

Wisconsin Technical College System Curriculum Standards & Model Program Summary

50-432-1 Sheet Metal Construction (JATC)

Program Information

Program Description

Sheet metal workers make, install, and maintain heating, ventilation, and air-conditioning duct systems; roofs; siding; rain gutters; downspouts; skylights; restaurant equipment; outdoor signs; railroad cars; tailgates; customized precision equipment; and many other products made from metal sheets. They also may work with fiberglass and plastic materials. Although some workers specialize in fabrication, installation, or maintenance, most do all three jobs. Sheet metal workers do both construction-related work and mass production of sheet metal products in manufacturing. Sheet metal workers first study plans and specifications to determine the kind and quantity of materials they will need. They measure, cut, bend, shape, and fasten pieces of sheet metal to make ductwork, countertops, and other custom products. Sheet metal workers program and operate computerized metalworking equipment. They cut, drill, and form parts with computer-controlled saws, lasers, shears, and presses. (Source: www.bls.gov)

External Requirements

Sheet Metal Workers' International Association (SMWIA)

Sheet Metal and Air Conditioning Contractors' National Association (SMACNA)

Wisconsin Department of Workforce Development, Bureau of Apprenticeship Standards

OSHA Construction Safety 29CFR 1910, 1926, and related regulations

Apprentice must in his/her final year complete the Transition-To-Trainer Course

5 year on-the-job training program which includes 8,000 hours on-the-job training, 500 hours paid related instruction, and unpaid related instruction

Entry Requirements

Must be 17 years of age

HS Diploma or equivalent

Meet required norms on aptitude test

Personal interview (or other requirements determined by local committees)

Physically able to perform trade

Registered sheet metal apprentice in the state of Wisconsin

Valid driver's license or reliable transportation

Program Outcomes

- 1 Work safely in a variety of work situations.
- 2 Demonstrate proficiency in welding.
- 3 Plan for installing sheet metal components according to industry standards.
- 4 Layout sheet metal components according to specification.
- 5 Fabricate sheet metal components using a variety of metal fabricating machinery.
- 6 Interpret trade related documents.
- 7 Demonstrate proficiency using oxy/fuel and hand plasma cutting (OPTIONAL)..
- 8 Apply principles of air handling systems to EST and TABB.

Program Configurations for Related Instruction

50-432-1 WTCS Sheet Metal Apprenticeship Related Instruction (JATC)

Description

This program configuration for the Sheet Metal Apprenticeship (JATC) provides a model for related instruction of 5 years and 10 semesters. The courses and course sequence shown here parallels the JATC Local 18 Sheet Metal Curriculum standards and WTCS courses are cross-referenced to the JATC course numbers. The WTCS Apprenticeship Credit Calculation formulas for WTCS Aid Code 50 courses were used (1 credit = 30 hours). Effective Date: 2013.

Colleges and local committees may implement this model as needed to meet regional needs and employer priorities. Courses can be assigned to day school or night school as needed.

Credits

Total Credits = 31.75
Total Hours = 984.5

Term 1

Course #	Course Title	Credits Hours	Course Descriptions
50-432-721	Duct Layout 1 for Sheet Metal Apprenticeship	1.00 30 hours	A course for the individual who wishes to acquire skill in the development of patterns for rectangular duct fittings such as are encountered in air conditioning systems. Patterns are developed for such fittings as elbows, angles, Y-branches, tees, etc., utilizing the various seams employed in the fabrication of these fittings. Intended for first semester of the sheet metal apprenticeship program for JATC.
50-432-722	Duct Layout 2 for	1.00	Designed to further the basic skills of the student in

