



# **STATE PARAMEDICAL SCIENCE** **FACULTY**

## **Diploma of Physiotherapy**

### **Year I**

<b>Objectives of the Course</b>		
<p>Physiotherapy requires not only skills for therapeutic treatment but also patience, skills and attitude for treating such patients. It also includes the electric and manual test for the level of intervention required. Physiotherapy maintains, restores and increases the functional capacity of people with various related disorders.</p>		
<b>Paper I : Introduction to Physiotherapy, Anatomy, Physiology and Elemental Nursing</b>		
<b>Sr. No.</b>	<b>Topics</b>	<b>Hrs.</b>
1.	Introduction to Physiotherapy – Meaning, importance, and anatomy related to locomotors.	10
2.	Human Cells and Tissues – Muscle, blood, gland, bone, nerve, reproductive cells and tissues – Organization and their functions	15
3.	Directional references of human body	05
4.	Body Cavities – Dorsal and ventral	03
5.	Skeletal System – Terminology, position, basic details. Joints – Terminology, types, structure	10
6.	Integumentary System – Terminology, basics	05
7.	Gastrointestinal System – Terminology, position, structure, parts and their functions. Digestive process, absorption and defaecation.	05
8.	Respiratory System – Terminology, position, structure, parts and their functions, breathing mechanism.	05
9.	Urinary System – Terminology, position, structure, parts and their functions, process of urine formation and voiding.	05
10.	Male and Female Reproductive System – Terminology, position, structure, parts and their functions	05
11.	Endocrine System – Basics	05

12.	Brain and Spinal Cord – Terminology, structure, functions	05
13.	Blood – Terminology, composition, lymphatic details and clotting system.	05
14.	Cardiovascular System – Terminology, structure. Vessels entering and leaving the heart.	05
15.	Elemental Nursing – Meaning, importance, principles, interpersonal relationship.	03
16.	Bandaging: Basic turns, bandaging extremities, triangular Bandages and their applications. Surgical dressing procedures.	10
17.	Bed Making – Materials used, bed making, special beds, positions in bed, moving and lifting patients, other appliances used in bed.	10
18.	Patient Observation – Importance of habit of observation, delirium, appetite, sleep, cough, expectoration, vomit, tongue, mouth and skin, fluid intake and output, temperature monitoring, pulse character, observation (normal and abnormal pulse), rate of respiration observation, recording the vitals (temperature, pulse, respiration, input, output etc., giving and writing of reports.	20
19.	Care of sick – Daily toilet, bathing, bed sores, ulcers, bedpans, spittoons, urinals,	20
20.	Feeding and Nourishment – Feeding, tube feeding, drips, transfusion etc.	20
21.	Inhalations – Administration of oxygen, other inhalations	10
22.	Instrument and Equipment Handling - Dressings and instruments commonly used in wards. Preparation of nursing trays and trolleys.	15

**Lab – Introduction to Physiotherapy, Anatomy, Physiology and Elemental Nursing**

1.	Identification and description of all anatomical structures
2.	Study of bones, muscles, joints, nerve supply of the limbs and arteries of limbs
3.	Identification and description of surface land marks - bony, muscular and ligamentous
4.	Identification and description of surface anatomy of major nerves, arteries of the limbs
5.	Examination of pulse, B.P., respiratory rate, reflexes

