

SILVERSMITHING COURSE OUTLINE

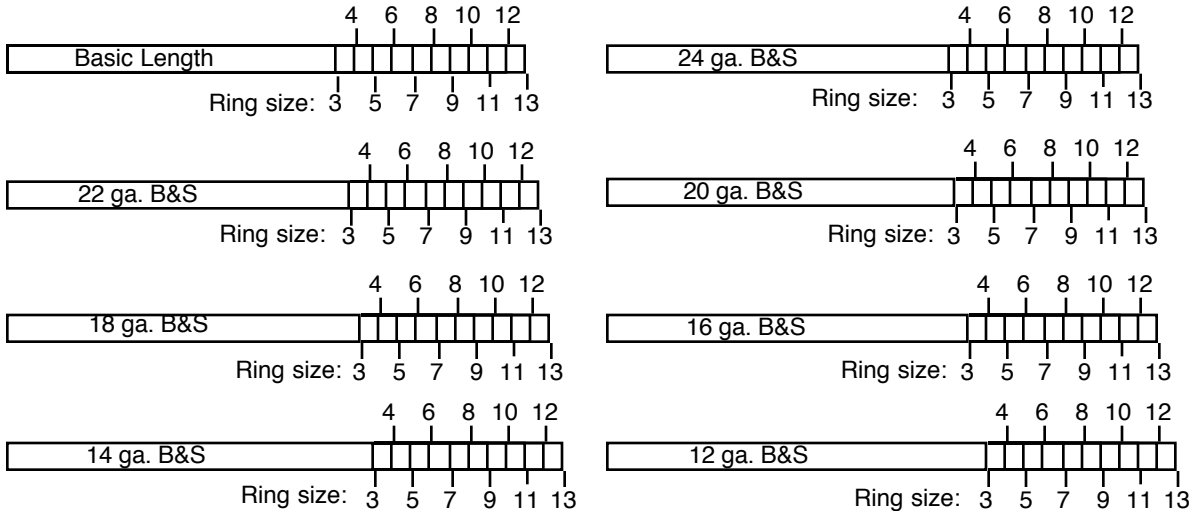
- 1. Course Description:** Design and fabrication of jewelry and small metal objects, involving silver, bronze, and copper sheet and wire, in combination with other materials.
- 2. Course Content and Objectives:** Upon completion of the class, students should be able to design and render jewelry and small metal objects directly from sheet, wire, and other metal forms. They should gain an appreciation of the esthetics and utility of design in metal, in combination with other materials such as stones, ivory, wood, and other natural and found objects, and gain experience in creating original designs . Students should have a basic acquaintance with metal fabrication terms and techniques including sawing, piercing, soldering, acid etching, riveting, reticulation, repoussage and chasing, dapping, forging, buffing and polishing. They should gain a working knowledge of the safe and proper use of a variety of jewelry making materials, chemicals and tools, including the jeweler's saw, files, flexible shaft, dapping tools, ring and bracelet mandrels, anvils and soldering torches. They should be able to make a variety of objects, including rings, brooches, bracelets, earrings, necklaces, barrettes, buckles, chains, etc., and should be able to set stones in a bezel setting. The same materials and techniques may also be used for small sculpture or utilitarian objects. And finally, students should have an adequate acquaintance with resource literature, books, and supply catalogs to independently pursue the craft should they choose.
- 3. Teaching Methodologies:** Instruction will be principally by step-by-step demonstration, utilizing appropriate samples, slides, and literature. Students will be given individual instruction and assistance in the design and construction of their projects. Time will be devoted to study and discussion of design factors, literature and resources. A typical class period will begin with an initial introduction and demonstration of the particular techniques, followed by hands-on practice by the students with individual instruction.
- 4. Evaluation:** Evaluation will be with a pass/fail standard, based on the student's attendance, completion of a project or projects, craftsmanship and design.
- 5. Resources:** Text, tools, supplies and materials will be provided for use during the class.
- 6. Contact Time:** 20 hours of class over fiive days time.

