GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
DIRECTORATE GENERAL OF TRAINING

COMPETENCY BASED CURRICULUM

BAMBOO WORKS

(Duration: One Year)

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL: 2.5



SECTOR – HANDICRAFTS & CARPETS

CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE
Kolkata-700091

BAMBOO WORKS

(Non-Engineering Trade)

(Revised in August 2025)

Version: 3.0

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL: 2.5

Developed By

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1. COURSE INFORMATION

During the one-year duration of "Bamboo Works" trade, a candidate is trained on Professional Skill, Professional Knowledge and Employability Skills related to job roles. In addition to this, a candidate is entrusted to undertake project work, extracurricular activities and on-the-job training to build up confidence. The broad components covered under Professional Skill subject are as below: -

The trainee learns about elementary first aid, firefighting, environment regulation and housekeeping etc. The trainee identifiesbamboo items & safety tools. He will be able to recognize and operate various hand tools used in Bamboo Technology. He identifies, plans & applies preservatives, dyes, smoke treatment & chemical treatment process to preserve bamboo items. The trainee learns to operate various bamboo processing machineries and carry out their maintenance. He is able to operate glue mixing machine & weaving machine for fixing different parts of bamboo products. He is able to bend bamboo strips, slivers & bamboo pole using blow lamp. The trainee will be able to troubleshoot & perform maintenance procedure of different machines used in Bamboo works. Also, he can also carry out different process of seasoning of bamboos & various propagation methods.

The trainee identifies and selects appropriate bamboo species for different industrial Handicraft products. He can design various gift items, stationery Item by free hand drawing. He is able to identify different computer parts; boots& operates basic functions of computer. He is able to install utilize AutoCAD software to prepare different shapes and design of the products. The trainee learns to make various decorative products by designing innovative gift items, stationary items models/ prototype. He is able to select &apply different process of bending & joints in different sections like furniture, handicraft & housing etc. He is able to apply different techniques and process of making various kinds of bamboo furniture; uses Jigs & fixture to make uniform size & reduce production cost. He identifies the finishing materials & applies different methods of finishing of bamboo products. Also, he is able to identify quality products as per market demand for production as per requirement and estimate the cost.

2. TRAINING SYSTEM

2.1 GENERAL

The Directorate General of Training (DGT) under Ministry of Skill Development & Entrepreneurship offers a range of vocational training courses catering to the need of different sectors of economy/ Labour market. The vocational training programmes are delivered under the aegis of Directorate General of Training (DGT). Craftsman Training Scheme (CTS) with variants and Apprenticeship Training Scheme (ATS) are two pioneer schemes of DGT for strengthening vocational training.

'Bamboo Works' trade under CTS is delivered nationwide through a network of ITIs. The course is of one year duration. It mainly consists of Domain area and Core area. The Domain area (Trade Theory & Practical) imparts professional skills and knowledge, while the Core area (Employability Skill) imparts requisite core skills, knowledge, and life skills. After passing out the training program, the trainee is awarded National Trade Certificate (NTC) by DGT which is recognized world-wide.

Candidates broadly need to demonstrate that they are able to:

- Read and interpret technical parameters/documents, plan and organize work processes, identify necessary materials and tools;
- Perform tasks with due consideration to safety rules, accident prevention regulations and environmental protection stipulations;
- Apply professional skill, knowledge & employability skills while performing jobs.
- Document the technical parameters related to the task undertaken.

2.2 PROGRESSION PATHWAYS

- Can join industry as Craftsman and will progress further as Senior Craftsman, Supervisor and can rise up to the level of Manager.
- Can become Entrepreneur in the related field.
- Can join Apprenticeship programs in different types of industries leading to a National Apprenticeship certificate (NAC).
- Can join Crafts Instructor Training Scheme (CITS) in the trade for becoming instructor in ITIs.
- Can join industries related to Bamboo works.
- Can become an entrepreneur.
- Can join Advanced Diploma (Vocational) courses under DGT as applicable.

2.3 COURSE STRUCTURE

Table below depicts the distribution of training hours across various course elements during a period of one year: -

S No.	Course Element	Notional Training Hours
1	Professional Skill (Trade Practical)	840
2	Professional Knowledge (Trade Theory)	240
3	Employability Skills	120
Total		**1200**
On the Job Training (OJT)/ Group Project *		150
Optional Courses**		240
Grand Total		**1590**

***** The trainee has to undergo 150 hours of mandatory OJT (On the Job Training) at nearby industry or wherever industry not available then group project has to be done with the supervision of the trade instructor for every year.

** Trainees of one-year or two-year trade can also opt for optional courses of up to 240 hours in each year for obtaining 10th/ 12th class certificate from NIOS along with ITI certification, or, short term courses for extra skills/knowledge.

2.4 ASSESSMENT & CERTIFICATION

The trainee will be tested for his/ her skill, knowledge and attitude during the period of course through formative assessment and at the end of the training programme through summative assessment as notified by the DGT from time to time.

a) The Continuous Assessment (Internal) during the period of training will be done by **Formative Assessment Method** by testing for assessment criteria listed against learning outcomes. The training institute has to maintain individual trainee portfolio as detailed in assessment guideline. The marks of internal assessment will be as per the formative assessment template provided on www.cstaricalcutta.gov.in or www.bharatskills.gov.in

b) The final assessment will be in the form of summative assessment. The All India Trade Test for awarding NTC will be conducted by, DGT as per the guidelines. The pattern and marking structure is

being notified by DGT from time to time. **The learning outcome and assessment criteria will be basis for setting question papers for final assessment. The examiner during final examination will also check** individual trainee's profile as detailed in assessment guideline before giving marks for practical examination.

