

## Railroad Industrial Technology (RRIT)

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### Courses

#### **RRIT 132 Thermite Welding\* (3 Hours)**

**Prerequisites** : Department approval.

Upon successful completion of this course, the student should be able to produce in a safe manner high-quality, sound thermite welds on standard rail and mismatched rail. This course is intended for people who are employed in the railroad industry. It will include specific in-depth industrial training. Students will be required to make various rail alignments and to grind various new and worn rails.

#### **RRIT 136 Rail and Switch Point Repair Welding\* (3 Hours)**

**Prerequisites** : BNSF Railway Training Director approval and JCCC department approval.

Upon successful completion of this course, the student should be able to identify and/or produce in a safe manner high-quality welding repairs and correct welding techniques to railroad track components to include maintenance, grinding, welding and repairs of switches, track rail ends, track wheel burns, battered welds, rail transition ramp building methods, Pandrol weld on shoulders, proper placement of work piece connections, and approved switch point welding procedures, as specified by the Burlington Northern Santa Fe Railway. This course will involve the study of different welding processes, welding safety, proper grounding techniques, rail heater and metallurgy. The effects of heat in relationship to specific rail steel components will be discussed. Students will be required to experience all appropriate methods and processes including welding, cutting, grinding, straight edging rail steel and preparing switch points for proper mating surface according to current industry standards. Evaluation will be in a classroom and laboratory setting.

#### **RRIT 142 Structural Pile Welding\* (3 Hours)**

**Prerequisites** : BNSF Railway Training Director approval and JCCC department approval.

Upon successful completion of this course, the student should be able to splice pipe and H-beam piling and install cap plate gussets according to Burlington Northern Santa Fe (BNSF) standard blueprints. This course shall make use of oxy-fuel cutting (OFC), grinding, shielded metal arc welding (SMAW), and flux cored arc welding (FCAW) to prepare, fit and weld piling. Selected welds will have test strips bent to check for soundness of welds. These strips should meet basic American Welding Society (AWS) test standards. Basic metallurgy will be discussed as it applies to the need for preheat and post heat in the building of railroad bridges.

#### **RRIT 145 Frog Welding\* (3 Hours)**

**Prerequisites** : BNSF Railway Training Director approval and JCCC department approval.

Upon successful completion of this course, the student should be able to repair by welding a manganese frog casting according to Burlington Northern Santa Fe Railway standards. This course will involve the study of different welding and cutting processes, with emphasis on the FCAW process. Metallurgy and the effects of heat in relationship to austenitic manganese steel will be discussed. Students will be required to cut, grind, straight edge, dye penetrant test, weld and monitor heat input during the repair process on austenitic steel frog casting for evaluation in an actual laboratory setting.

#### **RRIT 160 Basic Welding\* (3 Hours)**

**Prerequisites** : BNSF Railway Training Director approval and JCCC department approval.

Upon successful completion of this course, the student should be able to properly use oxyfuel cutting (OFC), plasma arc cutting (PAC), plasma arc gouging, air carbon arc cutting (CAC-A), shielded metal arc welding (SMAW), and flux core arc welding (FCAW) equipment. The SMAW and FCAW portion of the course will concentrate on flat groove welds (1G) and horizontal fillet welds (2F). The student is required to pass welding tests in accordance with the Railroad Welding Specification for Cars and Locomotives (AWS D15.1).

#### **RRIT 162 Structural Stick Welding\* (3 Hours)**

**Prerequisites** : BNSF Railway Training Director approval and JCCC department approval.

Upon successful completion of this course, the student should be able to properly use the shielded metal arc welding (SMAW) process on multi-pass groove welds in the horizontal (2G), vertical up (3G), and overhead (4G) positions. The student is required to pass welding tests in accordance with the Railroad Welding Specification for Cars and Locomotives (AWS D15.1).

#### **RRIT 164 Structural Wire Welding\* (3 Hours)**

**Prerequisites** : BNSF Railway Training Director approval and JCCC department approval.

Upon successful completion of this course, the student should be able to properly use the flux core arc welding (FCAW) process on multi-pass groove welds in the horizontal (2G), vertical up (3G), and overhead (4G) positions. The student is required to pass welding tests in accordance with the Railroad Welding Specification for Cars and Locomotives (AWS D15.1).

#### **RRIT 166 Mechanical Welding Air Brake Pipe\* (3 Hours)**

**Prerequisites** : Department approval.

Upon successful completion of this course, the student should be able to properly use the shielded metal arc welding (SMAW) and flux cored arc welding (FCAW) processes on pipe welds. The student is required to pass welding tests in accordance with the Railroad Welding Specification for Cars and Locomotives (AWS D15.1).



**RRIT 168 Sheet Metal Welding\* (3 Hours)**

**Prerequisites :** BNSF Railway Training Director approval and JCCC department approval.

Upon successful completion of this course, the student should be able to properly use the gas metal arc welding (GMAW) and gas tungsten arc welding (GTAW) processes on sheet metal. The student is required to pass welding tests in accordance with the Railroad Welding Specification for Cars and Locomotives (AWS D15.1).