Bibliography for Silversmithing Class-Art Koeninger, 2003

- Art Nouveau Jewellery & Fans-Mourey, Vallance, et al
Art Through the Ages-Helen Gardner
Body Jewelry-Donald Willcox
Book of Signs-Rudolph Koch
Clues to American Sculpture-Kathleen Sinclair Wood
Crossroads of Continents-Fitzhugh and Crowell
Design Motives of Ancient Mexico-Jorge' Enciso
Designing and Making Handwrought Jewelry-Joseph F. Schoenfelt
Designs on Prehistoric Hopi Pottery-J. W. Fewkes
Drawing on the Right Side of the Brain-Betty Edwards
Essential Design-Catherine McDermott
Ethnic Jewelry-John Mack
First Steps in Enameling-Jinks McGrath
How to Make Modern Jewelry-Museum of Modern Art- Martin
Inventive Jewelry Making-Ramona Solberg
Jewelry Concepts and Technology-Oppi Untracht
Jewelry Making and Design-Rose & Cirino
Metal Techniques for Craftsmen-Oppi Untracht
New Design in Jewelry-Donald Willcox
Post-Modern Design-Collins and Papadakis
Primitive and Folk Jewelry-Martin Gerlich
Rings for the Finger-G.F. Kunz
The Artist's Way-Julia Cameron
The Arts & Crafts Metalwork of Janet Payne Bowles-Shiffman
The Complete Metalsmith-Tim McCreight
The Creative Lapidary-Frank W. Long
The Decorative Arts Library-Jewelry-Lydia Darbyshire
The Design and Creation of Jewelry-Robert von Neumannn
The Encyclopedia of Jewelry Making Techniques-Jinks McGrath
The Nature of Design-David Pye
The Penland School of Crafts Book of Jewelry Making-Coyne
Victorian Jewellery-Margaret Flower
Welded Sculpture-Nathan Cabot Hale
Welding, Cutting and Heating Guide-Victor Equipment Co.
- CATALOGS:**
Rio Grande Jewelers-4516 Anaheim Ave. NE, Albuquerque, NM 87113
1-800-545-6566 www.riogrande.com/
Stuller, Inc.-PO Box 87777, Lafayette, LA 70598-7777
1-800-877-7777 www.stuller.com
TSI, Inc.-PO Box 9266, Seattle, WA 98109 1-800-426-9984 www.tsijeweltools.com/

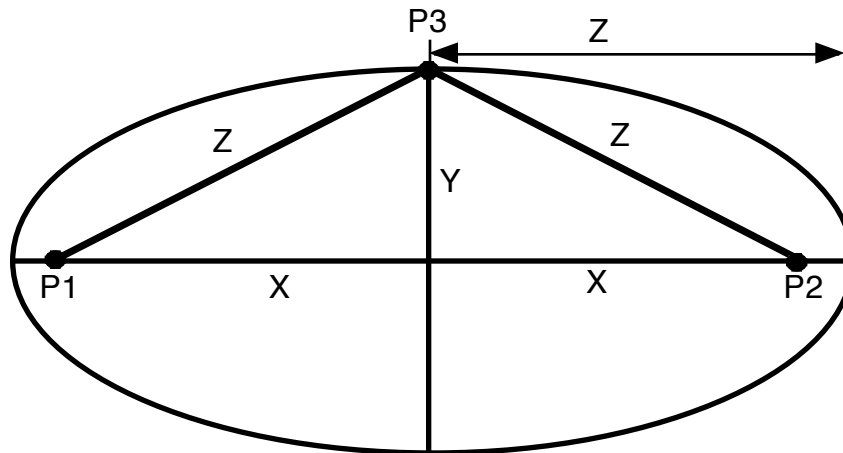
RING BLANK LENGTHS IN B&S GAUGE

For rings narrower than 4mm, add approximately 3 times the thickness of the metal to the basic length:



Add 0.5 mm { | } to these lengths if the ring is wider than 4mm.

DRAWING OVALS



To plot the oval:

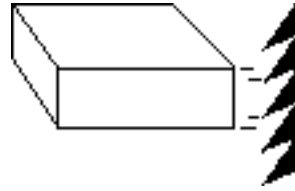
- (1) Place pins at P1, P2, & P3, loop a string around them & tie it.
- (2) Replace the pin at P3 with a pencil or scribe.
- (3) Mark the oval by rotating the pencil or scribe around P1 & P2 while stretching the string to its limit for the full rotation, get it?

Or, $x = \sqrt{z^2 - y^2}$ & length of string = $2x + 2z$. Right?

