



**Columbus State Community College
Design, Construction and Trades Department
Skilled Trades Technology**

COURSE NUMBER: SKTR 2080

COURSE TITLE: Welding: Intermediate Stick and MIG

INSTRUCTOR: Scott Laslo, MS, CWI|CWE

CONTACT: slaslo1@csc.edu

CREDITS: 2

CLASS HOURS PER WEEK: 3

PREREQUISITES: SKTR 1180, SKTR 1380

DESCRIPTION OF COURSE

Using welding methods, materials, and techniques of SMAW, GMAW, and FCAW the student will be instructed in methods that are best suited for welding metals in a wide range of real-world applications and positions. This includes "in-position" and "out-of-position" welding on both flat work and round work materials. The learner will be engaged in lab projects using the SMAW, GMAW, and FCAW processes welding: Tee, Lap, and Square Groove joints, in and out-of-position.

COURSE STUDENT LEARNING OUTCOMES

Upon completion of this course, the student will be able to:

- Demonstrate how to work safely and discuss the importance of paying attention to safety issues when working in the welding field.
- Basic understanding/Ability to begin welding out of position.
- Demonstrate GMAW techniques and principles to out-of-position scenarios
- Discuss factors that affect the cost of producing weldments.
- Outline and explain each of the design factors that affect the cost of welding.
- Demonstrate how to determine weld volume for groove and fillet welds.
- Explain how weld deposit efficiency affects welding cost for each of the major welding processes.
- Demonstrate FCAW techniques and principles to out-of-position scenarios
- Explain the importance of knowing welding metallurgy.
- Explain the difference between heat, temperature, and energy
- Explain the relationship between the color of light given off by an object and its temperature.
- Describe the two basic forms in which all solid matter exists.
- Explain the information illustrated on the Basic Guide to Ferrous Metallurgy diagram.

- Describe the effect that a change in the percentage of carbon has on iron.
- Demonstrate FCAW techniques and principles to out-of-position scenarios
- Discuss the information contained in a set of drawings.
- Explain the purpose of using different types of lines.
- Explain how computers have made it easier to draw plans for projects
- Outline the factors to be considered when selecting a welded joint design.
- Explain the purpose of a weld joint.
- List the types of forces that a weld joint must withstand.
- List the parts of a weld joint design that can be changed.
- Identify the types of joints.
- Identify the types of edge preparations.
- Identify the joint dimensions.
- Explain joint design features determined by codes and standards.
- Discuss the importance of welder skill.
- Review ways to reduce costs.

PROGRAM OUTCOMES

1. Understand the role and function of the skilled trades in the construction industry
2. Discriminate the work they perform and how it interrelates with the other trades in the overall scope of a construction project
3. Apply underlying theories and principles that are foundational to the trade that they have chosen
4. Read, interpret, and follow construction drawings.
5. Apply current industry-specific building codes in the planning and execution of work
6. Demonstrate the use of proper safety procedures in all activities

OUTCOMES BASED ASSESSMENT OF STUDENT LEARNING

For this course, students are expected to demonstrate the skills associated with the Institutional Learning Goals (ILG) identified below:

1. Critical Thinking
2. Ethical Reasoning
3. Quantitative Skills
4. Scientific Literacy
5. Technological Competence
6. Communication Competence
7. Social and Cultural Awareness
8. Professional and Life Skills

In class students are assessed on their achievement of these outcomes. Names will not be used when reporting results. Outcomes-based assessment is used to improve instructional planning and design and the quality of student learning throughout the college.

COURSE MATERIALS REQUIRED

1. Blue jeans or work pant
 - A. No holes or frayed cuffs

2. Work shoe
 - A. Leather uppers and hard sole
 - B. Steel toed (preferred)
3. Long sleeve shirt
 - A. 100% cotton
 - B. Welders Jacket
4. Hat
 - A. Baseball cap
 - B. Welders cap
5. OSHA approved safety glasses
6. Leather work gloves
 - A. Welders glove
 - B. Drivers Glove

TEXTBOOK(S), MANUALS, REFERENCES, AND OTHER READINGS

ULINC

SKTR 2080 Lab Manual

GENERAL INSTRUCTIONAL METHODS

Lecture, Demonstration, Practical Exercise, Technical Video

STANDARDS AND METHODS FOR EVALUATION

Attendance 10%

Quizzes 30%

Homework 10%

Lab Projects 20%

Final Lab and Written Exam 30%

GRADING SCALE

A: 91% – 100%

B: 81% – 90%

C: 71% – 80%

D: 61% – 70%

E: 00% – 60%

SPECIAL COURSE REQUIREMENTS

Lab

Backpacks or book bags are **NOT** allowed in the lab area. All students are required to follow proper safety procedures in the lab. Proper safety procedures require students to demonstrate at all times proper individual safety and group safety. Students must understand and follow the concept of safety first when using the Welding lab. All students must wear proper garments and protective gear when using the Welding lab. The student must wear long pants (**no shorts, skirts, or dresses**) and a long-sleeve shirt. The protective gear includes but is not limited to the following; safety goggles, welding gloves, welding apron, leather boots or shoes. Sandals are

NOT Permitted. If a student does not have the proper safety gear, he/she will not be allowed to use the lab that class session, resulting in a grade of Zero for that session.