2.4.1 PASS REGULATION

For the purposes of determining the overall result, weightage of 100% is applied for six months and one year duration courses and 50% weightage is applied to each examination for two years courses. The minimum pass percentage for Trade Practical and Formative assessment are 60% & for all other subjects is 33%.

2.4.2 ASSESSMENT GUIDELINE

Appropriate arrangements should be made to ensure that there will be no artificial barriers to assessment. The nature of special needs should be taken into account while undertaking the assessment. Due consideration should be given while assessing for teamwork, avoidance/reduction of scrap/wastage and disposal of scrap/waste as per procedure, behavioral attitude, sensitivity to the environment and regularity in training. The sensitivity towards Occupational Safety, Health and Environment (OSHE) and self-learning attitude are to be considered while assessing competency.

Assessment will be evidence based comprising some of the following:

- Job carried out in labs/workshop
- Record book/ daily diary
- Answer sheet of assessment
- Viva-voce
- Progress chart
- Attendance and punctuality
- Assignment
- Project work
- Computer based multiple choice question examination
- Practical Examination

Evidences and records of internal (Formative) assessments are to be preserved until forthcoming examination for audit and verification by examining body. The following marking pattern to be adopted for formative assessment:

Marks Allotted during Assessment	Performance Level	Evidence
Marks between 60% to 75%	For performance in this grade, the candidate should produce work which demonstrates attainment of an acceptable standard of craftsmanship with occasional guidance, and due regard for safety procedures and practices	• Demonstration of good skills and accuracy in the field of work/ assignments. • A fairly good level of neatness and consistency to accomplish job activities. • Occasional support in completing the task/ job.
Marks above 75% to 90%	For this grade, a candidate should produce work which demonstrates attainment of a reasonable standard of craftsmanship, with little guidance, and regard for safety procedures and practices	• Good skill levels and accuracy in the field of work/ assignments. • A good level of neatness and consistency to accomplish job activities. • Little support in completing the task/job.
Marks Above 90%	For performance in this grade, the candidate, with minimal or no support in organization and execution and with due regard for safety procedures and practices, has produced work which demonstrates attainment of a high standard of craftsmanship.	• High skill levels and accuracy in the field of work/ assignments. • A high level of neatness and consistency to accomplish job activities. • Minimal or no support in completing the task/ job.

3. JOB ROLE

Brief Description of Job Roles:

Mat Weaver, Bamboo; makes mats of seasoned and coloured bamboo strips according to pattern or design. Soaks precut bamboo stakes in water to soften and bleach them; removes stakes from bath when soft, cuts and removes splints and splits them into strips of desired size and thickness; dresses bamboo strips to remove sharpness; colours strips according to desired pattern and weaves them into mat, cutting off and concealing or weaving together loose ends to finish edges; weaves thicker strips and ornamental borders on edge or end of mat. May make own designs. May weave window and door screens. May make fans, fruit baskets etc.

Furniture Maker, Bamboo; makes bamboo furniture by sizing and dressing bamboo pieces, drilling holes, building frames and body with strengthening pieces. Studies pattern, size or design of furniture to be made; collects seasoned bamboo stakes (rods) them and soaks in water; removes stakes from bath when soft and cuts and removes thin splints and splits them into strips of desired size and thickness with selects cut bamboo into specific sizes, drills holes where necessary and sets them into required pattern; completes object by weaving seat, back and other parts as necessary and fastening ends either with bamboo or cane strips. May specialize in a particular article such as Table, Chair, Sofa set, etc. May also undertake repair work.

Basket Maker; makes baskets of specified size and shape by interlacing willow, rattan or other materials. Forms bottom of basket by interlacing strips of bamboo or similar material with framework of bamboo ribs; inserts ribs around edge of bottom and between woven sections of bottom to serve as framework of sides; bends ribs perpendicular to bottom and secures to hold them in position for weaving of sides; weaves strips through ribs until sides are completed; tapers or points ends of protruding ribs, and bends and inserts them into spaces in top edge of woven sides. May make solid bottom boards, using band saw, drill press, and carpenters' hand tools. May interlace reeds through stakes (rods), secured in screw blocks, to form parts of basket, such as woven bottom. May design baskets. May be designated according to type of basket woven as Hamper Maker; Market-Basket Maker; or according to material used as Rattan Worker; Willow Worker.

Chick Maker; makes reed or bamboo chicks by sizing and dressing reeds or bamboo wickers and fastening together by twine. Collects material, cuts and sizes them into thin strips according to design; assembles and fastens strips together with thin rope or twine to form into mat of desired size; trims edges and fixes cloth piping on four sides. May stitch coloured cloth over chicks.

Khas Thatti Maker; makes Khas Thatties; (screens made with Khas) a type of aromatic grass roots used for keeping room cool form summer heat when cold water is sprinkled on them. Collects dry khas roots; prepares bamboo frames of required size; spreads layers of khas roots to make bed of

required thickness and fastens it into bamboo frame with bamboo splinters to support on both sides and binds them with thin rope or sutli; trims edges to complete screen.

