

Syllabus
For the trade of
DENTAL LABORATORY TECHNICIAN
Under
Craftsmen Training Scheme (CTS)

Year - 2002

Designed by
Government of India
Ministry of Labour (D.G.E.&T.)
CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE
EN – Block, Sector – V, Salt Lake,
Kolkata-700091.

List of Members of the Trade Committee Meeting approved the syllabus for the trade of “Dental Laboratory Technician” under C.T.S. held on 13.11.2002 at CSTARI, Kolkata.

1.	Shri H.Somasundaram	Director, CSTARI, Kolkata	Chairman
2.	Dr. S.K.Mukherjee	ADLRI Ltd.	Member
3.	Dr. B.K.Biswas	Avinash Dental Lab. & R.I.Pvt. Ltd.	Member
4.	Dr.S.K.Das	HOD Prosthetic Dr.R.Ahmed Dental College	Member
5.	Dr. Gopal Lal Shree	Kolkata-4	Member
6.	Dr. Moni Lal Shree	Madhyamgram, Kolkata	Member
7.	Dr. Sanjit Lal Das.	44B, S.P.Mukherjee Rd, Kolkata	Member
8.	Shri T.Mukhopadhyay,DDT	CSTARI, Kolkata	Member
9.	Sri S. Kant, DDT	CSTARI., Kolkata	Member
10.	Shri M.S.Ekambaram, ADT	CSTARI, Kolkata	Member
11.	Sri M.K.Batabyal,T.O.	CSTARI, Kolkata	Member

GENERAL INFORMATION

1. Name of the Trade : Dental Laboratory Technician
2. N. C. O. Code No. :
3. Duration of Craftsmen Training : 2 Years
4. Entry Qualification : Passed 10th class under 10 + 2 system of education.
5. Unit Strength : 20
6. Space Requirement (Laboratory) : 1500 Sq. ft.
(Including 300 Sq. ft. Air-conditioned Laboratory for Wax-up section and Ceramic section)
7. Faculty : One Qualified Dental Surgeon and
One Prosthodontics (MDS) or Master Degree Holder Dental Surgeon or Specially laboratory Trained Dental Surgeon or Qualified Dental Laboratory Technician

- Note:**
1. Dental Technician shall restrict his activities to purely Mechanical Laboratory work at the instance of the registered Dental surgeon. He shall not do any chair side work and he should not Prescribe any Drugs.
 2. Dental clinic assistance is very important to complete the training.

**SYLLABUS FOR THE TRADE OF “DENTAL LABORATORY TECHNICIAN” UNDER
C.T.S.**

Duration : 2 Years

Week No.	Practical	Theory
1 to 14	<p>Introduction of the course, Role & responsibilities of Dental Technicians. Familiarisation of the Institute.</p> <p>Safety precautions to be observed during handling of chemical, laboratory apparatus equipments and machineries</p> <p>Familiarisation with weighing machine. Practice on weighing correct to a milligram.</p> <p>Demonstration of specific gravity of solids and liquids.</p> <p>Practice of reading temperature shown by temperature gauge fitted in the different equipments.</p> <p>Some practical experiment on conduction, convection, radiations.</p> <p>Practice on measuring voltage, current, (Both AC & DC)</p> <p>Practice on working with electrical furnaces, familiarisation with the Process of electroplating, electroforming, and anodising.</p>	<p>Introduction of the course, Role & responsibilities of Dental Technicians. Familiarisation of the Institute.</p> <p>Safety precautions to be observed during handling of chemical, laboratory apparatus equipments and machineries</p> <p>Study of density, specific gravity, properties of matter, cohesion, viscosity, elasticity, diffusion and osmosis.</p> <p>Temperature, temperature measurements, temperature measuring instruments & thermostats.</p> <p>Boyle’s Law and Charles Law, unit of heat, thermal capacity, specific heat, latent heat, melting point, expansion of solids, liquids and gases by heat. Gas pressure and hydraulic pressure, study of properties of vapours, conduction, convection and radiation..</p> <p>Study of electro – technology applied to dental work.</p> <p>Basic Electricity, voltage, current, Ohm’s Law, Krichhop’s Law, AC, DC, Electrical Measurements. Electrical safety, Low voltage systems, Isolation Transformer, Necessity of Earthing.</p> <p>Knowledge about motors, different types & uses.</p> <p>Study of electrical features, heaters, temperature cantilever, electro plating, electroforming and anodising.</p> <p>Study of work, power and energy,</p>

