

# Nondestructive Testing Technology (NDT)

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## Courses

### NDT A100 Radiographic Testing Safety 2 Credits

Presents safety practices and USNRC regulations for industrial radiography in nondestructive examination. Prepares for both Radioactive Materials (RAM) and the X-ray category Industrial Radiography Radiation Safety Personnel (IRRSP) examination administered by the American Society for Nondestructive Testing (ASNT).

**Prerequisites:** ALEKS Overall Test 1 with a score of 030 or ALEKS Overall Test 2 with a score of 030 or ALEKS Overall Test 3 with a score of 030 or ALEKS Overall Test 4 with a score of 030 or ALEKS Overall Test 5 with a score of 030 or MATH A104 with a minimum grade of C or MATH A105 with a minimum grade of C or MATH A115 with a minimum grade of C or MATH A121 with a minimum grade of C or MATH A151 with a minimum grade of C or MATH A152 with a minimum grade of C or MATH A155 with a minimum grade of C or MATH A221 with a minimum grade of C or MATH A251 with a minimum grade of C or MATH A251F with a minimum grade of C or MATH A252 with a minimum grade of C or MATH A252F with a minimum grade of C or MATH A253 with a minimum grade of C.

**Corequisites:** NDT A101 AND NDT A102 AND NDT A103.

### NDT A101 Magnetic Particle Testing Level One 3 Credits

Prepares students for the "American Society for Nondestructive Testing (ASNT) SNT-TC-1A" Level I code examination for magnetic particle testing. Introduces students to principles and theories associated with "dry" magnetic particle inspection methods. Administers the general, practical, and specific code exams once ASNT classroom hour requirements have been met. Provides hands-on training.

**Prerequisites:** ALEKS Overall Test 1 with a score of 030 or ALEKS Overall Test 2 with a score of 030 or ALEKS Overall Test 3 with a score of 030 or ALEKS Overall Test 4 with a score of 030 or ALEKS Overall Test 5 with a score of 030 or MATH A104 with a minimum grade of C or MATH A105 with a minimum grade of C or MATH A115 with a minimum grade of C or MATH A121 with a minimum grade of C or MATH A151 with a minimum grade of C or MATH A152 with a minimum grade of C or MATH A155 with a minimum grade of C or MATH A221 with a minimum grade of C or MATH A251 with a minimum grade of C or MATH A251F with a minimum grade of C or MATH A252 with a minimum grade of C or MATH A252F with a minimum grade of C or MATH A253 with a minimum grade of C.

**Corequisites:** NDT A100 AND NDT A102 AND NDT A103.

### NDT A102 Penetrant Testing Level One 3 Credits

Prepares students for the "American Society for Nondestructive Testing (ASNT) SNT-TC-1A" Level I code examination for "visible" magnetic particle testing. Introduces students to principles and theories associated with penetrant testing inspection methods. Administers the general, practical, and specific code exams once ASNT classroom hour requirements have been met. Provides hands-on training.

**Prerequisites:** ALEKS Overall Test 1 with a score of 030 or ALEKS Overall Test 2 with a score of 030 or ALEKS Overall Test 3 with a score of 030 or ALEKS Overall Test 4 with a score of 030 or ALEKS Overall Test 5 with a score of 030 or MATH A104 with a minimum grade of C or MATH A105 with a minimum grade of C or MATH A115 with a minimum grade of C or MATH A121 with a minimum grade of C or MATH A151 with a minimum grade of C or MATH A152 with a minimum grade of C or MATH A155 with a minimum grade of C or MATH A221 with a minimum grade of C or MATH A251 with a minimum grade of C or MATH A251F with a minimum grade of C or MATH A252 with a minimum grade of C or MATH A252F with a minimum grade of C or MATH A253 with a minimum grade of C.

**Corequisites:** NDT A100 AND NDT A101 AND NDT A103.

### NDT A103 Ultrasonic Testing Level One 3 Credits

Prepares students for the "American Society for Nondestructive Testing (ASNT) SNT-TC-1A" Level I code examination for ultrasonic testing. Introduces students to principles and theories associated with ultrasonic inspection using the 0 degree (straight beam) method. Administers the general, practical, and specific code exams once ASNT classroom hour requirements have been met. Provides hands-on training.