	Sheet Metal Apprenticeship	30 hours	developing patterns for rectangular duct fittings. Patterns are developed for various types of offsets and transitions, utilizing the various seams used in the fabrication of these fittings. Intended for first semester of the sheet metal apprenticeship program for JATC.
50-432-723	Fabrication Techniques 1 for Sheet Metal Trades	1.00 30 hours	The student applies layout skills in the fabrication of shop projects. Experience is gained through the use of hand tools and machines. The projects are based on the parallel line development method. Fittings such as a tee joint and a chimney extension are fabricated. Course is intended for the first semester of the sheet metal apprenticeship related instruction.
50-432-724	Sheet Metal Math I	1.00 30 hours	A course dealing with arithmetical calculations that must commonly be made by sheet metal workers. It includes common and decimal fractions, linear and angular measures, area and volume measures, and formulas. Facility is developed in the use of such common measuring tools as the steel rule, the protractor, and the dividers. Intended for first semester of the sheet metal apprenticeship program for JATC.
50-432-725	Safety/Orientation for Sheet Metal Apprentices	1.00 30 hours	This course is designed to educate people who are entering the sheet metal trade to the dangers involved in working in the trade. It provides safety education in shop and field work, hand and power tools, shop equipment, electrical and welding safety, fire hazards, confined space entry and Hazard Communication. Intended for first semester of the sheet metal apprenticeship program for JATC.
50-432-726	Welding Basic Techniques for Sheet Metal Trades	1.00 30 hours	This course is primarily for beginner welders. It consists of practical uses of stick and wire-welding equipment. Students are given demonstrations of how to use equipment in various positions and typical weld joints. It provides students with the capability to perform simple welding procedures in the shop and the field. The student is introduced to oxyacetylene welding and cutting processes. Intended for first semester of the sheet metal apprenticeship program for JATC.

Term 2

Course #	Course Title	Credits Hours	Course Descriptions
50-432-727	Sheet Metal Math 2	1.00 30 hours	A course dealing with mathematical calculations that must commonly be made by sheet metal workers. It includes formulas, equations, proportions, and trigonometry. Intended for the second semester of the sheet metal apprenticeship program for JATC.
50-432-728	Parallel Line	1.00	This course enables the student to gain a thorough

	Development for Sheet Metal Trades	30 hours	knowledge of the principles of parallel line development as applied to cylindrical objects. Skill in pattern developments is acquired by laying out patterns for a variety of fittings. Intended for the second semester of the sheet metal apprenticeship program for JATC.
50-432-729	Fabrication Techniques 2 for Sheet Metal Trades	1.00 30 hours	Patterns are developed through a combination of parallel line and radial line layout methods. Further skills in the use of hand tools and machines are attained in the fabrication and assembly of such projects as ventilators and riveted elbows. Intended for the second semester of the sheet metal apprenticeship program for JATC.
50-432-730	Fabrication Techniques 3 for Sheet Metal Trades	1.00 30 hours	Designed to enable the student to acquire experience in developing patterns for air conditioning fittings. Skills are gained in the use of hand tools and machines through the fabrication and assembly of various fittings, such as a change elbow and a tee and pitch. Intended for the second semester of the sheet metal apprenticeship program for JATC.
50-432-731	Radial Line Development for Sheet Metal Trades	1.00 30 hours	A comprehensive knowledge of the principles of radial line development may be obtained through this course. Patterns for various conical objects are developed in which these principles are applied. Course includes radial line concepts related to intersections. Intended for the second semester of the sheet metal apprenticeship program for JATC.
50-432-732	Architectural Sheet Metal	1.25 37.5 hours	A review of shop layout and shop practices is offered. Further skill is gained through the fabrication and assembly of various architectural sheet metal problems, such as chimney flashing and gutter miters. Intended for the second semester of the sheet metal apprenticeship program for JATC.

Term 3

Course #	Course Title	Credits Hours	Course Descriptions
50-432-733	Wire Welding for Sheet Metal Trades	1.00 30 hours	Manipulative welding skills are developed, using a semi-automatic arc welding gun feeding coiled hard steel wire, and using carbon dioxide as gaseous shield. A general coverage of basic service and maintenance problems relating to the equipment is presented along with technical concepts as they pertain to the welding process. Intended for the third semester of the sheet metal apprenticeship program for JATC.
50-432-734	Triangulation 1	1.00 30 hours	This course develops a basic understanding of the principles of triangulation, the method used to lay out patterns for irregular objects. Skill in pattern development is acquired through the development of

