### Non-Destructive Inspection

**Catalog Year:** 2020, **Required Hours:** 900

#### Required Core Courses (800 hours required)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>NDIT1005</td>
<td>Introduction to Materials and Processes</td>
<td>60.00</td>
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<tr>
<td>NDIT1001</td>
<td>Introduction to Non-Destructive Inspection</td>
<td>40.00</td>
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</tbody>
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**NDIT1005**  
*Introduction to Materials and Processes*

Students in this course will learn the processes involved in making a part from casting, forging, and molds, rolled, and also materials such as carbon fiber, fiberglass, and ARAMID (Kevlar). Students will use these concepts to be able to identify the types of failures that occur in industry using non-destructive inspection processes.

**NDIT1001**  
*Introduction to Non-Destructive Inspection*

This course is designed to provide the general applications and scope of inspection which are called NDI. The student will learn why we perform NDI and why it matters, as it relates to the safety of operation in all areas of our lives. The student will be introduced to the many methods of inspection available.

Objectives:
- Recognize why NDI is so important to the safety and quality of a product
- Comprehend why there are so many types of inspection
- Be familiar with the reason some types of inspections do not work on every part
- Recognize the material properties that make each method useful in its own way
- Identify magnetic material from nonmagnetic material even if they look the same
- Know the dangers involved with not performing an inspection properly.

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<tbody>
<tr>
<td>NDIT1160</td>
<td>Industrial Safety and Health</td>
<td>30.00</td>
</tr>
<tr>
<td>MATH1019</td>
<td>Math I</td>
<td>60.00</td>
</tr>
<tr>
<td>WKSK1107</td>
<td>Introduction to Computers</td>
<td>30.00</td>
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**MATH1019**  
*Math I*

This course offers an introduction to basic mathematics, including operations with whole numbers, fractions, and decimals, as well as proportions, averages and percentages. Students are prepared for more advanced mathematics.

Competencies:
- Perform different operations with whole numbers
- Perform different operations with fractions
- Perform different operations with decimals
- Solve simple problems with proportions, percentages and averages

**WKSK1107**  
*Introduction to Computers*

Introduction to Computers introduces basic computer tasks using Windows, typing with a word processor, navigating the web, and working with email.

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<tr>
<td>NDIT1180</td>
<td>Magnet Particle Inspection I and II</td>
<td>60.00</td>
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<tr>
<td>MATH1400</td>
<td>NDI Math</td>
<td>90.00</td>
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</table>

**NDIT1180**  
*Magnet Particle Inspection I and II*

Students in this course will learn fundamental knowledge required for qualification as a Level I and II inspector. Students will use magnetic particle inspection (MPI) to detect surface and slight subsurface discontinuities in ferromagnetic materials such as iron, nickel, cobalt, and some other alloys. Student will demonstrate inducing magnetic field in part tests. Student will use direct or indirect magnetization. Students will evaluate and determine cracks and inclusions and explain the effect to the service life of the parts tested. State of the art industry NDI equipment used for hands on lab lessons and demonstration of skills achieved.

**MATH1400**  
*NDI Math*

This course teaches pre-algebra, unit conversions in the US customary units and the metric system. Students learn how to manipulate formulas to solve for any specified variable. This course also teaches students to identify the proper NDI parameters and specifications.

Competencies:
- Solve simple algebraic equations
- Convert units from the US system to the metric system and metric to US
- Solve for specified variable from any given formula
NDIT1701  Electromagnetic Inspection I  90.00
The course provides basic electromagnetic physics concepts and how this method of non-destructive testing is used to analyze the impedance, electromagnetic induction and the eddy current that occurs within the test object to determine if defects are unseen. Also to determine the conductivity and heat treat of some parts which could affect their performance. State of the art industry NDI equipment used for hands on lab lessons and demonstration of skills achieved.
Competencies:
• Explain the physics of basic electromagnetic testing theory for eddy currents
• Calibrate test equipment
• Measure conductivity as % IACS (International Annealed Copper Standard)
• Demonstrate inspections and calibrate equipment

NDIT1302  Ultrasound Inspection I  95.00
Ultrasonic testing is one of the most widely used non-destructive test methods. It is regularly used to measure thickness or to examine the internal structure of a material. In this course students study the theory, operation and testing procedures for ultrasonic NDI. State of the art industry NDI equipment used for hands on lab lessons and demonstration of skills achieved.
• Define ultrasonic testing and its uses
• Explain the basic principles of sound propagation in solid, liquid, and gas
• Identify and calibrate to basic instrument standardization
• Describe transducer operation and theory
• Identify and differentiate basic ultrasonic testing methods
• Demonstrate hands on application of pulse echo and through transmission

NDIT1190  Radiation Safety  60.00
Students in this course will learn various sources of radiation, safe and unsafe exposures to radiation, proper procedures for emergency situations, and the importance of checking for radiation leaks. Students will learn the four factors of controlling radiation exposure. Students learn how distance reduces exposure and student will be able to identify situations which require notification of the Radiation Safety Officer (RSO). This course fulfills radiation safety training and complies with the As Low As Reasonably Achievable (ALARA) standard.

NDIT1402  Radiography Inspection I  110.00
The course provides the basic knowledge of the fundamentals of radiographic testing. An individual completing the course studies about using radiography to test a part or item to ensure the piece is properly built and meets specified standards. State of the art industry NDI equipment used for hands on lab lessons and demonstration of skills achieved.
Objectives:
• Practice Radiation Safety
• Explain the concepts of radiography
• Comprehend the advantage and limitations of radiography
• Identify and use X-ray and gamma equipment properly
• Conduct radiographic exams on parts typical in the workplace

WKJS1015  Job Seeking Skills Complete-15 hrs  15.00
This course is in-depth for students who have never had a job or never had a job in their field of training and is designed for students unfamiliar with creating the tools and knowing the best practices for a successful job search and job interview.
Competencies:
• Identify your skills and attributes
• Conduct targeted company research
• Conduct an informational interview with someone working in the field.
• Establish a network of job contacts
• Complete a master job application form
• Create a current resume
• Create a cover letter of application
• Create a references page
• Demonstrate competency in a job interview
• Understand the components of a portfolio
• Learn and practice follow-up with prospective employers

Elective Courses (100 hours required)

Non-Destructive Inspection (100 hours required)

NDIT2000  Ultrasound Inspection II  100.00
Students in this course will learn fundamental knowledge required for qualification as a Level II inspector. Student will conduct ultrasonic testing to measure thickness of materials and detect defects in welds to metals. Students will study the theory of sound propagation in materials and inspection of materials by measuring characteristics of sound in material. State of the art industry NDI equipment used for hands on lab lessons and demonstration of skills achieved.

NDIT2010  Radiography Inspection II  100.00
Students in this course will learn fundamental knowledge required for qualification as a Level II inspector. Student will learn to use radiography to determine if materials meet requirements determined by original specifications. Student will use radiography to detect cracks, corrosion, or foreign materials in materials. State of the art industry NDI equipment used for hands on lab lessons and demonstration of skills achieved.
Students in this course will learn fundamental knowledge required for qualification as a Level II inspector. Students will learn electromagnetic physics concepts to analyze indications derived from sensitive electronic inspection equipment. Students will determine properties of materials that have a negative effect test objects. Student will use conductivity to determine heat treat properties that can make a part fail under a stress load. This is a Level II class that is a follow-on to the Electromagnetic Inspection I. State of the art industry NDI equipment used for hands on lab lessons and demonstration of skills achieved.