Reference NCO-2015:

a) 7317.0800 – Mat Weaver, Bamboo
b) 7317.0300 – Furniture Maker, Bamboo
c) 7317.0700 – Basket Maker
d) 7317.1100 – Chick Maker
e) 7317.1200 – Khas Thatti Maker

Reference NOS: -

a) HCS/N9486
b) HCS/N9403
c) HCS/N9401
d) HCS/N9487
e) HCS/N9410
f) HCS/N9404
g) HCS/N9488
h) HCS/N9413
i) HCS/N9414
j) HCS/N9489
k) HCS/N9428
l) HCS/N9429
m) HCS/N9430
n) HCS/N9431

4. GENERAL INFORMATION

Name of the Trade	**BAMBOO WORKS**
Trade Code	DGT/1108
NCO – 2015	7317.0800, 7317.0300,7317.0700, 7317.1100, 7317.1200
NOS Covered	HCS/N9486, HCS/N9403, HCS/N9401, HCS/N9487, HCS/N9410, HCS/N9404, HCS/N9488, HCS/N9413, HCS/N9414, HCS/N9489, HCS/N9428, HCS/N9429, HCS/N9430, HCS/N9431
NSQF Level	Level: 2.5
Duration of the Trade	One Year
Entry Qualification	Passed 8th Class Examination
Minimum Age	14 years as on first day of academic session.
Eligibility for PwD	LD, CP, LC, DW, AA, BLIND, LV, DEAF, HH, AUTISM, ID, SLD, MD
Unit Strength (No. of Student)	24 (There is no separate provision of supernumerary seats)
Space Norms	100 Sq. m
Power Norms	10 KW
Instructors Qualification for:	
(i) Bamboo Works Trade	B.Voc/Degree in Bamboo Technology / Bamboo Studies from UGC recognized university with **one year of teaching or industry experience** in the Bamboo works field. **OR** Diploma (Minimum 2 years)/ PG diploma (1 year) in Bamboo Technology/ Bamboo Studies from a recognized board of education with **two years of teaching or industry experience** in the Bamboo works field. **OR** NTC/NAC passed in the Trade of "Cane Willow and Bamboo Worker/ Bamboo Works/ Bamboo Technology" with **three years of teaching or industry experience** in Bamboo works field. **<u>Essential Qualification:</u>** Regular/ RPL variants of National Craft Instructor Certificate (NCIC) in Machinist trade under DGT.

	Note: - Out of two Instructors required for the unit of 2(1+1), one must have Degree/Diploma and other must have NTC/NAC qualifications.
(ii) Employability Skill	MBA/ BBA / Any Graduate/ Diploma in any discipline with **Two years' of teaching or industry experience with short term ToT Course** in Employability Skills conducted by DGT institutions. (Must have studied English/ Communication Skills and Basic Computer at 12th / Diploma level and above) **OR** Existing Social Studies Instructors in ITIs with short term ToT Course in Employability Skills conducted by DGT institutions.
(iii) Minimum Age for Instructor	21 Years
List of Tools and Equipment	As per Annexure – I

5. LEARNING OUTCOME

Learning outcomes are a reflection of total competencies of a trainee and assessment will be carried out as per the assessment criteria.

5.1 LEARNING OUTCOMES

Sl. No.	NOS CODE	Learning Outcome	Duration		
			Practical	Theory	Total
1.	HCS/N9486	Identify bamboo items, safety tools & explain various Bamboo resource generation techniques following safety precaution.	45	15	60
2.	HCS/N9403	Identify and operate various hand tools used in Bamboo Technology.	45	15	60
3.	HCS/N9401	Identify, plan & apply preservatives, dyes, smoke treatment & chemical treatment process to preserve bamboo items.	25	5	30
4.	HCS/N9487	Operate various bamboo processing machineries and carry out their maintenance.	110	40	150
5.	HCS/N9410	Operate Glue Mixing machine & weaving machine for fixing different parts of bamboo products.	45	15	60
6.	HCS/N9404	Bend bamboo strips, Slivers & bamboo pole using blow lamp.	25	5	30
7.	HCS/N9410	Troubleshoot & perform maintenance procedure of different machines used in Bamboo works.	45	15	60
8.	HCS/N9488	Carry out different process of seasoning of bamboos.	135	45	180
9.	HCS/N9413	Identify & select appropriate bamboo species for different industrial Handicraft products.	25	5	30
10.	HCS/N9414	Design various gift items, stationery Item by free hand drawing.	35	10	45
11.	HCS/N9489	Select & apply different process of bending & joints in different sections like furniture, handicraft & housing etc.	130	35	165
12.	HCS/N9428	Apply different techniques and process of making various kinds of bamboo furniture.	75	15	90

13.	HCS/N9429	Use Jigs & fixture to make uniform size & reduce production cost.	25	5	30
14.	HCS/N9430	Identify finishing materials & apply different methods of finishing of bamboo products.	25	5	30
15.	HCS/N9431	Identify quality products as per market demand for production as per requirement and estimate the cost.	50	10	60
Employability Skills				**120**	**120**
Total			**840**	**360**	**1200**