			patterns for a variety of fittings and objects. Intended for the third semester of the sheet metal apprenticeship program for JATC.
50-432-735	Duct Construction	1.00 30 hours	A course designed to meet the needs of those interested in the design and fabrication of duct work for industrial plants and residences. A study is made of duct fittings, dampers and regulators, diffusers, heaters and air washer casings and housings, fans, insulation, automatic controls and ventilating hoods. Intended for the third semester of the sheet metal apprenticeship program for JATC.
50-432-736	Fabrication Techniques 4 for Sheet Metal Trades	1.00 30 hours	Triangulation is the basic layout method used in developing patterns for this course. Further skills are attained in the use of hand tools and machines through the fabrication and assembly of such fittings as square-to-round transitions, Y-branches, and gore elbows. Intended for the third semester of the sheet metal apprenticeship program for JATC.
50-432-737	Blueprint Reading 1 for Sheet Metal Trades	1.25 45 hours	Students are trained to visualize, interpret and scale elevations, plan views, sections and details from the civil, architectural and structural portions of a set of blueprints and translate them into practical situations. Students also locate and interpret additional information concerning building construction from the specifications. Intended for the third semester of the sheet metal apprenticeship program for JATC.
50-432-738	Residential Sheet Metal 1	1.25 45 hours	Residential Sheet Metal 1 is the first of a 6 course program intended to provide students with the fabrication and installation skills needed for residential sheet metal work. In this first course, the student will receive an overview of the subject, be given instruction in the safety, tools and materials required in the trade, receive training in blueprint reading and drafting, and be given experience in the hand on fabrication of sheet metal items. Intended for the third semester of the sheet metal apprenticeship program for JATC.

Term 4

Course #	Course Title	Credits Hours	Course Descriptions
50-432-739	Advanced Layout 1 for Sheet Metal (Join Processes)	1.00 30 hours	A course designed for the student who has completed all of the fundamental sheet metal drawing courses and who wishes to take advanced work for the purpose of developing shortcuts. Layouts are made in such a way that skill in the saving of time, effort and materials is acquired. Intended for the fourth semester of the sheet metal apprenticeship program for JATC.
50-432-740	Shop Drawing &	1.00	Using a HVAC equipment room drawing, students

	Sketching for Sheet Metal Trades	30 hours	draw elevation views for six different fan systems. Fan types, installation requirements and techniques and duct construction standards are studied. Intended for the fourth semester of the sheet metal apprenticeship program for JATC.
50-432-741	Heavy Metal Fabrication Techniques	1.00 30 hours	Designed to enable the student to gain experience in layout and fabrication of heavy-gage sheet metal. Metal thickness and bend allowances figure in pattern development. Skills are developed in the use of power equipment in cutting, bending, rolling, shaping and welding heavy gage metal. Intended for the fourth semester of the sheet metal apprenticeship program for JATC.
50-432-742	Fabrication Techniques 5 for Sheet Metal Trades	1.00 30 hours	Instruction includes units on fittings encountered in air conditioning work. Training is given in the layout of patterns for the various fittings. Further experience is gained in the use of hand tools and machines through the fabrication and assembly of fittings, including tapering transitions, belt guards and louvers. Intended for the fourth semester of the sheet metal apprenticeship program for JATC.
50-432-743	Industrial Sheet Metal	1.00 30 hours	The student receives instruction in the principles and operation of blowpipe systems. Air-moving devices, cyclones, baghouses, bunker dumps and types of fittings are discussed. Instruction is given in design and fabrication of blowpipe work. Intended for the fourth semester of the sheet metal apprenticeship program for JATC.
50-432-744	TIG Welding for Sheet Metal Trades	1.00 30 hours	Instruction is given in inert-gas shielded arc welding with manually operated torch on such metals as aluminum, mild steel, and stainless steel. Intended for the fourth semester of the sheet metal apprenticeship program for JATC.