<p>15-62</p>	<p>Test for acids & alkalis radicals.</p> <p>Simple exercise on electroplating of metal.</p> <p>Practice on:- Impression:-Preservation and Boxing-in. Cast:-Preparation, trimming, including orthodontic casts. Construction of special trays – spacers. Adjustments, mounting of casts.</p> <p>Setting of teeth and wax fixing.</p> <p>Flasking, dewaxing, packing, curing and deflasking.</p> <p>Finishing and polishing of dentures.</p> <p>Additions, repairs, relining and reversing of dentures. Making of Acrylic teeth.</p> <p>Principles of wire bending. Preparation of wrought clasps, occlusal rests and lingual bars.</p> <p>Setting of teeth and completion of denture on metals skeletons</p> <p>Stainless steel wire preparation of clasps springs and arch wires for orthodontic</p>	<p>power, friction, momentum, centre of gravity, types of lever, stress, strain, shearing strain, torsion, mechanical properties of metals.</p> <p>Knowledge of atmosphere. Physical and chemical changes of elements, mixtures and compounds. Oxides, burning, rusting.</p> <p>Electrolysis, ionic theory of solution, electro potential, Electroplating</p> <p>General characteristics of common metal used in the dental work and their compounds.</p> <p>Alcohol, ethers, aldehydes and ketones. Fatty acids and their more important derivatives, amines, carbohydrates, fats and proteins. Benzenes and its homologues.</p> <p><u>Study of Dental Materials:</u></p> <p>Study of composition, properties, uses, advantages & disadvantages of the following materials:-</p> <p>Stone plaster, dental cement, plaster & pairs, zinc oxide, investment materials, impression materials, waxes, denture base materials, both for cold curing and heat curing, tooth materials, base plate and other materials used in dentistry.</p> <p>Knowledge about metallurgical terms. Study in metals used in dentistry such as gold, silver, copper, zinc, tin, lead and aluminium.</p> <p>Study of alloys used in dentistry i.e. casting of silver alloys, gold, stainless steel etc.</p> <p>Heat treatment, annealing and Solders, flexes, anti-flexes.</p> <p>Tarnish and corrosion.</p>
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<p>appliance. Preparation removal orthodontic appliance, activators, retention appliances and oral screen.</p> <p>Construction of fixed orthodontic appliances, bands, tubes and arches</p> <p>Soldering and spot welding – soldering of clasps, togs, strengtheners and lingual bars.</p>	<p>Electroplating (electric deposition). Study of Principles of wire bending</p> <p><u>ORAL ANATOMY:</u></p> <p>Study of:-</p> <ul style="list-style-type: none"> ❑ Elementary anatomy of structure of denture/bearing area. ❑ Human dentition and occlusion. ❑ Function of teeth and morphology of crowns of teeth. ❑ Tooth carving in wax and plaster. ❑ Muscles of mastication and facial expression. ❑ Mastication duplication and phonation. ❑ Movements of temporomandibular joint. ❑ Cast preparation, trimming, including orthodontic casts. ❑ Cast duplication – various methods. ❑ Construction and bridge using porcelain and acrylic pontics. ❑ Principles of bridge work – types of abutments, abutment & pontics. ❑ Bite blocks – base plates and wax rims. ❑ Articulators Occlusal plane, protrusive balance, working bite, balancing bite, curve of space, compensating curve, lateral curve. ❑ Principles of selection of teeth. ❑ Immediate denture construction. ❑ Kennedy’s classification of partial dentures. ❑ Principles of partial denture, design, clasp surveyor, surveying, path of insertion and removal. Establishment of clasp seat, clasp’s parts, classification, function and reciprocation. ❑ Principles of wire bending. Preparation of wrought clasps, occlusal rests and lingual bars
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<p>63 to 102</p>	<p>Familiarisation with Casting machines: Centrifugal and pressure casting machines, furnaces</p> <p>Construction of fixed orthodontic appliances, bands, tubes and arches.</p> <p>Practice on Soldering and spot welding – soldering of clasps, togs, strengtheners and lingual bars.</p> <p>Construction and bridge using porcelain and acrylic pontics.</p>	<p>Study of:-</p> <p>Casting machines: Centrifugal and pressure casting machines, furnaces, principles of casting. Casting techniques of partial denture (skeleton) clasps, bars, occlusion rest. Mechanical principles of orthodontic appliances, anchorage, force, tissue changes and retention Use of various types of expansion screws. Method of removal orthodontic appliances, activators, retention appliance and oral screen. Study of Construction of fixed orthodontic appliances, bands, tubes and arches. Soldering and spot welding – soldering of clasps, togs, strengtheners and lingual bars. Inlays and crowns-classification and construction - facing and backings, casting procedures. Principles of bridgework – types of abutments, abutment & pontics. Study of Construction and bridge using porcelain and acrylic pontics. Gypsum product and Die materials.</p>
<p>103 & 104</p>	<p>REVISION & TEST</p>	

