MAHARASHTRA STATE BOARD OF VOCATIONAL EDUCATION EXAMINATION, MUMBAI

1	**Name of Course**	**CERTIFICATE COURSE IN BRASSWARE TECHINIQUES**	
2	**Max no. of Students**	25	**Course Code - 411178**
3	**Duration**	6 month	
4	**Course Type**	Full Time	
5	**No. of Days per week**	6 days	
6	**No. of hours per day**	7 Hrs	
7	**Space require**	Theory Class Room – 200 sqft Practical Lab – 1000 sqft Total – 1200 sqft	
8	**Entry qualification**	S.S.C. Pass	
9	**Objective of syllabus**	To teach various skills and workmanship practices about Brassware manufacturing techniques	
10	**Employment opportunities**	After completion of this training the Participant would be able to: work in Brassware Manufacturing Industry	
11	**Teachers Qualification**	Diploma / Certificate Course in concern field.	

12] **Teaching Scheme –**

Training System per Week

Theory	Practical	Total
12 Hours	30 Hours	42 Hours

.

13] **Examination Scheme –**

Sr	Paper code	Name of Subject	TH/PR	Hours	Max. Marks	Min Marks
1	**41117811**	BASIC OF BRASSWARE	Theory - I	3 Hrs	100	35
2	**41117821**	BASIC OF BRASSWARE	Practical - I	3 Hrs	100	50
3	**41117822**	BRASSWARE TECHNIQUE	Practical - II	6 Hrs	200	100
		Total			400	185

.

BRASSWARE TECHINIQUES

BASIC OF BRASSWARE - THEORY - I
Knowledge of different combination/grades of alloy used — zinc and copper Knowledge of different grades of material with different levels of combination and types of material such as brass sheet metal, ingot. Knowledge of various methods of manufacturing such as sand casting, die casting pressing/spinning of sheet metal etc.
Knowledge of scale of units to determine the minimum thickness of metal required for engraving Awareness of minimum units of thickness of brass which can be worked upon Knowledge of various methods of measurement
Awareness about likely accidents and hazards of not using a particular safety equipment • Awareness about hazard of not holding the chisel/kalam properly (i.e. away from the body) for engraving
Congenial behaviour and etiquette • Presentation skills • Awareness of how to discuss business with exporters, contractors, clients
Ability to sketch any type of pattern on paper using drawing instrument Awareness of minimum thickness of brass required for engraving a particular sketch/pattern • Ability to forecast time (give an estimate of time) required for engraving a given pattern
Knowledge of securely placing and positioning the brass article for engraving on a wooden tripod Ability to engrave different patterns in between lines. • Ability to engrave basic traight/curved lines work on brass.
Knowledge of different engraving kalams Knowledge of kachhi and pakki kalam and conditions when to use which one • -Knowledge of striking tools
Knowledge of how to hold the kalam Knowledge of how much pressure to put on the kalam with the striking tools to get the required eveness of lines/pattern • Knowledge of when and how to sharpen the engraving tool/kalam to get a uniform line on the brass article • Knowledge of correct posture so that pressure of kalam and striking tools on the kalam for engraving is even
Ability to engrave basic patterns ('Japani') lines and curves - on flat and curved brass surface with synchronized/fluid movement of the hands and the engraving tools (kalam and thappi)

Knowledge of different patterns which can be filled in between two lines
Knowledge of taking forward a design engraved in a small portion of the brass article (through marking/measurement, tracing) to the whole brass article without a break in pattern being evident
Identify brass Differentiate the properties of brass, quality of brass, type of brass and methods of manufacturing Differentiate a particular type of brass from a pool of articles say 3 made from different types of brass
Identify the manufacturing technique of a brass article and comment upon its hardness
Correlate different measuring units of brass Differentiate, and correlate between, different measuring units such as millimeter, soot, microns and SWG by using vernier callipers.
Exercise safety measures necessary to avoid hazards and to finally achieve functional success Use safety glasses
Identify correct cutting direction
Apply basic communication skills to develop good relationship at work and with customers Communication skills
Sketching a pattern on paper Perform sketching/tracing/replicating/differenting/tracing/replicating/ different patterns of engraving on the brass article Tracing a sketch on brass
Replicating
Selection of Engraving tools Select design/s for engraving suitable to the type and shape of the brass article .
Forecast whether or not a given pattern can be engraved on a given article
Securely place the brass article Securely place the brass article and mark and measure/trace basic lines/pattern on the surface of brass article for engraving
Sitting posture
Mark and measure on the surface of brass article for engraving
Select tools specific to the design to be engraved Select tools specific to the design to be engraved
Basic engraving (Japan work) Engrave basic patterns (`Japan') with ease on flat and curved brass surfaces.
Filling work-'Jaali' Engrave filling work ('Jaali' and `Daane') in between given outlined/pre-engraved patterns
Filling work-'Daane'
Enlarge a sketch/pattern on the brass article Enlarge a sketch/pattern on the brass article to a desired size and engrave it

