

Course Catalog

Training Class Descriptions



Sun City West

Metal Club

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Introduction

About

This catalog provides Metal Club members with general information about the training courses offered to our members.

Orientation

All new Metal Club members are required to complete the Orientation course before receiving their Club badge. The orientation course is therefore a prerequisite for all the courses in this catalog.

Class signup

Signup sheets for classes are next to the Monitor station. Please pay the class fee when signing up for a class. If you do not show up for the class, your class fee is forfeited.

Class Instructors

The instructor for each class is listed on the signup sheets for classes.

Costs

Charges for courses vary and are posted on the course sign-up sheets.

Availability

Not all courses are available year-round, because some instructors are seasonal residents.

Certification

Once you have successfully completed a course, your name and badge number will be entered in the Club computer and you are permitted to use that equipment. Please do not use any shop equipment that you have not been trained on. If you have a question on a specific piece of equipment, whether it requires training, ask the Monitors.

Walk-Through

If you have previous experience on a particular piece of equipment, contact the Shop Monitor to identify an Instructor and request a "Walk-Through" of that equipment. There is no charge for walk-throughs. Once you have successfully demonstrated your knowledge, the Instructor will enter your certification in the computer.

Safety – applies to all courses

Our shop policy is no open-toe shoes, and eye protection must always be worn. The club has safety equipment for your use; however, it is strongly recommended that you bring your own eye, ear, and respiratory protection.

Club Orientation

Prerequisites – Club Membership

Course Description

This course will help each new member become an active club member. Topics include club structure/procedures; facility organization; some equipment introduction/operation; certification program; and material purchasing.

Course Materials & Equipment

- Each new member will receive a Member Handbook, which includes an outline of subjects covered in the four-hour orientation class and various reference pages relating to tools and/or materials used in the shop.

The Member Handbook has room for expansion and organization of information/handouts from other club training classes.

- New members will also operate several basic machines during orientation, excepting most that require certification.

The club has the necessary safety equipment for use during the orientation class, but it is strongly recommended that each member provide his/her own eye, ear, and respiratory protection for future working time in the club.

Course Structure

The course is limited to four (4) students. Instruction will be through lecture, demonstrations, discussions, and hands-on activities. Students are expected to follow up the class by reading their Member Handbook and become familiar with the contents.

Course Objective

Each student will be able to: make purchases, check out tools, and sign up for classes at the Monitors station; locate a tool in the Machine Shop area using the Tool Locator notebook; select/use the proper tool/machine for cutting a given piece of metal; operate the Rotex machine; bend small flat stock using two pedestal hand benders; and operate the sand blaster.

Course Information

Monitor Training

Prerequisites – None

Course Description

An introduction of the knowledge/skills necessary to serve as a monitor for the Metal Club.

Course Materials & Equipment

- Monitor Reference Notebook.
- Club computers for processing sales and other transactions using Quick Books POS (point of sale), and other software programs.
- Various other reference notebooks used at the Monitor's station.

Course Structure

The prospective monitor will be given a copy of the Monitor Reference Notebook to review before hands-on training using the POS system to make transactions.

The prospective monitor will "shadow" another Monitor for at least three (3) shifts to learn/experience the multiple duties of serving as Monitor.

Course Objective

Each new monitor will be able to: Cordially greet guests/members entering the Club; process transactions using the POS computer system; follow a script to give a Club tour to a guest; demonstrate the steps to "opening" the Club in the morning and demonstrate the steps for "closing" the Club in the evening; select a shift, place his/her name on the Monitor's calendar, and become an active Monitor.



Lathe 101 (#5101)

Prerequisites – None

Course Description

An introduction to the safety and basic use of a metal lathe. We employ a conservative approach to the setup and use of the metal lathe in order to minimize risks to the user and the equipment.

Course Materials & Equipment

Enco Lathe and/or others as appropriate

Course Structure

This is a 2 ½ hour hands-on class. The class starts with a discussion of safety. Each operation will emphasize the safe set-up and use of the lathe and tooling.

Course Objective

The student will execute multiple lathe operations including turning, facing, parting, drilling, boring, and power tapping threads. They will also demonstrate multiple feed and speed changes as appropriate for each operation being executed.



Course Information

Milling 101 (#5109)

Prerequisites – Using Vernier Caliper and knowledge of fractions & decimals.
This course is required for advancing to CNC Milling machines.

Course Description

This course will teach you how to safely use a Basic Milling machine, covering all aspects of the machine and associated tools and parts.

