SOUTHEAST COMMUNITY COLLEGE
CONSTRUCTION MANUFACTURING AND TECHNOLOGY DIVISION
Nondestructive Testing Technology Program
Revision Date: August 2025

I. CATALOG DESCRIPTION

Course Number:	NDTT2652
Course Title	Ultrasonics II
Prerequisite(s):	NDTT1360
Corequisite(s):	NDTT2679
Catalog Description:	Continued study of ultrasonic testing. Developing testing techniques and procedures. Instrumentation, calibration methods, code requirements, evaluation procedures. Computer assisted motion control and data acquisition systems.
Credit Hours:	4
Class Hours:	30
Lab Hours:	90
Total Contact Hours:	120

II. COURSE OBJECTIVES: *Course will:*

A. This course is intended for individuals who have previous experience in ultrasonic examinations. It is suitable for individuals who wish to increase their knowledge and/or upgrade skills.

B. Discusses the theory and establishes sound practices for use in examination or wrought materials, various products forms, as well as composites.

C. Introduces students to additional standards, traditional and specialized techniques, as well as advanced methods.

D. Addresses primary variables of examination and provides a basis for which students may expand their knowledge.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

A. Student Learning Outcomes: *Student will be able to:*

1. Apply the principles and theory which govern modern ultrasonic testing techniques and practices in an industrial/manufacturing environment.

2. Demonstrate proficiencies in the use of ultrasonic test equipment for purposes of calibrations, examinations to various codes/standards (AWS, ASME, etc.), examination of various product forms, and composite materials, and data acquisition.

3. Demonstrate proficiencies in his/her ability to conduct independent examinations in accordance with recognized codes, standards, specifications, and procedures and correctly document and disposition results.

4. Become proficient in the use of modern ultrasonic testing techniques applicable to a variety of product forms and manufacturing/fabrication processes.

B. General Education Learning Outcomes (GELOs)

1. GELO #3: Critical Thinking & Problem Solving
   Outcome 1: Collect, identify, interpret and analyze data.

IV. CONTENT/TOPICAL OUTLINE *(course outline may provide more detailed information)*

A. Review of ultrasonic principles and practices.

B. Review of AWS shear wave techniques with lab and individual performance demonstrations.
C. Continued study of instrumentation and circuitry.
D. Continued study of wave propagation and characteristics in various media.
E. Alternate calibration techniques with application to specific code requirements.
F. Advanced instrumentation and specific controls: DAC/TCG/TVG and others.
G. Introduction to IGSCC.
H. Introduction to phased array technology.
I. Introduction to data acquisition and analysis.
J. Codes/standards applications.

V. INSTRUCTIONAL MATERIALS

A. Required Text(s):
- **1.** Nondestructive Testing Handbook, Volume 7, Ultrasonic Testing, Third Edition
- **2.** American Welding Society, AWS D1.1/D1.1M, Structural Welding Code-Steel (2020 or latest edition)
- **3.** American Society of Mechanical Engineers, Boiler & Pressure Vessel Code, Section V (2023 edition or latest edition)

B. Supplies:
- **1.** Instructor handouts
- **2.** Notebook
- **3.** Scientific calculator
- **4.** 6” steel rule
- **5.** Tape measure
- **6.** Portable flash media storage device
- **7.** Vis-à-vis colored water marker(s)
- **8.** Small standard blade/Phillips screwdrivers
- **9.** 0-1 in OD micrometer

C. Additional Equipment:
- **1.** Students must have readily accessible safety glasses

VI. METHODS OF PRESENTATION/INSTRUCTION

A. Methods of presentation typically include a combination of the following:
- **1.** Lecturing
- **2.** Small and large group discussion
- **3.** Video presentations
- **4.** Demonstrations
- **5.** Handouts
- **6.** Observations
- **7.** Assigned lab projects

VII. METHODS OF EVALUATION *(course outline may provide more detailed information)*

A. Methods of evaluation, although determined by the individual instructor, traditionally includes a combination of the following:
- **1.** Homework
- **2.** Quizzes
- **3.** Tests
- **4.** Lab grades
- **5.** Attendance/class conduct

VIII. SPECIFIC COURSE REQUIREMENTS:

A. Attendance
B. Examinations/Quizzes
C. Homework
D. Lab Projects
E. Must earn a final grade of 70% (2.0) or higher.