Government of Pakistan

National Vocational and Technical Training Commission

Prime Minister's Hunarmand Pakistan Program

"Skills for All"

Course Contents / Lesson Plan

Course Title: Goldsmith (Basic)

Duration: 3 Months

Trainer Name	
Course Title	**Goldsmith (Basic)**
Objectives and Expectations	Employable skills and hands on practice for a Goldsmith **Training Objectives:** Overall objective of this course is to introduce the fundamentals of gold jewellery making techniques involved in produce the traditional and fine gold jewellery. Yes, we wish to well aware and trained our apprentice about it all, who should have clear understanding of the relevant techniques, tools and materials used in gold jewellery making processes. This course covers all major skills of a professional goldsmith which are very important for the object to design and create a adornment of human body, usually made of precious and non-precious metals often with precious or semiprecious stone and other organic substances **Main Expectations:** After the completion of this course trainee will be a functional part of jewellery industry. Also he will be able to make his own workshop OR he can get a respectable job as a skilled worker in a factory or abroad. whether he could be a sale person at a jeweler's shop
Entry-level of trainees	Matric
Learning Outcomes of the course	By the end of this course, students will be able to: • Draw and design basic shape of jewellery components • Apply workshop safety pre-cautions and health care • Select correct alloys to make specific carats of gold • Select correct tools and materials for the given job • Make ingot according to required shape and size • Draw sheets with safety and care • Perform annealing process and maintain gauges sheets • Perform sawing and piercing • Perform shaping and doming • Draw wires and able to maintain gauges • Perform filigree work for tradition jewellery • Perform assembly and soldering of metals • Make different components for human ordainments • Apply finishing and polishing techniques
Course Execution Plan	Total duration of the course: **3 months (12 Weeks)** Class hours: **4 hours per day** Weekly hours: **20 hours per week** Total contact hours: 24**0 hours** Theory: **20%** Practical: **80%**
Job Opportunities	• Self-employed • Manufacturer

	• Industrial worker • Sales person
No of Students	10
Learning Place	Classroom / Lab
Instructional Resources	➢ Jewellery Making written by Carles Codina ➢ The Complete Metalsmith: An Illustrated Handbook" by Tim Mc Creight

MODULES

Weeks	Module Title	Day	Hour	Learning Units	Tasks
Week 1	**Drawing and Design concepts**	**1**	**1-4**	• Introduction of drawing materials and tools • Description of drawing and designs • Practical exercise of free hand drawings (object drawings)	**3**
		2	**1-4**	• Introduction of measuring tools, measuring units and their usage • Practical exercise of 2 D Geometrical shape drawings with measurements	**2**
		3	**1-4**	• Introduction of common and simple jewellery shapes • Practical exercise of technical drawings of simple jewellery designs	**2**
		4	**1-4**	• Practical exercise of technical drawings of simple jewellery designs	**1**
		5	**1-4**	• Practical exercises to draw a simple band in a isometric view • Practice to draw a single stone solitaire ring in a isometric view	**2**
Week 2	**Working with precious and non-precious metals**	**1**	**1-4**	• Introductions of Gold, carats, solders and alloys. • A comparison of other precious and non-precious metals used for jewellery making • Workshop safety pre-cautions and health care • Introductions of tools and machinery and their usage	**4**
		2	**1-4**	• Apply SOPs of workshop safety • Apply gold wastage control measures • Practical exercise of ingot making for sheet drawing using non-precious (Copper and zinc) • Practical to make pickling solution to restore metal color after melting	**7**

