**Welding: SMAW II Course Syllabus**

Course Number: 13207G1002

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**Course Description**

Welding: SMAW II presents information and skills needed to weld pipes and plates of various kinds. Topics include SMAW open-root pipe welds, plate welding, and stainless steel and carbon steel welding. The course also incorporates information about gas tungsten arc (tungsten inert gas) welding.

**Goals**

Students learn and apply safety concepts, explore career opportunities and requirements, practice the skills needed to succeed in the workplace, develop leadership qualities and take advantage of the opportunities afforded by Career and Technical Student Organizations (CTSOs), and learn and practice essential digital literacy skills.

**Pre-requisites**: None

**Fees:** There is a required fee of $40 per year ($20 per semester)

***Foundational Standards***

1. Incorporate safety procedures in handling, operating, and maintaining tools and machinery; handling materials; utilizing personal protective equipment; maintaining a safe work area; and handling hazardous materials and forces.
2. Demonstrate effective workplace and employability skills, including communication, awareness of diversity, positive work ethic, problem-solving, time management, and teamwork.
3. Explore the range of careers available in the field and investigate their educational requirements, and demonstrate job-seeking skills including resume-writing and interviewing.
4. Advocate and practice safe, legal, responsible, and ethical use of information and technology tools specific to the industry pathway.
5. Participate in a Career and Technical Student Organization (CTSO) to increase knowledge and skills and to enhance leadership and teamwork.

***Content Standards***

1. Explain the basic concepts of open-root shielded metal arc welding (SMAW) of pipe.

a. Prepare the area, materials, and equipment for shielded metal arc welding.

2. Produce SMAW weld profiles in all open-root pipe welding positions.

3. State the basic concepts of open-root shielded metal arc welding (SMAW) of plate.

4. Prepare the area, base metal, equipment, and materials for SMAW of plate with backing strip and open groove.

5. Demonstrate open-root V-groove plate welding positions and SMAW plate-welding techniques.

a. Complete root and fill passes using SMAW techniques.

6. Describe the basic concepts of open-root SMAW of carbon-steel pipe.

a. Prepare the area, materials, and equipment for SMAW carbon-steel pipe welding.

7. Describe how to prepare the area, materials, and equipment for low alloy and stainless steel pipe welding using the gas tungsten arc welding process.

8. Describe open-root V-groove pipe welding positions and GTAW pipe-welding techniques.

a. Describe the techniques used to apply GTAW to low alloy and stainless steel pipe.

b. Explain how to make the root pass with a gas backing.

c. Describe the techniques required to produce open-root GTAW low alloy and stainless steel pipe welds in various positions.

9. Describe special considerations for shielded metal arc welding (SMAW) of various types of stainless steel and identify electrodes to be used for each type.

a. Explain principles of stainless steel metallurgy.

b. Describe methods for controlling carbide precipitation.

c. Describe the selection and storage of stainless steel electrodes.

10. State the basic concepts of SMAW of stainless steel.

a. Explain how to prepare the area, materials, and equipment for SMAW of stainless steel.

11. Describe open-root V-groove plate and pipe welding positions and SMAW stainless steel welding techniques.

a. State general considerations for handling electrodes for SMAW of stainless

steel.

b. Describe how to make the root pass.

c. Describe the techniques required to produce open-root V-groove SMAW stainless steel plate welds in 1G, 2G, 3G, and 4G positions.

d. Describe the techniques required to produce open-root V-groove SMAW stainless steel pipe welds in 1G-ROTATED, 2G, 5G, and 6G positions.

**Embedded Numeracy Anchor Assignment**

This course presents informational methods of contextual mathematical instruction directly related to Welding. Students will review pre-existing concepts and learn new concepts that are specific to the welding industry. Relative mathematics will prepare students for higher education or provide them with the knowledge necessary to enter directly into the trade. Students will complete various assignments but not limited to projects and problem solving activities. Additionally, students will practice Accuplacer- prep objectives.

**Embedded Literacy Anchor Assignment**

The ECRC welding program will capitalize on student interest in welding technology and practical experience in the welding shop. Students will be encouraged to choose topics related to welding technology and the workplace when conducting research and presenting information.

**Embedded Science Anchor Assignment**

The metallurgy of the weld, as well as the area around it, is directly related to the composition of the base metal (the metal you started with), the weld metal (the admixture of melted base metal and deposited filler metal, if used), heat input, the size of the HAZ, and the process and procedures used.

**Classroom Expectations**

1. Be respectful of the teacher, each other, and all classroom property
2. Participate in classroom discussion and group work
3. Use appropriate language at all times
4. Be in class on time and seated
5. No Phone usage

**Daily Class Work**

Students will review previous class work and get more in depth to the information technology cluster.

**Assessment Procedures:** Final grades will be comprised of daily activities, quizzes, and tests

Major (50%): Units tests and welding examples

Minor (40%): Daily activities and quizzes

9th Weeks Exam (10%)

**Grading Policy**

A (90-100), B (80-89), C (70-79), D (60-69), and F (below 60).

# Student Credentialing

For the welding program, industry-recognized credentials of value and certifications have been established that validate the rigor of the curriculum to students, parents, and members of business and industry. In addition, articulation agreements are developed in partnership with the Alabama Community College System to allow for a seamless transition for students to further their education. Students must pass the AWS plate test and vertical plate test three times that will be viewed by an outside party before we send to Wesco for certification. Credential options may change any time under guidance from the state department of education and testing eligibility will update accordingly.

**CTSO**: Career and Technical Student Organizations are integral, co-curricular components of each career and technical education course. These organizations enhance classroom instruction while helping students develop leadership abilities, expand workplace-readiness skills, and access opportunities for personal and professional growth. Students in the Architecture and Construction career cluster affiliate with SkillsUSA.

Print Student Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Student Signature\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Parent or Guardian Signature\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*\* The syllabus serves as a guide for both the teacher and student; however, during the term it may become necessary to make additions, deletions, or substitutions. For any necessary changes, adequate notice will be provided to the students.*