

**MAHARASHTRA STATE BOARD OF VOCATIONAL EDUCATION EXAMINATION, MUMBAI**

1	Name of Course	<b>Diploma Course in Physiotherapist (W.E.F. 2015-16)</b>
2	Course Code	<b>201410</b>
3	Max.No.of Students Per Batch	25
4	Duration	2 year
5	Type	Full Time
6	No.Of Days / Week	6 days
7	No.Of Hours /Days	7 Hrs
8	Space Required	Theory Class Room – 200 sqft, Lab Sub.– 500 sqft, Lab Elective - 400 sqft <b>Total = 1100 Sq.ft.</b>
9	Minimum Entry Qualification	S.S.C. Pass
10	Objective Of Course	To understand basic of physiotherapist techniques, Anatomy, Psychology, Medical and surgical condition, Orthopaedics, Electropathy and Exercise Therapy
11	Employment opportunities	He will assist the qualified person.
12	Teachers Qualification	For Vocational Subject -Diploma in Physiotheoraphy and Nursing +Experience, B.P.Ed or Bachelor in Yoga Education or equivalent + Experience or Equivalent and for Non Vocational Subject Master Degree in concern Subject.

**13] Teaching Scheme –**

Ppr		Subject Code	Clock Hours / Week		Total
			Theory	Practical	
1	English (Communication Skill)	<b>90000001</b>	2 Hrs	1 Hrs	3 Hrs
2	Elective – I		2 Hrs	1 Hrs	3 Hrs
3	Elective – II		2 Hrs	1 Hrs	3 Hrs
4	Anatomy, Physiology and Psychology	<b>20140022</b>	3 Hrs	8 Hrs	11 Hrs
5	Electrotherapy, Biomechanics and Exercise therapy	<b>20140023</b>	3 Hrs	8 Hrs	11 Hrs
6	Orthopaedics, Neurology, Medical and Surgical Condition	<b>20140024</b>	3 Hrs	8 Hrs	11 Hrs
<b>Total</b>					<b>42 Hrs</b>

**14] Internship Two Month Summer Internship from 1st May to 30th June is Compulsory.**

**15] Examination Scheme – Final Examination will be based on syllabus of both years.**

Ppr	Subject	Sub Code	Theory			Practical			Total	
			Dur	Max	Min	Duration	Max	Min	Max	Min
1	English (Communication Skill)	<b>90000001</b>	3 Hrs	70	25	3 Hrs	30	15	100	40
2	Elective – I		3 Hrs	70	25	3 Hrs	30	15	100	40
3	Elective – II		3 Hrs	70	25	3 Hrs	30	15	100	40
4	Anatomy, Physiology and Psychology	<b>20140022</b>	3 Hrs	100	35	3 Hrs	100	50	200	85
5	Electrotherapy, Biomechanics and Exercise therapy	<b>20140023</b>	3 Hrs	100	35	3 Hrs	100	50	200	85
6	Orthopaedics, Neurology, Medical and Surgical Condition	<b>20140024</b>	3 Hrs	100	35	3 Hrs	100	50	200	85
<b>Total</b>									<b>900</b>	<b>375</b>

**16] Teachers –** Three Teachers per batch for vocational component. For English, Elective-I & II guest faculty on clock hour basis.

**17] Student have to choose any one subject for Elective-I and Elective-II from below given subjects**

18	<b>a) For Elective I – Student can choose any one subject</b>	<b>Code Subject Name</b> 90000011 Applied Mathematics 90000012 Business Economics 90000013 Physical Biology (Botany & Zoology) 90000014 Entrepreneurship 90000015 Psychology
	<b>b) For Elective II – Student can choose any one subject</b>	<b>Code Subject Name</b> 90000021 Applied Sciences(Physics & Chemistry) 90000022 Computer Application 90000023 Business Mathematics