6. ASSESSMENT CRITERIA

LEARNING OUTCOMES	ASSESSMENT CRITERIA
1. Identify bamboo items, safety tools & explain various Bamboo resource generation techniques following safety precaution. (NOS: HCS/N9486)	• Demonstrate workshop safety & discipline. • Use of tools safety and workshop safety. • Identify different types of bamboo items. • Demonstrate via field visit/ Harvesting Practice. • Demonstrate modern utilization of bamboo items by showing visual aids.
2. Identify and operate various hand tools used in Bamboo Technology. (NOS: HCS/N9403)	• Identify various kinds of hand tools/machine tools used in bamboo works industry. • Maintain the hand tools/machine tools and follow the safety /precautionary guidelines. • Identify measuring tools & use conversion tables for measurement. • Check for dimensional accuracy. • Plan and select material and machine for drill holes to make observing safety points. • Perform hand sawing/ drilling/ skinning/filing process. • Mark the job as per drawing. • Demonstrate pattern making by using blow lamp and it precautions.
3. Identify, plan & apply preservatives, dyes, smoke treatment & chemical treatment process to preserve bamboo items. (NOS: HCS/N9401)	• Identify various preservatives/dyes used to preserve the bamboos/bamboo products. • Perform finishing of the surface of bamboo product as per requirement and arrange required items and tools. • Select material and inspect visually for defects. • Explain use of Borax/ Boric Acid in preservation. • Demonstrate smoke chamber /other Chemical Process of preservation. • Perform Traditional processes of preservation. • Dye the bamboo products utilizing various chemical/ vegetative dyes.

4. Operate various bamboo processing machineries and carry out their maintenance. (NOS: HCS/N9487)	• Plan and select the job and set up machine accessories at position to perform desired operation. • Set the job and perform desired operation with proper adjustment of table, guide, fence and blade guard. • Operate Cross Cutting machine & perform oiling/ lubrication including preventive maintenance of the machine. • Operate Radial splitting Machine/ Automatic splitting Machine/ knot removing machine according to the marking following safety norms. • Troubleshoot & maintain the Radial splitting Machine/ Automatic splitting Machine/ knot removing machine • Polish /oil /lubricate different machines like manual slivering machine/ round stick machine for proper functioning. • Operate & maintain electric drill machine/ 2 side/ 4 side machine planer. • Perform desired operation and check the correctness as per drawing. • Operate & troubleshoot Hydraulic Press Machine/ Resign Applicator machine.
5. Operate Glue Mixing machine & weaving machine for fixing different parts of bamboo products. (NOS: HCS/N9410)	• Operate & maintain the Glue Mixing machine / DD Saw machine. • Operate & maintain weaving Machine. • Avoid waste and plan for reuse/ dispose of the unused items.
6. Bend bamboo strips, Slivers & bamboo pole using blow lamp. (NOS: HCS/N9404)	• Study the drawing and make a plan for making desired pattern. • Mark the work as per dimension of the drawing. • Make pattern, using blow torch and explain it precautions. • Bend bamboo strips/bamboo poles using blow lamp. • Check for dimensional accuracy of the bamboo product.
7. Troubleshoot & perform maintenance procedure of different machines used in	• Clean & maintain machine parts by oiling/ greasing/ lubricating. • Identify basic faults and trouble shoot them

Bamboo works. (NOS: HCS/N9410)	• Explain different procedures of maintenance of machines
8. Carry out different process of seasoning of bamboos. (NOS: HCS/N9488)	• Explain Anatomical properties/ Chemical properties/ Physical/ Mechanical properties of bamboos. • Demonstrate various bamboo propagation methods. • Perform Air seasoning/ Kiln seasoning/ chemical seasoning. • Trace seasoning defects and take remedial action. • Explain Gross anatomy-Parechyma/ Vascular bundles/ fibers.
9. Identify & select appropriate bamboo species for different industrial handicraft products. (NOS: HCS/N9413)	• Identify bamboo species as per job requirement at practical field. • Select appropriate bamboo species as per requirement of the bamboo product. • Utilize various bamboo species for the formation of different bamboo handicrafts.
10. Design various gift items, stationery Item by free hand drawing. (NOS: HCS/N9414)	• Demonstrate free hand drawing & mark layout as per drawing. • Draw various gift items/stationery Item. • Plan required steps of operation to produce the gift/ stationary item. • Arrange required materials, tools and machineries for smooth performance of the operations.
11. Select & apply different process of bending & joints in different sections like furniture, handicraft &housing etc. (NOS: HCS/N9489)	• Choose exact type of joint to employ and arrange materials, tools and equipment to perform the operation. • Construct tongue and groove/ male and female joint/ Bolt fastening joint/Overlapping joint/U-shape joint/ Horizontal joint/ Vertical joint etc. • Assemble different parts and check for correctness, strength and finishing. • Make a design of Gift item and bamboo jewelries / ornaments. • Make Bamboo bags. • Make tea coaster/ bamboo bags etc. in workshop with the help of machines and hand tools.

	• Identify& select various type of furniture as per requirement. • Draw the Neat sketch of furniture. • Demonstrate different material used in furniture making • Make Bamboo Mats and Blinds. • Make Bamboo Mats / Bamboo Blinds by using Weaving Machine / manually.
12. Apply different techniques and process of making various kinds of bamboo furniture. (NOS: HCS/N9428)	• Apply appropriate Techniques for making furniture. • Make Sofa set/Chair/ Table/Bed Beach & Garden/Dining chair/Wall Chair/Swing/Relaxing Chair/Centre Table. • Select raw material for bamboo houses. • Make prototype houses. • Preserve & use bamboo for structural purposes - Code of practice.
13. Use Jigs & fixture to make uniform size & reduce production cost. (NOS: HCS/N9429)	• Identify & select materials for making jigs & fixtures. • Make various jig& fixtures as per requirement. • Make different products using jigs & fixtures. • Make various moulds for making moulded Products.
14. Identify finishing materials & apply different methods of finishing of bamboo products. (NOS: HCS/N9430)	• Identify & select finishing tools/materials. • Plan for finish the surface of bamboo product as per requirement and arrange required items and tools. • Apply different techniques of finishing. • Final touch on the products using finishing materials.
15. Identify quality products as per market demand for production as per requirement and estimate the cost. (NOS: HCS/N9431)	• Collect sample according to Company sampling procedures. • Measure samples for specified parameters according to company technical specifications. • Estimate cost of production.