Course Materials & Equipment

- Milling Machines 1, 2, and 6
- All steel used during the class Is provided
- Vernier caliper, milling tools, associated machinist bits

Course Structure

You are taught individually in a single class that generally runs between 2-3 hours. A class outline will guide you while learning and you will have "hands on" during the process. The machine is learned step by step; safety, various moving parts, theory of milling and more.

Course Objective

To be certified as competent to run a milling machine. Able to demonstrate during the class ability to operate machine functions safely, comprehend procedures, repeat processes being taught, and actual milling of metal.



Course Information

Milling 201 (#5110)

Prerequisites – Milling 101 & Instructor Approval

Course Description

Introduction to how to operate a CNC (Computer Numerical Control) 2 Axis milling machine in a “one on one” class format.

Course Materials & Equipment

- Webb 2 Axis CNC Milling Machine
- Course outline and notes
- Machine tools; end mills, surfacing mills, drill bits provided by the club
- Computer floppy disk provided by instructor

Course Structure

You will be provided a written and verbal introduction to the functions of the 2 Axis CNC mill and how it differs from a basic milling machine. You will learn the functions of the computer control and various programming steps by generating a sample project. Full knowledge of decimal equivalents and how they apply to the CNC mill are stressed, as well as understanding the Display monitor and how it applies to the milling job. Written and oral instructions regarding safety issues when running the Mill will be provided.

Course Objective

Student will be expected demonstrate knowledge of how the 2 Axis CNC mill provides “Numerical Control” of the x and y axis but not the z axis, and to operate the mill based on instructor demonstrations, as it relates to x, y and z coordinates. Student will demonstrate sufficient knowledge about the CNC milling machine, develop confidence and skill in order to operate the milling machine, provide a safe working environment through provided safety instructions, enabling the student to be certified as knowledgeable and safe to operate the machine on their own.



Course Information

Milling 202 (#5111)

Prerequisites – Milling 101, 201 & Instructor Approval

Course Description

Introduction to how to operate a CNC (Computer Numerical Control) 3 Axis milling machine in a "one on one" class format.

Course Materials & Equipment

- Webb 3 Axis CNC Milling Machine
- Course outline and notes
- Machine tools; end mills, surfacing mills, drill bits provided by the club
- Computer floppy disk provided by instructor

Course Structure

You will be provided a written and verbal introduction to the functions of the 3 Axis CNC mill and how it differs from a 2 axis CNC milling machine. You will learn the functions of the computer control and various programming steps by generating a sample project. Full knowledge of decimal equivalents and how they apply to the CNC mill are stressed, as well as understanding the Display monitor and how it applies to the milling job. Written and oral instructions regarding safety issues when running the Mill will be provided.

Course Objective

Student will be expected demonstrate knowledge of how the 3 Axis CNC mill provides "Numerical Control" of the x, y axis and z axis, and to operate the mill based on instructor demonstrations, as it relates to x, y and z coordinates. Student will demonstrate sufficient knowledge about the CNC milling machine, develop confidence and skill in order to operate the milling machine, provide a safe working environment through provided safety instructions, enabling the student to be certified as knowledgeable and safe to operate the machine on their own.



Course Information

Metal Art – Plasma Cutting

Metal Art 101 (#5102)

Prerequisites – None

Course Description

This course is the introduction to producing wall-hanging plasma cut art. The Members will learn about plasma cutting, grinding, spot welding, and using a gas torch to color the metal art piece. Each Member will have a finished metal art product upon completion of this class.

Course Materials & Equipment

- Navigator Plasma Cutter
- Navigator electrode & nozzle is furnished for the class
- Grinders and grinding benches
- Hydraulic press and spot welder for making hangers
- Gas torch for coloring metal
- Metal for practice art is provided

Course Structure

This course is limited to 4 students and will last approximately 3 hours.

Course Objective

Each student will demonstrate their ability to properly set up and operate the Navigator plasma cutter, successfully cut out a pattern, and shut down and cleaning the Navigator. They will also demonstrate use and clean-up of the grinding bench, safe operation of the gas torches, hydraulic press and spot welder.



Course Information

Metal Art 201 (#5103)

Prerequisites – Metal Art 101 and Basic Computer Skills

Course Description

Introduction to computer programming to (CNC) plasma cut metal art and the **Blaze** computer-controlled plasma cutting machine.

NOTE: Recertification is required if you have not used the Blaze for 60 days. There is no charge for recertification.