**Subject – 1 Anatomy, Physiology and Psychology - 1<sup>st</sup> year**  
**(Subject Code : 20140022)**

Subject – 1 – Theory - 1 <sup>st</sup> year	Subject – 1 – Practical - 1 <sup>st</sup> year
<p><b>ANATOMY – THEORY</b></p> <p><b>1. Emphasis to be placed on Topographical, skeletal, Neuro Muscular and functional aspects of Anatomy 5 hrs.</b></p> <p>a) Planes of the Humanbody  b) Systems of the Body  c) The Units of structure and Functions of Cell</p> <p><b>2. Osteology</b></p> <p>a) Anatomical Position, planes, surfaces, relationship of parts of the body - proximal and distal  b) Bones - Types of Bones, Function, repair, structure of long bone, vertebral column, type of vertebral bones, and surface land marks.</p> <p><b>3. Arthology</b></p> <p>a) Classification of joints  b) construction of joints  c) Motions of joints  d) Articulations - articular surfaces and types of joints</p> <p><b>4. Myology</b></p> <p>a) Types of Muscle tissue and Fascia  b) Muscles of upper extremity, lower extremity, trunk, eye and face etc.  c) Origin, function, nerve supply and actions  d) Muscle spindle in detail</p> <p><b>5. Cardio - vascular system</b></p> <p>a) The heart main arteries, veins and capillaries  b) Lymphatic circulation</p> <p><b>6. Nervous System</b></p> <p>a) Division and function of Nervous system  b) Nerve tissue - neurone, nerve fibre  c) spinal cord, brain and their structure  d) Name the peripheral and cranial nerves, supplying the major functional group.  e) Cerebro Spinal Fluid</p> <p><b>7. Respiratory System.</b></p> <p>a) Anatomy of respiratory organs, Air passages, lungs, bronchial tree and segments</p> <p><b>8. Digestive System</b></p> <p>a) Anatomy of digestive organs, Oesophagus stomach, intestines  b) the digestive glands</p> <p><b>9. Urinary System</b></p> <p>a) Anatomy of urinary organs, kidney, ureter, urinary bladder</p> <p><b>10. Reproductive System</b></p> <p>a) Male and female reproductive organs Physiology</p> <p><b>PHYSIOLOGY</b></p>	<p><b>ANATOMY PRACTICAL</b></p> <p>1. Identification and description of skeletal system and joints  2. Demonstration of Torax with organs in situations  3. Identification of various organs with the abdomen  4. Description of brain and peripheral nerves  5. Records of various system diagram and labelling</p>

<p><b>1. Animal Cell</b></p> <p><b>2. Blood</b></p> <p>a) Composition of blood - plasma, coagulation phenomenon, blood groups</p> <p><b>3. Heart and circulation</b></p> <p>a) Properties of heart muscles</p> <p>b) Cardiac cycle</p> <p>c) Heart sounds</p> <p>d) B.P.</p> <p><b>4. Respiration</b></p> <p>a) Mechanism of breathing</p> <p>b) Lung volumes and capacities</p> <p>c) Dyspnoea</p> <p><b>5. Neuromuscular System</b></p> <p>a) Phenomenon of muscle contraction</p> <p>b) Change in body during exercise</p> <p>c) synapse</p> <p>d) Neuro muscular junction</p> <p>e) Degeneration and generation of nerves</p>	
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## Subject – 1 Anatomy, Physiology and Psychology - 2<sup>nd</sup> year

Subject – 1 – Theory – 2 <sup>nd</sup> year	Subject – 1 – Practical – 2 <sup>nd</sup> year
<b>6) C.N.S.</b> a) Functions of Hypothalamns b) Cerebellum c) Thalamus d) Basal ganglia <b>7. Metabolism of fat, carbohydrates proteins</b> <b>8. Excretony System</b> a) Functionas of kidney b) Micturation phenomenon c) Skin functions and temp regulation <b>9. Endocrine system</b> a) Functions of pancreas, pitutary and Thyroid <b>10. Reproductive System</b> a) Mensturation b) Physiological changes during pregnancy c) Contraceptive method	<b>PHYSIOLOGY PRACTICAL</b> <b>1. Study of Microscope</b> <b>2. Recording of changes during exercise</b> a) B.P. b) Pulse rate c) Respiratory rate <b>3. Recording of B.P. .</b> <b>4. T.P.R. Description</b> <b>5. Records of various physiological system with labels</b>
1. What is Psychology 2. Behaviour a) Types of abnormal behaviours 3. Intelligence a) Evaluation, Mental Retardation, I.Q. 4. Aptitudes 5. Motivation a) Types and methods 6. Personality development, assesment and disorder 7. Learning 8. Remembering and forgetting 9. Thinking perception and attending 10. Individual differences 11. Frustrations and conflicts 12. Psyc neurotic and psychosomatic disorder 13. Child adolscent and geriatric psychology 14. Alcoholism and drug addiction 15. Menopausal Syndrome 16. Functional Psychosis	<b>PRACTICALS</b> 1. Intelligence Evaluation 2. Intelligence test 3. Binets scale & stanford Binet scale 4. Personality evaluation a) Human Figure test, drawing, painting & play b) Wechrlers memory scale 5. Visits to psychiatric institutions 6. Evaluation of psyciatric patients a) Patients with different behavioural disorders 7. Treatment of patients with Alcoholism and drug addiction 8. Treating different psychiatric conditions under supervision of psychiatrist