Late Work

Late work will not be accepted for any un-excused absence or work that is not turned in by the established due date. This is to include due dates included in this document or published on the Black Board Course website.

ATTENDANCE POLICY

Determined by your instructor, as follows:

Due to the nature of this course, it is in YOUR best interest to attend EVERY class. If an absence is unavoidable, students are responsible for obtaining any materials or information given out in their absence. If you are absent on the day of a quiz or test, you may not make up the quiz or test without official, written documentation. Coming in late will result in attendance/safety grade being reduced by 50%. In the event it is a scheduled test or quiz; quiz or test grade will be reduced 5% for every 15minute increment in conjunction with 50% reduction of attendance/safety grade.

COLLEGE SYLLABUS STATEMENTS

Columbus State Community College required College Syllabus Statements on College Policies and Student Support Services can be found at www.csc.edu/syllabus or on the College website Quick Links "Syllabus Statements"

UNITS OF INSTRUCTION (Must be included using one of the following examples, Sample A or Sample B) (*Sample A*) (*Please provide a weekly course schedule indicating the units of instruction, learning objectives/goals, assigned readings, assignments, and assessment methods.*)

	UNIT OF INSTRUCTION	ASSESSMENT METHODS	ASSIGNMENTS	ASSIGNMENT DUE DATE
Week 1	Principles of SMAW SMAW Lab assignments	Homework Lab assessment	Principles of SMAW Lab assignments	Due on 1/23- Principles of SMAW Lab assignments
Week 2	SMAW Electrodes SMAW Lab assignments	Homework Lab assessment	SMAW Electrodes Lab assignments	Due on 1/30 SMAW Electrodes Lab assignments
Week 3	SMAW Evaluation and Trouble Shooting SMAW Lab assignments	Homework Lab assessment	SMAW Evaluation and Trouble Shooting Lab assignments	Due on 2/6 SMAW Evaluation and Trouble Shooting Lab assignments
Week 4	SMAW Maintenance and Repair SMAW Lab assignments SMAW Quiz#1	Homework Lab assessment Quiz	SMAW Maintenance and Repair SMAW Lab assignments	Due on 2/13 SMAW Maintenance and Repair SMAW Quiz#1 Lab assignments
Week 5	Introduction to Fabrication Plans	Homework Lab assessment	Introduction to Fabrication Plans Lab assignments	Due on 2/20 Introduction to Fabrication Plans Lab assignments
Week 6	Reading Plans and Drawings	Homework Lab assessment	Reading Plans and Drawings Lab assignments	Due on 2/27 Reading Plans and Drawings Lab assignments
Week 7	Developing the cut list and bill of materials	Homework Lab assessment	Developing the cut list and bill of materials Lab assignments	Due on 3/6 Developing the cut list and bill of materials Lab assignments
Week 8	Cost analysis	Homework Lab Mid Term Quiz (Written)	Cost analysis Lab Mid Term Quiz (Written)	Due on 3/9 Lab Midterm Due on 3/13 Cost analysis Fabrication Quiz#2
Week 9	Principles of GMAW Welding	Homework Lab assessment	Principles of GMAW Welding Lab assignments	Due on 3/20 Principles of GMAW Welding Lab assignments
Week 10	GMAW Equipment and Accessories	Homework Lab assessment	GMAW Equipment and Accessories Lab assignments	Due on 3/27 GMAW Equipment and Accessories Lab assignments
Week 11	GMAW Maintenance, Repair, and Troubleshooting	Homework Lab assessment	GMAW Maintenance, Repair, and Troubleshooting Lab assignments	Due on 4/3 GMAW Maintenance, Repair, and Troubleshooting Lab assignments
Week 12	GMAW Aluminum Welding	Homework Lab assessment	GMAW Aluminum Welding Lab assignments	Due on 4/10 GMAW Aluminum Welding
Week 13	GMAW Stainless Steel Welding	Homework Lab assessment	GMAW Stainless Steel Welding Lab assignments	Due on 4/17 GMAW Stainless Steel Welding
Week 14	GMAW Quiz#3	Quiz	GMAW Quiz	Due on 4/24 GMAW Quiz #3
Week 15	SMAW/GMAW Final Lab Exam	Lab Final	Lab Final Exam	Due on 5/1 Lab Final Exam
Week 16	Finals Week	Written Final On Blackboard	Written Final Exam	Due on 5/13 Written Final Exam



This workforce product was funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. The product was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The U.S. Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership.



This work is licensed under the Creative Commons Attribution 4.0 International License. It is attributed to Ohio TechNet. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>.