

SOUTHEAST COMMUNITY COLLEGE
ADVANCED TECHNOLOGIES AND SKILLED TRADES DIVISION
WELDING TECHNOLOGY
COURSE SYLLABUS
November 21, 2025

I. CATALOG DESCRIPTION

Course Number: WELD2510
Course Title: NDT Procedures for Welding
Prerequisite: None

Catalog Description: Theory of Nondestructive Testing methods, welding discontinuities, weld inspection and quality assurance.

Credit Hours: 3.0
Classroom Hours: 45
Lab Hours: 0
Total Contact Hours: 45

II. COURSE OBJECTIVES: *Course will:*

- A. Introduce students to visual inspection testing and nondestructive testing.
- B. Get the student familiar with major steel manufacturing and primary / secondary processing.
- C. Teach the student to define fillet & groove weld terminology and be introduced to welding / manufacturing discontinuities.
- D. Get the student familiar with the proper use of fillet & groove weld gages, joint design, costs and component layout.
- E. Discuss major destructive and nondestructive testing methods and practical application.
- F. Introduce the student to welding codes, standards, specifications, procedures and certification.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES

A. STUDENT LEARNING OUTCOMES: *The student will be able to:*

- 1. Perform visual welding inspection in accordance with AWS, ASME, or API codes and standards. Identify, classify and measure surface discontinuities such as porosity, undercut, overlap, cracks, incomplete fusion, and excessive reinforcement.
- 2. Successfully execute liquid penetrant testing (PT) procedures (Type I & Type II, visible and fluorescent) on ferrous and non-ferrous materials, properly apply penetrant, remover, and developer, interpret indications, distinguish relevant from non-relevant indications.
- 3. Conduct wet and dry magnetic particle testing (MT) using yoke, prod, and coil techniques on ferromagnetic materials, establish proper field direction and strength, detect surface and slightly subsurface discontinuities, correctly evaluate indications.
- 4. Perform ultrasonic thickness measurements and shear-wave flaw detection (UT) using A-scan equipment, calibrate instruments for straight-beam and angle-beam inspection, locate flaws in welds and base materials.

5. Explain the principles of radiographic inspection for welds, including the selection and application of radiation sources and image quality indicators. Identify radiation safety concerns associated with (RT). Identify defects in base metal and welds.

B. GENERAL EDUCATION LEARNING OUTCOMES:

GELO #3: Critical Thinking & Problem Solving

Outcomes:

1. Collect, identify, interpret and analyze data.
2. Synthesize information to arrive at reasoned solutions to problems.
3. Evaluate ideas presented in writing, medial, speech, or artistic presentations.
4. Evaluate the validity of arguments, alternatives, data, outcomes and/or impacts of actions.
5. Acquire and integrate knowledge and construct relationships across disciplines.

IV. CONTENT/UNIT OF INSTRUCTION

- A.** Introduction to inspection and nondestructive testing methods
- B.** Steel manufacturing processes
- C.** Primary processing – metal forming
- D.** Secondary processing
- E.** Service discontinuities
- F.** Joining processes
 1. Fillet & groove weld terminology / lab
 2. Welding discontinuities
- G.** Dimensional aids to visual inspection
 1. Weld gages / lab
- H.** Optical aids to visual inspection
- I.** Major nondestructive testing methods
 1. Weld inspection / lab
- J.** Weld joint design
 1. Welding symbols
 2. Lay-out / lab
- K.** Welding automation including robotics, semi-automatic and automatic.

V. INSTRUCTIONAL MATERIALS

Required Text(s): Refer to Course Information Document and/or course instructor for required text(s)

Other Resources: Fillet Weld Gages & V-WAC Gage
 Supplemental handouts supplied by instructor
 Notebook
 Tools/Supplies listed on the Welding Technology Program required tool list

VI. METHODS OF PRESENTATION / INSTRUCTION

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

1. Lecture
2. Instructor demonstrations
3. Video presentations

VII. METHODS OF EVALUATION**A. Methods of evaluation typically include a combination of the following:**

1. Written assignments
2. Written tests and quizzes

VIII. SPECIFIC COURSE REQUIREMENTS**A. Grading**

1. It is the students' responsibility to make up tests, quizzes or lab when absent.
2. A ten percent (10%) deduction will apply to all assignments for each day late.
3. The instructor reserves the right to revise assignments and/or grading scale in accordance to the progress of the class at any time during the semester.
4. All assigned work / lab must be completed; failure to turn in required assigned work will result in a "U" for the course.
5. Minimum course grade of C (70%)