

# CURRICULUM FOR CRAFTING TECHNIQUES FOR BRASS & COPPER HANDICRAFTS

6-MONTHS  
(Certificate Course)

National Vocational & Technical Training Commission, Islamabad (February, 2012)



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## TRAINING OBJECTIVES

This training program will enable the trainee to:

1. Acquire the skills for brass and copper handicraft manufacturing within a few months instead of working as helpers for many years.

2. Enabling the pass outs to meet the needs of the job market, and having the scientific understanding of brass and copper handicraft manufacturing techniques.
3. Start their own small business which will improve self employment in the country.
4. Learn about the brass sanitary parts industry.
5. Identify the hardware Industry like door handles, cups and other fancy fittings being produced.
6. Understand the artificial jewelry industry.

## **CURRICULUM SALIENT POINTS**

Name of Course	Crafting Techniques for Brass & Copper Handicrafts.	
Entry Level	Middle	
Duration of course	6-Months	
Total Training Hours	800 Hours	
Training Hours	40 Hours per week 7 Hours per day except Friday 5 Hours	
Training Methodology	Practical	90%
	Theory	10%
Medium of Instruction:	Urdu	

## SKILL PROFICIENCY DETAILS

On successful completion of this course, the trainee should be able to: -

1. Select proper materials for use in manufacturing of handicraft.
2. Identify proper metal sheets i.e. brass & copper etc. according to design and work requirements.
3. Design and make new patterns.
4. Perform casting according to the requirements of the design.
5. Use the grinding machine and tools of several types
6. Operate the manual lath machine and its tools along with the technique to develop the same.
7. Rough finish the pieces of several types with abrasives tools.
8. Final finish the pieces with buff and relevant tools
9. Weld the brass / copper pieces by gas welding and the tools used for the same.
10. Electroplate the finished pieces by way of different types of electroplating.
11. Color the pieces according to design.
12. Make designs on pieces, with hand make tools of engraving, in different designs and shapes.
13. Fabricate the brass or copper sheet in several shapes according to design
14. Engrave several designs on metal sheet.
15. Use safety kits, goggles and safety procedures during all processes.

## KNOWLEDGE PROFICIENCY DETAILS

On successful completion of this course, the trainee should be able to: -

1. Understand basic techniques to produce a metal handicraft.
2. Define different types of raw materials used in metal handicraft manufacturing.
3. Classify processes in metal handicraft manufacturing.
4. Define how to design a handicraft and its pattern.
5. Categorize how to design new moulds (reza) for patterns in casting.
6. Describe processes used in manufacturing handicrafts.
7. Elaborate the different types of manual lath machines, its basic parts and tools.
8. Explain about working on the grinding machine and its tools.
9. Identify how many processes and tools are used for finishing the pieces.
10. Define gas welding of a handicraft and its tools.
11. Describe electroplating process and types.
12. State coloring of handicraft and its types.
13. Explain engraving and its basic tools, according to designs of engraving in both (casting manufacturing and sheet manufacturing).
14. Illustrate safety measures and procedures that need to be adopted during the manufacturing process.

## CURRICULUM DELIVERY STRUCTURE

Week	Course Delivery	Make up Session	Revision	Co Curricula Activities / Vacations	Final Test	Total
	1-20	21-22	23-24	25	26	26
	20	2	2	1	1	

## SCHEME OF STUDIES

### Crafting Techniques for Brass & Copper Handicrafts (06-Months Course)

S. No	Main Topics	Theory Hrs.	Practical Hrs.	Total Hrs.
1.	Introduction to brass & copper handicraft and selection of proper raw material (brass / copper / germen silver)	8	-	8
2.	Classification of manufacturing processes	3	-	3
3.	Manufacturing of Handicraft with Sheets (Chitayi)	25	300	325
4.	Manufacturing of Handicrafts by Casting	44	400	444
5.	Work Ethics	-	20	20
<b>Total Hours</b>		<b>80</b>	<b>720</b>	<b>800</b>