Term 5

Course #	Course Title	Credits Hours	Course Descriptions
50-432-745	HVAC Systems for Sheet Metal Trades	1.00 40 hours	Fundamentals of electricity, electrical circuits and ladder diagrams. Introduction to air movement and measuring devices. Basic understanding of air conditioning systems. Basic understanding of heating systems. To be able to identify the basic components of an air conditioning and heating system. Basic understanding of the equipment used to measure electricity, air movement, in the air conditioning systems and heating systems. Intended for the fifth semester of the sheet metal apprenticeship program for JATC.
50-432-746	Service 1 for Sheet Metal	1.00	A course designed to present an introduction to service work as it relates to the sheet metal trade.

		30 hours	The student will be given an overview of Electrical Theory and Circuiting, Gas Heating Controls and Start-up, Mechanical Cooling and Economizers and Control Systems, including VAV Systems, Air Handlers and Make-up Air Systems. Intended for the fifth semester of the sheet metal apprenticeship program for JATC.
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Term 6

Course #	Course Title	Credits	Function
50-432-747	Measurement & Sketching for Sheet Metal	1.00 30 hours	In this course, the student will be given a single line drawing and some design parameters. The student will design, size and measure the system. A sketch and shop drawing will be made from this. A takeoff will be made from this and analyzed using basic computer software. Intended for the sixth semester of the sheet metal apprenticeship program for JATC.

Term 7

Course #	Course Title	Credits Hours	Course Descriptions
50-432-748	Measurement & Fabrication with Sheet Metal	1.00 30 hours	A course designed to accurately measure between two given points and determine the fittings and duct required to join both points. Sketch (not freehand) and detail duct run. Fill out Fab. form tickets as if material were being ordered from the shop for the field install (without missing info). To layout, form, and assemble various square, rectangular and cylindrical fittings that utilize Triangulation, radial Line and Parallel Line development principles. To install material fabricated between the points from which it was measured. To obtain practice in trigonometry using Sine, Cosine, Tangent and the rules of various types of triangles (rt., 45 degree, 30/60/90, etc.). Intended for the seventh semester of the sheet metal apprenticeship program for JATC.

Term 8

Course #	Course Title	Credits Hours	Course Descriptions
50-432-749	Plasma Cutting for Sheet Metal Trades	1.00 30 hours	The student will be able to identify the major components of a plasma cutting system, explain important acronyms: CNC, DNC, NC, CAD, IBM, and DOS, give a short definition of plasma arc and know the meaning of dross, kerf, multitasking and fiber optics. The student will also know the danger of the high intensity arc and the potentially harmful fumes produced in the cutting process. Intended for the eighth semester of the sheet metal apprenticeship program for JATC.

Term 9

Course #	Course Title	Credits Hours	Course Descriptions
50-432-750	TAB 1 for Sheet Metal Trades	1.00 30 hours	The purpose of this course is to introduce the art and science of testing, adjusting and balancing environmental systems. Students will learn how and why to take field measurements of air conditioning systems to assist in performing testing, adjusting and balancing. Emphasis will be on definitions, the interrelation of components in the total systems, the use of instruments, recording of data and following basic procedures. Intended for the ninth semester of the sheet metal apprenticeship program for JATC.

Term 10

Course #	Course Title	Credits Hours	Course Descriptions
47-455-455	Transition to Trainer: Your Role as a Journey Worker	0.00 8 hours	<p>Apprenticeship training is a collaborative partnership: employer and employee associations, government, and educational institutions each play a part. In reality, most learning takes place through the daily interaction between an apprentice and his/her co-workers. Surveys have shown that the apprentices are least satisfied with the on-the-job portion of their training--particularly the ability of journey level workers and supervisors to pass on their knowledge of the trade.</p> <p>You have already learned to use the tools of your chosen trade. In this workshop you will be introduced to a new set of basic tools--the tools of a jobsite trainer. You will explore the skills that are necessary to be an effective trainer, discover how to deliver hands-on training, and examine the process for giving useful feedback. During the workshop you will build a Training Toolkit to take back to your work on the job.</p>
50-432-751	Sheet Metal Capstone Course	1.00 30 hours	To apply the principles and skills acquired in the preceding classes of the apprenticeship training, and apply them to complete a small duct job. To properly analyze, draw, layout, and fabricate the components of the required duct run. Intended for the tenth semester of the sheet metal apprenticeship program for JATC.

