

## Pipe Work

**Course Objective:** The student will be able to study all aspects of pipe work i.e. the bending, fitting, cutting, threading, brazing, connecting, and disconnecting of air, water, gas, oil, and steam pipes. Also learn the shape and name of various types of pipes, how they are sized, tables of pipe sizes, hot and cold bending of pipe and conduit, machines for bending hot or cold pipe, bending other kinds of pipe, table for radius of conduit bends, the making of templates used to measure pipe size, pipe measurements and off sets; valves which provide the means to start, stop, or regulate the flowing piping systems, various types of valves used in water systems, their maintenance and repair. Also, study tables and procedures for working pressures for pipe fittings, pictures of various pipe fittings, their names and common usage, piping layout, especially on freight, passenger train, work trains and diesels.

**Who this is for:** Pipe fitters, apprentices, plumbers or other interested in learning the basics of pipe work.

Item Code	Lesson Description
PF.1	Pipe work
PF.2	Pipe fitting
PF.3	Railroad piping problems
PF.4	Cutting and threading pipe
PF.4A	The bending of pipe and conduit
PF.5	Pipe measurements, offsets, templates
PF.6	Valves

\*A separate booklet is required for each lesson.

Item Code	Full Course Title (Includes Textbook)	Price
PF1FC	Pipe Work	\$203.00

Enrolled students may take individual lessons.  
Please contact student services for individual lesson and textbook pricing.

# Metal Trades

## Electric Arc Welding

**Course Objective:** The student will acquire knowledge of the elements of arc welding, be familiar with electrical welding machines and how to operate them safely when doing electric welding. Also, other lessons center on striking an arc, performing a simple welding operation, hooking up the cable from the machine to the work and various size electrodes and proper amperage to use for welding different materials. Electrodes used in “off hand” arc welding process, information about electrode coatings and the selection of electrodes for various jobs as well as joint classification that can be welded by an electrode. Spark test of metals to determine type of metal, welding practice and kinds of welds and when to use them.

**Who this is for:** Welders, sheet metal workers, and apprentices.

Item Code	Lesson Description
W.1	Welding machines
W.2	Hooking up to weld, striking the arc
W.3	Electrodes
W.4	Welding procedure

\*A separate booklet is required for each lesson.

Item Code	Full Course Title (Includes Textbook)	Price
W1FC	Electric Arc Welding	\$116.00

Enrolled students may take individual lessons.

Please contact student services for individual lesson and textbook pricing.

## Welding Safety

**Course Objective:** The student will be able to study welding with a good understanding of precautions. Including the storage of containers and gases used for welding, proper handling and installation of arc welding equipment as well as fire protection of area, protective clothing and ventilation.

**Who this is for:** Welders, sheet metal workers, apprentices.

Item Code	Lesson Description
W.51	Welding Safety Handbook (Part I)
W.52	Welding Safety Handbook (Part II)

Item Code	Required Textbook
BKWSH	<i>Welding Safety Handbook</i>

Item Code	Full Course Title (Includes Textbook)	Price
W51FC	Welding Safety	\$52.25

Enrolled students may take individual lessons.  
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# Metal Trades

## Basic Modern Welding

**Course Objective:** The student will acquire an understanding of the entire welding field. The text covers the theory, fundamentals, and basic processes along with the practical applications that build skills and techniques for the welder.

**Who this is for:** Secondary and post secondary students, apprentices and journeyman welders, technical students, instructors, and those who wish to teach themselves about welding.

Item Code	Lesson Description
MW.20A	Safety in the welding shop
MW.21A	Reading welding symbols
MW.22A	Welding and cutting process
MW.23A	Oxyfuel gas welding, equipment and supplies
MW.24A	Oxyfuel gas welding
MW.25A	Oxyfuel gas cutting, cutting equipment and supplies
MW.26A	Oxyfuel gas cutting
MW.27A	Soldering
MW.28A	Brazing and braze welding
MW.29A	Shielded metal arc-welding equipment and supplies
MW.30A	Shielded metal arc welding (AC and DC)
MW.31A	GTAW and GMAW equipment and supplies
MW.32A	Gas tungsten arc welding
MW.33A	Gas metal arc welding
MW.34A	Arc and oxygen arc cutting equipment and supplies
MW.35A	Arc and oxygen arc cutting and gouging
MW.36A	Resistance welding equipment and supplies
MW.37A	Resistance welding
MW.38A	Special welding processes

*Course continued on facing page*

## *Basic Modern Welding continued*

Item Code	Lesson Description
MW.39A	Special ferrous welding applications
MW.40A	Special nonferrous welding applications
MW.41A	Pipe and tube welding
MW.42A	Special cutting processes
MW.43A	Automatic welding and robots
MW.44A	Metal surfacing
MW.45A	Production of metals
MW.46A	Metal properties and identification
MW.47A	Heat treatment of metals
MW.48A	Inspecting and testing welding
MW.49A	Procedure and welder qualifications
MW.50A	The welding shop
MW.51A	Technical data

Item Code	Required Textbook
BKMW	<i>Modern Welding</i>

Item Code	Full Course Title (Includes Textbook)	Price
MW20AFC	Basic Modern Welding	\$765.00

Enrolled students may take individual lessons.  
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## ***Metal Trades***

### **Flame Cutting and Brazing with MAPP Gas**

**Course Objective:** Learn flame cutting fundamentals, flame cutting applications, cutting tips, cutting procedures and using the flame appropriately. Brazing with MAPP, torch tips, flame adjustment, coupling distance, liquid fluxes, brazing procedures and Safety Rules.