Course Materials & Equipment

- PlasmaCAM and SheetCam computer software.
- Blaze computer-controlled plasma cutting machine.
- Student is supplied with class materials: a USB flash drive, 2x2 sheet of metal to cut pattern, and electrode and nozzle.

Course Structure

This course consists of three consecutive weekly sessions from 4 to 6 PM:

- Session 1 – students will learn to use the PlasmaCAM software to create a pattern.
- Session 2 – students will learn how to convert and import that pattern into the SheetCam software.
- Session 3 – students will first review the computer processes and then learn how to safely operate the Blaze plasma cutting machine.

Course Objective

Each student will demonstrate proficiency in creating and cutting a metal art project. Use of the software as well as safe and proper setup, use, and clean-up of the Blaze plasma cutter will also be demonstrated.



Course Information

Metal Art 202 (#5201)

Prerequisites – Metal Art 201

Course Description

Introduction to the operation of the **Laguna** computer-controlled plasma cutting machine. This course builds on the knowledge from the Blaze class.

NOTE: Recertification is required if you have not used the Laguna for 60 days. There is no charge for recertification.

Course Materials & Equipment

- Laguna Plasma Cutting Machine.
- Student will supply their own ready-to-cut pattern, metal, electrode and nozzle.

Course Structure

This course will demonstrate the proper post-processing of a metal art project using the dedicated Laguna computer and plasma cutting machine. Students will also learn to create a Laguna .TXT file, load it properly into the Laguna system, and cut the metal art project.

Course Objective

Each student will demonstrate proficiency in creating and cutting a metal art project on the Laguna plasma cutter. Safe operation and clean-up will also be demonstrated.



Course Information

Metal Surfacing

Honing 101 (#5120)

Prerequisites – Basic machine shop knowledge/experience.

Course Description

Introduction to basic surface honing. The student will learn to operate the Sunnen MMB-1660 Honing Machine. In general, honing is a process in which an abrasive cutting tool is used to produce a very fine surface. The honing machine used for this course is a precision tool with a mechanically rotated abrasive tip for enlarging holes to precise dimensions.

Course Materials & Equipment

- Sunnen MMB-1660 Honing Machine.
- The student should have a project for the instructor to evaluate and use for demonstration.

Course Structure

This class is one-on-one instruction. The student's project will be used for hands-on instruction and guidance to completion of the project.

Course Objective

The student will be able to demonstrate full set up, operation, and clean-up of the Sunnen Honing Machine.



Course Information

Paint Booth 101 (#5105)

Prerequisites – None

Course Description

This course will teach you the basics of using the paint booth.

Course Materials & Equipment

- Spray gun.
- Course materials will be supplied before the class starts.

Course Structure

To be determined.

Course Objective

To be determined

This class is currently unavailable

–

Instructor needed.



Course Information

Powder Coating 101 (#5123)

Prerequisites – None

Course Description

This course will teach you the basics of Powder coating including the use of the oven, spray booth and spray guns. You will also learn how to apply powder and bake your item.

Course Materials & Equipment

- JC Metal Fabrication Powder Booth and Oven.
- Course materials will be supplied before the class starts.

Course Structure

This course is limited to 2 students. This course will utilize Power Point and hands on training. Training will last approximately two to three hours.

Course Objective

Each student will demonstrate the ability to apply powder to an item with the shop spray gun and know how to operate oven properly and safely.



Course Information

Sand Blasting 101 (#N/A)

Prerequisites – None, included in Orientation Class

Course Description

This course is an introduction to the basics of sand blasting and operation of a sand blasting machine.

Course Materials & Equipment

- TP Tools Skat Blaster 1536.
- In addition to required eye protection, the member may wish to employ ear and respiratory protection. Wearing latex glove liners inside the sand blasting gloves may be considered.

Course Structure

Instruction will begin with a review of two handouts included in the Member Handbook. This will be followed with a demonstration at the sand blaster, and each student will actively sand blast a piece of metal.

Course Objective

Each student will be able to: prepare the sand blasting machine for processing a project; clean up and close down the sand blasting machine; state several "do's & don'ts" for processing projects.



Course Information

Surface Grinding 101 (#5118)

Prerequisites – Basic machine shop knowledge/experience.

Course Description

Introduction to basic surface grinding, the most common of grinding operations. Surface grinders are abrasive machines that utilize a grinding wheel to create smooth, flat surfaces. Instruction in operating the Kent KGS-618N Manual Hand Feed Grinder.

Course Materials & Equipment

- Kent KGS-618N Manual Hand Feed Grinder.
- The student should have a project for the instructor to evaluate and use for demonstration.