LIST OF TOOLS & EQUIPMENT FOR DENTAL LABORATORY TECHNICIAN

(Unit Size : 20)

Machines / Equipments / Instruments

a) **For Denture Section**

- | | |
|------------------|--------|
| 1) Hanging Motor | 2 Nos. |
| 2) Hand Piece | 2 Nos. |
| 3) Cable Arm | 2 Nos. |

b) **For Metal Section**

- | | |
|----------------------------------|-------|
| 1) Hanging Motor | 1 No. |
| 2) Hand Piece | 1 No. |
| 3) Cable Arm | 1 No. |
| 4) Micro Motor Inc. Hand Piece | 1 Set |
| 5) Vacuum Mixer Cum Vibrator Mc. | 1 No. |

c) **For Wax –up Section**

- | | |
|---------------------------------------|-----------------|
| 1) Electro Waxer M/c. with hand piece | 1 Set |
| 2) Hand Wax curver (PKT Set) | |
| 3) Air conditioner | 1 No. (1.5 Ton) |

d) **For Ceramic Section**

- | | |
|-------------------------------------|-----------------|
| 1) Multimate Furnace | 1 No. |
| 2) Vita Vacumat – 40 Furnace | |
| 3) Micro Motor with Hand Piece | 2 Nos. |
| 4) Compact Ultra Sonic Cleaner | 1 No. |
| 5) Vita Chrom Delta Stains | 1 Box |
| 6) VKM 95 (3-D masters std. Set-12) | 1 Box |
| 7) Air conditioner | 1 No. (1.5 Ton) |
| 8) Ultrasonic cleaner | 1No. |

e) **For Casting Section**

- | | |
|------------------------------------|-------|
| 1) Induction casting Mc. (Galloni) | 1 No. |
| 2) Sand Blasting Mc. | 1 No. |
| 3) Heating Furnace | 1 No. |
| 4) Muffle Furnace | 1 No. |
| 5) Manual Casting Machine | |
| 6) Air compressor | |

f) **For Model Section**

- | | |
|--------------------|-------|
| 1) Trimmer | 1 No. |
| 2) Finishing lathe | 1 No. |
| 4) Heating Oven | |

g) **For Electrical**

- | | |
|---------------------------------------|-----------|
| 1) Multimeter | 1 No. |
| 2) Voltmeter AC & DC (0-250v, 0-500V) | 1 No.Each |
| 3) Ammeter AC & DC (0-5A, 0-20A) | 1 No.Each |

h) **Audio Visual Aid**

- | | |
|--------------------------------|----------------------|
| 1. Over Head Projector (OHP) | 1 No. per class Room |
| 2. VCD | 1 No. |
| 3. VCR | 1 No. |
| 4. Colour T.V | 1. No. |
| 5. Model of Oral Anatomy | |
| 6. Charts related to Dentistry | |

