

Syllabus for the trade of

**PHYSIOTHERAPY TECHNICIAN**  
(SEMESTER PATTERN)

under  
CRAFTSMAN TRAINING SCHEME(CTS)

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-700091

## LIST OF MEMBERS ATTENDED TRADE COMMITTEE MEETING

Sl.No.	Name & Designation	Office	Remarks
1	Sri M.S. Lingaiah, Director	CSTARI, Salt Lake, Kolkata - 91	Chairman
2	Prof. S. Basu, Special Secretary Health and Family Welfare.	Govt. of West Bengal, Deptt. Of Health.	Member
3	Prof. S. Pal, Professor, Biomedical Engg.	Jadavpur University, Kolkata-72	Member
4	Sri Aminul Ahsan,	West Bengal Voluntary Health Association	Member
5	Sri Jnan Praakash Poddar	Indian Institute of Training & Dev. SRIJAN, Kolkata.	Member
6	Dr. Jyanta Kr. Paul	Nilratan Sarkar Medical College Hospital, Kolkata.	Member
7	Dr. Prabir Chowdhury, Radiation Oncologist.	Chittaranjan National Cancer Institute	Member
8	Dr. Soumitra Kr. Chowdhuri, Head,	Chittaranjan National Cancer Institute	Member
9	Dr. Suparna Majumdar, HOD/Deptt. Deptt. Of Radiology.	Chittaranjan National Cancer Institute	Member
10	Dr. P.K.Sarkar, Head, Health Physics Unit.	Variable Energy Cyclotron Centre.	Member
11	Prof. Anjali Mukherjee, Sivatosh Mukherjee Science Centre	S .M. Sc., Kolkata - 25	Member
12	Dr. R. Kumar Angrish	Life Aids Physiotherapy Unit, New Alipore, Kolkata.	Member
13	Mrs. Prachi Angrish	- do -	Member
14	Sri R. Senthil Kumar, JDT	CSTARI, Salt Lake, Kolkata-91	Member
15	Sri M.M. Gera, DDT	CSTARI, Salt Lake, Kolkata-91	Member
16	Sri T. Mukhopadhyay, DDT.	CSTARI, Salt Lake, Kolkata-91	Member
17	Sri S. Kumar, JDT	CSTARI, Salt Lake, Kolkata-91	Member
18	A.Chakraborty, ADT	CSTARI, Salt Lake, Kolkata-91	Member
19	Sri P.K. Koley, T.O.	CSTARI, Salt Lake, Kolkata-91	Member
20	Mrs. Anindita Chakraborty, Psychologist.	Salt Lake, Kolkata	Special Contributors
21	Dr. N.L. Dutta Banik	Kolkata.	Special Contributors
22	Dr. K.L. Ganguli	Bharat Seva Shram Sangha	Special Contributors

**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.**

<b>Sl. No.</b>	<b>Name &amp; Designation</b>	<b>Organisation</b>	<b>Remarks</b>
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. Mukherjee, 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

Physiotherapy Technician

2. NCO Code No

3. Duration

: One year (Two semesters)

4. Power Norms

: 3 Kw. : 100 sq.

5. Space Norms

Mtrs

6. Entry Qualification

: 10<sup>th</sup> class passed

7. Unit Size (No. of students)

: 16

8. Instructor's/Trainer's Qualification:

(a) Degree or Diploma in physiotherapy with 1 or 2 years post qualification experience respectively.

Or, NTC/NAC in the relevant trade with 3 years post qualification experience.

(b) Desirable Qualification: Preference will be given to a candidate with Craft Instructor Certificate..

