The student demonstrates proper set-up procedure for gas metal arc welding. The student is expected to:** W2L.C.8

- a use safe operating practices; W2L.C.8.A
- b demonstrate gas metal arc welding principles; W2L.C.8.B
- c demonstrate proper set-up for gas metal arc welding; W2L.C.8.C
- d select appropriate filler metals for base metal in gas metal arc welding; W2L.C.8.D
- e perform fillet and groove welds in all positions according to industry-accepted welding standards. W2L.C.8.

9 **The student performs flux cored arc welding principles and practices on metals. The student is expected to:** W2L.C.9

- a use safe operating practices; W2L.C.9.A
- b employ and appraise flux cored arc welding principles; W2L.C.9.B
- c demonstrate proper set-up procedures for flux cored arc welding; W2L.C.9.C
- d appraise appropriate filler metal for base metal in flux cored arc welding; W2L.C.9.D
- e perform fillet and groove welds; W2L.C.9.E
- f perform welds in all appropriate positions according to industry-accepted welding standards. W2L.C.9.F

10 **The student performs gas tungsten arc welding principles and practices on metals. The student is expected to:** W2L.C.10

- a use safe operating practices; W2L.C.10.A
- b demonstrate gas tungsten arc welding principles; W2L.C.10.B
- c demonstrate proper set-up for gas tungsten arc welding; W2L.C.10.C
- d select appropriate use of filler metals for base metal in gas tungsten arc welding; W2L.C.10.D
- e perform welds in all appropriate positions according to industry-accepted welding standards. W2L.C.10.E

11 **The student performs weldment fabrications. The student is expected to:** W2L.C.11

- a identify layout tools; W2L.C.11.A
- b perform a part layout on plate according to a blueprint; W2L.C.11.B
- c perform a layout of a pipe fitting according to a blueprint; W2L.C.11.C
- d perform an assembly according to a blueprint. W2L.C.11.D