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Course Outline for WLDT 66

WELDING INSPECTION AND TESTING

Effective: Fall 2008

I. CATALOG DESCRIPTION:
WLDT 66 — WELDING INSPECTION AND TESTING — 2.00 units

Theory and skills in performing inspections and tests using destructive and nondestructive methods. Tensile and hardness testing; dye penetrant, magnetic particle, radiographic, ultrasonic, and metallographic inspection.

1.00 Units Lecture 1.00 Units Lab

Prerequisite
WLDT 62BL - Advanced GTAW and GMAW Skills Lab
with a minimum grade of C

Grading Methods:
Letter or P/NP

Discipline:

	MIN
Lecture Hours:	18.00
Lab Hours:	54.00
Total Hours:	72.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 4

III. PREREQUISITE AND/OR ADVISORY SKILLS:
Before entering the course a student should be able to:

A. WLDT62BL

IV. MEASURABLE OBJECTIVES:
Upon completion of this course, the student should be able to:

A. Specify requirements to become a Certified Welding Instructor (CWI)
B. Describe requirements and duties of a CWI;
C. Identify and interpret AWS welding testing symbols, codes and specifications;
D. Practice welding inspection and tests, record test data, and write critiques for test results using industry accepted inspection and testing methods;
E. Describe qualification and testing of welders, welding processes and welding procedures;
F. Explain existing non-destructive testing methods, state their limitations and optimum applications;
G. Explain existing destructive testing methods, state their limitations and optimum applications;
H. Recognize ten or more weld defects and suggest cause and corrective actions;
I. Employ welds and tests according to procedures similar to those used by a certified test laboratory.

V. CONTENT:
A. Requirements to become a CWI
1. Written testing
2. Practical testing
3. Visual acuity
4. Background and experience
5. Working conditions
6. Employment outlook
7. Staying current
B. List requirements and duties of a CWI
1. Ethics
2. Professionalism
3. Adhering to standards and requirements
4. Depth of knowledge
5. Inspection
6. Testing
7. Approval
8. Documentation

9. Reliability and repeatability

C. Identify and interpret AWS welding testing symbols, codes and specifications
   1. AWS D1.1 Structural Welding Code
   2. ASME Section IX
   3. API 1104
   4. AWS welding and testing symbols
   5. Other codes and specifications important to welding and inspection

D. Perform welding inspection and tests, record test data, and write critiques for test results using industry accepted inspection and testing methods
   1. Visual Testing (VT) use, application and limitations
   2. Penetrant Testing (PT) use, application and limitations
   3. Magnetic Particle Testing (MT) use, application and limitations
   4. Radiographic Testing (RT) use, application and limitations
   5. Ultrasonic Testing (UT) use, application and limitations
   6. Hardness Testing use, application and limitations
   7. Tensile Testing use, application and limitations
   8. Charpy Testing use, application and limitations
   9. Guided Bend Testing, use application and limitations
   10. Metallographic Testing use, application and limitations
   11. Hydrostatic Pressure Testing use, application and limitations
   12. Helium Leak Testing use, application and limitations
   13. Current trends in inspection and testing
   14. Documenting and reporting

E. Understand qualification and testing of welders, welding processes and welding procedures
   1. Welder qualification and certification
   2. Welder testing
   3. Welding process or procedure qualification and testing
   4. Prequalified welding procedures

F. Explain existing non-destructive testing methods, state their limitations and optimum applications
   1. Non-destructive methods
   2. Limitations
   3. Applications

G. Explain existing destructive testing methods, state their limitations and optimum applications
   1. estructive testing methods
   2. Limitations
   3. Applications

H. Recognize ten or more weld defects and suggest cause and corrective actions
   1. Common weld discontinuities
   2. Common weld discontinuity causes
   3. Common weld discontinuity corrective actions

I. Perform welds and tests according to procedures similar to those used by a certified test laboratory.
   1. Writing a welding procedure
   2. Welding according to welding a procedure
   3. Testing welds according to a welding procedure

VI. METHODS OF INSTRUCTION:
- A. **Lecture** -
- B. Visual presentations
- C. **Field Trips** -
- D. Invited guests
- E. **Demonstration** -

VII. TYPICAL ASSIGNMENTS:
A. Methods 1. Read chapter related to visual testing 2. Discuss the chapter content 3. Use the information in the chapter to perform visual testing and document and the results

VIII. EVALUATION:
- A. **Methods**
   1. Exams/Tests
   2. Quizzes
   3. Class Participation
   4. Lab Activities
   5. Other:
      a. Class participation
      b. Safe operation in laboratory and safe use of equipment
      c. Quality and quantity of work produced
      d. Quizzes
      e. Exams
- B. **Frequency**

IX. TYPICAL TEXTS:
1. American Welding Society *Welding Inspection Technology*., -, 2006.

X. OTHER MATERIALS REQUIRED OF STUDENTS:
- A. Personal protective equipment
- B. Welding gloves
- C. Welders safety glasses
- D. Leather boots or shoes
- E. Calculator with Trig functions