**DETAILS OF COURSE CONTENTS**  
**Crafting Techniques for Brass & Copper Handicrafts**  
(06-Months Course)

Sr. No.	Subject Main Topic	Theory Hours	Practical Hours
<b>1.</b>	<b>Introduction to brass &amp; copper handicraft and selection of proper raw material (brass/copper/germen silver)</b>		
	1.1 introduction to handicraft (brass & copper) industry	<b>2</b>	-
	1.2 raw materials for brass & copper H/C	<b>2</b>	-
	1.3 compositions of brass used in handicraft	<b>2</b>	-
	1.4 Selection of proper raw materials	<b>2</b>	-
<b>2.</b>	<b>Classification of manufacturing</b>		
	2.1 classification of processes in H/C manufacturing	<b>1</b>	-
	2.2 By casting manufacturing	<b>1</b>	-
	2.3 Manufacturing of handicrafts with sheets	<b>1</b>	-
<b>3</b>	<b>Manufacturing of Handicraft with Sheets (Chitayi)</b>		
	3.1 Introduction to Chitayi	<b>3</b>	-
	3.2 Tools and equipment	<b>5</b>	-
	3.3 Types of Chitayi	-	-
	3.3.1 Plane sheet work	<b>5</b>	<b>80</b>
	3.3.2 Fabrication	<b>5</b>	<b>130</b>
	3.4 Basic designs of Chitayi	<b>5</b>	<b>80</b>
	<b>3.4.1</b> Safety precautions and procedures	<b>2</b>	<b>10</b>
<b>4.</b>	<b>Manufacturing of Handicrafts by Casting</b>		
	4.1 Pattern designing	<b>2</b>	10
	4.2 Pattern making	<b>3</b>	<b>20</b>
	4.3 Casting		
	4.3.1 Introduction to brass Casting	1	-
	4.3.2 Tools & equipment for casting	1	-
	4.3.3 Structure of furnace	1	-
	4.3.4 Preparation of furnace	-	6
	4.3.5 Selection of Reza for pattern	-	3

4.3.6	Preparing the Reza with pattern	1	12
4.3.7	Melting of brass in furnace and pouring	1	12
4.3.8	Safety precautions and procedures	1	2
4.4	Grinding		
4.4.1	Tools and machinery	2	-
4.4.2	Grinding the piece for basic shape	-	10
4.4.3	Grinding the faces of piece	-	7
4.4.4	Grinding the complete piece	-	10
4.4.5	Grinding of welded joints	-	6
4.4.6	Safety precautions and procedure	1	2
4.5	Specially designed Manual Lathe machine		
4.5.1	Introduction	½	-
4.5.2	Structure and usage of Manual Lathe	2	-
4.5.3	Tools and equipment	½	8
4.5.4	Fastening and removing of piece	-	6
4.5.5	Procedure of work	1	22
4.5.6	Safety precautions and procedures	1	4
4.6	Gas Welding		
4.6.1	Introduction of Brass gas welding	1	-
4.6.2	Tools and equipment	1	3
4.6.3	Procedure of work	1	30
4.6.4	Safety precautions and procedures	1	7
4.7	Rough Finishing		
4.7.1	Tools and equipment	1	9
4.7.2	Rough finishing on surface	-	12
4.7.3	Rough finishing on welded joints	-	12
4.7.4	Safety procedures and precautions	1	2
4.8	Polish and buffing		
4.8.1	Tools and equipment	1	3
4.8.2	Procedure of polishing	-	10
4.8.3	Types of buff and their usage	1	3
4.8.4	Procedure of buffing	-	10
4.8.5	Safety precautions and procedures	1	4



	4.9 Electroplating		
	4.9.1 Electroplating chemicals (Types and usage)	2	-
	4.9.2 Tools and equipment	1	3
	4.9.3 Structure of electroplating tank	2	5
	4.9.4 Procedure of electroplating	-	<b>25</b>
	4.9.5 Safety precautions and procedures	1	<b>2</b>
	4.10 Lathe machine		
	4.10.1 Introduction	2	-
	4.10.2 Usage of Lathe machine in handicraft manufacturing	3	15
	4.10.3 Safety precautions and procedures	1	5
	4.11 Coloring		
	4.11.1 Tools and equipment	-	<b>10</b>
	4.11.2 Procedure and types of coloring	-	<b>20</b>
	4.12 Engraving		
	4.12.1 Introduction	<b>1</b>	-
	4.12.2 Making tools of engraving	½	<b>10</b>
	4.12.3 Metallurgy of tools	<b>1</b>	3
	4.12.4 Engraving drawing	-	<b>13</b>
	4.12.5 Basic designs of engraving	½	6
	4.12.6 Engraving on pieces of different types	-	<b>35</b>
	4.12.7 Safety precautions and procedures	½	<b>3</b>
<b>5</b>	<b>Work Ethics</b>		20
<b>Total</b>		<b>80</b>	<b>720</b>

## LIST OF MACHINERY / EQUIPMENT / TOOLS

(For a class of 25 students)

Name of Trade	(Name of Course)
Crafting Techniques for Brass & Copper Handicrafts	06-Months Course