Wisconsin Technical College System

50-432-721 Duct Layout 1 for Sheet Metal Apprenticeship

Course Outcome Summary

Course Information

Description A course for the individual who wishes to acquire skill in the development of patterns for rectangular duct fittings such as are encountered in air conditioning systems. Patterns are developed for such fittings as elbows, angles, Y-branches, tees, etc., utilizing the various seams employed in the fabrication of these fittings. Intended for first semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-722 Duct Layout 2 for Sheet Metal Apprenticeship

Course Outcome Summary

Course Information

Description Designed to further the basic skills of the student in developing patterns for rectangular duct fittings. Patterns are developed for various types of offsets and transitions, utilizing the various seams used in the fabrication of these fittings. Intended for first semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-723 Fabrication Techniques 1 for Sheet Metal Trades

Course Outcome Summary

Course Information

Description The student applies layout skills in the fabrication of shop projects. Experience is gained through the use of hand tools and machines. The projects are based on the parallel line development method. Fittings such as a tee joint and a chimney extension are fabricated. Course is intended for the first semester of the sheet metal apprenticeship related instruction.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-724 Sheet Metal Math I

Course Outcome Summary

Course Information

Description A course dealing with arithmetical calculations that must commonly be made by sheet metal workers. It includes common and decimal fractions, linear and angular measures, area and volume measures, and formulas. Facility is developed in the use of such common measuring tools as the steel rule, the protractor, and the dividers. Intended for first semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-725 Safety/Orientation for Sheet Metal Apprentices

Course Outcome Summary

Course Information

Description This course is designed to educate people who are entering the sheet metal trade to the dangers involved in working in the trade. It provides safety education in shop and field work, hand and power tools, shop equipment, electrical and welding safety, fire hazards, confined space entry and Hazard Communication. Intended for first semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-726 Welding Basic Techniques for Sheet Metal Trades

Course Outcome Summary

Course Information

Description This course is primarily for beginner welders. It consists of practical uses of stick and wire-welding equipment. Students are given demonstrations of how to use equipment in various positions and typical weld joints. It provides students with the capability to perform simple welding procedures in the shop and the field. The student is introduced to oxyacetylene welding and cutting processes. Intended for first semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-727 Sheet Metal Math 2

Course Outcome Summary

Course Information

Description A course dealing with mathematical calculations that must commonly be made by sheet metal workers. It includes formulas, equations, proportions, and trigonometry. Intended for the second semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-728 Parallel Line Development for Sheet Metal Trades

Course Outcome Summary

Course Information

Description This course enables the student to gain a thorough knowledge of the principles of parallel line development as applied to cylindrical objects. Skill in pattern developments is acquired by laying out patterns for a variety of fittings. Intended for the second semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-729 Fabrication Techniques 2 for Sheet Metal Trades

Course Outcome Summary

Course Information

Description Patterns are developed through a combination of parallel line and radial line layout methods. Further skills in the use of hand tools and machines are attained in the fabrication and assembly of such projects as ventilators and riveted elbows. Intended for the second semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-730 Fabrication Techniques 3 for Sheet Metal Trades

Course Outcome Summary

Course Information

Description Designed to enable the student to acquire experience in developing patterns for air conditioning fittings. Skills are gained in the use of hand tools and machines through the fabrication and assembly of various fittings, such as a change elbow and a tee and pitch. Intended for the second semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-731 Radial Line Development for Sheet Metal Trades

Course Outcome Summary

Course Information

Description A comprehensive knowledge of the principles of radial line development may be obtained through this course. Patterns for various conical objects are developed in which these principles are applied. Course includes radial line concepts related to intersections. Intended for the second semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-732 Architectural Sheet Metal

Course Outcome Summary

Course Information

Description A review of shop layout and shop practices is offered. Further skill is gained through the fabrication and assembly of various architectural sheet metal problems, such as chimney flashing and gutter miters. Intended for the second semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.25 (37.5 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-733 Wire Welding for Sheet Metal Trades