**Prerequisites:** ALEKS Overall Test 1 with a score of 030 or ALEKS Overall Test 2 with a score of 030 or ALEKS Overall Test 3 with a score of 030 or ALEKS Overall Test 4 with a score of 030 or ALEKS Overall Test 5 with a score of 030 or MATH A104 with a minimum grade of C or MATH A105 with a minimum grade of C or MATH A115 with a minimum grade of C or MATH A121 with a minimum grade of C or MATH A151 with a minimum grade of C or MATH A152 with a minimum grade of C or MATH A155 with a minimum grade of C or MATH A221 with a minimum grade of C or MATH A251 with a minimum grade of C or MATH A251F with a minimum grade of C or MATH A252 with a minimum grade of C or MATH A252F with a minimum grade of C or MATH A253 with a minimum grade of C.

**Corequisites:** NDT A100 AND NDT A101 AND NDT A102.

### NDT A104 Radiographic Testing Level One 3 Credits

Prepares students for the "American Society for Nondestructive Testing (ASNT) SNT-TC-1A" Level I code examination for radiographic testing. Introduces students to principles and theories associated with radiographic testing inspection methods including X-rays, film development, and film artifact detections. Administers the general, practical, and specific code exams once ASNT classroom hour requirements have been met. Provides hands-on training.

**Prerequisites:** NDT A100 with a minimum grade of C and NDT A101 with a minimum grade of C and NDT A102 with a minimum grade of C and NDT A103 with a minimum grade of C.

**Corequisites:** NDT A105 AND NDT A105L AND NDT A106.

**NDT A105** Introduction to American Welding Society Code **3 Credits**  
Introduces the American Welding Society's "AWS D1.1 Structural Code - Steel" code book. Outlines entry level concepts associated with the AWS Certified Welding Inspector (CWI) activities including Welding Procedure Specifications (WPS), qualifications, and inspections.

**Prerequisites:** NDT A100 with a minimum grade of C and NDT A101 with a minimum grade of C and NDT A102 with a minimum grade of C and NDT A103 with a minimum grade of C.

**Corequisites:** NDT A104 AND NDT A105L AND NDT A106.

**NDT A105L** American Welding Society Code Lab **2 Credits**  
Assesses knowledge of the AWS D1.1 Code Book. Simulates mock code inspections using field inspection tools, actual welding procedure specifications and welder performance qualification documentation, welded components, mill test reports, and related conformances.

**Prerequisites:** NDT A100 with a minimum grade of C and NDT A101 with a minimum grade of C and NDT A102 with a minimum grade of C and NDT A103 with a minimum grade of C.

**Corequisites:** NDT A104 AND NDT A105 AND NDT A106.

**NDT A106** Welding for Nondestructive Inspection **2 Credits**  
Introduces inspector's perspective pertaining to welders, welding equipment, and welding operations. Covers welding gases, welding electrode identification, and application as well as provides education and training simulations orbiting incorrect equipment, incorrect equipment settings and operations, incorrect gasses, and filler metals. Contains a hot-work component for hands-on experience.

**Prerequisites:** NDT A100 with a minimum grade of C and NDT A101 with a minimum grade of C and NDT A102 with a minimum grade of C and NDT A103 with a minimum grade of C.

**Corequisites:** NDT A104 AND NDT A105 AND NDT A105L.

**NDT A200** Magnetic Particle Testing Level Two **3 Credits**  
Prepares students for the "American Society for Nondestructive Testing (ASNT) SNT-TC-1A" Level II code examination for magnetic particle testing (MT). Expands on knowledge achieved in NDT A101 and further explains principles and theories associated with magnetic particle inspection methods as well as introduces the "wet" method of MT. Administers the general, practical, and specific code exams once ASNT classroom hour requirements have been met. Provides hands-on training.

**Prerequisites:** NDT A104 with a minimum grade of C and NDT A105 with a minimum grade of C and NDT A105L with a minimum grade of C and NDT A106 with a minimum grade of C.

**Corequisites:** NDT A201 AND NDT A202 AND NDT A203.

**NDT A201** Penetrant Testing Level Two **3 Credits**  
Prepares students for the "American Society for Nondestructive Testing (ASNT) SNT-TC-1A" Level II code examination for penetrant testing (PT). Expands on knowledge achieved in NDT A102, further explains principles and theories associated with penetrant inspection methods, and introduces the ultra-violet (fluorescent) method of PT. Administers the general, practical, and specific code exams once ASNT classroom hour requirements have been met. Provides hands-on training.

