

# Metals 101 Certification Class

## Hand tools

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## Welcome!!

We will continue to the practical portion of our certification class. Reading this online does not constitute certification. You will need to perform the sampler project in order to achieve certification. (Special circumstances may apply-instructor discretion)

### Prerequisite: Metals 100

**This portion is a prerequisite for 102 and 201.**

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## Goals:

- Identify basic hand tools for the 101 certification
  - Demo of tool use
  - Practice using tools and materials
  - Complete the certification sampler project and checklist.
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**Identify Tools:** There are tools that perform different jobs, the following 5 categories cover most uses of basic hand (bench) tools. The following tools can be used on unheated metal sheet, wire, and tubing using traditional skills.

- **Gripping/Securing:** bench pin, vise, pin vise, pliers, clamps, adhesive, 3<sup>rd</sup> hand
- **Cutting/Removing material:** Jeweler's saw, hole punches, shears, snips, disc cutter, files, sand paper
- **Shaping and Forming:** Hammers, pliers, mandrels, jump-ring maker, stakes, anvils, bench blocks, dapping punches/blocks, stamps
- **Measuring, Marking and aligning:** center punch/scribe, jeweler's rule, dividers, templates, tri-square, gauge wheel, ruler, triangle, compass
- **Finishing:** sanding sticks/paper, polishing cloths, preservative wax or spray, steel wool, brass brush, chamois

There are many other processes that share tools with the categories listed above, such as surface treatment, fabrication, and wire wrapping. Surface treatment falls more into the finishing category but can be approached at most any time in the process of making depending on the desired effect.

## Demo time!! How do I use this?

- Jeweler's saw
  - Hole punch
  - File
  - Sanding media—what grit do I use first?
  - Hammers- There are different types of hammers...
  - Ring Mandrel
  - Bench Block
  - Anvil
  - Dapping Punch/Block
  - Disc Cutter
  - Pliers—which pliers do I use for what purpose? Wait, there are different kinds??
  - Aviation shears
  - Calipers, Jewelers rule, gauge wheel
  - Bench pin
  - Stamps and punches
  - Jump ring maker
  - Trinity
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## Important to Remember!!

- Annealing is a heat process to soften metal that has become hardened through fabrication processing, to make it pliable and prevent it from getting too brittle
- Annealing your materials may be required depending upon the process you choose to complete your project. For future use you will want to take the Metals 102 and 201 classes.
  - Rule of thumb for disc cutter, shear and rolling mill: metal over 20 gauge will need to be annealed before using these tools.
- Do NOT use STEEL for your work material. Doing so will mar the tools and transfer those marks to future materials.
- Avoid exposing tools to moisture: dry tools thoroughly if wet, dry pieces (work material) thoroughly before using tools. Any moisture on the tools will rust them immediately.

## Practice time! Complete a sampler project and checklist:

### Materials:

- 1 3"x3" square of Copper for your project
- 1 2"x 2" square of Copper for your sample cuts
- Any materials from the Scrap bin
- 1 pc of 16-gauge wire at 6"
- 1 pc of 20-gauge wire at 6"

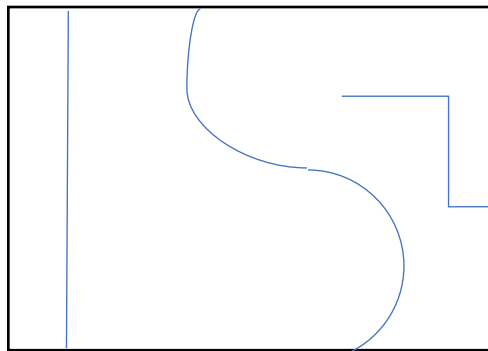
### Sampler Requirements:

- You must use the check listed tools in your processes
- It is suggested that you utilize your 2" square for sawing practice before working on your project. You will want to practice a curved cut, an angled cut and a straight cut.
- Have some sort of plan before you start. Tell me the plan.
- Improvise and experiment.

### Instructions:

#### Jeweler's saw practice:

1. Using your 2" square and a ruler, draw a straight line. Either free hand or using the ruler draw an angled line with several angles. Either free hand or with the circle template draw a curved line.
2. Select a blade from the holder, load your frame and cut the lines that you drew. Think about an order of operations and how you are going to hold the material.



### Sampler Instructions:

1. Design your project: to make life easier, choose from earrings, pendant or a sculptural object. If your design has objects that connect we can work that out! Make a sketch of this idea. Consider your check list and how you will be able to incorporate those tools into making your project.
2. Transfer your idea to the metal and begin cutting/removing metal.
3. Be sure to file and clean your metal with sand paper to make it friendly.
4. Think about texture....
5. Think about how it can be worn, used, or shown.

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## Recap and Review:

Answer the following questions (may be done orally):

1. Name three ways to ensure your safety when using hand tools:
  - a. How do we ensure safety of others while in the shop?
2. Name three ways to avoid unnecessary damage to tools?
  - a. What do you do if a tool is damaged?
3. Which hammers can you use for striking steel tools?
  - a. What happens if you use a different hammer?

## Certification Check list:

You must demonstrate safe and proper use of the tools listed below:

Measuring/Marking	Cutting	Surface Finishing	Forming	Gripping
Gauge Wheel	Jeweler's saw	Files	Dapping block	Bench pin
Scribe	Trinity	Stamps	Anvil	vises
Ruler	Hole Punch	Sanding sticks/paper	Bench block	clamps
	Disc Cutter	Hammer texture	Jump ring maker	ring clamp
			Hammer use	

## Shop clean up:

You are responsible for the area you worked in, the tools you used and the area around your work area. Do not leave a mess, if you do not remember where it goes ask. Always put the tools back where they belong. When you are finished, collect your things and you are free to go. You may want to keep these handouts for your future reference.

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