				• Practical exercise of sheet drawing using hand rolling machine • Introduction and Comparison of burner annealing and kiln annealing • Practical of annealing metal after 1st drawing process	
				• Practical exercise to use gauges and thickness measuring tools • Practical exercise of 2nd sheet drawing using hand rolling machine • Practical of annealing metal after 2nd Repeat sheet drawing process to achieve required thickness	**3**
		4-5	4-4	**Practical exercise of sawing and piercing** • Apply SOPs of workshop safety • Apply gold wastage control measures • Draw a simple shape on paper and past on metal sheet • Punch marks on spaces where need to cut inside and outside the shape drawn on metal sheet • Drills a hole on marks to insert saw blade • Insert saw blade through the hole to cut inside the shape • Maintain jeweler saw blade's tension or intensity • Use jeweler's saw to cut inside the shape first, then cut the shape from outside from the metal • Filling exercise to remove flashes form sawing outcomes • Repeat exercise for different shapes and designs	**10**
Week 3	**Metal doming and wire drawing process**	**1**	1-4	**Practical of doming exercises** • Apply SOPs of workshop safety • Apply gold wastage control measures • cut a simple solid shape form flat metal sheet • Anneal the metal shape to make softer for doming process • Dome the flat metal shape using dapping tools • Repeat annealing and doming process until achieve the required shape • Introduction of types of files and sanding papers • Practices to marks dapping marks from domed shapes using files • Use sanding papers to remove filling	**Task** **9**

				marks from domed piece	
		2	1-4	• Repeat doming exercise to make flat patterns in dome forms using different dapping tools • Remove dapping marks from domed shapes with files • Remove files marks from filled domed pieces with sanding papers	**3**
		3		• Apply SOPs of workshop safety • Apply gold wastage control measures • ply gold wastage control • Practical exercise to make ingot for wires using non-precious (Copper and zinc) • Practice to draw wire from rolling machine • Apply annealing process to make metal softer • Maintain wire gauges during rolling process • Check hardness of wire to apply annealing for re-rolling process • Apply pickling solution to restore metal color after rolling process	**9**
		4-5	4+4	**Micro wire drawing process:** • Apply SOPs of workshop safety • Apply gold wastage control measures • Practice to draw thin wires using wire drawing plate. • Make wire end pointed with file before draw from the plate. • Use lubricants to draw wires form the plate. • Measure and maintain gauges during process • Perform annealing to soften wires during process. • Check hardness of wire to apply annealing for re-drawing process • Apply pickling solution to restore metal color after rolling process	**9**
Week 4	**Filigree making and soldering process**	**1**	1-4	**Filigree making process**: • Apply SOPs of workshop safety • Apply gold wastage control measures • Draw wire 28 gauge for filigree work • Apply annealing and pickling • Bend wire in ”U” shape and place the	**Task** **7**

				loop end in a ”? “mark hook fixed on the table and other both end of wire hold in a chuck of hand drill and wind it slowly clock wise and stop after 15-20 turns • Apply annealing • Flatten the wire through rolling machine or with flat hammer on a polished flat surface	
		2+3	4+4	**Soldering process:** • Apply SOPs of workshop safety • Apply gold wastage control measures • Introduction types of torches, fuels, soldering tools and materials • Simple soldering exercise to sold two flat stripes edge to edge • File the edges straight to align the sides of both strips to be soldered • Place both stripes on soldering block parallel and apply flux • Heat the both pieces together until turned cherry red color • Use solder pick to put solder chips on joint • Move flame to the opposite direction of solder chips where need to flow solder in joint • Keep spotting flame on solder chips • Dip the job in pickling solution instantly after complete the job • Turn off soldering gun and remove it after finish the soldering process • Examine the job carefully and repeat process again if soldering is incomplete • Apply filing and sanding on soldered piece to make surface even	**14**
		4+5	1-4	**2nd soldering exercise:** • Rub the one previously domed piece on 600 grit sand paper to make edges equal • Sand the surface of flat piece recently soldered in 1st soldering exercise • Place flat piece on soldering block and apply flux on it • Put the domed piece at the surface of flat piece laying on soldering block • Put some pieces of soldering chips around the domed piece and apply heat with soldering gun until turn cherry red • Move the soldering gun around the domed piece and increase intensity of heat until solder melt and move	**8**