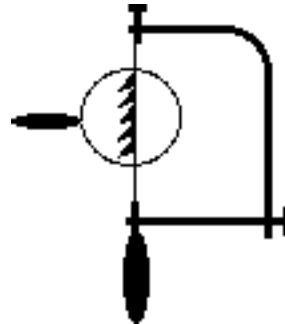
METAL FABRICATING PROCESSES

Sawing:

To avoid jamming, the distance between the teeth on the saw blade should be less than the thickness of the metal to be cut.



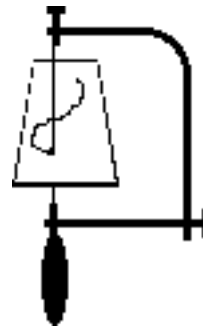
Place blade with teeth pointed outward & down (toward handle).
Blade should be secured with tension on frame.



Secure metal to be cut on bench pin.
Cut with saw perpendicular to the metal.
Cut with long, even strokes. Rapid, short strokes in one place will wear out blade.
Let down stroke do the cutting. Pressing forward on blade can break it.
You can cut curved lines either by turning the saw or by turning the metal.
Lubricate occasionally with bees' wax.

Cutting a pierced design:

Sketch design on tracing paper.
Paste paper on sheet metal.
Drill hole in one end of design.
Slip blade through hole, teeth pointed down.
Set blade in frame & cut as above.



Soldering:

Metal and solder must be clean.

The pieces to be soldered must fit, i.e., touch and held in contact with each other. You can't solder air.

All pieces & solder must be fluxed, to exclude oxides from the soldering area & to reduce fire scale in areas not being soldered. Totally cover all surfaces that will be heated.

The correct solder and amount of heat must be applied to the metal.

Work in a well ventilated area.

Place fluxed pieces on soldering pad or metal screen, cleaning off any unwanted pieces of solder from pad. Pieces may be held together with thin binding wire, and can be held in place on soldering pad by heavier binding wire brads.

Slowly preheat entire piece until water in flux dries out.

Continue heating until metal turns a slight red color & flux turns to liquid.

You can then focus on the area of the joint. Warm metal until it reaches the melting & flow points of the solder, rather than heating the solder directly with the flame. Avoid overheating the solder

before the metal reaches sufficient temperature to receive the solder.

Solder will flow toward the hottest part. Heat larger areas first to avoid overheating smaller areas. Solder will first melt. Continue heating until solder flows. Remove heat immediately.

Sweat Soldering:

A process of tinning-applying a thin layer of solder to a metal that is to be soldered to another metal. For overlay or applique' work, sweat solder the back of the piece before cutting (see sawing instructions.) Distribute bits of solder in a 1/4" grid. Proceed per above directions. As solder begins to flow, spread the solder around with a soldering pick. Remove heat as soon as the surface is completely covered. After any necessary cutting of the shape, clamp the two pieces together with the tinned surface between them, and heat until the solder flows to make a clean union.

Pickling:

Before pickling, boil project in hot water to remove any baked on flux.

To remove oxides from the metal, treat piece after final soldering in pickling acid. The amount of time depends on strength and temperature of the solution.

Always use copper tongs to place and retrieve metal from pickle. NEVER use steel tweezers or place any ferrous (iron based) metal in pickling solution; it will copper plate your piece, and contaminate the solution for future use. ALWAYS add acid to water, NEVER add water to acid, it can cause an explosion in certain circumstances.

Finishing:

Remove any unwanted areas by filing & sanding. A dark antiquing patina can be used to bring out the highlights of the design. Buffing compound is abrasive and will remove a fine layer of metal, including unwanted areas of the patina. Polish will add a final shine. Wash with detergent and water between buffing and polishing. Do not cross contaminate the two, or neither will do their job. Wash with detergent and water as a final step to reduce smudging and finger printing.

Tool etiquette & safety:

Use the proper tool for the appropriate purpose. E.g., use polished hammers on soft metals only, not for center punch, hammering nails, chasing tools, etc. Files cut in only one direction; push in direction of the tip. Don't rub files back & forth, it dulls them. Do not put needle files in flex shaft. When using center punch, place over anvil but punch moderately. You only need a small dimple. Do not punch through & puncture anvil.