BASIC OF BRASSWARE - PRACTICAL - I
Differentiate the properties of brass, quality of brass, type of brass and methods of manufacturing
Differentiate, and correlate between, different measuring units such as millimetre, `soot', microns and SWG by using vernier callipers
Exercise safety measures necessary to avoid hazards and to finally achieve functional success
Apply basic communication skills to develop good relationship at work and with the customers
Perform sketching/tracing/replicating different patterns on the brass article
Select designs for engraving suitable to the type and shape of the brass article
Securely place the brass article; mark and measure/trace basic lines/pattern onthe surface of brass article for engraving
Select correct tools specific to the design to be engraved
Engrave on the marked lines/pattern on the surface of brass article uniform through correct handling of selected tools
Engrave basic patterns ('Japani') with ease on flat and curved brass surfaces
Engrave filling work (`Jalli' and `Dann') in between given outlined/pre- engraved patterns
Enlarge a sketch/pattern to a desired size and engrave it.

BRASSWARE TECHNIQUE - PRACTICAL - II
Identify brass from a pool of 4 to 5 materials by visual inspection (through color, appearance, weight (density) and feel of the material
Identify a particular type of brass say 70/30 by visual inspection and acoustic testing from a pool of different brasses commonly used (3 types viz free cutting, 70/30, 65/35 etc)
Identify the manufacturing technique of a brass article and comment upon its hardness
•Measure thickness of a given brass article with scale and Vernier Calipers and compare the readings •Convert SWG in mm using data chart provided in trainer's handbook •Recognize relations between millimetre, SWG, microns and soot
Explain need to use safety glasses
Identify the correct method of method removal out of the correct and incorrect one (The chips shall be thrown in out wards direction, away from the eyes of engraver)

• Demonstrate interaction with peers, supervisors, customers Communicate/explain his/her ideas clearly • Convince the other person about his/her Congenial behavior during ability to complete and deliver the specific/assigned task in a given/specific time period
Select appropriate drawing instruments Draw sketch in a clear and precise manner Forecast time to be taken to create a given sketch Complete a drawing assignment by mixing and joining parts of different patterns evenly without any trace of disjointedness Enlarge a given pattern to cover a specified area
Select appropriate instruments for tracing • Trace with a steady hand on to the brass article • Clear pattern on the brass article visible for engraving
Identify and explain replicating techniques of a sketch • Explain available preserving techniques for future replication of sketches like lamination, scanning etc.
Select proper engraving tools from the tool box for a given job Decide and select kachhi or pakki kalam for a particular pattern and with respect to a given brass surface
Identify sketches which require deep engraving and excess material (Jameen) removal Select a given sketch to be engraved on a brass article with a minimum SWG (and also soot) requirement
Securely brass article on a tripod with the area to be worked upon tilted at an angle for the comfort of the artisan
Adopt proper sitting posture which is comfortable and can support the brass object while working
Identify and using marking and measuring tools Evaluate a given sketch assess minimum SWG (and soot) of a brass article on which it has to be engraved
Select proper engraving tools from the tool box for a given job Decide and select kacchi or pakki kalam/chisel for a particular pattern with respect to a given brass surface
Perform basic engraving `Japan' work in an accurate and consistent manner • Perform `Japan' work in a specified time
Perform engraved `Jaali' work in between a pre- outline in an accurate and consistent manner Perform `Jaali' work in a specified time.
Perform engraved `Danne' work in between a pre- outline in an accurate and consistent manner Perform `Danne' work in a specified time
Perform through enlarging a sketch/pattern on a larger surface area which has already been engraved in a small area of the brass article Perform through consistent flow of the pattern with no evident break

Resources required:

Working Table (Tripod Stand — preferably wooden with a slight curved surface at the centre to hold the brass article in place during the process of engraving)

Geometrical tools- Compass, divider, metal scale, protector, set squares

Drawing accessories- pencils, eraser, tracing papers, plane paper, carbon papers

Measuring tools- Vernier calipers, wire gage

Engraving tools- Kachhi (non-treated) and pakki (heat treated) kalams (chisels)

Striking tools- wooden flat hammer (Thapki) and iron hammer

Sharpening tools — sandstone (for sharpening kalams/chisels)

Fixtures - rope, wooden bricks

Cleaning accessories- cloth, solvent (acetone/gasoline/kerosene)

Finishing tools- files, emery papers

****