				between the both pieces to be solders • Put the soldered piece in pickling solution to restore the bright and shiny original color • Examine the soldered piece carefully, if found incomplete repeat the soldering process again	
Week 5	**Finishing and polishing techniques**	**1**	1-4	**Finishing and polishing exercise:** • Examine the domed and flat piece soldered in last exercise carefully • Remove leftover solder and unevenness form the surface using files • Remove file marks using sanding paper from the surface • Buffing of domed piece with course • compound (Tripoli • Wash with Ultrasonic and steam • cleaner • Polishing of domed piece with luster • compound (apply rouge) to achieve • mirror finish • Wash with Ultrasonic and steam • cleaner • Hold domed piece with tong during • washing to avoid finger prints on mirror finish	**Task** **14**
		2	1-4	**Metal texturing(** all types of texturing apply on a flat mirror finished object) • Hammer texturing • graver texturing • stone texturing • sanding texturing • bur texturing • File texturing • Rolling mill texturing	**7**
		3		**Matte finish (Sandblasting)** Adopt safety pre-cautions • Apply sand blasting on a 40x40mm flat mirror finished sheet • Perform masking that parts of object which to avoid sand blasting • Select the specific sand grit • Maintain air pressure • Maintain sand speed to drop on the object • Adjust the timer OR note time for specific sanding duration • Remove masking and wash in Ultra-sonic machine to clean it	**7**

		4		**Stipple finish** • Prepare 40x40mm flat mirror finished sheet for stippling • Select tool and fix with stippling machine • Adjust speed of stripling machine • Apply stippling on your object	**4**
		5	1-4	**Satin finish (Wire wheel)** • Prepare 40x40mm flat mirror finished sheet for wire wheel finish • Select wire wheel for satin finish • Wind on polishing motor • Adjust speed of polishing motor **Satin finish (wire brush)** • Prepare 40x40mm flat mirror finished sheet for wire brush finish • Select wire brush for satin finish • Draw a series of tiny parallel lines with wire brush on mirror finished sheet	**7**
Week 6	**Settings for Gemstones**	**1**		**Make a Bezel setting:** • Select and measure a cabochon stone to determine the size of bezel to be made • Select the metal sheet for the bezel • Select the flat wire for surrounding the cabochon • Measure and cut the flat wire according to the size of cabochon • Matching up the flat wire ends • Solder flat wire ends • Insert the cabochon in soldered flat wire circle to match and shape the flat wire according to the shape of cabochon • Solder the Shaped flat wire on flat metal sheet to make the bezel for setting • Dip hot bezel in pickling solution to clean and restore color of metal	**Task** **9**
		2		**Make a 4 Prongs setting:** • Make a tube from strip according to the size of stone • Open tube from one side using cone shaped dapping tools • File the cone in and outside nicely to remove the dapping marks • Use piercing saw to mark 4 cuts at equal • distance on open side of tube's face • saw down marks about 2/3 of the height of the coned tube • Use file to expand the original saw cut and raise up the prongs.	**8**

				• Use sand paper to remove marks of file and finish it	
		3	1-4	**Make tube setting:** • Make a long strip from 0.5 - 1 mm thick • Make a “u” at one end of the strip • Pass through this “U” from wire drawing plate according to required size • Anneal it and pass through again a smaller hole of wire drawing plate before used • Repeat process until achieve a round tube • Solder the tube slot to make it stronger • File out tube to remove outer solder and finish it • Cut the tube nuggets for stone setting or assemble with other parts of jewellery	**8**
		4	1-4	**Exercises for basic stone settings** Set a stone in bezel settings • Place a cabochon stone in a bezel and press bezel toward stone with help of brass pusher • Use banisher to secure stone and polish the bezel Set a stone in 4 prongs setting • Open the prong as according to stone size • Cut bearing with heart bur to make a seat (don’t cut prongs more than 40% of total thickness) • Place stone in bearing and press prong toward stone with brass pusher than press the opposite side prong toward stone • Repeat the same way press remaining prongs to secure stone in prongs • Cut extra height of prongs and make them round with file OR cup bur to avoid snatching clothes Set a stone in tube: • Cut seat in tube using heart OR setting bur below the collar of tube • Place stone in tube and push tube’s	**10**

				edges on stone • Hold stone in tube properly and polish to finish it	
		5	1-4	**Midterm Examination** Make a gents ring with 4 prong settings for 6 mm stone	
Week 7	**Product base exercises (1)**	**1**	**1-4**	**Jewellery Findings:** **Jump ring making process** • Select wire thickness • Wind on mandrel tightly make a closed spring • Cut each ring of spring with pointed cutter **Bail for pendants:** • Select sheet gauge to make bails for pendants • Cut sheet with saw or sheer in rhombus shape • Make “u” from center and match pointed ends together **Earring hooks:** • Select a wire, measure thickness and length • Make a “O” ring at one end and insert thin wire spring from other end bring close to “O” ring and bend wire to make hook shape **Clasp:** • Select a wire, measure thickness and length • Make a “O” at one end question mark hook on other end	**Task** **10**
		2+3	**4+4**	**A simple ladies ring** • Draw a plan to make simple ladies ring with single stone on it • Make ingot for strip • Draw bar from rolling to make strip • Maintain width and length according to planned on paper • Cut out strip according to size of shank • Roll strip on mandrel to make it round • Match the ends of strip and solder it • Snuggle shank on mandrel and round	**14**

