

PELLISSIPPI STATE TECHNICAL COMMUNITY COLLEGE
MASTER SYLLABUS

DESTRUCTIVE AND NON-DESTRUCTIVE TESTING
MET 2810

Class Hours: 2.0

Credit Hours: 4.0

Laboratory Hours: 3.0

Date Revised: Spring
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Catalog Course Description:

A study in the methods, procedures, and equipment associated with physical testing.

Entry Level Standards:

Students entering this course should have a fundamental knowledge of materials, basic metallurgy, and basic machining practices.

Prerequisites:

None

Textbook(s) and Other Reference Materials Basic to the Course:

Equipment Operational Manuals

Instructor Developed Material

References:

Nondestructive Testing [PI-4-3], 4th Edition, General Dynamics.

Nondestructive Testing [CT-6-3], 2nd Edition, General Dynamics.

Nondestructive Testing Handbook: Vol. 2, 2nd Edition, American Society for Nondestructive Testing, 1982.

Inspection of Metals-Destructive Testing: Vol. 2, Anderson, Carnes Publication Services, 1988.

Inspection & Gaging: Kennedy, Industrial Press, 6th Edition, 1987.

I. Week/Unit/Topic Basis:

Week	Topic
1	Introduction
2-3	Hardness Testing
4-6	Tensile and Compression Testing
7-8	Impact Testing
9-10	Dye Penetrant Testing
11-12	Magnetic Particle Testing

13-15 Ultrasonic Testing; Miscellaneous Testing Methods

16 Presentations/Final Exam

II. Course Objectives*:

- A. Understand destructive and non-destructive testing principles. I, II
- B. Prepare test samples, set-up, and functionally operate testing equipment. II, III, V
- C. Collect data and analyze results. II, III, V
- D. Communicate technical information. IV

*Roman numerals after course objectives reference goals of the Engineering and Media Technologies department.

III. Instructional Processes*:

Students will:

1. Actively listen to class lectures and participate in class discussions that develop and reinforce an understanding of the theories, concepts, principles, and applications of destructive and non-destructive testing. *Communication Outcome, Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Information Literacy Outcome, Active Learning Strategies*
2. Work individually or in teams to complete projects, lab experiments, and assignments related to the theories, concepts, principles, and applications covered in the lecture or demonstration portion of the course. *Communication Outcome, Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Numerical Literacy Outcome, Information Literacy Outcome, Active Learning Strategies*
3. Collect, analyze, and tabulate data in an orderly format to prepare a college level technical report using computer software packages such as Autocad, Microsoft Word, Word Perfect, Excel, EZ-Feature Manufacturing Software, Data Myte Statistical Process Control, Ziess-Numerex Coordinate Measuring software, MD Solids, Working Model 2D. *Communication Outcome, Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Numerical Literacy Outcome, Information Literacy Outcome, Active Learning Strategies*
4. Use research and oral presentation skills to present findings to a subject matter expert, peer group or an evaluation team from industry. *Communication Outcome, Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Numerical Literacy Outcome, Information Literacy Outcome, Active Learning Strategies, Transitional Strategy*

*Strategies and outcomes listed after instructional processes reference Pellissippi State's goals for strengthening general education knowledge and skills, connecting coursework to experiences beyond the classroom, and encouraging students to take active and responsible roles in the educational process.

IV. Expectations for Student Performance*:

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

1. Define, explain, and associate the terminology used in destructive and non-destructive testing. A

2. Select appropriate testing methods and identify equipment required for the testing process. A
3. Select appropriate test samples. B
4. Calibrate equipment as required. B
5. Determine material hardness using both Rockwell and Brinell testing methods. B
6. Perform tensile and compression tests on various types and shapes of materials. B
7. Determine shear strength of a material by performing a Charpy/Izod impact test. B
8. Perform a dye penetrant and magnetic particle test to detect surface defects. B
9. Perform a basic ultrasonic test to detect internal material defects. B
10. Select appropriate data collection method. C
11. Determine acceptability of data and "accept or reject" results. C
12. Document technical information in a neat and orderly format.
13. Locate and extract needed information from ANSI standards and technical manuals. D
14. Complete assignments based on oral instructions. D

*Letters after performance expectations reference the course objectives listed above.

V. Evaluation:

A. Testing Procedures:

Quizzes--15 point--Approximately 6-8 quizzes will be administered during the course. They will include discussion questions, short answer questions, true/false questions, and problem solving.

B. Laboratory Expectations:

N/A

C. Field Work:

Equipment Proficiency Evaluation--35 points
Physical Testing Proficiency--35 points
Guidelines and requirements for each project will be provided by the instructor.

D. Other Evaluation Methods:

Participation--15 points
Based on instructor observation during the course, each student will be evaluated on participation activities. Evaluation parameters to include active participation in class discussions, being prepared, efficient use of lab time, striving to achieve more than minimum requirements, and regular attendance.

E. Grading Scale:

A	92-100
B+	88-91
B	83-87
C+	79-82
C	74-78
D	65-73
F	Below 65

VI. Policies:

A. Attendance Policy:

Pellissippi State Technical Community College expects students to attend all scheduled instructional activities. As a minimum, students in all courses must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course. Individual departments/ programs/ disciplines, with the approval of the vice president of Academic and Student Affairs, may have requirements that are more stringent.

B. Academic Dishonesty:

Cheating on a quiz or assigned project will not be tolerated. First offense will result in immediate dismissal and automatic failure of the course. Assistance from other students is encouraged during the learning stages of the course, but each student is responsible for completing their own course assignments.

C. Other Policies:

Make-Up Quizzes: As a general rule, no make-up quizzes will be administered during the course.

Safety and Equipment Abuse: Repeated safety violations will result in a reduction of final grade, at the instructor's discretion. Flagrant violations which result in equipment damage or personal injury will result in automatic failure of the course.

Counseling: Counseling is available during posted office hours or by appointment.