Sr. No.	Tools / Equipments	Quantity
1.	Vice 4" (fixed on wooden work table)	5
2.	Steel Rule 12"	25
3.	Measuring tapes 15'	5
4.	Try square	10
5.	Vernier caliper	10
6.	File (Reti) Different types	50
7.	File (Small / In different shapes)	6 sets
8.	Tongs (with 2'-6" Arm)	3
9.	Pattern Simple vase 6" (Sarru Type)	1 Set
10.	Pattern Simple vase 8" (Sarru Type)	1 Set
11.	Pattern Simple vase 10" (Sarru Type)	1 Set
12.	Pattern Simple vase 12" (Sarru Type)	1 Set
13.	Pattern Simple vase 16" (Sarru Type)	1 Set
14.	Pattern Simple vase 12" (Kashmiri Type)	1 Set
15.	Pattern Simple vase 14" (Kashmiri Type)	1 Set
16.	Pattern Simple vase 16" (Kashmiri Type)	1 Set
17.	Pattern Simple vase 10" (Jar Type)	1 Set
18.	Pattern Simple vase 12" (Jar Type)	1 Set
19.	Patterns of different animals (Elephant, Horse, Duck, Camel, Dove)	1 set each
20.	Tongs (10"-12"-15")	20

21.	Steel Rod 3/4"	20 Ft.
22.	Steel Rod 1/2"	20 Ft
23.	Steel plates 8" x 8" x 3/4"	4
24.	Reza / moulds (Round shape in different sizes)	50
25.	Reza / moulds (Irregular and square shape in different sizes)	50
26.	Hammers (Different types)	6
27.	Below fans	4
28.	Iron Weight 7" x 7" x 1 1/2"	4
29.	Haven Dasta	2 set
30.	Grinding machines (2 HP / 3 Phase)	2 units
31.	Grinding wheels (8"Ø x 1" )	5
32.	Grinding wheels (6"Ø x 1")	5
33.	Grinding wheels (8"Ø x 1/2")	5
34.	Grinding wheels (6"Ø x 1/2")	5
35.	Grinding disk cutter (9"Ø x 1/8")	25
36.	Grinding disk cutter (9"Ø x 1/16")	25
37.	Polish / Buffing machine (3 HP / 3 Phase)	2 units
38.	Leather saan (8"Ø x 1/2")	30
39.	Leather saan (8"Ø x 1")	30
40.	Leather saan (8"Ø x 1 1/2")	30
41.	Leather saan (4"Ø x 1")	30
42.	Leather saan (6"Ø x 1")	30
43.	Buff (Cloth made) 6"Ø / 60 P	10
44.	Buff (Cloth made) 8"Ø / 60 P	10
45.	Buff (Cloth made) 8"Ø / 80 P	10

46.	Buff (Cloth made) 8"Ø / 100 P	10
47.	Buff (Cloth made) 12"Ø / 60 P	10
48.	Buff (Cloth made) 12"Ø / 80 P	10
49.	Buff (Cloth made) 12"Ø / 100 P	10
50.	Buff (Half warmish) 6"Ø / 60 P	10
51.	Buff (Half warmish) 8"Ø / 60 P	10
52.	Buff (Half warmish) 8"Ø / 80 P	10
53.	Buff (Half warmish) 8"Ø / 100 P	10
54.	Buff (Half warmish) 12"Ø / 60 P	10
55.	Buff (Half warmish) 12"Ø / 80 P	10
56.	Buff (Half warmish) 12"Ø / 100 P	10
57.	Manual lathe machine (Especially designed for Handicrafts) 3 HP / 3 Phase	2 units
58.	Hand made randa	15
59.	Steel rod 3/4"	10 Ft
60.	Wooden pieces 8"Ø x 4"	10
61.	Wooden pieces 6"Ø x 4"	10
62.	Wooden pieces 4"Ø x 4"	10
63.	Wooden pieces 2"Ø x 4"	10
64.	Automatic drill machine	2
65.	Hand drill machine	2
66.	Hand grinder	2
67.	O <sub>2</sub> Cylinder	4
68.	O <sub>2</sub> Pressure gauges	4
69.	LPG cylinder	4
70.	LPG cylinder regulator	4

71.	Pressure rubber hose	50 Ft
72.	Spark lighters	3
73.	Work table for gas welding	2
74.	Water tank for Electroplating	2
75.	Electrifier for electroplating AC / DC	2
76.	Engraving work tables	5
77.	Stone pieces for tool sharpening	2
78.	Lathe machine 3Ft	1 unit
79.	Lathe machine 5Ft	1 unit
80.	Dog chuck 8"Ø	1
81.	Dog chuck 12"Ø	1
82.	Through chuck 4"Ø	1
83.	Through chuck 6"Ø	1
84.	Through Chuck 8"Ø	1
85.	Drill Chuck 3/4"	3
86.	Drill chuck 1/2"	3
87.	Bearing center	2
88.	Grinding machines 3/4 HP-1 Pahse (with work stand)	2 units
89.	Grinding machines 3/4 HP-1 Pahse	2 units
90.	Wooden work tables 3' x 5'	5
91.	Steel bowls (Different types and sizes)	10
92.	Hand made engraving tools (Kalam)	200
93.	Color spraying machine with all accessories	1 Unit
94.	Work Tables for Sheet Working 4' X 6'	5
95.	Hand Saw for Metal Cutting	10

