Railroad Industrial Technology (RRIT)

Courses

RRIT 124 Fast Track Elements and Basic Welding (3 Hours)
Upon successful completion of this course, the student should be able to properly use oxy-fuel cutting (OFC) and shielded metal arc welding (SMAW). The OFC will cover straight line cutting, beveling and piercing. The SMAW portion of the course will concentrate on 1G and 2F welds with bend tests being performed on selected weldments. Student should be able to discuss electrical safety in shielded metal arc welding, handle welding cables properly, understand eye hazards, list safe clothing requirements and discuss environmental safety. Achieving the specified score on the unit test will evidence this knowledge. 2 hrs. lecture, 3 hrs. lab/wk.

RRIT 132 Thermite Welding* (3 Hours)
Prerequisites: Approval of the BNSF manager of engineering and maintenance training and the JCCC 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. 1 hr. lecture, 4 hrs. lab/wk.

RRIT 136 Rail and Switch Point Repair Welding* (3 Hours)
Prerequisites: RRIT 124 and BNSF manager of engineering and maintenance training 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. 1 hr. lecture, 4 hrs. lab/wk.

RRIT 137 Structural Welding SMAW* (3 Hours)
Prerequisites: RRIT 124 and BNSF manager of engineering and maintenance training approval and JCCC department approval.

Upon successful completion of this course, the student should be qualified to weld with SMAW according to AWS D1.1.96 code. All welds will be made in the vertical (3G) and overhead (4G) positions. Passing or failing will be determined by the student's ability to successfully produce welds according to prescribed standards in AWS D1.1.96. 1 hr. lecture, 4 hrs. lab/wk.

RRIT 138 Structural Welding FCAW* (3 Hours)
Prerequisites: RRIT 137 and approval of the BNSF manager of engineering and maintenance training and the JCCC department approval.

Upon successful completion of this course, the student should be qualified to weld with FCAW according to AWS D1.1.96 code. All welding will be made in the vertical (3G and 3F) and overhead (4G and 4F) positions. Passing or failing will be determined by the student's ability to successfully produce welds according to prescribed standards in AWS D1.1.96. 1 hr. lecture, 4 hrs. lab/wk.

RRIT 142 Structural Pile Welding* (3 Hours)
Prerequisites: RRIT 137 and RRIT 138 and approval of the BNSF manager of engineering and maintenance training and the 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. 1 hr. lecture, 4 hrs. lab/wk.

RRIT 145 Frog Welding* (3 Hours)
Prerequisites: RRIT 124 and BNSF manager of engineering and maintenance training 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. 1 hr. lecture, 4 hrs. lab/wk.

RRIT 160 Mechanical Basic Welding* (3 Hours)
Prerequisites: Approval of Burlington Northern Santa Fe (BNSF) Training Director.

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), and shielded metal arc welding (SMAW) equipment. The SMAW portion of the course will concentrate on flat groove welds (1G) and horizontal fillet welds (1F). The student is required to pass a welding test in accordance with the Railroad Welding Specification for Cars and Locomotives (AWS D15.1). 1 hour lecture 4 hours lab per week.

RRIT 162 Mechanical Welding Structural Stick* (3 Hours)
Prerequisites: Approval of Burlington Northern Santa Fe (BNSF) Training Director.

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). 1 hour lecture 4 hours lab per week.

RRIT 164 Mechanical Welding Structural Wire* (3 Hours)
Prerequisites: Approval of Burlington Northern Santa Fe (BNSF) Training Director.

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). 1 hour lecture 4 hours lab per week.

RRIT 166 Mechanical Welding Air Brake Pipe* (3 Hours)
Prerequisites: Approval of Burlington Northern Santa Fe (BNSF) Training Director.

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). 1hour lecture 4 hours lab per week.

RRIT 168 Mechanical Welding Sheet Metal* (3 Hours)
Prerequisites: Approval of Burlington Northern Santa Fe (BNSF) Training Director.

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). 1 hour lecture 4hours lab per week.