



**COWLEY COLLEGE
& Area Vocational Technical School**

COURSE PROCEDURE FOR

**EDDY CURRENT TESTING I
NDT3467 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 3467 - EDDY CURRENT TESTING I (3 hrs)

This course is devised to give the student a complete introduction through hands-on-experience in the Eddy Current method within the field of Nondestructive Testing. The course is designed to meet certain NDT Level I requirements in accordance with A.S.N.T., SNT-TC-1A, & NAS-410.

Prerequisites:

INR3716 Technical Mathematics or instructor approval.

Controlling Purpose:

This course is designed to impart the fundamentals of Eddy Current Testing, its applications, techniques, process controls and the terminology such that the student could pass a typical industrial certification examination in accordance with A.S.N.T. SNT-TC-1A.

Learner Outcomes:

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

1. Perform and interpret Eddy Current test procedures.
2. List and describe differences between the specific processes.
3. List and describe types of defects found with Eddy Current.
4. Determine test requirements for a specific component from a given specification.
5. Perform basic Eddy Current inspection correctly and to interpret and report the results.
6. Correctly apply all safety attitude and procedures associated with Eddy Current testing that will insure a safe work place environment.
7. Successfully pass both the theory and practical qualification examination prepared in accordance with the industry standards (SNT-TC-1A & NAS-410).
8. Apply knowledge of Eddy Current to inspections commonly performed by a Level I inspector.

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DISCLAIMER: THIS INFORMATION IS SUBJECT TO CHANGE. FOR THE OFFICIAL COURSE PROCEDURE CONTACT ACADEMIC AFFAIRS.

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.

UNIT 1: History Of Eddy Current Testing						
Outcomes: Upon completion of this unit, the students will be able to successfully describe the history of Eddy Current Testing.						
A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						List the individuals credited with developing Eddy Current inspection and introducing it to industry.

UNIT 2: Definitions Of Eddy Current Terms

Outcomes: Upon completion of this unit, the students will be able to successfully list and describe terms used in Eddy Current inspection.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						List and illustrate ten terms used in Eddy Current inspection.
						Group together terms that describe areas of Eddy Current instruments, inspections, and parts inspected.

UNIT 3: Eddy Current Theory

Outcomes: upon completion of this unit, the students will be able to successfully recognize terms and practices related to theory.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						List and describe the skin effect.
						List and describe ec interactions in a material.
						List and describe ec generation in the probe.
						List and describe the workings of an Eddy Current instrument.
						Describe and perform Ohm's Law calculations.
						Describe "skin effect".
						Calculate depth of penetration with a given frequency and conductivity.

UNIT 4: Types Of Probes And Coils

Outcomes: Upon completion of this unit, the student will be able to successfully explain the workings of three types of probes.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Illustrate and describe the workings of three absolute contact probes.
						Illustrate and describe the workings of two differential probes.
						Illustrate and describe the workings of a bobbin probe and hole probe.
						Illustrate and describe the workings of a reflection coil.

UNIT 5: Probe And Coil Impedance

Outcomes: Upon completion of this unit, the students will be able to successfully relate coil impedance to applications in industry.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Define impedance as it relates to eddy current.
						List and describe the impedance plane.

UNIT 6: Test Frequency Selections

Outcomes: Upon completion of this unit, the students will be able to successfully demonstrate the proper choice of test frequency for a part.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Calculate and select the proper frequency for one standard depth of penetration in three standards.
						Determine the proper depth of penetration through calculations for twenty-five materials at different frequencies.

UNIT 7: Instrument Designs And Read Out Mechanisms

Outcomes: Upon completion of this unit, the students will be able to successfully classify instruments.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Apply inspection procedures to inspect three parts for conductivity readings on a meter instrument.
						Apply inspection procedures to inspect four parts for conductivity changes using a phase amplitude instrument.

UNIT 8: Test Equipment

Outcomes: Upon completion of this unit, the students will be able to successfully list three manufactures of test equipment.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						List and describe the capabilities and limitations of four pieces of equipment in use today.
						Apply inspection procedures to inspect four parts for conductivity changes using a phase amplitude instrument.

UNIT 9: Interpretation Of Eddy Current Indications

Outcomes: Upon completion of this unit, the students will be able to successfully distinguish between false indications and relevant indications from known defects.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Apply knowledge of inspection to three test parts and list the indications that are relevant and the ones that are not.

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](#)

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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.