7. TRADE SYLLABUS

SYLLABUS - BAMBOO WORKS			
Duration – One Year			
Duration	**Reference Learning Outcome**	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**
Professional Skill 45 Hrs.; Professional Knowledge 15 Hrs.	1. Identify bamboo items, safety tools & explain various Bamboo resource generation techniques following safety precaution.	1. Familiarization with the Institute, classroom and equipment's. Demonstrate PPE for bamboo works. 2. Barrier free environment. 3. Identifying safety symbols and hazard identification. 4. Practice safe methods of fire fighting in case of electrical fire. 5. Use of fire extinguishers.	Introduction to the trade **Safe working practices** Scope of the Bamboo works trade. Safety rules and safety signs. Types and working of fire extinguishers.
		6. Demonstration of different bamboo item, its modern utilization by showing visual aids. 7. Use of tools safety and workshop safety. 8. Demonstration through field visit and Harvesting Practice.	History of Bamboo utilization, day-to-day use of bamboo and modern application of bamboo. Types of Bamboo: Future prospects of bamboo technology. General Workshop safety and Tools safety. Basics of Bamboo resources, type of propagation and practice in India and abroad, Selection of bamboo to make various bamboo products.
Professional Skill 45 Hrs.;	2. Identify and operate various hand tools used in Bamboo Technology.	**Introduction of Tools** 9. Operate and practice of hand tools, its maintenance and precautions.	Introduction of various hand tools and machine tools used on Bamboo technology, measuring tools. Conversion table etc.

Professional Knowledge 15 Hrs.		10. Practice of measurement of all systems. Practice with portable power tools (Drill, angle grinder, orbital sander, planner, tool maintenance etc.) 11. Hand sawing, Drilling, Skinning, Filling practice. 12. Practice of hand-sawing. 13. Drilling, Skinning, filling practice etc	Brief description of Hand tools and Machine tools. Specification of tools and types of tools.
		Use of Blow lamp 14. Practice of pattern making, use of blow lamp and its precautions.	How to make pattern, banding, buffing and polishing of bamboo.
Professional Skill 25 Hrs.; Professional Knowledge 05 Hrs.	3. Identify, plan & apply preservatives, dyes, smoke treatment & chemical treatment process to preserve bamboo items.	15. Use of Borax & Boric Acid. 16. Use of Smoke chamber and other Chemical Process. 17. Practice of Traditional process. 18. Practice of dying utilizing various chemical and vegetative dyes.	**Preservation of Bamboo** Various techniques of Preservation and Treatment of Bamboo (Through ancient/ traditional and modern methods) Colouring/Dying of Bamboo strips/ slivers.
Professional Skill 110 Hrs.; Professional Knowledge 40 Hrs.	4. Operate various bamboo processing machineries and carry out their maintenance.	**Bamboo processing Machine** 19. Practice on different machineries used to make various primary bamboo products. 20. Practice of Cross Cutting machine, oiling and lubrication of machine.	Introduction of Bamboo Primary processing Machineries and its uses. Brief description of cross cutting machine and how to operate, trouble shooting of these machines.
		Splitting Machine 21. Practice of operation in Radial splitting Machine,	Brief description of Radial Splitting machine, Automatic Splitter Machine and how to

		oiling and lubrication of machine. 22. Practice of operation in knot removing machine.	operate, trouble shooting of these machines. Brief description of knot removing machine and how to operate, trouble shooting of the machine.
		Polishing Machine 23. Practice of operation in polishing machine, oiling and lubrication of machine. 24. Practice of operation in slivering machine, oiling and lubrication of machine. 25. Practice of operation in round stick machine oiling and lubrication of machine.	Brief description of polishing machine and how to operate, trouble shooting of the machine. Brief description of manual slivering machine and how to operate, trouble shooting of the machine. Brief description of round stick making machine and how to operate trouble shooting of this machine.
		Drill Machine 26. Practice of operation in electric drill machine, oiling and lubrication of machine. 27. Practice of operation in 4 side machine planer, oiling and lubrication of machine including preventive maintenance.	Brief description of electric Drill Machine and how to operate trouble shooting of these machines. Brief description of 4 side planer machine and how to operate trouble shooting of this machine.
		Pressure Machine 28. Practice on Hydraulic Press Machine. 29. Practice on Resin Applicator machine.	Brief description of Hydraulic Press Machine and its operation & maintenance and also trouble shooting of these machines. Brief description of Resign Applicator and Its operation & maintenance and also trouble shooting of these machines.
Professional Skill 45 Hrs.;	5. Operate Glue Mixing machine	**Glue Mixing and Weaving Machine**	Brief description of Glue Mixing Machine, DD Saw

