



**COWLEY COLLEGE  
& Area Vocational Technical School**

**COURSE PROCEDURE FOR**

**CODES AND PRACTICES  
NDT3453 3 Credit Hours**

**Student Level:**

This course is open to students on the college level in either the freshman or sophomore year and to high school vocational students.

**Catalog Description:**

**NDT 3453 - CODES AND PRACTICES (3 hrs)**

This course is designed to acquaint the student with Federal and State codes and standards associated with six disciplines involved with nondestructive evaluation: radiographic, ultrasonics, eddy current, magnetic particle liquid penetrants, and visual inspection typically used in the manufacturing industry. Students will develop a procedure and acceptance requirements for a given inspection.

**Prerequisites:**

None

**Controlling Purpose:**

This course is designed to introduce the student to quality control codes and practices commonly used by industry.

**Learner Outcomes:**

Upon completion of this course the student will be able to:

1. Define a code, standard and a specification.
2. List and describe working documents used in industry.
3. Explain the benefits of regulations for public safety.
4. Locate codes, standards and specifications that concern themselves with Nondestructive Testing.
5. Interpret and explain codes and standards used in Nondestructive Testing.
6. Construct a procedure and technique card for use in Magnetic Particle inspection.

The learning outcomes and competencies detailed in this course outline or syllabus meet or exceed the learning outcomes and competencies specified by the Kansas Core Outcomes Groups project for this course as approved by the Kansas Board of Regents.

**Units Outcomes and Criterion Based Evaluation Key for Core Content:**

The following defines the minimum core content not including the final examination period. Instructors may add other content as time allows.

Evaluation Key:

- A = All major and minor goals have been achieved and the achievement level is considerably above the minimum required for doing more advanced work in the same field.
- B = All major goals have been achieved, but the student has failed to achieve some of the less important goals. However, the student has progressed to the point where the goals of work at the next level can be easily achieved.
- C = All major goals have been achieved, but many of the minor goals have not been achieved. In this grade range, the minimum level of proficiency represents a person who has achieved the major goals to the minimum amount of preparation necessary for taking more advanced work in the same field, but without any major handicap of inadequacy in his background.
- D = A few of the major goals have been achieved, but the student’s achievement is so limited that he is not well prepared to work at a more advanced level in the same field.
- F = Failing, will be computed in GPA and hours attempted.
- N = No instruction or training in this area.

<b>UNIT 1: Functions Of Regulations For Public Safety</b>						
Outcomes: Upon completion of this unit, the students will be able to successfully summarize the need for codes and regulations for public safety.						
A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Classify the regulation bodies in the Nondestructive Testing industry.
						Describe two examples of code and regulation violations.

## UNIT 2: Codes Used In Nondestructive Testing

Outcomes: Upon completion of this unit, the students will be able to successfully list and describe the major codes used in Nondestructive Testing.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						List and describe the differences between structural and pressure vessel codes.
						Given a situation, determine which code would be used.
						Describe the codes used in tanking and pipeline manufacture and service.

## UNIT 3: Standard Practices Used In Nondestructive Testing

Outcomes: Upon completion of this unit, the students will be able to successfully demonstrate the use of standard practices in industry.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Given a specific type of defect, locate a standard practice for inspection in ASTM E-03.03.
						Evaluate a written procedure assuring that all requirements of ASTM E-1444 are met.
						Read and report on five standard practices from ASTM E-03.03.

## UNIT 4: Application Of Codes, Standards, To A Task

Outcomes: Upon completion of this unit, the students will be able to successfully apply a code standard to the evaluation of a part.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Inspect one part following directions in a written practice developed by another student.
						Apply the accept/reject requirements of visual inspection using the D1.1 code to a weld plate.

**UNIT 5: SNT TC 1A Requirements As A Recommended Practice**

Outcomes: Upon completion of this unit, the students will be able to successfully list and describe the requirements of a Level II inspector per requirements of SNT TC 1-A, NAS-410 and CP-189.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						List and describe the requirements for a Level II inspector as stated in SNT-TC1-A.
						List and describe the requirements for a Level II inspector as stated in NAS-410.
						List and describe the requirements for a Level II inspector as stated in CP189.

**UNIT 6: Organizations That Write Codes**

Outcomes: Upon completion of this unit, the students will be able to successfully list and describe code-writing bodies.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Identify a code writing body by its industry application.
						Explain the differences between structural and pressure and vessel codes.
						Explain the applications of ISO-9000 series documents.

**UNIT 7: Code Interpretation**

Outcomes: Upon completion of this unit, the students will be able to successfully read and interpret a code or standard practice.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Document MIL. STD-1907 and correctly state the acceptance criteria for a given grade when performing magnetic particle inspection.
						Evaluate document ASME Section VIII and correctly state the acceptance requirements for liquid penetrant inspection.
						Evaluate document D1.1 and correctly state the acceptance criteria for Ultrasonic Inspection of a statically loaded member.

## UNIT 8: Procedure And Technique Writing

Outcomes: Upon completion of this unit, the students will be able to successfully create a written procedure using a code or standard practice.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Extrapolate information in a given code or standard practice, develop written instructions and acceptance criteria for a given inspection.

### **Projects Required:**

As assigned

### **Textbook:**

Contact Bookstore for current textbook.

### **Materials/Equipment Required:**

None

### **Attendance Policy:**

Students should adhere to the attendance policy outlined by the instructor in the course syllabus.

### **Grading Policy:**

The grading policy will be outlined by the instructor in the course syllabus.

### **Maximum class size:**

Based on classroom occupancy

### **Course Timeframe:**

The U.S. Department of Education, Higher Learning Commission and the Kansas Board of Regents define credit hour and have specific regulations that the college must follow when developing, teaching and assessing the educational aspects of the college. A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally-established equivalency that reasonably approximates not less than one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work for approximately fifteen weeks for one semester hour of credit or an equivalent amount of work over a different amount of time. The number of semester hours of credit allowed for each distance education or blended hybrid courses shall be assigned by the college based on the amount of time needed to achieve the same course outcomes in a purely face-to-face format.

### **Refer to the following policies:**

[402.00 Academic Code of Conduct](#)

263.00 Student Appeal of Course Grades

403.00 Student Code of Conduct

**Disability Services Program:**

Cowley College, in recognition of state and federal laws, will accommodate a student with a documented disability. If a student has a disability, which may impact work in this class which requires accommodations, contact the Disability Services Coordinator.