Course Outcome Summary

Course Information

Description Manipulative welding skills are developed, using a semi-automatic arc welding gun feeding coiled hard steel wire, and using carbon dioxide as gaseous shield. A general coverage of basic service and maintenance problems relating to the equipment is presented along with technical concepts as they pertain to the welding process. Intended for the third semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-734 Triangulation 1

Course Outcome Summary

Course Information

Description This course develops a basic understanding of the principles of triangulation, the method used to lay out patterns for irregular objects. Skill in pattern development is acquired through the development of patterns for a variety of fittings and objects. Intended for the third semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-735 Duct Construction

Course Outcome Summary

Course Information

Description A course designed to meet the needs of those interested in the design and fabrication of duct work for industrial plants and residences. A study is made of duct fittings, dampers and regulators, diffusers, heaters and air washer casings and housings, fans, insulation, automatic controls and ventilating hoods. Intended for the third semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-736 Fabrication Techniques 4 for Sheet Metal Trades

Course Outcome Summary

Course Information

Description Triangulation is the basic layout method used in developing patterns for this course. Further skills are attained in the use of hand tools and machines through the fabrication and assembly of such fittings as square-to-round transitions, Y-branches, and gore elbows. Intended for the third semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-737 Blueprint Reading 1 for Sheet Metal Trades

Course Outcome Summary

Course Information

Description Students are trained to visualize, interpret and scale elevations, plan views, sections and details from the civil, architectural and structural portions of a set of blueprints and translate them into practical situations. Students also locate and interpret additional information concerning building construction from the specifications. Intended for the third semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.25 (45 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-738 Residential Sheet Metal 1

Course Outcome Summary

Course Information

Description Residential Sheet Metal 1 is the first of a 6 course program intended to provide students with the fabrication and installation skills needed for residential sheet metal work. In this first course, the student will receive an overview of the subject, be given instruction in the safety, tools and materials required in the trade, receive training in blueprint reading and drafting, and be given experience in the hand on fabrication of sheet metal items. Intended for the third semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.25 (45 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-739 Advanced Layout 1 for Sheet Metal (Join Processes)

Course Outcome Summary

Course Information

Description A course designed for the student who has completed all of the fundamental sheet metal drawing courses and who wishes to take advanced work for the purpose of developing shortcuts. Layouts are made in such a way that skill in the saving of time, effort and materials is acquired. Intended for the fourth semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-740 Shop Drawing & Sketching for Sheet Metal Trades

Course Outcome Summary

Course Information

Description Using a HVAC equipment room drawing, students draw elevation views for six different fan systems. Fan types, installation requirements and techniques and duct construction standards are studied. Intended for the fourth semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-741 Heavy Metal Fabrication Techniques

Course Outcome Summary

Course Information

Description Designed to enable the student to gain experience in layout and fabrication of heavy-gage sheet metal. Metal thickness and bend allowances figure in pattern development. Skills are developed in the use of power equipment in cutting, bending, rolling, shaping and welding heavy gage metal. Intended for the fourth semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-742 Fabrication Techniques 5 for Sheet Metal Trades

Course Outcome Summary

Course Information

Description Instruction includes units on fittings encountered in air conditioning work. Training is given in the layout of patterns for the various fittings. Further experience is gained in the use of hand tools and machines through the fabrication and assembly of fittings, including tapering transitions, belt guards and louvers. Intended for the fourth semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-743 Industrial Sheet Metal

Course Outcome Summary

Course Information

Description The student receives instruction in the principles and operation of blowpipe systems. Air-moving devices, cyclones, baghouses, bunker dumps and types of fittings are discussed. Instruction is given in design and fabrication of blowpipe work. Intended for the fourth semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-744 TIG Welding for Sheet Metal Trades

Course Outcome Summary

Course Information

Description Instruction is given in inert-gas shielded arc welding with manually operated torch on such metals as aluminum, mild steel, and stainless steel. Intended for the fourth semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-745 HVAC Systems for Sheet Metal Trades