Professional Knowledge 15 Hrs.	& weaving machine for fixing different parts of bamboo products.	30. Practice on Glue Mixing machine and DD Saw machine. 31. Practice on Mat weaving Machine. Practice on blind weaving Machine.	machine. How to operate and maintenance these machines. Operation and maintenance of Automatic Weaving machine.
Professional Skill 25 Hrs.; Professional Knowledge 5 Hrs.	6. Bend bamboo strips, Slivers & bamboo pole using blow lamp.	**Use of Blow Torch (LPG)** 32. Practice of pattern making, use of blow torch and its precaution.	How to make pattern, bending, buffing and polishing of bamboo.
Professional Skill 45 Hrs.; Professional Knowledge 15 Hrs.	7. Troubleshoot & perform maintenance procedure of different machines used in Bamboo works.	**Maintenance of Machine** 33. Cleaning of machine, Lubrication and oiling of machine and trouble shooting. 34. Sharpening/ maintenance of tools and cutters.	What precaution should be observed in operating bamboo processing machine and proper maintenance of machine.
Professional Skill 135 Hrs.; Professional Knowledge 45 Hrs.	8. Carry out different process of seasoning of bamboos.	**Methods used of lab** 35. Practice of seasoning bamboos by different process.	Introduction of various - Anatomical structure, Chemical properties, Physical properties and Mechanical Properties. Gross anatomy-Parenchyma, Vascular bundles, fibres. Chemical constitution, Cellulose and hemicelluloses, lignin etc. Moisture content, Fibre saturation point and shrinkage, Specific gravity and mechanical properties, influence of age

			Air seasoning; Kiln seasoning; chemical seasoning and seasoning defects & remedies. Other process.
Professional Skill 25 Hrs.; Professional Knowledge 5 Hrs.	9. Identify & select appropriate bamboo species for different industrial Handicraft products.	**Selection of Bamboo Variety** 36. Identification of bamboo as per job requirement at practical field.	Various bamboo species and their utilization. Selection of bamboo as per job specification.
Professional Skill 35 Hrs.; Professional Knowledge 10 Hrs.	10. Design various gift items, stationery Item by free hand drawing.	**Designing** 37. Practice on free hand drawing. 38. Practice on Drawing of various gift items, stationery Item.	What is Design? Free hand drawing of various items.
Professional Skill 130 Hrs.; Professional Knowledge 35 Hrs.	11. Select & apply different process of bending & joints in different sections like furniture, handicraft & housing etc.	39. Practice in tongue and groove or male and female joint, Bolt fastening joint. 40. Overlapping joint, U-shape joint. Horizontal joint, Vertical joint etc.	Joints: Briefing about various joints, method of joints, uses of joints.
		Gift items and Jewellery 41. How to make a design of Gift item and bamboo jewelleries /ornaments. 42. Making of Bamboo bags. 43. Making some products like tea coaster, bamboo bags, etc in workshop with the help of machines and hand tools.	Practice of bamboo ornaments and various gift items. Designing of various Handicraft items. Identification of suitable products as per market demand like tea coaster, bamboo bags, placemat etc. Make a process lay-out of individual products.
		Types of Furniture 44. Demonstrate various type of furniture (Digitally/ physically).	Introduction: Use of various Household and Public furniture, Advantage of sketch

		45. Draw the Neat sketch of furniture.	making of various furniture designs.
		Materials of Furniture 46. Demonstration of different material used in furniture making.	Use of Jigs & fixture. Bamboo, Cane, Wood, Nail, Adhesive, Binding wire, Plastic Rope, Nut-bolt etc.
		47. Making of Bamboo Mats and Blinds. 48. Making of Bamboo Mats by using Weaving Machine and Manually. 49. Making of Bamboo Blinds.	Process of Weaving Bamboo Mats, Process of making Bamboo Blinds Different patterns of Mat and Blind.
Professional Skill 75 Hrs.; Professional Knowledge 15 Hrs.	12. Apply different techniques and process of making various kinds of bamboo furniture.	67. Demonstrate the techniques of furniture making 68. Practice of furniture making (i) Sofa set (ii) Chair (iii) Table (iv) Bed (v) Beach & Garden (vi) Dining chair (vii) Wall Chair (viii) Swing (ix) Relaxing Chair (x) Centre Table	Various joineries used in furniture making process.
		69. Selection of raw material for bamboo houses. 70. Prototype houses. 71. Structural uses of bamboo. Preservation of bamboo for structural purposes - Code of practice (IS 9096)	Architecture, Engineering and Social Housing aspects- their relevance. Free hand houses design and drawing. Bamboo in construction, Infrastructure, Reinforcement and Scaffolding. Preservation of bamboo for structural purposes - Code of practice (IS 9096)
Professional Skill 25 Hrs.;	13. Use Jigs & fixture to make	**Jigs and Fixtures**	What are jig and fixtures?

Professional Knowledge 05 Hrs.	uniform size & reduce production cost.	72. Make various jig & fixtures as per requirement and make different products. 73. Make various moulds for making moulded Products.	What are the advantages of Jig & fixtures? When we use Jig & Fixtures? Materials using to make jig & fixtures.
Professional Skill 25 Hrs.; Professional Knowledge 05 Hrs.	14. Identify finishing materials & apply different methods of finishing of bamboo products.	**Finishing Technique** 74. Final touch on the products using finishing materials.	Various methods of finishing techniques, Various finishing materials & there uses.
Professional Skill 50 Hrs.; Professional Knowledge 10 Hrs.	15. Identify quality products as per market demand for production as per requirement and estimate the cost.	**Quality Concern** 75. Random samples are taken according to Company sampling procedures. 76. Samples are measured for specified parameters according to company technical specifications. 77. Prepare bill of material and Cost sheet.	**What are Quality concerns** Sample and assess Bamboo production according to company technical specifications. Range: parameters to be specified.
Project work/ Industrial Visit (Optional) **Broad areas: -** a) Visit to various shops and exhibitions. b) Market survey in some rural / urban areas. c) Innovative decorative, gift and stationary items. d) Participating at various Exhibition, Seminar, Trade fair etc.			

