SOUTHEAST COMMUNITY COLLEGE
TRANSPORTATION OCCUPATIONS
WELDING TECHNOLOGY
COURSE SYLLABUS
January 20, 2023

I. CATALOG DESCRIPTION

Course Number: WELD1279
Course Title: Basic Mechanical
Prerequisite: Approval of BNSF Training Director

Catalog Description: Theory and practice of SMAW and FCAW welding, plasma, oxyfuel, and air carbon arc cutting and gouging. Equipment setup, safety, and operation are stressed.

Credit Hours: 3
Classroom Hours: 30
Lab Hours: 50
Total Contact Hours: 80

II. COURSE OBJECTIVES: *Course will cover:*

A. Flux core arc welding using .045" E71T-1
1. Flat pad on 3/8" x 5" x 8" plate
2. Flat v-block on 3/8" x 2 ½" x 8" plate
3. Horizontal tee on 3/8" x 2 ½" x 8" plate
4. Flat single-v-groove joint with backing on 3/8" x 2" x 6" plate (simulator)

B. FCAW final welding test

C. Shielded metal arc welding using 1/8" E6010
1. Flat pad on 3/8" x 5" x 8" plate
2. Horizontal lap joint on 3/8" x 2 ½" x 8" plate

D. Shielded metal arc welding using 1/8" E7018
1. Flat pad on 3/8" x 5" x 8" plate
2. Flat v-block on 3/8" x 2 ½" x 8" plate
3. Horizontal lap joint on 3/8" x 2 ½" x 8" plate
4. Flat single-v-groove joint with backing on 3/8" x 2" x 6" plate (simulator)

E. SMAW final welding test

F. AWS D15.1 welder qualification
1. Weld profile
   a. Groove welds
2. Test results required
   a. Visual inspection
   b. Root-, face-, and side-bend tests.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCAITON LEARNING OUTCOMES

A. STUDENT LEARNING OUTCOMES: *Student will be able to:*

1. Demonstrate shop safety and the safety rules required when using various welding and cutting processes.
2. Understand the Shielded Metal Arc Welding (SMAW) process.
3. Identify SMAW variables.
4. Understand the Flux Cored Arc Welding (FCAW) process.
5. Identify FCAW variables.
6. Understand the Oxy-Propane Cutting (OPC) or Oxy-Fuel Cutting (OFC) process.
7. Understand the Plasma Arc Cutting (PAC) process and Plasma Arc Gouging process.
8. Understand the electrode required for SMAW.
9. Understand the electrode required for FCAW.
10. Understand and apply knowledge of Carbon Arc Cutting with Air (CAC-A).
11. Demonstrate the ability to successfully weld selected lab projects.
12. Demonstrate the ability to successfully set up, weld and test V-groove welds.
13. Identify the difference between welder qualification and welder certification.
14. Successfully pass AWS D15.1 code test in the 1G position.

B. GENERAL EDUCATION LEARNING OUTCOMES:

IV. INSTRUCTIONAL MATERIALS

Required Text(s): Provided by BNSF
Required Class Materials: Provided by BNSF

V. METHODS OF PRESENTATION/INSTRUCTION

A. Methods of presentation typically include a combination of the following:

1. Written midterm and final
2. Performance welding tests
3. Lab competencies
4. Participation in 10-day class

VI. METHODS OF EVALUATION OF COMPETENCIES

Lab competencies will be assigned a level of competency on a scale of 0-100.
Evaluation of student mastery of course competencies will be accomplished using the following methods:

Lab Competencies	35%	Grade Scale:
Classroom/Lab Participation	10%	A = 100-95%
Midterm Test	5%	B = 94-90%
SMAW Code Test	20%	C = 89-80% (BNSF Minimum Grade is 80%)
FCAW Code Test	20%	D = 79-70%
Final Test	10%	F = 69%
TOTAL	100%	

VII. SPECIFIC COURSE REQUIREMENTS

A. BNSF requires the student to have a minimum grade of 80%

B. Attendance:

1. Attendance each of the 10 days of class is very important as it is difficult to make up lost time or incomplete projects.
2. Unexcused absence(s) will result in a grade reduction of one letter grade.
3. If a student drops after completion of one-fourth of the class, no grade will appear on his/her transcript.

C. Late work and makeup policy:

1. Failure to turn in lab projects will affect the student's final grade.
2. Uncompleted work or assignments will be recorded as a zero (0) when the final grade is calculated.

D. Safety

1. **BNSF Employee Safety Rules will be followed. *** While attending training, BNSF employees are considered "ON DUTY" and must comply with BNSF safety rules.**
2. Safety glasses with side shields must be worn during lab activities associated with this course.
3. When grinding with a hand grinder, BNSF requires that students wear approved face shield in conjunction with safety glasses or goggles.
4. When working in the lab BNSF requires the student to wear approved footwear.
5. In addition, all students need to strictly follow the BNSF rules regarding the proper use of personal protection equipment. The first violation will result in a verbal warning, the second will result in a grade reduction of 5%, and a third will result in a letter grade reduction and will be counseled by the BNSF Manager of Training which may result in dismissal from the class.