Course Outcome Summary

Course Information

Description Fundamentals of electricity, electrical circuits and ladder diagrams. Introduction to air movement and measuring devices. Basic understanding of air conditioning systems. Basic understanding of heating systems. To be able to identify the basic components of an air conditioning and heating system. Basic understanding of the equipment used to measure electricity, air movement, in the air conditioning systems and heating systems. Intended for the fifth semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-746 Service 1 for Sheet Metal

Course Outcome Summary

Course Information

Description A course designed to present an introduction to service work as it relates to the sheet metal trade. The student will be given an overview of Electrical Theory and Circuiting, Gas Heating Controls and Start-up, Mechanical Cooling and Economizers and Control Systems, including VAV Systems, Air Handlers and Make-up Air Systems. Intended for the fifth semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-747 Measurement & Sketching for Sheet Metal

Course Outcome Summary

Course Information

Description In this course, the student will be given a single line drawing and some design parameters. The student will design, size and measure the system. A sketch and shop drawing will be made from this. A takeoff will be made from this and analyzed using basic computer software. Intended for the sixth semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-748 Measurement & Fabrication With Sheet Metal

Course Outcome Summary

Course Information

Description A course designed to accurately measure between two given points and determine the fittings and duct required to join both points. Sketch (not freehand) and detail duct run. Fill out Fab. form tickets as if material were being ordered from the shop for the field install (without missing info). To layout, form, and assemble various square, rectangular and cylindrical fittings that utilize Triangulation, radial Line and Parallel Line development principles. To install material fabricated between the points from which it was measured. To obtain practice in trigonometry using Sine, Cosine, Tangent and the rules of various types of triangles (rt., 45 degree, 30/60/90, etc.). Intended for the seventh semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-749 Plasma Cutting for Sheet Metal Trades

Course Outcome Summary

Course Information

Description The student will be able to identify the major components of a plasma cutting system, explain important acronyms: CNC, DNC, NC, CAD, IBM, and DOS, give a short definition of plasma arc and know the meaning of dross, kerf, multitasking and fiber optics. The student will also know the danger of the high intensity arc and the potentially harmful fumes produced in the cutting process. Intended for the eighth semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-750 TAB 1 for Sheet Metal Trades

Course Outcome Summary

Course Information

Description The purpose of this course is to introduce the art and science of testing, adjusting and balancing environmental systems. Students will learn how and why to take field measurements of air conditioning systems to assist in performing testing, adjusting and balancing. Emphasis will be on definitions, the interrelation of components in the total systems, the use of instruments, recording of data and following basic procedures. Intended for the ninth semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

50-432-751 Sheet Metal Capstone Course

Course Outcome Summary

Course Information

Description To apply the principles and skills acquired in the preceding classes of the apprenticeship training, and apply them to complete a small duct job. To properly analyze , draw, layout, and fabricate the components of the required duct run. Intended for the tenth semester of the sheet metal apprenticeship program for JATC.

Total Credits 1.00 (30 hours)

Course Competencies

- 1 Due to proprietary curriculum: contact the JATC Local 18 or Wisconsin technical college for the current course competencies, learning objectives, and instructional materials which may be available.

Wisconsin Technical College System

47-455-455 Transition to Trainer: Your Role as a Journey Worker

Course Outcome Summary

Course Information

Description Apprenticeship training is a collaborative partnership: employer and employee associations, government, and educational institutions each play a part. In reality, most learning takes place through the daily interaction between an apprentice and his/her co-workers. Surveys have shown that the apprentices are least satisfied with the on-the-job portion of their training--particularly the ability of journey level workers and supervisors to pass on their knowledge of the trade.

You have already learned to use the tools of your chosen trade. In this workshop you will be introduced to a new set of basic tools--the tools of a jobsite trainer. You will explore the skills that are necessary to be an effective trainer, discover how to deliver hands-on training, and examine the process for giving useful feedback. During the workshop you will build a Training Toolkit to take back to your work on the job. 8 Hours.

Course Competencies

- 1 Value your role as a journey worker trainer
- 2 Serve as a mentor and job coach
- 3 Foster a positive work environment by acting as an ally/advocate
- 4 Provide hands-on skills training
- 5 Provide feedback on apprentice performance