List of Chemicals & Store Materials

<u>Sl.No.</u>	<u>Name of the Item</u>	<u>Sl.No.</u>	<u>Name of the Item</u>
01.	Aestic Teeth	43.	Dioxing Flask
02.	Articulator.	44.	Duralloy
03.	Artery Forceps	45.	Denture Polisher
04.	Airoter Bar Holder	46.	Denture Works Pattern
05.	Acrylic Polisher	47.	Dentrox Stone powder
06.	Bellabond (Ceramic)	48.	Disc (Separating/big & small)
07.	Buff (Woolen)	49.	Dentrex Plaster
08.	Bff (Cloth)	50.	Disc Holder
09.	Black Brush	51.	Elctro Waxer
10.	B.P.Handle No. 30	52.	Enamel (VKM
11.	B.P.Blade No. 5.	53.	Expansion Screw
12.	Bar Vol.	54.	Feltcone
13.	Brush (Ceramic)	55.	Forceps
14.	Bar T.C.	56.	Flask (Metal)
15.	Ball Bearing	57.	Green Sticky wax
16.	Base Plate	58.	Glass Tube
17.	Bleaching Trays	59.	G.C. Spatula
18.	Blue Wax	60.	Glazing Powder
19.	Cable Arm (GD)	61.	Hindusthan Wax
20.	Cable Arm (India)	62.	Hand Piece for hanging motor
21.	Cosmo Teeth	63.	Hanging Motor
1.	Crucible	64.	Heat Cure (Powder & Liquid)
23.	Cellophane Paper	65.	Investment Powder
24.	Cellophane Tape	66.	Iron clamp
25.	Cold Mould Seal (Liquid)	67.	Impression Steel Tray (U / L)
26.	Curver (Wards)	68.	Kulzer teeth
27.	Curver Lacral)	69.	Kenda Metal Polisher
28.	Cotton	70.	Luciton (liquid)
29.	Cloth Bob Ring	71.	Micro Polisher
30.	Chrome Cobalt (Metal)	72.	M M Handle
31.	Ceramic Technique Kit	73.	Metal polisher
32.	Clamp (Iron)	74.	Mandrils
33.	Cintered Diamond Bar	75.	Modeling Wax
34.	Ceramic Polisher	76.	Midzel Polisher
35.	Cotton Holder	77.	Majordent teeth
36.	Cold Cure (RR)	78.	Modeling Liquid
37.	Casting Ring		
38.	Cotton Duster		
39.	Die Pins		
40.	Diamond Disc		
41.	Dentin (ceramic Powder of Different Shades)		
42.	Durabond non precious ceramic alloy		
79.	Melodent Powder		

80. Melodent Liquid
81. Machine Oil
- 82.. Marine
- 83... Neck Powder
84. Ni – chrome Metal
85. Niddle Holder
86. Nozzle for Sand Blaster Machine
87. Opaque (different Shades)
88. Orthodontic Wire
89. Orateek Teeth
90. Paris Plaster
91. Pumice Powder
92. Premadent teeth
93. Polishing Points (Bar)
94. Plaster Knife
95. R R. Clear Powder
96. Rose Works
97. Ring liner
98. Retentioner
99. Retention - beads
100. Stone Powder
101. Sticky wax
102. Stone Die Hardener
103. Smith Wire
104. SC 10
105. Stone Points
106. SS Ring
107. Spatula
108. Spirit Lamp
109. Spirit
110. Saw Blade
111. Straight Steel Bar
112. Silicon Rubber Wheel
113. Silicon Polisher
114. Sand Paper Holder
115. Trevalon (Vein/Pink)
116. True Blue
117. Tech. Gold Alloy
118. Transulent
119. Tissue Paper
120. Ultra Stone Whiting Powder
121. Wax Wire
122. Wax Pattern
123. Wash Opaque
124. Whiting Powder

HAND TOOLS REQUIRED FOR A BATCH OF 20 TRAINEES (01 UNIT)

1.	Works knife	20 Nos.
2.	Works spatula	20 ”
3.	Plaster knife	20 ”
4.	Plaster spatula	20 ”
5.	Rubber bowel	20 ”
6.	Inlay cover	20 ”
7.	Some trimming bars for Acrylic, Metal, & ceramic	
8.	Flask (Different Size)	
9.	PKT- Set	20 Sets