**Prerequisites:** NDT A104 with a minimum grade of C and NDT A105 with a minimum grade of C and NDT A105L with a minimum grade of C and NDT A106 with a minimum grade of C.

**Corequisites:** NDT A200 AND NDT A202 AND NDT A203.

**NDT A202** Ultrasonic Testing Level Two **3 Credits**  
Prepares students for the "American Society for Nondestructive Testing (ASNT) SNT-TC-1A" Level II code examination for ultrasonic testing. Introduces students to principles and theories associated with ultrasonic inspection using the 90 degree (shear wave) method. Administers the general, practical, and specific code exams once ASNT classroom hour requirements have been met. Provides hands-on training.

**Prerequisites:** NDT A104 with a minimum grade of C and NDT A105 with a minimum grade of C and NDT A105L with a minimum grade of C and NDT A106 with a minimum grade of C.

**Corequisites:** NDT A200 AND NDT A201 AND NDT A203.

**NDT A203** Radiographic Testing Level Two **3 Credits**  
Prepares students for the "American Society for Nondestructive Testing (ASNT) SNT-TC-1A" Level II code examination for radiographic testing. Introduces students to principles and theories associated with the radiographic testing inspection method, Computerized Radiography, or Digital Radiography (when available). Administers the general, practical, and specific code exams once ASNT classroom hour requirements have been met. Provides hands-on training.

**Prerequisites:** NDT A104 with a minimum grade of C and NDT A105 with a minimum grade of C and NDT A105L with a minimum grade of C and NDT A106 with a minimum grade of C.

**Corequisites:** NDT A200 AND NDT A201 AND NDT A202.

**NDT A204** Pipeline Corrosion **3 Credits**  
Covers pipeline inspection, examination, interpretation of relevant and irrelevant indications as well as documentation under the American Petroleum Institute's API 570 Piping and Inspection Code: In-service Inspection, Rating, Repair, and Alteration of Piping Systems. Utilizes extensive ultrasonic testing (UT) applications.

**Prerequisites:** NDT A200 with a minimum grade of C and NDT A201 with a minimum grade of C and NDT A202 with a minimum grade of C and NDT A203 with a minimum grade of C.

**Corequisites:** NDT A205 AND NDT A206 AND NDT A206L.

**NDT A205** Welding Metallurgy **5 Credits**  
Introduces students to the mechanical properties and mechanical failures of both ferrous and non-ferrous materials using laboratory exercises. Requires the use of sophisticated equipment, associated peripherals, and their respective consumables.

**Prerequisites:** NDT A200 with a minimum grade of C and NDT A201 with a minimum grade of C and NDT A202 with a minimum grade of C and NDT A203 with a minimum grade of C.

**Corequisites:** NDT A204 AND NDT A206 AND NDT A206L.

**NDT A206** Introduction to American Petroleum Institute Code **3 Credits**  
Introduces the American Petroleum Institute's "API 1104 Pipelines and Related Facilities" code book. Outlines entry level concepts associated with the AWS Certified Welding Inspector (CWI) activities including Welding Procedure Specifications (WPS), qualifications, and inspections.

**Prerequisites:** NDT A200 with a minimum grade of C and NDT A201 with a minimum grade of C and NDT A202 with a minimum grade of C and NDT A203 with a minimum grade of C.

**Corequisites:** NDT A204 AND NDT A205 AND NDT A206L.

**NDT A206L American Petroleum Institute Code Lab 2 Credits**

Assesses knowledge of the API 1104 Code Book. Simulates mock code inspections using field inspection tools, actual welding procedure specifications and actual welder performance qualification documentation, welded components, mill test reports, and related conformances.

**Prerequisites:** NDT A200 with a minimum grade of C and NDT A201 with a minimum grade of C and NDT A202 with a minimum grade of C and NDT A203 with a minimum grade of C.

**Corequisites:** NDT A204 AND NDT A205 AND NDT A206.

**NDT A261 Ultrasonic Testing 4 Credits**

Covers the principles of ultrasonic testing (UT) methods with compression and shear wave techniques. Examines inspection techniques in accordance with American Welding Society (AWS) D1.1, API 1104 and American Society of Mechanical Engineers (ASME) codes. Prepares students for the American Society for Nondestructive Testing (ASNT) SNT-TC-1A code recommended Level I and Level II UT general, specific, and practical examinations.