Course Structure

This class is one-on-one instruction. The student's project will be used for hands-on instruction and guidance to completion of the project.

Course Objective

The student will be able to demonstrate full set up, operation, and clean-up of the Kent surface grinder.



Course Information

Surface Grinding 201 (#5117)

Prerequisites – Surface Grinding 101

Course Description

Introduction to the operation of an automated surface grinder, the Brown & Sharpe Micromaster 818 Surface Grinder. This surface grinder has an automated table and uses a coolant/lubricant. Surface grinders are abrasive machines that utilize a grinding wheel to create smooth, flat surfaces. Surface grinding is the most common of the grinding operations.

Course Materials & Equipment

- Brown & Sharp Micromaster 818 Surface Grinder.
- The student should have a project for the instructor to evaluate and use for demonstration.

Course Structure

This class is one-on-one instruction. The student's project will be used for hands-on instruction and guidance to completion of the project.

Course Objective

The student will be able to demonstrate full set up, operation, and clean-up of the Brown & Sharpe Surface Grinder.



Bending 101 (#5121)

Prerequisites – None

Course Description

Introduction to bending structural metal (pipe, angle, square tube, flat and more) using a three-roll power bender. This machine is used to bend arcs and circles and not specific angle bends as done on the hydraulic bender. It will bend round and square tubing, as well as solid bar of different shapes and sizes.

This course will teach you how to set up and safely operate the Eagle three-roll power bender. In this course You will learn how to rough-estimate tube length, tube cutting, deburring, and degreasing.

Course Materials & Equipment

- Eagle three-roll bender.
- A length of practice tubing will be provided.
- An instructional manual is provided for each student.

Course Structure

- This course is limited to 4 students who will work in teams of 2.
- Each team will be given a bending assignment.
- The course is approximately 2 hours long.

Course Objective

Students will demonstrate tube selection, length estimating, cutting, and preparation; correct installation of the bending rolls, spacers and flanges; and the safe operation of the Eagle three-roll bender to complete the bending assignment.



Course Information

Bending 201 (#5106)

Prerequisites – None

Course Description

Introduction to bending tubes (round, square) using an air/hydraulic tubing bender, the J.D. Squared Hydraulic Bender.

This course will teach you how to set up and operate the hydraulic tube bender; estimate the length of tubing needed; locate, cut, deburr, and degrease the tubing; how to bend tubes at precise angles; and how to make multiple bends of the same angle.

Course Materials & Equipment

- J.D. Squared Hydraulic Bender.
- A length of practice tubing and an instruction manual will be provided.

Course Structure

- This course is limited to 4 students who will work in teams of 2.
- The course is approximately 2 hours long.
- Each student team will be given a bending assignment.

Course Objective

Students will be able to demonstrate tube selection, cutting, and preparation; accurate tube marking with the use of bend templates; installation of the appropriate bending die set; and the safe operation of the hydraulic bender to achieve the assigned tube bends.



Course Information

Foundry 101 – Basic Sand Casting (#5108)

Prerequisites – None

Course Description

Introduction to basic aluminum and brass sand casting. Basics of the green sand-casting process will be taught. Students will leave the class with a simple aluminum casting they made.

Course Materials & Equipment

Kiln and casting equipment.

Course Structure

Class size is limited to 2 students because we only have two work stations at the foundry.

The class is 3 hours in length. After a 20-minute introduction, the remainder of the class is demonstration and hands-on learning by doing. Students will experience all the steps from key parts of the pattern to making a sand mold ready for receiving molten metal. After the casting is produced it will be removed from the sand and taken home by students.

Course Objective

Through guided discussion, demonstrations, and hands-on learning, the student will complete a simple sand casting and be able to describe the basic green sand-casting process.



Course Information

Foundry 201 – Furnace Operation and Pouring Safety (#5125)

Prerequisites – Foundry 101 & Instructor Approval

Course Description

Students completing this course will demonstrate the safe practices of operating the foundry furnace and procedures for melting and pouring non-ferrous metals while protecting themselves and others during and after furnace operation.

Course Materials & Equipment

- Operation of propane fired foundry furnace
- Safety checklist for making a melt and pour of aluminum
- Safety equipment: Apron, leggings, arm shields, gloves, face shield, fire extinguisher and shovel

Course Structure

Students will be guided through the steps to operate the furnace to safety standards. Also, they will use a checklist to master the steps of melting a pour of aluminum or brass. Upon completing the course, the students will be able to demonstrate the safe procedures to the instructor.