				it using wooden hammer • File out shank from inside and outside to remove extra solder and unevenness • Remove file marks using sanding paper • Buff out shank to remove sanding marks • Make a collet 4 prongs for single stone • Solder 4 prongs setting on top of the shank • Repeat finishing process to complete the ladies ring	
		4-5	**4+4**	**A simple pendant with bezel settings** • Draw a plan to make a pendent with bezel settings • Make ingot for wire • Draw bar from rolling machine to make a wire • Apply annealing process accordingly • Maintain thickness and length according to planned on paper • Make wire flat using rolling machine • Measure and cut flat wires to make main frame • Make main frame of pendant • Solder all joints of pendant • Make a bezel for stone • Assemble and solder the bezel with pendant • File out pendant from in and outside to remove extra solder and unevenness • Remove file marks using sanding paper • Buff out band to remove sanding marks • Wind the round wire to make jump rings • Assembles jump ring to hang up the pendant • Make a bail and assemble with jump ring to wear the chain in	**17**

Week 8	**Product base exercises (2)**	**1**	4	**Make a pendent (use sawing techniques)** • Draw a plan to makes a pendant with details on paper • Make ingot and draw it from rolling machine • Apply annealing and maintain thickness • Don't anneal after final rolling • Past designed paper on the metal sheet • Mark, punch and drill the holes that points need to extract from sheet • Saw the inners design of pendant first then saw the outline of pendant • Use files to remove uneven cuts and sawing marks • Use files to manipulate surface according to design • Use sanding paper to smooth pendant from all sides • Polish, wash and finish the job	**Task** **11**
		2		**Make a pair of pearls studs:** • Design and plan pearl studs on paper • Make a pair of round discs (20 gauge)to mount the pearls • Anneal and dap the discs to make a bit dome to accommodate pearls • Solder (pearl size) pins in center of domed disks to fix the pearls • Measure and cut a pair of (18 gauge) 6mm long round wire to make post • Solder to Joint the (wire) post behind domed discs • File and sand the components to make it smooth • Buff, finish and wash the pair of studs • Mount the pearls on discs with UHU glue	**9**

		3-4	4+4	**Dangle earring:** • Design and draw a 3 steps dangle earrings • Make 6 pieces of tubes for 6 mm stones • Solder small jumps rings both sides of each tube • Make 2 small half ball using dapping tools • Solder a strip cross behind the both half balls • Solder one jump ring beside the each half ball • Fix the post pin center strips of both half balls • Buff and polish all pieces • Set 6 mm stone on each tube • Link up each half ball with 3 tubes using jump rings	**10**
		5		**Create a bypass ring:** • Design and plan a bypass ring for women • Make ingot for wire and draw half round wire from rolling machine • Anneal and repeat rolling process to achieve required shape and thickness • Attach prongs or pins for stone or pearls at both ends of half round wire • Wind the half round wire on mandrel to create the bypass ring • Polish and wash the ring to finish the job • Set stones or pearls at both ends as per plan	**7**
Week 9	**Product base exercise (3)**	**1**	1+4	**A simple gent's band:** • Draw a plan to make simple band on paper with measurements • Make ingot for strip • Draw bar from rolling to make strip • Maintain width and length according to planned on paper • Cut out strip according to size of band • Roll strip on mandrel to make it round • Match the ends of strip and solder it • Snuggle band on mandrel and round it using wooden hammer • File out band from in and outside to remove extra solder and unevenness • Remove file marks using sanding paper • Buff out band to remove sanding	**Task** **10**