**Who this is for:** Welders, sheet metal workers, apprentices.

Item Code	Lesson Description
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MG.1A	Flame cutting and brazing with MAPP gas
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Item Code	Required Textbook
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BKMAP	<i>Flame Cutting and Brazing with MAPP Gas</i>
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Item Code	Full Course Title (Includes Textbook)	Price
MG1AFC	Flame Cutting with MAPP Gas	\$28.25

Enrolled students may take individual lessons.

**Oxy-acetylene Welding**

**Course Objective:** Learn the specifics of oxy-acetylene welding how it developed, the properties of oxy-acetylene and precautions to take when using it. Includes equipment for the oxy-acetylene process, set-up and operation, and safe practices in welding and cutting operations. Also covers physical and mechanical properties of metals, welding of various metals, and methods of testing good and bad welds. Tables are in both metric and U.S.

**Who this is for:** Welders, sheet metal workers, apprentices.

Item Code	Lesson Description
W.21A	Welding processes, welding and cutting, oxygen and acetylene, the oxy-acetylene flame
W.22A	Equipment, setup and operation, safe practices
W.23A	Physical and mechanical properties of metals, structure of steel, how steels are classified, expansion and contraction
W.24A	Preparation for welding, welding carbon steel
W.25A	Braze welding, welding cast iron, welding other ferrous metals, welding aluminum, welding other nonferrous metals
W.26A	Braze welding, hard facing, rebuilding, brazing and soldering, heat and heat treating
W.27A	Oxygen cutting, manual cutting, oxygen cutting by machine, testing and inspecting

Item Code	Required Textbook
BK0XY	<i>Oxy-Acetylene</i>

Item Code	Full Course Title (Includes Textbook)	Price
W21AFC	Oxy-acetylene Welding	\$191.80

Enrolled students may take individual lessons.  
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# Metal Trades

## Sheet Metal Machine Processes

**Course Objective:** The fabrication of sheet metal ducts, fittings, and parts depends on the skill of the sheet metal technician in operating the machines of his trade. Sheet metal processes not only explains the procedure used on hand-operated machines, but also those for power-operated machines. Illustrations closely correlate with the individual processes and show not only the various machines but also depict the proper procedures. Sheet metal process is described in a step-by-step fashion that is clear, concise, and easily understood. Various tools include modern developments as well as those tools that have been used in the trade for many years.

**Who this is for:** Vocational students, industrial arts students, apprentices, sheet metal workers.

Item Code	Lesson Description
SM.15	Metal-cutting machines, bending machines
SM.16	Metal-forming machines, turning machines
SM.17	Metal-punching machines, standard power-driven machines
SM.18	Portable power-operated tools

Item Code	Required Textbook
BKSM MA	<i>Sheet Metal Machine Processes</i>
	This book not available separately

Item Code	Full Course Title (Includes Textbook)	Price
SM15FC	Sheet Metal Machine Processes	\$162.95

## Sheet Metal Hand Processes

**Course Objective:** Introduces the beginning sheet metal technician to basic instruction in the properties and selection of metal and the process performed with measuring and marking, bench, cutting, piercing, joining, and soldering tools. Since each hand tool is designed for a specific purpose, the text emphasizes the selection and use of the proper tool for a particular operation. Safety precautions are emphasized in the use of each hand tool.

**Who this is for:** Vocational students, industrial arts student, apprentices, sheet metal workers.

Item Code	Lesson Description
SM.11	Basic metals, measuring and marking tools, bench tools
SM.12	Metal-cutting tools, metal-piercing and special job tools
SM.13	Metal-joining tools, soldering processes
SM.14	Metalworking processes

Item Code	Required Textbook
BKSM HA	<i>Sheet Metal Hand Processes</i>
	This book not available separately

Item Code	Full Course Title (Includes Textbook)	Price
SM11FC	Sheet Metal Hand Processes	\$162.95

Enrolled students may take individual lessons.  
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# Metal Trades

## Sheet Metal

**Course Objective:** The student will be knowledgeable about practical sheet metal bench and floor work, including the machine tools used by the sheet metal worker. Learn about the various metals used in sheet metal, sheet metal gages and tables, weight and thickness tables, hand tools i.e. stake and bench plates, shop machines i.e. shears, punches and bending brakes. Learn about the various machines used in sheet metal for folding or making seams, their description and how they are used, also various materials for making seams.

**Who this is for:** Shop workers, sheet metal workers, apprentices.

Item Code	Lesson Description
SM.1	Sheet metal, sheet metal gages
SM.1A	Sheet metal work, hand tools
SM.2	Sheet metal shop machinery, shears, punches, and bending brakes
SM.3	Sheet metal shop machinery, bar folders, slip-roll formers, pipe folders, and grooving machines
SM.3A	Sheet metal shop machinery, rotary machines
SM.4	Soldering: basic principles, equipment

\*A separate booklet is needed for each lesson

Item Code	Full Course Title (Includes Textbook)	Price
SM1FC	Sheet Metal	\$174.00

Enrolled students may take individual lessons.

Please contact student services for individual lesson and textbook pricing.