**Subject – 2 - Electrotherapy, Biomechanics and Exercise therapy - 1<sup>st</sup> year**

**(Subject Code : 20140023)**

<b>Subject – 2 – Theory – 1<sup>st</sup> year</b>	<b>Subject – 2 – Practical – 1<sup>st</sup> year</b>
<p><b>I. Biomechanics :</b></p> <p>1. Mechanical Principles Definition of Biomechanics, Axis and planes, kinematics, kinetics, gravity, center of gravity, line of gravity, base of support, equilibrium, fixation and stabilisation, force, type of forces, levers of the body and their mechanical advantage, pulleys, springs, elasticity, types of muscle contraction, range of muscle work, the group action of muscles, limb length measurement</p> <p>2. Gait Analysis Definition, stages of gait, pathological gaits</p> <p><b>II. Exercise Therapy</b></p> <p>I. Introduction to Physiotherapy - Role of physiotherapy General considerations, principles of treatment - Methods and effects</p> <p>1. Starting positions</p> <p>2. An introduction to exercise therapy : Aims of exercise therapy, techniques of exercise therapy, Goniometry in detail</p> <p>3. Passive Movements Definition, classification, principles effects and uses of passive movements</p> <p>4. Active Movements Definition, classification, techniques, effects and uses of active movements</p> <p>5. Relaxation Definition, techniques of general and local relaxation</p> <p>6. Joint Mobility - Introduction, classification of Joints, limitation of joint range of motion, mobilising methods, Hip, Knee and Ankle.</p> <p>7. Muscle Strength - Introduction type of muscle work, range of muscle work, muscular weakness and paralysis, prevention of muscle wasting,</p> <p>8. Stretching - Definition, classification, effects and uses</p>	<p><b>EXERCISE THERAPY PRACTICALS</b></p> <p>1. Description of Exercise Therapy equipments and its uses.</p> <p>2. Passive Movements, Active movements (resisted exercise)</p> <p>3. Gait and Gait training</p> <p>4. Goniometer, suspension therapy</p> <p>5. Joint mobilisation techniques Shoulder, elbow, hip and knee</p> <p>6. Muscle strengthening techniques</p> <p>8. Breathing Exercises, postural drainage</p> <p>9. Massage</p> <p>10. Manual Muscle testing</p>

