

Syllabus for the trade

Of

# **DENTAL LABORATORY EQUIPMENT TECHNICIAN**

(SEMESTER PATTERN)

UNDER

CRAFTSMAN TRAINING SCHEME

Designed in: 2013

By

Government of India

**CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE**

Directorate General of Employment & Training

Ministry of Labour & Employment

EN - 81, SECTOR – V, SALT LAKE CITY

Kolkata – 700 091

**List of members of trade committee meeting for the trade of  
Dental Laboratory Equipment Technician**

<b>SI No</b>	<b>Name &amp; Designation</b>	<b>Name of the organization</b>	<b>Remarks</b>
1	Shri V.G.Mavani, Director,	TRUMEX IND, RAJKOT	Chairman
2	Dr. Hiren Thumar	PARTH DENTEL CARE,RAJKOT	Member
3	Dr.Mira Ghoricha	GURUKUL HOSPITAL	Member
4	Dr. Dharmendra Shah. MDS. Dental Surgen	Medical Practitioner, Amedabad	Member
5	Dr. P.R.Bhanvaidya	GURUKUL HOSPITAL RAJKOT	Member
6	Dr. Kashyap Pandya, BDS, Dental Surgeon	Nirmal charitable Trust, Sola Road, Ahmedabad.	Member
7	Dr. Shravanbhai Joshi, BDS, Dental Surgeon	Shravan Dental Clinic, Ahmedabad	Member
8	Shri Rakesh Raval, Dental Technician	Plus Dental Lab, Nava vadej, Ahmedabad.	Member
9	Shri Satish Raval, Dental Technician	Plus Dental Lab, Nava vadej, Ahmedabad	Member
10	Dr.Suresh J Rathi	Asst.Proffessor, Department of Community Medicine,SBKS Medical Institute & Research Centre, Pipaliya,Di.Vadodara	Member
11	Bhavin N.Rathod	Director, Gujarat Training Centre Vadhavan, Di. Surendranagar.	Member
12	Shri S.A.Pandav, Regional Deputy Director	Regional Office, Rajkot.	Member
13	Shri PL Raval, Principal	I.T.I. Rajkot	Member
14	Shri L.K. Mukherjee Deputy Director	C.S.T.A.R.I., Kolkata	Member

**List of members attended the Workshop to finalize the syllabi of existing CTS into Semester Pattern held from 6<sup>th</sup> to 10<sup>th</sup> May'2013 at CSTARI, Kolkata.**

Sl. No.	Name & Designation	Organisation	Remarks
1.	R.N. Bandyopadhyaya, Director	CSTARI, Kolkata-91	Chairman
2.	K. L. Kuli, Joint Director of Training	CSTARI, Kolkata-91	Member
3.	K. Srinivasa Rao, Joint Director of Training	CSTARI, Kolkata-91	Member
4.	L.K. Muhkerjee, Deputy Director of Training	CSTARI, Kolkata-91	Member
5.	Ashoke Rarhi, Deputy Director of Training	ATI-EPI, Dehradun	Member
6.	N. Nath, Assistant Director of Training	CSTARI, Kolkata-91	Member
7.	S. Srinivasu, Assistant Director of Training	ATI-EPI, Hyderabad-13	Member
8.	Sharanappa, Assistant Director of Training	ATI-EPI, Hyderabad-13	Member
9.	Ramakrishne Gowda, Assistant Director of Training	FTI, Bangalore	Member
10.	Goutam Das Modak, Assistant Director of Trg./Principal	RVTI, Kolkata-91	Member
11.	Venketesh. Ch. , Principal	Govt. ITI, Dollygunj, Andaman & Nicobar Island	Member
12.	A.K. Ghate, Training Officer	ATI, Mumbai	Member
13.	V.B. Zumbre, Training Officer	ATI, Mumbai	Member
14.	P.M. Radhakrishna pillai, Training Officer	CTI, Chennai-32	Member
15.	A.Jayaraman, Training officer	CTI Chennai-32,	Member
16.	S. Bandyopadhyay, Training Officer	ATI, Kanpur	Member
17.	Suriya Kumari .K , Training Officer	RVTI, Kolkata-91	Member
18.	R.K. Bhattacharyya, Training Officer	RVTI, Trivandrum	Member
19.	Vijay Kumar, Training Officer	ATI, Ludhiana	Member
20.	Anil Kumar, Training Officer	ATI, Ludhiana	Member
21.	Sunil M.K. Training Officer	ATI, Kolkata	Member
22.	Devender, Training Officer	ATI, Kolkata	Member
23.	R. N. Manna, Training Officer	CSTARI, Kolkata-91	Member
24.	Mrs. S. Das, Training Officer	CSTARI, Kolkata-91	Member
25.	Jyoti Balwani, Training Officer	RVTI, Kolkata-91	Member
26.	Pragna H. Ravat, Training Officer	RVTI, Kolkata-91	Member
27.	Sarbojit Neogi, Vocational Instructor	RVTI, Kolkata-91	Member
28.	Nilotpal Saha, Vocational Instructor	I.T.I., Berhampore, Murshidabad, (W.B.)	Member
29.	Vijay Kumar, Data Entry Operator	RVTI, Kolkata-91	Member