Course Objective

Demonstrate and explain the proper steps for operating the furnace, melting and pouring metal.



Course Information

Ironworker 101 (#N/A)

Prerequisites – None

Course Description

Introduction to punching, shearing, and bending heavy mild steel using the hydraulic ironworker. Operational safety is also stressed in this course.

Course Materials & Equipment

Uni-Hydro Ironworker Pro 50.

Course Structure

This course is limited to 3 students. This course will consist of proper use and techniques for the safe and efficient operation of this shop workhorse. Training will last approximately 1 hour.

Course Objective

Each student will demonstrate that they are able to safely and properly perform cutting, punch installation and alignment, and punching operations on the Ironworker.



Course Information

Knife Making 101 (#5122)

Prerequisites – None

Course Description

Introduction to the steps of making a knife, including design, cutting, shaping, treating, and sharpening. **THIS IS NOT A KNIFE SHARPENING CLASS.** Upon completion of the training class, the Member will have a finished knife product.

Course Materials & Equipment

Materials supplied for this class will be knife sanding belts of different grits, several practice steel pieces and one (1) Carbon or Stainless-Steel blank to be used for creating your final knife.

Course Structure

Class size will be limited to two people who will be pre-screened for the course by the instructors.

Students can expect hands-on training, demonstrations, lecture or a mixture of these.

Upon completion of the course, the student should have the knowledge and skill to complete a finished knife.

Course Objective

Each student will demonstrate the basic skills to design and build a knife.



Course Information

Sheet Metal 101 (#5104)

Prerequisites – None

Course Description

Introduction to the basics of sheet metal work, including cutting, shearing, bending, notching, seaming.

Course Materials & Equipment

- Shears, brakes, and various metal-working tools.
- The student will be supplied the necessary sheet metal to complete the required projects.

Course Structure

This class is limited to two or three (2-3) students. The class will take two to three (2-3) hours, and will consist of hands-on, demonstrations, lecture or a mixture of these.

Student will learn to make two (2) boxes that will be 6"x8"x3" with one box having welded seams and the other box having machined seams.

Course Objective

Upon completion of this course, students will have the basic knowledge to complete projects on their own, using the shop equipment demonstrated in this class.



Welding 101 – MIG (#5107)

Prerequisites – None

Course Description

Introduction to MIG, wire feed welding

Course Materials & Equipment

Miller Millermatic and Lincoln Electric POWER MIG welders.

This course will expose you to flame and sparks. You are required to wear appropriate non-flammable clothing. Welding apron and gloves are required. The club will supply welding helmets for the class.

Course Structure

This class is limited to 4 students and will take between 2 and 3 hours to complete. This is a hands-on training session and will cover equipment and personal safety and the setup and use of the MIG equipment.

Course Objective

Each student will demonstrate safe and proper use and setup of the MIG equipment and the ability to apply that knowledge in joining metal parts.



Course Information

Welding 201 – TIG (#5114)

Prerequisites – Welding 101, Instructor approval

Course Description

Introduction to TIG welding.

Course Materials & Equipment

- Miller Dynasty 200
- Student must supply own, tungsten electrode, welding helmet, welding apron, welding gloves, and long clothing to prevent radiation burns.

Course Structure

This advanced course is taught individually in a class that generally runs between 2 and 3 hours. This is a hands-on class and is provided to club members who have demonstrated previous welding experience and abilities, either through the club or prior experience. The instructor reserves the right to provide this class solely to students that the instructor approves.

Course Objective

Each student will demonstrate safe and proper use and setup of the TIG equipment and the ability to apply that knowledge in joining metal parts.



Course Information

Oxy/Acetylene Brazing 101 (#5115)

Prerequisites – None

Course Description

This course will teach you how to safely use the oxygen/Acetylene torch and associated equipment to join steel using bronze brazing rods. You will be introduced to the O/A equipment, safety, and brazing techniques.

Course Materials & Equipment

Oxygen/Acetylene Torch, brazing rods and flux, all supplied.

This course will expose you to flame and sparks. You are required to wear appropriate non-flammable clothing. Apron and welding gloves are required. The club will supply eye protection for the class.

Course Structure

This course is limited to 2 students. The training session will last 2 hours and consists of a half-hour of lecture and the remainder in hands-on practice. Training includes safe and proper use of the O/A equipment, safety equipment and procedures, and brazing techniques.

Course Objective

Each student will demonstrate their ability to safely operate the O/A torch and equipment. Class project consists of joining scrap steel as an introduction to the brazing process.