SYLLABUS FOR CORE SKILLS
1. Employability Skills (Common for all CTS trades) (120 Hrs.)

Learning outcomes, assessment criteria, syllabus and Tool List of Employability Skills is provided separately in www.cstaricalcutta.gov.in / www.bharatskills.gov.in / www.dgt.gov.in.

ANNEXURE-I

List of Tools & Equipment			
BAMBOO WORKS (for Batch of 24 Candidates)			
S No.	**Name of the Tools and Equipment**	**Specification**	**Quantity**
A. TRAINEES TOOL KIT			
1.	Combination pliers	200 mm insulated	24+1 Nos.
2.	Screw driver	100mm, 200mm	24+1 Nos. each
3.	Neon Tester	500 V pencil bit type	24+1 Nos.
4.	Electrician knife		24+1 Nos.
5.	Hammer ball pin	0.25 kg	24+1 Nos.
6.	File round	150mm	24+1 Nos.
7.	Plier side cutting	200 mm	24+1 Nos.
8.	Plier round nose	200 mm	24+1 Nos.
9.	Plier flat nose	150 mm	24+1 Nos.
10.	Pliers long nose	200 mm	24+1 Nos.
11.	Hammer chisel	25 mm	24+1 Nos.
12.	Hammer ball pin	1.0 kg	24+1 Nos.
13.	Wall Jumper Octagonal mm	37 mm x 450	24+1 Nos.
14.	Center punch	100 mm	24+1 Nos.
15.	Steel measuring tape	20 mts.	24+1 Nos.
16.	Allen keys		24+1 Nos.
17.	Spanner double ended set of G		24+1 Nos.
18.	Adjustable Spanner		24+1 Nos.
19.	Steel rule	300 mm	24+1 Nos.
20.	Electric soldering iron	35 w	24+1 Nos.
21.	Electric soldering iron	125 w	24+1 Nos.
22.	Bamboo Tool kit box		24+1 Nos.
LIST OF THE TOOLS AND EQUIPMENT			
23.	Rubber gloves	5000 V	5 pairs
24.	Multimeter	0-5, 100, 200, 500 mili amperes 0-100-1000 10000 ohms 0-150, 300, 600 VAC/DC	10 Nos.
25.	Tong Tester		1 No.
26.	Megger		1 No.
27.	DC Power Supply	0 V 110V/SA	1 No.

28.	Auto transformer variac	230 V	1 No.
29.	Tweezers		24 Nos.
30.	Crimping Tools		2 Sets
31.	Desktop Computer	CPU: 32/64 Bit i3/i5/i7 or latest processor, Speed: 3 GHz or Higher. RAM: 4 GB DDR-III or Higher, Wi-Fi Enabled. Network Card: Integrated Gigabit Ethernet, with USB Mouse, USB Keyboard and Monitor (Min. 17 Inch. Licensed Operating System and Antivirus compatible with trade related software.	01 No.
32.	UPS		1 No.
33.	Laser Printer		1 No.
34.	Scanner		1 No.
35.	Windows Operating System (Latest)		01 No.
36.	MS Office (Latest)		01 Nos.
37.	Common Hacksaw		12 Nos.
38.	Adjustable Hacksaw		12 Nos.
39.	Hand saw	450 mm	07 Nos.
40.	Dhau		24 Nos.
41.	Round Knife		24 Nos.
42.	Radial Hand splitter	4.8.12.16 blades	2 Nos.
43.	Tripura Dhahu		12 Nos.
44.	Foldable knife		12 Nos.
45.	Multi-purpose Knife		12 Nos.
46.	Common scissors		24 Nos.
47.	Hand drill (Manual)		05 Nos.
48.	Portable Hand drill		02 Nos.
49.	Pedestal Drill machine		01 No.
50.	Drill Bit (Set)		04 Nos.
51.	IDC Gauge		12 Nos.
52.	Folding scale		12 Nos.
53.	Bamboo Cross cutting machine (Heavy Duty)		01 No.

54.	Bamboo Portable crosscutting m/c		01 No.
55.	Bamboo Radial splitting m/c (Chain type)		01 No.
56.	Bamboo Round Stick Making Machine		01 No.
57.	Bamboo Square Stick Making Machine		01 No.
58.	Bamboo Stick Polishing Machine		01 No.
59.	Bamboo Slicing Machine (Heavy Duty)		01 No.
60.	Bamboo Stick Sizing Machine		01 No.
61.	Bamboo Parallel Splitter		01 No.
62.	Bamboo Two Side Planning cum knot removing Machine		01 No.
63.	Bamboo Four Side Planning Machine		01 No.
64.	Bamboo Treatment Plant		01 No.
65.	Bamboo Dying Tank		01 No.
66.	Manual Slivering machine		01 No.
67.	Universal Grinding machine		01 No.
68.	Table grinding machine		01 No.
69.	Machine saw		01 No.
70.	Machine planner		01 No.
71.	Lathe machine		01 No.
72.	Hand Gloves		24 Nos.
73.	Portable sanding machine		01 No.
74.	Spray Gun		07 Nos.
75.	Dying Chamber		01 No.
76.	Resin Applicator		01 No.
77.	Glue mixing machine		01 No.
78.	Hydraulic Press Machine	(4' X2') (Maximum pressure required 45 kg/cm2)	01 No.
79.	DD Saw		01 No.
80.	Spade		12 Nos.
81.	Steel float		12 Nos.