**\*Note:** At least one Instructor must have Degree or Diploma in relevant field.

**SYLLABUS FOR THE TRADE OF PHYSIOTHERAPY TECHNICIAN**

**Under Craftsman Training Scheme (CTS)**

**Duration : Six Month**

**First Semester**

**(Semester Code no. PHT - 01)**

<b>Week No.</b>	<b>Trade Practical</b>	<b>Trade Theory</b>	<b>Engineering Drawing</b>	<b>Workshop Cal. &amp; Science</b>
1.	Demonstration & A.V. display	<b>i) Introduction to Anatomy/Physiology</b> a) Definition & the sub-divisions of anatomy. b) Anatomical & fundamental position. c) Anatomical regions, sections & planes. The descriptive Anatomical terms	Basic concept of Engineering Drawing , 1 <sup>st</sup> & 3 <sup>rd</sup> angle projection .	Force-definition, diagrammatic representation. Classification of forces. Concurrent, coplanar and co-linear forces. Composition and resolution of forces, angle of pulls of muscle.
2.	1. Techniques of Massage of different parts of the Human Body- 2. Kynationology 3. Head & Neck Massage b) Arms Massage c) Back Massage d) Upper leg, Lower leg & Foot Massage 4. Therapeutic application of Massage (such as Bell's palsy, Paraplegia, Hemiplegia etc.)	<b>ii) Osteology</b> a) Basic terminologies b) About the skeleton c) Brief descriptions about Bone & Cartilage (structure, types , functions etc.) d) Identification, side determinations & structural details of bones of skull, Thorax, Vertebral column, Upper & Lower extremities	-do-	-do-
3.	Demonstration & A.V. display	<b>iii) Orthology</b> a) Definition & classifications of joints b) The terms related to the movements of joints c) Description of joints of the upper & lower extremities with their ligamental	Basic free hand sketches of various geometrical shapes.	Calculations of percentages. Ratio and proportion, Inverse-square law. Geometry of triangles.
4.	Demonstration & A.V. display	<b>iv) Neurology</b> a) Knowledge of CNS and its pathology. b) Knowledge of Central Nervous System & its pathology. c) Description about Spinal nerves d) Nerve plexus of the body with their distributions (cervical plexus, brachial plexus, limbo-sacral plexus) <b>v) Myology</b>	-do-	Momentum, its principles and practical applications.

		<p>a) Classifications &amp; structures of Muscles</p> <p>b) Description of all major muscles with their origin, insertion, nerve supplies, blood supplies &amp; actions.</p> <p>c) Muscles acting on joints of upper &amp; lower extremities</p>		
5.	<p>Demonstration &amp; A.V. Display</p> <p>Study of different X-Ray plates</p>	<p><b>vi) Visceral Anatomy</b> Description of organs related to Digestive, Respiratory, Circulatory, Excretory &amp; Reproductive System (in brief)</p> <p><b>vii) Radiological Anatomy</b> Demonstration of some normal and abnormal x-ray plates.</p>	Types of lines and its applications, line practice.	Laws of Friction and its applications.
6-7	<p>Identification of bones, nerve routes and muscle attachment, related surface, reading X-ray plates, types of joints &amp; their movements in different axes, Nerve muscle physiology, measurement of B.P. pulse &amp; idea of reflexes and their examination</p>	<p><b>viii) Applied Anatomy</b> Common clinical conditions of Axial &amp; Appendicular skeleton such as, a) Carpal tunnel syndrome b) Erb's palsy c) Klumpke palsy d) De Quervain's disease e) Dupuytren contracture g) Trigger finger, Mallet finger h) Wrist ganglion i) Rotator cuff Impingement Syndrome (R.C.I.S) j) Fixed Flexion Deformity (F.F.D) k) Wrist drop l) Road Traffic Accident (R.T.A) m) Deltoid ligament rupture n) Achilles tendon rupture o) Trendelenburg's sign p) Tarsal tunnel syndrome q) Genu valgum/vera r) Coxa valgum/vera s) Hallux valgus t) Foot drop</p>	Types of lines and its applications, line practice. Lettering practice.	<p>Electric current, voltage and resistance. Ohm's law and its applications. Introduction to AC and DC circuits. Measurement of current and voltage.</p>
8.	<p>Nerve muscle physiology, measurement of B.P. Pulse and idea of reflexes and their examination</p> <p>Case history recording &amp; follow-up in Clinic on patient.</p>	<p><b>PHYSIOLOGY</b></p> <p>i) Cell- definition, structure &amp; function - Tissues - structure, function.</p> <p>ii) circulatory system</p> <p><b>a)</b> Structure &amp; function of heart</p> <p>b) Heart rates &amp; Heart sound</p> <p>c) Blood circulation d) Composition &amp; function of Blood e) Blood pressure &amp; the influencing factors</p> <p>iii) Nervous system</p> <p><b>a)</b> About the Nervous tissue- Neuron (structure &amp; function), Neuroglia (Definition)</p> <p>b) About the Nerve fibers- motor &amp; sensory</p>	Reading of different types of scales and its applications.	Gravity: definition, line of gravity, centre of gravity.

