Texas CTE

Welding II

General requirements. This course is recommended for students in Grades 11 and 12. Prerequisite: Welding I. Recommended prerequisites: Algebra I or Geometry. Recommended corequisite: Welding II Lab. Students shall be awarded two credits for successful completion of this course. W2.A

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Introduction. W2.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** W2.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.** W2.B.2

3 **Welding II builds on the knowledge and skills developed in Welding I. Students will develop advanced welding concepts and skills as related to personal and career development. Students will integrate academic and technical knowledge and skills. Students will have opportunities to reinforce, apply, and transfer knowledge and skills to a variety of settings and problems.** W2.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.** W2.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.** W2.B.5

Knowledge and skills W2.C

1 **The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:** W2.C.1

- a express ideas to others in a clear, concise, and effective manner through written and verbal communication; W2.C.1.A
- b convey written information that is easily understandable to others; W2.C.1.B
- c demonstrate acceptable work ethics in reporting for duty and performing assigned tasks as directed; W2.C.1.C
- d conduct oneself in a manner acceptable for the profession and work site such as suitable dress and polite speech; W2.C.1.D
- e choose the ethical course of action and comply with all applicable rules, laws, and regulations; W2.C.1.E
- f review the fine, detailed aspects of both quantitative and qualitative work process and end products; W2.C.1.F
- g evaluate systems and operations; identify causes, problems, patterns, or issues; and explore workable solutions or remedies to improve situations; W2.C.1.G
- h follow written and oral instructions and adhere to established business practices, policies, and procedures, including health and safety rules; W2.C.1.H
- i prioritize tasks, follow schedules, and work toward goal-relevant activities in an effective, efficient manner; W2.C.1.I
- j analyze how teams function; W2.C.1.J
- k evaluate employers' work expectations to measure project success W2.C.1.K

2 **The student explores the employability characteristics of a successful worker in the global economy. The student is expected to:** W2.C.2

- a determine academic knowledge and skills required for postsecondary education; W2.C.2.A
- b identify employers' expectations to foster positive customer satisfaction; W2.C.2.B
- c demonstrate the professional standards required in the workplace such as interviewing skills, flexibility, willingness to learn new skills and acquire knowledge, self-discipline, self-worth, positive attitude, and integrity in a work situation; W2.C.2.C
- d evaluate progress toward personal career goals; W2.C.2.
- e communicate effectively with others in the workplace to clarify objectives; W2.C.2.E
- f apply knowledge and skills related to health and safety in the workplace as specified by appropriate governmental regulations. W2.C.2.F

3 **The student applies academic skills to the requirements of welding. The student is expected to:** W2.C.3

- a demonstrate mathematical skills to estimate costs; W2.C.3.A
- b explain the impact of accurate readings of measuring devices on cost estimates; W2.C.3.B
- c justify the selection of a tool to make accurate measurements; W2.C.3.C
- d compute measurements such as area, surface area, volume, and perimeter; W2.C.3.D
- e solve problems using whole numbers, fractions, mixed numbers, and decimals; W2.C.3.E
- f apply right triangle relationships using the Pythagorean Theorem; W2.C.3.F
- g select a mathematical formula for estimation. W2.C.3.G

4 **The student knows the functions and applications of the tools, equipment, technologies, and materials used in welding. The student is expected to:** W2.C.4

- a use welding equipment according to safety standards; W2.C.4.A
- b dispose of environmentally hazardous materials used in welding; W2.C.4.B
- c. explain the importance of recycling materials used in welding; W2.C.4.C
- d evaluate the performance impact of emerging technologies in welding; W2.C.4.D
- e use appropriate personal protective equipment to follow safety measures; W2.C.4.E
- f investigate the use of automated welding machines such as numerical control, computer numerical control, and robotics-controlled welding machines. W2.C.4.F

5 **The student illustrates welding joint design, symbols, and welds. The student is expected to:** W2.C.5

- a use knowledge of engineering drawings to complete an advanced project; W2.C.5.A
- b evaluate projects using engineering drawing specifications. W2.C.5.B

6 **The student applies the concepts and skills of welding to perform tasks. The student is expected to:** W2.C.6

- a work independently in fabricating welded projects; W2.C.6.A
- b work collaboratively with other students to complete a real-world application item; W2.C.6.B
- c troubleshoot equipment. W2.C.6.C

7 **The student analyzes the concepts and intricacies of inspections related to welding codes. The student is expected to:** W2.C.7

- a inspect the welding projects of team members; W2.C.7.A
- b select codes for weld inspections; W2.C.7.B
- c critique and evaluate the weldments of team members. W2.C.7.C

8 **The student performs advanced cutting processes on carbon steels. The student is expected to:** W2.C.8

- a observe safe operating practices; W2.C.8.A
- b apply safe handling of compressed gases; W2.C.8.B
- c perform cutting processes according to accepted welding standards W2.C.8.C

9 **The student performs shielded metal arc welding on metals. The student is expected to:** W2.C.9

- a employ safe operating practices; W2.C.9.A
- b demonstrate skills required to make welds in all positions according to industry-accepted welding standards. W2.C.9.B

10 **The student performs flux cored metal arc welding. The student is expected to:** W2.C.10

- a use safe operating practices; W2.C.10.A
- b perform fillet and groove welds; W2.C.10.B
- c perform welds in all appropriate positions according to to industry-accepted welding standards. W2.C.10.C

11 **The student performs gas tungsten arc welding on metals. The student is expected to:** W2.C.11

- a employ safe operating practices; W2.C.11.A
- b perform fillet and groove welds in all positions; W2.C.11.B
- c perform welds on metals such as carbon steel, stainless steel, pipe, and aluminum according to industry-accepted welding standards W2.C.11.C