				marks Using Tripoli compound. • Buff out band with rough to achieve mirror finish • Wash with ultrasonic machine following steam cleaner	
		2+3	4+4	**Make a pair of wedding bands:** • Design and draw a pair of wedding band decorated by stippling techniques • Make ingot for sheet and draw from rolling mill • Anneal re-roll to maintain thickness and width • Select, measure cut a metal strip according to the size of gents band • Select, measure and cut a metal strip according to the size of ladies band • Anneal and wind on mandrel one by one and maintain the size of bands • Match ends of bands and solder carefully • Apply filling, sanding and puffing process • Wash and clean in ultrasonic and steam cleaner • Apply stippling to finish the pair of bands	**10**
		4	1-4	**Solitaire ring:** • Draw a solitaire ring plan on paper (4 prong for 5 mm single stone) **Make a Prongs/claw setting** • Select 1 mm thick wire for prongs • Make a across of wires to create 4 prongs • Raise up the cross ends to make a basket for prongs setting • Place a jump ring in center of basket and solder it to rest the stone in prongs **Make a shank:** • Draw a laydown shank on paper • Select a sheet to extract a shank by sawing and piercing • Past shank designed paper on metal sheet and mark a punch in center and outer side of shank • Drill a hole in center and outer mark of shank • 1st saw inside and then outside the shank drawn on metal sheet • Remove lashes and unevenness with files and sanding paper **Solder prongs on shank**	**11**

				• Hold prongs in grip tweezers put some soldering flux and solder it with shank	
		5	1-4	**Cluster studs** Design a pair of 7 stones cluster studs • Select a metal sheet, measure thickness to make a pair of cluster bases • Measure size of stones to mark the distance between stones • Mark a circle on sheet from center of cluster base covering distance from center stone to surrounding 6 stones making cluster • Mark and punch center point of each stone of cluster • Drill a pilot hole at each punch mark • Arrange cluster base with prongs on modelling clay • Pour past of water and plaster and let dry • Remove modeling clay mold from plaster • Solder joints fixed in plaster than remove plaster form metal • Wash and clean cluster ready to fix post it. **Solder post on back of cluster** • Hold cluster in grip tweezers, put some soldering flux and solder the post on it	
Week 10	**Product base exercise (4)**	1-2	4+4	**2 piece pendant set (earrings-pendant)** • Draw and design a pendant set with nuggets textured and mirror look • Make ingot and draw a 1 mm thick sheet from rolling machine • Measure and mark three 40x40 mm squire for two for earrings and one for pendant • Saw out to extract 3 pieces from metal sheet and file to correct unevenness and lashes • Attach jump ring with pendant for bail • Add bail into jump ring of pendant and solder the joint • Solder the posts behind the earrings • Use sanding and polishing as preparation of final finish (texturing) and mirror polish • Apply Tripoli to remove all marks and	**15**

				clean well with steam cleaner to remove all particles of Tripoli • Apply rouge to achieve mirror polish • Clean well with ultrasonic and steam cleaner • Draw a line with metal scriber to divide all three squire pieces • in two half • one half carve nugget texture with 1 mm bur and the other half keep remain mirror finish • apply final rouge, wash and clean for display in class room	
		3-4-5	4+4+4	**3 pieces pendant set (ring-pendant-earrings)** • Design and draw pendant set with 10 mm round cut stone set in 4 prongs • Make ingot and draw 1.5 mm round wire to make prongs • Make ingot and draw a sheet to make 4 discs to create prong setting for pendant set • Draw 4 circles of 7 mm diameter on metal sheet to make discs for prongs setting • Draw a 4 mm smaller circle in center of 7 mm circle previously marked at all discs • Punch a center mark in each disc and drill a pilot hole • Saw out (4 mm)inner circle to accommodate large stone • Mark 4 points around 4 mm circle at equal distance to fix prongs • Use 1.5 mm drill to make holes on 4 marked point • Mark, punch and drill a hole between 4 mm and 7mm circle (parallel outer line) for small stones at equal distance • Raise up and solder 4 prongs at 1.5 mm holes previously done at surface of all disc for large stone • Attach two thin prongs with soldering at every small hole around the large stone at outer side of all discs • Remove extra solder and unevenness with files and smooth with sanding paper **Segregate components to attach findings** **One disc** attach jump ring and bail to make pendant **Two discs** attach post to make earring **One disc** attach shank to make finger ring • Apply finishing and polishing after completion of the pendant set • Grab all components with shellac	**20**