## GENERAL INFORMATION

1. **Name of the Trade** : Dental Laboratory Equipment Technician
2. **N. C. O. Code No.** :
3. **Duration** : 2 Year(4 semesters)
4. **Power norms** : 12 Kw
5. **Space Norms (Laboratory)** : 120 Sq.mtr  
(Including 30 Sq. mtr Air-conditioned Laboratory for Wax-up section and Ceramic section)
6. **Entry Qualification** : Passed 10<sup>th</sup> class Examination
7. **Unit Size** : 20
8. **Instructor's/Trainer's Qualification**: One Qualified Dental Surgeon and  
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 Equipment Technician Under C.T.S**  
**DURATION:- six months**

**First Semester**

**Semester Code: DLT: SEM I**

Week No.	Practical	Theory
1 to 24	<p>Introduction of the course, Role &amp; responsibilities of Dental Technicians. Familiarisation of the Institute.</p> <p>Safety precautions to be observed during handling of chemical, laboratory apparatus equipments and machineries. <b>Knowledge of General Safety, Occupational health and hygiene.</b></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 &amp; DC)</p> <p>Practice on working with electrical furnaces, familiarisation with the Process of electroplating, electroforming, and anodising.</p> <p>Test for acids &amp; alkalis radicals.</p>	<p>Introduction of the course, Role &amp; 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 &amp; 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, Electrical Measurement and measuring instruments i.e. voltmeter, ammeters etc. Electrical safety, Low voltage systems, Isolation Transformer, Necessity of Earthing.</p> <p>Knowledge about motors, different types &amp; uses. Study of electrical features, heaters, temperature cantilever, electro 15-34 plating, electroforming and anodising.</p> <p>Study of work, power and energy, power, friction, momentum, centre of</p>

	Simple exercise on electroplating of metal.	<p>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.</p> <p>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>
25	Project work / Industrial visit (optional)	
26	Examination	

# Syllabus For The Trade Of Dental Laboratory Equipment Technician Under C.T.S

**DURATION:- Six months**

**Second Semester**

**Semester Code: DLT: SEM II**

Week No.	Practical	Theory
1-24	<p><b>Practice on:-</b>  <b>Impression:-</b>Preservation and Boxing-in.  <b>Cast:-</b>Preparation, trimming, including orthodontic casts.</p> <p>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.                      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 appliance.</p>	<p><b><u>Study of Dental Materials:</u></b>                      Study of composition, properties, uses, advantages &amp; disadvantages of the following materials:-</p> <p>Stone plaster, dental cement, plaster &amp; 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> <p>Electroplating (electric deposition).                      Study of Principles of wire bending</p>
25	Project work / Industrial visit (optional)	
26	Examination	

**Syllabus For The Trade Of Dental Laboratory Equipment Technician Under C.T.S**

**DURATION:- Six months**

**Third Semester**

**Semester Code: DLT: SEM III**

<p>1 – 24</p>	<p>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><b>ORAL ANATOMY:</b>  <b>Study of:-</b>                  =&gt; Elementary anatomy of structure of denture/bearing area.                  =&gt; Human dentition and occlusion.                  =&gt; Function of teeth and morphology of crowns of teeth.                  =&gt; Tooth carving in wax and plaster.                  =&gt; Muscles of mastication and facial expression.                  =&gt; Mastication duplication and phonation.                  =&gt; Movements of temporomandibular joint.                  =&gt; Cast preparation, trimming, including orthodontic casts.                  =&gt; Cast duplication – various methods.                  =&gt; Construction and bridge using porcelain and acrylic pontics.                  =&gt; Principles of bridge work – types of abutments, abutment &amp; pontics.                  =&gt; Bite blocks – base plates and wax rims.                  =&gt; Articulators Occlusal plane, protrusive balance, working bite, balancing bite, curve of space, compensating curve, lateral curve.                  =&gt; Principles of selection of teeth.                  =&gt; Immediate denture construction.                  =&gt; Kennedy’s classification of partial dentures.                  =&gt; Principles of partial denture, design, clasp surveyor, surveying, path of insertion and removal. Establishment of clasp seat, clasp’s parts, classification, function and reciprocation.                  =&gt; Principles of wire bending.                  Preparation of wrought clasps, occlusal rests and lingual bars</p>
<p>25</p>	<p align="center">Project work / Industrial visit (optional)</p>	
<p>26</p>	<p align="center">Examination</p>	