- c) Divisions of Nervous system
- d) Central Nervous System-classifications, structures & functions of Brain & Spinal cord (in brief)
- e) Peripheral Nervous system-Cranial Nerves (names & functions) & Spinal Nerves (introduction)
- f) Sensory System-pain

**iv) Skin & Temperature regulation-**

- a) Structure of skin
- b) Function of skin
- c) Temperature regulation system

9.	-do-	<b>v) Food &amp; Nutrition-</b> a) Definition & types of Food (carbohydrate, protein, fat, minerals, Vitamins, water with example & brief descriptions b) Balance diet c) Relation between Food & Nutrition <b>vi) Digestive System-</b> a) Structure & function b) Details of food materials c) Steps of Digestion , Absorption & metabolism (in brief) c) Neurological factors related to Digestion	-do-	-do-
10.	-do-	<b>vii) Respiratory system-</b> a) Structure & Function b) Process of Respiration b) Technical datas related to pulmonary activity in relation to stress & rest c) Cardio-Respiratory relation d) Artificial Respiration e) Neurological control <b>viii) Endocrinology-</b> a) Definition, character & function of Hormones b) About the Hormone secreting glands c) Hormonal control on physiological activities <b>ix) Excretory system-</b> a) About the nephron b) Structure & function of Kidney c) Formation of urine d) Micturation	Free hand sketches of different types of tools used related to the trade.	Equilibrium: supporting base, types and stability of equilibrium.
11.	Antenatal and postnatal exercises.	<b>GYNAECOLOGY &amp; OBSTETRICS</b> 1. Introduction to Human Reproductive System 2. Physiology of pregnancy	-do-	Work, power, energy: types of energy.

12.	Identification of different Tools , equipment	<b>PHYSIOTHERAPY</b> <b>i. Introduction:</b> a) definition of Physiotherapy Terms of Physiotherapy i.e. Electrotherapy, Exercise-therapy, Massage-therapy, Ergonomics, Rehabilitation. d) definition of electrotherapy, Safety precautions in Electrotherapy. e) Physical modalities, which are used in Physiotherapy.	Study of the drawing related to various bones of human.	Levers: definition, function, classification and application of levers in physiotherapy and order of levers with example of lever in human body
13.	Application of ice pack, cold pack, ice towels, ice bath, ice cube message.	<b>2. Cryo therapy :</b> a) Physiological effects b) Methods of application (ice pack, cold pack, ice towels, ice bath, ice cube massage, vapocoolant sprays) c) cryokinetics d) Indications & Contraindications	-do-	-do-
14.	Demonstration of hot packs, Kenny packs, hot water bag etc. & its applications.	<b>3.Thermotherapy: a) Superficial Heating Agents-</b> A. Hot packs- Physiological effects, types of Hot Packs (hydrocollators, Kenny packs, hot water bag, electrical heating pads) with their Techniques of application, Indications & Contraindications	-do-	-do-
15.	Demonstration and Practice on wax bath preparation & its applications.	<b>B. Wax bath</b> - About the wax, Descriptions of a Wax bath Unit, Composition & method of preparation of wax bath, physiological effects, Techniques of application, Indications & Contraindications.	Free hand sketches of bones, spinal cord and joints.	Pulleys: system of pulleys, types and applications.
16.	Demonstration and Practice on infra-red applications.	<b>C. Infra-Red Radiation-</b> About the Infra-red rays, Sources of Infra-red rays, Technical datas, Physiological effects, Techniques of application, Terminations of IRR, Indications & Contraindications.	-do-	-do-
17.	Demonstration on application on S.W.D.	<b>b) Deep Heating Agents -A) S.W.D-</b> meanings of Short-wave & Diathermy, Effects of S.W.D. Technical datas, Descriptions of a S.W.D Instrument, Method of application, Positioning of Electrode pads During, Treatment, Dose & Duration of treatment, Indications & Contraindications.	-do-	Specific gravity, hydrostatic pressure, Archimedes principle. Properties of water and other liquids.
18.	Demonstration and Practice	<b>B) M.W.D-</b> Introduction. <b>C) U.S.T-</b> About the Ultra sound, Difference among Ultra sound, Infra sound & Audible sound, Effects of U.S.T in Human body, Technical datas, Descriptions of an U.S.T	-do-	-do-