**Prerequisites:** (MATH A105 with a minimum grade of C or MATH A121 with a minimum grade of C or MATH A151 with a minimum grade of C or MATH A152 with a minimum grade of C or MATH A155 with a minimum grade of C or MATH A211 with a minimum grade of C or MATH A212 with a minimum grade of C or MATH A221 with a minimum grade of C or MATH A251 with a minimum grade of C or MATH A251F with a minimum grade of C or MATH A252 with a minimum grade of C or MATH A252F with a minimum grade of C or MATH A253 with a minimum grade of C) and NDT A262 with a minimum grade of C.

**NDT A262 General Nondestructive Testing 3 Credits**

Presents nondestructive testing methods of dye penetrant, magnetic particle, and visual testing. Includes the applications, advantages, and limitations of these NDT methods. Prepares students for the American Society for Nondestructive Testing (ASNT) SNT-TC-1A code Level I and Level II examinations in liquid penetrant testing (PT) and magnetic particle testing (MT).

**Prerequisites:** MATH A105 with a minimum grade of C or MATH A121 with a minimum grade of C or MATH A151 with a minimum grade of C or MATH A152 with a minimum grade of C or MATH A155 with a minimum grade of C or MATH A211 with a minimum grade of C or MATH A212 with a minimum grade of C or MATH A221 with a minimum grade of C or MATH A251 with a minimum grade of C or MATH A251F with a minimum grade of C or MATH A252 with a minimum grade of C or MATH A252F with a minimum grade of C or MATH A253 with a minimum grade of C.

**NDT A264 Radiographic Testing 4 Credits**

Presents theory and application of industrial radiography and meets the American Society for Nondestructive Testing (ASNT) initial training hour requirements for Level I and Level II radiographer. Includes operation of equipment, film exposures and development, radiographic procedure specifications, interpretation of radiographs, and a brief review of radiation safety.

**Prerequisites:** (MATH A105 with a minimum grade of C or MATH A121 with a minimum grade of C or MATH A151 with a minimum grade of C or MATH A152 with a minimum grade of C or MATH A155 with a minimum grade of C or MATH A211 with a minimum grade of C or MATH A212 with a minimum grade of C or MATH A221 with a minimum grade of C or MATH A251 with a minimum grade of C or MATH A251F with a minimum grade of C or MATH A252 with a minimum grade of C or MATH A252F with a minimum grade of C or MATH A253 with a minimum grade of C) and WELD A112 with a minimum grade of C and NDT A100 with a minimum grade of C or concurrent enrollment.

**NDT A281 Welding Inspection and Code Review 3 Credits**

Presents various welding inspection methods and a study of applicable welding codes and standards in preparation for the American Welding Society (AWS) Certified Welding Inspector (CWI) Examination.

**Prerequisites:** (MATH A105 with a minimum grade of C or MATH A121 with a minimum grade of C or MATH A151 with a minimum grade of C or MATH A152 with a minimum grade of C or MATH A155 with a minimum grade of C or MATH A211 with a minimum grade of C or MATH A212 with a minimum grade of C or MATH A221 with a minimum grade of C or MATH A251 with a minimum grade of C or MATH A251F with a minimum grade of C or MATH A252 with a minimum grade of C or MATH A252F with a minimum grade of C or MATH A253 with a minimum grade of C) and WELD A112 with a minimum grade of C and WELD A157 with a minimum grade of C.

**NDT A287 Welding Metallurgy Applications 5 Credits**

Presents technical information in welding metallurgy. Includes laboratory practice in metallography, heat-treating, and mechanical properties testing of various metals.

**Prerequisites:** (MATH A105 with a minimum grade of C or MATH A121 with a minimum grade of C or MATH A151 with a minimum grade of C or MATH A152 with a minimum grade of C or MATH A155 with a minimum grade of C or MATH A211 with a minimum grade of C or MATH A212 with a minimum grade of C or MATH A221 with a minimum grade of C or MATH A251 with a minimum grade of C or MATH A251F with a minimum grade of C or MATH A252 with a minimum grade of C or MATH A252F with a minimum grade of C or MATH A253 with a minimum grade of C) and WELD A112 with a minimum grade of C.