82.	Spirit level	30 cm long	12 Nos.
83.	Chisel	25 cm long hammer	12 Nos.
84.	Bamboo Tool grinding machine		01 No.
85.	Ladder aluminum	30 m	01 No.
86.	Bench vice		07 Nos.
87.	C Clamp		01 No.
88.	Gloves Canvas		12 Nos.
89.	Grinding machine with various polishing stones		01 No.
90.	Brush for painting		12 Nos.
91.	Drawing board with facility of parallel bar		12 Nos.
92.	Mini drafter		24 Nos.
93.	Erasing shield small size		24 Nos.
94.	Automatic Mat weaving machine		01 No.
95.	Automatic Blind weaving machine		01 No.
96.	Pneumatic Nailer		01 No.
97.	Gas torch		12 Nos.
98.	Woodturning lathe	6'	02 Nos.
99.	Table Grinding machine	8"	02 Nos.
100.	Industrial Sewing Machine		04 Nos.
101.	Clamps for holding or tightening the jobs		12 Nos.
102.	Manual ball press machine		04 Nos.
103.	Sizing machine for window blinds		01 No.
104.	Compressor	300 lbs.	02 Nos.
105.	Manual Slivering Machine		04 Nos.
106.	Automatic Slivering Machine		02 Nos.
107.	Portable Planner		02 Nos.
108.	Various Mould for making moulded Furniture		As required
109.	Portable rip saw		04 Nos.
110.	Miter saw		02 Nos.
111.	Universal Planner		01 No.

112.	Oil Can		04 Nos.
113.	Angle grinder		01 No.
114.	Orbital Sander		01 No.
115.	Electrical planner		01 No.
Workshop furniture			
116.	Suitable Work Tables		04 Nos.
117.	Stools		25 Nos.
118.	Discussion Table		01 Nos.
119.	Tool Cabinet		02 Nos.
120.	Trainees locker	with 16 boxes	02 Nos.
121.	Firefighting equipment, first aid box etc.		05 Nos.
122.	Book Shelf (Glass panel)		01 No.
123.	Storage Rack		02 Nos.
Furniture -Computer Lab			
124.	Suitable Computer Tables		12 Nos.
125.	Computer Chairs		24 Nos.
126.	Tool Cabinet		02 Nos.
127.	Trainees Locker with	16 boxes	02 Nos.
128.	Book Shelf (Glass panel)		01 No.
129.	Shoes Rack		02 Nos.
130.	Vacuum cleaner		01 No.
Consumable Materials			
131.	Bamboo (Raw Green)	Bambusabalcooa, Bambusapolymorpha, Bambusatulda, Bambusanutans, Bambusapallida, Bambusacacharensis, Dendrocalamuslongispathus, Neohuzeauadullooa, Dendrocalamushamiltonii, Thyrsostchysoliveri, Dendrocalamusgiganteus, Melocannabacciffera, Bambusa spp. And as per available local species bamboo use.	As required

132.	Chemicals	Borax, Boric Acid, CCB, CCA, Acetic Acid, Sodium Penta chlorophenate, Glue, Boliden salts(S-25), etc	As required
133.	Finishing	Wooden Pencil (HB), Fevical (Adhesive), Strainer, Lacquer, Melamine, K. Oil, LPG, Dry colours, brush different side, polishing paper or sand paper (60/80/100/120), steel nail/other nail etc.	As required
134.	Plastic tubs / buckets	Plastic buckets size – 10 to 15 litters Plastic buckets size – 1 litters with handle	As required
135.	Lab material	Mask, Eyes safety glass, Apron, Hand wash (Dettol), Cotton cloths, Industrial hand glass & Shoes, First aid kit box and other safety items	As required
136.	Theory / Practical class material	Board marker or White board marker (Three Colours), Drawing sheet, Drawing tools	As required

Note: -

1. *All the tools and equipment are to be procured as per BIS specification.*
2. *Internet facility is desired to be provided in the class room.*

ANNEXURE-II

The DGT sincerely acknowledges contributions of the Industries, State Directorates, Trade Experts, Domain Experts, trainers of ITIs, NSTIs, faculties from universities and all others who contributed in revising the curriculum. Special acknowledgement is extended by DGT to the following expert members who had contributed immensely in this curriculum.

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ANNEXURE-III

ABBREVIATIONS	
CTS	Craftsmen Training Scheme
ATS	Apprenticeship Training Scheme
CITS	Crafts Instructor Training Scheme
DGT	Directorate General of Training
MSDE	Ministry of Skill Development and Entrepreneurship
NTC	National Trade Certificate
NAC	National Apprenticeship Certificate
NCIC	National Craft Instructor Certificate
LD	Locomotor Disability
CP	Cerebral Palsy
MD	Multiple Disabilities
LV	Low Vision
HH	Hard of Hearing
ID	Intellectual Disabilities
LC	Leprosy Cured
SLD	Specific Learning Disabilities
DW	Dwarfism
MI	Mental Illness
AA	Acid Attack
PwD	Person with disabilities


कौशलं बलम्