# Syllabus For The Trade Of Dental Laboratory Equipment Technician Under C.T.S

**DURATION:- Six months**

**Fourth Semester**

**Semester Code: DLT: SEM IV**

1 – 24	<p><b>Familiarisation with Casting machines:</b></p> <p>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. Construction and bridge using porcelain and acrylic pontics.</p>	<p><b>Study of:-</b></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</p> <p>Use of various types of expansion screws.</p> <p>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 &amp; pontics. Study of Construction and bridge using porcelain and acrylic pontics. Gypsum product and Die materials.</p>
25	Revision	
26	Examination	

**TRADE: DENTAL LABORATORY EQUIPMENT TECHNICIAN**

**LIST OF TOOLS & EQUIPMENT**

**A. TRAINEES TOOL KIT FOR 20 TRAINEES + ONE**

SL NO	NAME OF THE ITEM	QUANTITY
1.	Works knife	1 no each
2.	Works spatula	1 no each
3.	Plaster knife	1 no each
4.	Plaster spatula	1 no each
5.	Rubber bowel	1 no each
6.	Inlay cover	1 no each
7.	Some trimming bars for Acrylic, Metal, & ceramic	Each I no
8.	Flask (Different Size)	As required
9.	PKT- Set	Each I set
10.	Niddle Holder	1 no each
11.	R. R. Clear Powder	As required

**B. For Denture Section**

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

**C. 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.

**D. 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)

**E. 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.

### F. 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	1 no
6) Air compressor	1no

### G. For Model Section

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

### H. Audio Visual Aid

1. LCD Projector	1 No.
2. Computer with the configuration:	1 No.
3. Model of Oral Anatomy	2 no
4. Charts related to Dentistry	As required

### I. List of Chemicals & Store Materials (As required)

Sl.No.	Name of the Item
01.	Aestic Teeth
02.	Articulator.
03.	Artery Forceps
04.	Airoter Bar Holder
05.	Acrylic Polisher
06.	Bellabond (Ceramic)
07.	Buff (Woolen) & small
08.	Bff (Cloth)
09.	Black Brush
10.	B.P.Handle No. 30
11.	B.P.Blade No. 5.
12.	Bar Vol.
13.	Brush (Ceramic)
14.	Bar T.C.
15.	Ball Bearing
16.	Base Plate
17.	Bleaching Trays
18.	Blue Wax
19.	Cable Arm (GD)
20.	Cable Arm (India)
21.	Cosmo Teeth
22.	Crucible motor
23.	Cellophane Paper

24.	Cellophane Tape
25.	Cold Mould Seal (Liquid) Liquid)
26.	Curver (Wards)
27.	Curver Lacral)
28.	Cotton
29.	Cloth Bob Ring ( U / L)
30.	Chrome Cobalt (Metal)
31.	Ceramic Technique Kit
32.	Clamp (Iron)
33.	Cintered Diamond Bar
34.	Ceramic Polisher
35.	Cotton Holder
36.	Cold Cure (RR)
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
43.	Dioxing Flask
44.	Duralloy
45.	Denture Polisher
46.	Denture Works Pattern
47.	Dentrox Stone powder
48.	Disc (Separating/big
49.	Dentrex Plaster
50.	Disc Holder
51.	Elctro Waxer
52.	Enamel (VKM
53.	Expansion Screw
54.	Feltcone
55.	Forceps
56.	Flask (Metal)
57.	Green Sticky wax
58.	Glass Tube
59.	G.C. Spatula
60.	Glazing Powder
61.	Hindusthan Wax
62.	Hand Piece for hanging
63.	Hanging Motor
64.	Heat Cure (Powder &
65.	Investment Powder
66.	Iron clamp
67.	Impression Steel Tray

68.	Kulzer teeth
69.	Kenda Metal Polisher
70.	Luciton (liquid)
71.	Micro Polisher
72.	M M Handle
73.	Metal polisher
74.	Mandrils
75.	Modeling Wax
76.	Midzel Polisher
77.	Majordent teeth
78.	Modeling Liquid
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.	Transsulent
119.	Tissue Paper
120.	Ultra Stone Whiting Powder
121.	Wax Wire
122.	Wax Pattern
123.	Wash Opaque
124.	Whiting Powder