## Subject – 2 - Electrotherapy, Biomechanics and Exercise therapy - 2<sup>nd</sup> year

Subject – 2 – Theory – 2 <sup>nd</sup> year	Subject – 2 – Practical – 2 <sup>nd</sup> year
<p>9. Neuromuscular Coordination Frenkel's Exercises</p> <p>10. Proprioceptive Neuromuscular facilitation Definition, classification, effects and uses</p> <p>11. Hydro Therapy - Definition, indications, contraindications, dangers and precautions</p> <p>12. Breathing exercises, postural drainage</p> <p>13. Posture - Definition, classification, postural training</p> <p>14. Suspension therapy (types), Mat exercises, Re-education board, swiss ball, shoulder wheel, CPM, finger ladder, parallel bars, medicine balls, equilibrium board, (definition, uses of all the above equipments)</p> <p>15. Walking aids and gait training</p> <p>16. Massage in detail</p> <p><b>ELECTROTHERAPY</b></p> <p>1. Physics and Basic Electrical Components Electromagnetic radiation, Conductors &amp; Non-conductors of electricity, Transmission of heat, physical effects of heat, static electricity, electric shock, earth shock.</p> <p>2. Methods of heating the tissue : - Physiological effects of heat, Paraffin Wax bath, Hot packs, Moist packs, Infra-red rays, U.V.rays.</p> <p>3. Low frequency currents : -Faradic &amp; Galvanic currents, SD curve, Iontophoresis, TENS.</p> <p>4. Cryotherapy</p> <p>5. Medium Frequency Current : Interferential therapy</p> <p>6. High Frequency currents : SWD, MWD, US, (Basics of Laser) Difference between low frequency &amp; high frequency currents In all the above topics definition, production, preparation of apparatus &amp; patient, physiological effects, techniques, dosage, indication, contraindication, dangers and precautions are to be covered.</p>	<p><b>PRACTICALS</b></p> <p>1. Details of electrotherapy equipment its knowledge and its operation.</p> <p>2. Assisting to qualified physiotherapist in treating patients</p> <p>3. Treatment or application of equipment on models.</p> <p>i) Wax bath</p> <p>ii) Moist Pack</p> <p>iii) Infra red</p> <p>iv) Hot packs</p> <p>v) SWD</p> <p>vi) US</p> <p>vii) TENS</p> <p>viii) IFT</p> <p>ix) Stimulator</p> <p>x) Traction</p> <p>xi) Cryotherapy</p> <p>xii) U.V. Rays</p> <p>xiii) Iontophoresis</p>

**Subject – 3 - Orthopaedics, Neurology, Medical and Surgical Condition - 1<sup>st</sup> year**

**(Subject Code : 20140024)**

<b>Subject – 3 – Theory – 1<sup>st</sup> year</b>	<b>Subject – 3 – Practical – 1<sup>st</sup> year</b>
<b>MEDICAL &amp; SURGICAL CONDITIONS</b> <b>General Medicine with Physiotherapy Management</b> 1. Infections Diseases - Bones and Joints Rickets, scurvy, Osteo malacia and osteoporosis 6 3. Respiratory disorders , Asthma, Bronchitis, Emphysema Bronchitis 4. Cardio Vascular disorders Myocardial Infraction Angina Congenital heart diseases Ischechemic heart diseases 5. Endocrinal disorders , Dwarfism, Gigantism 6. Tetanus` 7. Gas Gangrene 8. S.T.D. AIDS, Syphilis, Gonorrhoea 9. LEprosy and tuberculosis <b>Surgery with PT Management</b> Tyres of incisions Anaesthesia Types Burns - classification, degree of burns contractures, skin graft and flaps Pre and Post Operative Physiotherapy Management for following surgeries Cardiac surgery Respiratory Surgery 3) Knee Replacement Gynaecology 1) Various stages of Labour and clinical management 2) Physiological changes during pregnancy and physiotherapy Management Paediatrics 1) Cerebral palsy and Pt Management 2) Developmental milestones 3) Hydro Cephalus and meningiocele 4) Polio-causes, stages, prevention medical and P.T.Management Dermatology . Dermatitis, Eczema, acne, Psoriasis, heucoderma, Alopecia	<b>MEDICAL AND SURGICAL CONDITIONS</b> 1. Case history of each patient Respiratory conditions - Aasthma, Bronchitis, Emphyrema, Bronchiectasis 2. Case history of Cardiac Patients . 1) Myocardial infraction 2) Angina 3) Tschemic heart disease 4) Congenital heart disease 3. Postural drianage and Breathing Exersises 4. Description and Physiotherapy Management for Medical conditions 1) Burns 2) Leprosy 5. Pre and post operative management for 1) Cardiac Surgery 2) Respiratory Surgery 6. Physiotherapy Management for 1) Acne Vulgaris 2) Psoriasis