**LIST OF CONSUMABLE MATERIAL  
FOR CLASS OF 25**

Sr. No.	Material	Quantity
1.	Brass Scrap	1,000 Kg
2.	Zinc Scrap	200 Kg
3.	Aluminum Scrap	50 Kg
4.	Lead Scrap	200 Kg
5.	Coal	500 Kg
6.	Sajji	100 Kg
7.	Suhaga	50 Kg
8.	Brass / Copper Sheets 2' x 4' / 22 gauge	50
9.	Brass / Copper Sheets 2' x 4' / 24 gauge	50
10.	Brass / Copper Sheets 2' x 4' / 26 gauge	50
11.	Raal	200 Kg
12.	Uramchi powder	3 Bags
13.	Drill bits 1/16" , 1/8" , 5/32" , 3/16" , 7/32" , 1/4"	10 Pkt for each
14.	Drill bits 9/32" , 5/16" , 11/32" , 3/8" , 7/16" , 1/2" , 9/16" , 5/8" , 3/4"	5 Pkt for each
15.	Kuthali # 4	50
16.	Kuthali # 5	50
17.	Fire bricks	100
18.	Fire clay (Powder type)	2 bags
19.	Fire clay (Dana type)	2 bags
20.	Ply wood sheets (1/2")	10 sheets
21.	Casting sand	10 bags
22.	High carbon stell bar for tip tools	15 ft

23.	Tips (HSS) 1/2" x 1/2" x 1/8"	50
24.	Tips (HSS) 3/4" x 3/4" x 1/8"	50
25.	Grinding wheels for tool grinding	2
26.	Nickel plates	4 Kg
27.	Black nickel salt	25 Kg
28.	Albus nickel salt	25 Kg
29.	Nickel sulphate	20 Kg
30.	Electroplating brighter (Different types)	6 Bottles
31.	Colors for spraying (Different types)	6 Gallons
32.	Sand paper # 60 (water proof, hard)	300 meter
33.	Adhesive solution (Elephant brand / 1Kg packing)	75
34.	Saresh (Dana type)	20 Kg
35.	Ambry # 120	50 Kg
36.	Ambry polish	10 Kg
37.	White masala bar	500
38.	Luster bar	20
39.	Steel Rite bar (Blue)	10
40.	Steel Rite bar (Pink)	10
41.	Liquid deco colors	As required
42.	Liquid Lacquer	As required
43.	Thinner for liquid colors	As required
44.	High Speed Steel Cutting Blades for Hand Saws	100

## LIST OF FURNITURE

<b>Sr. No.</b>	<b>Description</b>	<b>Quantity</b>
1.	Steel almirah for store	4
2.	Wooden cabinets	2
3.	Steel almirah for files	2
4.	Wooden stools for students (Workshop)	35
5.	Wooden tables with drawers for teacher	4
6.	Empty steel drums (Large size) for recycling	4
7.	Cart	1
8.	Class room chairs	25
9.	Chairs for teacher	2
10.	Office Chairs for Visitors	6



## **MINIMUM QUALIFICATION OF INSTRUCTOR**

- Matric with minimum 10 years Experience in field

## **SHOP ASSISTANT**

- Illiterate with minimum 5 years Experienced in field.

## **REFERENCE BOOKS**

- Workshop practice (1<sup>st</sup> Year DAE (Mechanical))
- Safety precautions & procedures (1<sup>st</sup> Year DAE Mechanical)

## **NAMES OF NATIONAL CURRICULUM & REVIEW COMMITTEE MEMBERS**

1. Nauman ul Haq, Chief Operating Officer, Dastkar Handicrafts, Kot Abdul Malik  
0346-4655178 (E.Mail: dastakarpak@hotmail.com)
2. Abdul Haq, Chief Executive Officer, Dastkar Handicrafts, Kot Abdul Malik  
0321-4759038
3. Muhammad Iqbal Mirza, Chief Executive Officer, M.M. Iqbal & Sons  
Handicrafts, Lahore  
0300-4342903
4. Rukhsana Khan, Executive Member of Central & North Punjab Women  
Chamber of Commerce & Industry & Chief Executive Officer, Descomp  
Pvt. Ltd. Lahore  
0345-9086787
5. Shazia Bukhari, Jewellery Designer, Kelly Rees, Lahore  
0333-4465167
6. Mrs. Kokab Perveen, President, Central & North Punjab Women  
Chamber of Commerce & Industry & Chief Executive Officer, Kokab  
Krafts, Lahore
7. Fakhra Hassan, Chief Executive Officer, Elite Group, 121-D, Model Town,  
Lahore  
0300-8447090
8. Imtiaz Akhtar (0321-4765254)
9. Tasneem Kausar (0322-4204388)