				• Set small stones around large stones • Set large stones at top of each component • Remove components from shellac • Clean in boiling water and liquid soap • Finally wash 3 piece set with steam cleaner	

Week 11	**Product base exercise (5)**	**1-2-3-4**	4+4+4+4	**4 pieces set with filigree work (earrings, pendant, ring, bracelet}** • Design a set with combination of filigree and swing techniques • Apply SOPs of workshop safety • Apply gold wastage control measures • Draw 28 gauge wire to make (metal thread) filigree work • Apply annealing and pickling • Bend wire in ”U” shape and place the loop end in a ”? “mark hook fixed on the table and other both end of wire hold in a chuck of hand drill and wind it slowly clock wise and stop after 15-20 turns • Apply annealing • Flatten the wire through rolling machine or with flat hammer on a polished flat surface • Make metal sheet about gauge I mm to make frames for 4 pieces set • Draw frame’s shape/design on paper • Past paper on metal sheet to extract frame from metal sheet • Extract all frames from metal sheet using sawing techniques • Apply Filling and sanding to removes lashes and unevenness from frames • Make filigree motifs with metal threads to fill in frames • fill all frames with motifs of metal threads (twisted wire) and apply soldering to make joints stronger **Segregate components to attach findings** • **One frame:** attach jump ring and bail to make pendant • **Two frames:** attach posts to make earring • **One frame:** attach shank to make finger ring • **Join a series of frame** to make bracelet respectively • Make a lock hook to attach with bracelet • Finally finish and wash complete set with ultrasonic machine	**21**

		5		**Make handmade chain** • Draw half round wire 14 gauge about 6 feet long • measure and maintain thickness • wrap up the wire on mandrel to make a spring without gape • cut the spring using saw to make jump rings • pile up two equal stakes separate • take one stake match jump ring faces and solder all of them carefully • take two soldered jump rings and one opened face to link up to gather • repeat linking process and solder the opened face links to complete the chain • polish the chain in steel shot vibrating machine	**9**

Week 12	**Product base exercise (6)**	**1-2-3-4**	**4+4+4+4**	**A Short set with filigree work** • Design a set with filigree work (ring-necklace-earrings) • Apply SOPs of workshop safety • Apply gold wastage control measures • Draw 28 gauge wire to make (metal thread) filigree work • Apply annealing and pickling • Bend wire in ”U” shape and place the loop end in a ”? “mark hook fixed on the table and other both end of wire hold in a chuck of hand drill and wind it slowly clock wise and stop after 15-20 turns • Apply annealing • Flatten the wire through rolling machine or with flat hammer on a polished flat surface • Draw 16 gauge wire, anneal it and pass through rolling machine for flattering it to make outer frames of filigree work • Spread modeling clay on a sheet in doming form according to design • Arrange flat wire as a frame of filigree	**20**

				work and fill these frames with motifs of metal threads • Cover sides of modeling clay with paper to make a mold • Fill this mold with a paste of plaster of Paris and water • Let it harden the mold for 30 minutes • Remove the modeling clay from mold • Solder all joints of filigree remaining hold in plaster mold • Examine all joints carefully and remove/break plaster to extract the finished job out mold • Wash the job with brass wire brush to remove remaining plaster • Assemble it accordingly • Buff, polish and wash set to finish the job	
		5	**1-4**	Final Exam Make 2 piece set with the combination of sawing and filigree techniques	

M C Qs

S No	Questions	1	2	3
1	How to measure a circle's circumference?	With scale	Dia X3.142	With caliper
2	What is the melting point of pure gold?	1064 C	980 C	1100 C
3	What is karat?	Weight of gold	Fineness of gold	Length of gold
4	How many karats is 100% gold?	26	22	24
5	How much pure gold in 21 K?	90%	87.5%	80%
6	What is sterling silver?	0.875	0.925	0.750
7	How many grams have One troy ounce of gold?	20.50	31.103	35.25
8	Which unit is used for measurements in jewellery making process in Pakistan?	Inches	MM	Both
9	How many grams in one tola gold?	10.700	12.350	11.664
10	Which acid used to make pickling solution?	Nitric	citric	sulfuric
11	What is the purpose of annealing process?	Hardening	Softening	Coloring
12	Which gauge of wire used in filigree work?	18	28	38
13	Which tool used to remove file marks?	Tweezers	saw	Sanding paper
14	Why use flux during soldering process?	coloring	Softening	melting
15	Which alloy used to make pink gold?	zinc	copper	nickel
16	Is white gold ring contain real gold?	Yes	NO	fake
17	Which tool used to remove fire scales from jewelley?	Hammer	File	Pickle
18	Which process used to deposit gold on artificial jewellery?	Electro-	Electro-	Electro-