<b>Subject – 3 – Theory – 2<sup>nd</sup> year</b>	<b>Subject – 3 – Practical – 2<sup>nd</sup> year</b>
<p><b>ORTHOPAEDICS &amp; PHYSIOTHERAPY</b></p> <ol style="list-style-type: none"> <li>1. Introduction, orthopaedic Surgery definition and scope brief history</li> <li>2. Sprains and strains, dislocation - its types - causes and principle of treatment</li> <li>3. Fractures - types, displacement, general symptoms healing process of treatment, union, delayed union and malunion and non union</li> <li>4. Fractures of upper limb and lower limb, pelvis and Vertebra including MP and IP joint dis location and Colle's, montegial Fratures of phalanges and meta carpels.</li> <li>5. Crush injury of Hand</li> <li>6. Bennets Fracture, mallet finger, tenosynovites trigger finger</li> <li>7. Myositis, tennis elbow, supracondylar</li> <li>8. Volkman's contracture, recurrent dislocation of shoulder and Periathritis of shoulder</li> <li>9. Brachial Plexus, carpeltunnel syndrome</li> <li>10. Osteo arthritis, Rheumatoid arthritis rthritis ankylosis spondylitis, osteoporosis</li> <li>11. Metabolic disorder - Ricketes, Scurvy, Osteomalacia</li> <li>12. Scoliosis, Kyphosis, lordosis, cervical spondylosis, lumbar spondylitis</li> <li>13. C.T.E.V., C.D.H. Torticolis</li> <li>14. I.V.D.P.</li> <li>15. Genuvalgum, Genuvarum, knee deformitis, Genu recurvatum.</li> <li>16. Tuberculosis of Bones</li> <li>17. Amputations and types role of Physiotherapy counselling</li> <li>18. Orthopaedic appliances - splints prosthesis and Orthotics.</li> <li>19. Quadriceps contracture</li> <li>20. Foot deformities - flat foot Calcaneal Spur Plantar Fascities</li> <li>21. Paraplegia, Quadriplegia</li> </ol>	<p><b>ORTHOPAEDICS &amp; NEUROLOGY</b></p> <ol style="list-style-type: none"> <li>1. Taking case history of different Orthopaedic and neurological conditions</li> <li>2. Identification of different Orthotics and porsthetics</li> <li>3. Description and Physiotherapy Management of following conditions                         <ol style="list-style-type: none"> <li>i) Hemiplegia patients</li> <li>ii) Polio Myelitis</li> <li>iii) Parkinsonism</li> <li>iv) Multiple Sclerosis</li> <li>v) GBS</li> <li>vi) Spinabifida</li> <li>vii) Cerebral Ataxia</li> <li>viii) Head injury</li> <li>ix) Different types of fractures</li> <li>x) TKR</li> <li>Xi) Paraplegia</li> <li>xii) Peripheral nerve injuries</li> <li>xiii) Amputations</li> <li>xiv) OA, RA etc.,</li> </ol> </li> </ol>
<p><b>NEUROLOGY &amp; PHYSIOTHERAPY TREATMENT</b></p> <p><b>1. Introduction - approach to Neurologica Case</b></p> <ol style="list-style-type: none"> <li>1. Cerebral Cortex</li> <li>2. Pyramidal tract</li> <li>3. Extrapyramidal tract</li> <li>4. Cerebellum</li> <li>5. Spinal Cord</li> <li>6. Peripheral Nerve</li> </ol> <p>Brief outline of their structure and functions. Difference between</p> <ol style="list-style-type: none"> <li>i) UMN and LMN lesions</li> <li>ii) Spasticity &amp; rigidity</li> </ol>	



<p>2. Cerebral circulation and its disorders, hemiplegia, coma</p> <p>3. Infections and inflammation Meningitis, encephalitis, encephalomyelitis, poliomyelitis, intra cranial tumours (gliomas, meningiomas)</p> <p>4. Extrapyramidal syndromes Chorea, Athetosis, Hemiballismus, tremors, rigidity, parkinsonism</p> <p>5. Syphilis and its neurological complications</p> <p>6. Demyelinating and degenerative disorders Multiple sclerosis, Motor neurone disorder</p> <p>7. Disorders of peripheral nerves</p> <p>8. Polyneuropathy GBS, Diabetic neuropathy</p> <p>9. Disorders of spinal cord - spina bifida, syringomyelia, transverse myelitis, spinal tumors.</p> <p>10. Convulsive disorders</p> <p>11. Ataxia - Types of ataxia, clinical features pathology, medical and physiotherapy treatment</p> <p>12. Head injury</p>	
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## List of Equipment to be available in Institute