		Instrument, Description about different types of Coupling medium, Method of application of U.S.T, Dose & Duration of treatment, Indications & Contraindications.		
19-21	Demonstration. Demonstration on Applications of TENS	<p><b>Stimulators-</b></p> <p><b>a) Faradic</b> - About the Faradic type of current, Technical datas, Description of a Faradic Stimulator &amp; Electrodes, Physiological effects, Method of application (Motor point stimulation method, Nerve conduction, method, Unipolar &amp; Bipolar Faradic Bath method etc.), Application of continuous &amp; Surged Faradic, Dose &amp; Duration of treatment, Indications &amp; Contraindications.</p> <p><b>b) Galvanic-</b> About the Galvanic type of current, Technical datas, Descriptions of a Galvanic Stimulator, Physiological effects, Method of application (Sensory point or Determinations stimulation method, ath method etc.), application of continuous &amp; Interrupted Galvanic, Dose &amp; duration of treatment, Indications &amp; Contraindications.</p> <p><b>c) T.E.N.S-</b> Meanings of 'transcutaneous', difference between transcutaneous &amp; percutaneous, Technical datas, Description of a T.E.N.S., Physiological effects ( among with pain gate Theory), Method of application (Trigger point stimulation method, Acupuncture point stimulation method etc.), Placements of T.E.N.S electrodes, Application of continuous, surged &amp; burst mode. Dose &amp; Duration of treatment, Indications &amp; contraindications.</p> <p><b>d) I.F.T-</b> Introduction, application, Indications &amp; Contraindications.</p>	-do-	Buoyancy law of flotation. Factors determining up-thrust, effect of buoyancy on movements. Equilibrium of floating body. Bernoulli's theorem.
22. to 24.	Demonstration on application on U.S.T.etc. Demonstration on basic massage techniques, gait training.	<p><b>Clinical Decision Making in Electrotherapy-</b> Differential application of S.W.D, U.S.T, F.S, G.S, T.E.N.S, I.F.T, I.R.R, Wax bath.</p> <p><b>MESSAGE THERAPY &amp; REHABILITATION.</b></p> <p>a) Definition of Massage</p> <p>b) Aim of Massage</p> <p>c) Physiological effects of Massage</p> <p>d) Therapeutic uses of Massage</p>	-do-	-do-

		e) Contraindications of Massage f) Materials used in Massage (oil, powder, ice etc.) g) Rules & direction of Massage h) Types of Massage		
25.		<b>(i) Project Work</b>	<b>(ii) Industrial Visit (Optional)</b>	
26.		<b>Examination</b>		