		polishing	plating	forming
19	How can reduce wire gauge from 1 mm to 0.7 mm?	Hammer	Rolling machine	Drawing plate
20	Which machine used to polish chains?	Steam cleaner	Tumbling machine	Buffing

LIST OF TOOL KIT

Name of Trade	Goldsmith (Basic)
Duration of course	3 Months
One tools kit each student	Class size: 10

List of tools for each kit

S. No	Tools	Quantity Nos
1	Tools box Large	1
2	Round Bur Set(large medium small)	3
3	Twisted Drill 1mm	2
4	Hard needles (for Scribing)	1
5	Small / needle File Set	6
6	Saw Frame	1
7	Saw blades no 3/0 - 4/0	1
8	Pliers set (chain nose- flat- round and long beak pliers	4
9	Side cutter	1
10	Vernier caliper	1
11	Surgical Blade with handle	1
12	Thickness gauge	1
13	Grip tweezers	1
14	Pointed tweezers	1
15	Split Mandrel	1
16	Soldering mesh/ block	1
17	Joint paper/sheet	1
18	Stainless steel ruler	1
19	Divider	1
20	Mini bench vise	1
21	Dapping block with dapping tools	1
22	Silicone Polishing wheel with mandrel-course and fine	6
23	Gravers (flat – Onglette – beveled -knife)	4
24	Sanding paper 200-1000-2000	3
25	wooden block	1
26	shellac /pitch/lakh 100 gram)	1
27	small hammer with handle	1
28	Tool sharpening stone	1
29	Small dishes	1

30	spirit lamp	4
31	Brass pusher	1
32	Ring mandrel	1
33	Ring sizer gauge	1
34	Large flat file	1
35	Large triangular file	1
36	Chasing hammer	1
37	Transparent scales	1
38	Lead Pencil	1
39	Eraser	1
40	Geometry box	

Note:

Jeweler's bench must be equipped with flexible shaft machine hanging over head and LPG gas line fittings

List of Machines: Goldsmith (Basic)

Common Machines Room

S No	Machine name	Quantity
1	Hand operated Sheet rolling machine with stand 6 inch rollers (rollers width 250-300 mm)	2
2	Hand operated wire rolling machine with stand 6 inch rollers (rollers width 250-300 mm)	2
3	Bench shear with blade length 130 mm cutting ability sheet 60mm and wire 130 mm	2
4	Wire drawing bench hand operated / drawing length 1200 mm / with wire drawing tong	1
5	Table top Drill machine chuck 0.5-6.00 mm spindle speed 500-3000 RPM throat depth 180 mm	1
6	Belt sanding machine speed 700-800 RPM table size 270x120 mm	1
7	Double ended grinding motor with safety flaps	1
8	Buffing table double spindle motor with suction system	1
9	Ultrasonic machine capacity 5 liters	1
10	Steam cleaner – Pressure 8 bar / steam temperature 160 C	1
11	Sand blasting machine / sand grit 25-50 um 90-120 um	1
12	Polishing vibrator/ tumbling machine with all shape of steel shot	1
13	Annealing and melting stand / 12" high bed size 36x24 inch with furnace tiles	2
14		

S No	Raw materials / consumables	Quantity	unit
1	Brass sheet	5	kg
2	Brass wire	5	kg
3	Flux	10	Pack
4	zinc	1/2	Kg
5	Sulfuric acid	1	Kg
6	borax	1	kg
7	Sanding papers	20	sheets
8	Polishing compound Tripoli	1	Bar
9	Polishing compound rouge	1	Bar

10	LPG Gas	20	kg