1. Wheel Chair
2. Goniometer
3. Inch tape
4. Knee hammer
5. BP apparatus
6. Suspension table
7. Examination table
8. Shoulder wheel
9. Quadriceps table
10. Static Bicycle
11. Supination-pronation board
12. Ankle Exercises
13. Swiss ball, Medicine balls
14. Traction table
15. Finger ladder
16. Parallel bars
17. All types of walkers
18. All types of crutches, sticks
19. Ropes and pulleys
20. Springs, slings
21. Cervical collar, LS belt
22. Equilibrium board
23. Re-education board
24. Splints
25. Crepe bandage
26. Electrotherapy equipments
  - i) Wax bath
  - ii) Auto tract (Cervical & lumbar traction machine)
  - iii) US (Ultra Sound)
  - iv) Electrical Muscle stimulator
  - v) Interferential therapy
  - vi) Short wave diathermy
  - vii) Ultra Violet radiation
  - viii) TENS
  - ix) Massager (Vibrator)
  - X) Infra red (luminous/non luminous)
  - xi) Hydrocollator packs
  - xii) Heat pads

## Reference Books

### I. Biomechanics

1. Cynthia & Norkins : Joint structure and function
2. Gardiner M.D. : The principles of Exercise Therapy

### II.Exercise Therapy

1. Kendall : Manual Muscle testing
2. Gardiner M.D. : The principles of Exercise Therapy
3. Margaret Hollis : Exercise Therapy
4. Kisner : Therapeutic Exercise
5. Cyriax J : Massage, Manipulation & local Anaesthesia
6. Cynthia's : Goniometry
7. Margaret Hollis : Massage Therapy

8. Resistance Exercise, Sports Training, Body Shaping, Obesity, Joint Pains by Prashant Shah
9. Exercise Therapy by Prashant Shah 9391017833
10. Swiss Ball, Medicine Ball, Tubes exercises by Prashant Shah 9391017833

### **III. Electrotherapy**

1. Clayton's : Electrotherapy
2. Low & Reed : Electrotherapy Explained
3. Joseph Kahn ; Electrotherapy
4. Sayeed Ahmeed : Electrotherapy

### **IV. Psychology**

1. S.K.Mangal : Textbook of Psychology & abnormal psychology
2. Murgesh : Psychology

### **V. Anatomy & Physiology**

1. B.D. Chaurasia : 3 Volumes, Textbook of Anatomy
2. Toratora : Anatomy & Physiology
3. Guyton : Textbook of Physiology
4. Chaudari : Textbook of Physiology
5. Gray : Gray's Anatomy
6. B.D.Chaurasia : Handbook of Anatomy
7. Evelyn Pearce : Anatomy & Physiology for Nurses
8. Murgesh : Anatomy & Physiology

### **VI. Medical & Surgical Condition**

1. Tidy's : Physiotherapy
2. Cash Medicine
3. Cash Surgery
4. Polden : PT in obstetrics & Gynaecology
5. Bailey & love : Text Book of surgery
6. Davidson : Textbook of Medicine
7. Golwalla : Textbook of Medicine
8. Das : Clinical Examination
9. P.J.Mehta : Clinical Examination
10. Das : Textbook of Surgery
11. Phyotherapy Dictionary
12. Hutchison's (handbook) : Clinical Examination

### **VIII. Orthopaedics & Neurology**

1. Cash Orthopaedics
2. Cash Neurology
3. O Sullivan : Physical Rehabilitation
4. Ian Bramley : Paraplegia & Tetraplegia
5. John Ebunzer : Orthopaedics in Physiotherapy
6. Adams J.C. : Outline of fractures including injuries
7. Jayant Joshi : Essential of Orthopaedics
8. Natrajan : Textbook of Orthopaedics
9. Mahesheswari : Textbook of Orthopaedics
10. Brain & Branister : Neurology
11. Inderbersing : Neuro Anatomy

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