		Biomechanics: Basic terminologies & practical approach		
8. to 13.	Demonstration.	<p><b>B. Fundamentals of Exercise</b></p> <ol style="list-style-type: none"> <li>1. Definition of Exercise</li> <li>2. Benefits of Exercise</li> <li>3. Physiological changes during Exercise.</li> <li>4. Classifications of Exercise- active, passive, resistive, isometric, functional, stretching, strengthening, closed-chain, open-chain etc.</li> </ol> <p><b>C. Applied Exercise Therapy</b></p> <ol style="list-style-type: none"> <li>1. Manual Muscle Testing</li> <li>2. Techniques of Stretching Exercise- Region of shoulder, elbow, wrist, trunk, hip, knee, ankle</li> <li>3. Exercises for Muscles Strengthening - Region of shoulder, elbow, wrist, trunk, hip, knee , ankle</li> <li>4. Techniques of P..F.</li> <li>5. Techniques of Breathing Exercises.</li> <li>6. Exercises for Co-ordination &amp; Balance</li> <li>7. Exercise with Instruments</li> <li>8. Exercise for increase ROM</li> <li>10. Goniometry</li> <li>11. Exercise as a Treatment of Diseases <ol style="list-style-type: none"> <li>a) Cervical Spondylosis</li> <li>b) Lumber Spondylosis</li> <li>c) Ankylosing Spondylosis</li> <li>d) Tennis Elbow e) Golfers Elbow f) Joint Stiffness</li> <li>g) Frozen Shoulder h) Bell's palsy I) Paralysis j) out k) R.A l) O.A. m) Foot Drop n) Wrist Drop o) Perkinsonism</li> </ol> </li> </ol>	Drawing of major muscles , nerve supplies & blood supply & action. Drawing of different joints of human organ. Drawing of Digestive, Respiratory & Excretory system	Definition of radiation and its types. Electromagnetic (EM) radiation. Radiation as a wave motion. Wave length, frequency, amplitude, velocity and their relation. Concept of Quanta. Energy of radiation . Electro magnetic spectrum , common properties of radiation
14. to 19.	Demonstration.	<p><b>ORTHO-NEURO-GENERAL Orthopaedical condition:</b></p> <p>Etiology, C/F, Investigations &amp; Physiotherapeutic Management of the followings: -i) Kyphosis ii) Lordosis iii) Scoliosis iv) Cervical Spondylosis v) Lumber Spondylosis vi) Ankylosing Spondylosis vii) Tennis Elbow viii) Folger's Elbow ix) Gout</p>	Different drawing of bones, nerve roots & muscle attachment. Sketches of heart Sketches of Neurons and nerves.	<b>Bio chemistry:</b> Chemistry of water, Mineral, Vitamins, Protein, Carbohydrate, Lipids, Nucleic acids, Enzymes, Blood, Extra cellular fluids.

	<p>x) Osteo-arthritis  xi) Rheumatoid Arthritis  xii) Frozen Shoulder  xiii) Fracture xiv) Dislocation &amp; subluxation xv) Sprain  xvi) Tendonitis. xvii) Rickets  xviii) Osteomalacia  xix) Osteomyelitis  xx) Calcaeneal Spar xxi) Flat foot.</p> <p><b>Neurological Condition:</b>  Etiology, C/F, Investigations &amp; Physiotherapeutic Management of the followings:-  i) Cerebral palsy  ii) Hemiplegia iii) Paraplegia  iv) Quadriplegia v) Myalgia vi) Fibromysities vii) Polio Myelitis viii) Parkinsonism  ix) Bell's palsy x) C.V.A  xi) Upper &amp; Lower Motor Neurone diseases  xii) Peripheral Nerve Injury  xiii) Spinal Cord Injury  xiv) Sciatica</p> <p><b>General condition:</b>  Etiology, C/F, Investigations &amp; Physiotherapeutic Management of the followings: -  i) Obesity ii) Burns iii) Epilepsy etc.</p>	<p>Sketches of digestive system  Sketches of respiratory system  Sketches of excretory system</p>	<p>Metabolism of Carbohydrate, Proteins, Lipids, Amino acids, Hemins, Purimes, Pyrimidies and Nucleic Acids. Nature, properties, Kinetics and mechanism of action of energy and co-enzymes, Biological oxidation and bio-energetic. Basic Ideas of Chemical Reactions</p>
20. to 24.	<b>CASE STUDIES</b>		
25.	<b>Revision</b>		
26.	<b>Examination</b>		

LIST OF TOOLS AND EQUIPMENT  
For Physiotherapy Technician

For a batch of 16 trainees.

Sl. No.	Items	Quantity.
1	Diagram of -(i) Human Organs "I Exercises charts J	1 set
2	Wax bath	1 no.
3	I. R. Radiator	1 no.
4	Short wave Diathermy unit	1 no..
5	Electric Muscle nerve Stimulator	1 no.
6	Battery 6 V & 12V	2 nos.
7	Battery Eliminator 6V, 9V, 12V	2 nos.
8	Traction set up including Pulley, Weight Table unit	1 set.
9	Apparatus for various exercises-Shoulder Wheel, Shoulder pulley, Finger exerciser.	1 Set Assorted
10	Durra mats	10 nos.
11	Table	1 no.
12	Chair with Desk	16 nos.
13	Cup Board	2 nos.
14	IFT (Interferential Therapy)	1no.
15	TENS (Trans Electric Nerve Stimulator)	1 no.
16	Ultra sound Apparatus	1 no.