6.	Exercise of elementary nursing procedures		
<b>Reference Books</b>			
1.	Introduction to Physiotherapy, Anatomy, Physiology and Elemental Nursing	P. R. Ashalatha	Juta, Limited
2.	Anatomy 101	Kevin Langford	Kevin Langford
<b>Paper II : Elemental Biochemistry, Pathology and Microbiology, Hygiene and Sanitation, Nutrition and Sanitation, Bio-medical Waste Management</b>			
1.	Basics of Biochemistry – Terminology, introduction, units of measurement		03
2.	Proteins – Basics of digestion, absorption of proteins (urea cycle and ammonia excretion) and functions.		03
3.	Lipids – Basics of digestion and absorption of lipids		03
4.	Fatty Acids – Basics of essential and non-essential fatty acids and their role.		03
5.	Enzymes – Basics of coenzyme, enzyme action and various factors effecting, significance of enzymes		03
6.	Carbohydrates – Definition, sources, classification, carbohydrate metabolism insulin and glucagon.		05
7.	Vitamins – Classification (water and fat soluble with deficiency effects)		05
8.	Mineral – Major And Minor Minerals In Human Body (calcium, phosphorus, magnesium, iron, copper, zinc, fluoride, selenium, manganese)		05
9.	Hormone – Characteristics, various hormones and their functional importance		03
10.	Introduction to Bacteria – Structure, shape, anatomy, structure of cell wall, classification and nutrition of bacteria		03
11.	Staining of Bacteria – Terminology, classification, special staining (Metachromatic granules, spores capsules, spirochetes and flagella)		03

12.	Sterilization and disinfection – Introduction to sterilization, disinfection, antiseptic, bacteriocidal agents, bacteriostatic agents, methods of sterilization (physical, chemical, dry heat, moist heat), filtration, radiation, autoclave, types of autoclave, commonly employed sterilization method for different clinical article, uses of disinfectant	05
13.	Infection - Classification of infection, source of infection in man, method of transmission of infection	05
14.	Morphology and Pathogenicity of – a) Gram positive cocci - Staphylococci, streptococci b) Gram negative cocci - Neisseria c) Gram positive bacilli - Corynebacterium, actinomy, listeria, bacillus, clostridia, mycobacterium tuberculosis and mycobacterium leprae. d) Gram negative bacilli - Pseudomonas, vibrio, aeromonas, plesiomonas, brucella, haemophilus, bordetella, chlamydia, spirochaetes, rickettsia, mycoplasma salmonella, shigella, vibrio	10
15.	Urine Analysis – Collection and preservation, physical, chemical and microscopic examination.	05
16.	Stool Analysis – Macroscopic, microscopic and chemical examination	05
17.	Semen Analysis – Collection of sample, physical properties, motility of spermatozoon, morphological examination of spermatozoon	05
18.	Food – Importance, nutrients derived. Definition of energy and calorie.	02
19.	Nutrition – Meaning, importance and sources of various nutrients (like carbohydrates etc.) Digestion, metabolism and absorption of nutrients. RDA, nutrient requirement of male or female and for all age groups. Concept of malnutrition (causes, signs-symptoms and treatment) and over nutrition (overweight and obesity related health risks).	10
20.	Health – Concept, classification and importance, definition, dimension and indicator.	02
21.	Hygiene – Concept, classification (domestic, community and environmental) and importance	02
22.	Environment and Sanitation – Determinants (air, water, light), ventilation, house sanitation, disposal of waste, ecosan system development within community and effects of noise and its reduction. Sanitation and its importance. Issues related to sanitation and	20

	<p>environment.</p> <p>Sustainable, effective water management and filtration.</p> <p>Personal hygiene, sustainable solution to WASH issues.</p> <p>Health and hygiene of newborn, children and women.</p> <p>Communicable diseases –</p> <p>Bacterial and viral agents, hosts and carriers, effects and prevention</p> <p>Rodents and arthropods communication, effects and prevention</p> <p>Insect carriers and communication. Parasite Control, effects and prevention.</p>	
23.	Bio-medical Waste Management - Definition, importance, hazards and infection control. Principles, categories of BMW, color coding, steps of waste management in hospitals, waste treatment and disposal and bio-safety.	10
<b>Reference Books</b>		
1.	An Integrated Approach to Health Sciences	Colbert Bruce, Jeff Ankney, Joe Wilson, John Havrilla Cengage Learning
2.	Robbins and Kumar Basic Pathology: First South Asia Edition	Kumar and Abbas Elsevier
3.	Text Book of Microbiology	Chakraborty New Central Book Agency P Ltd
4.	Text Book of Biochemistry	U Satyanarayana and Chakrapani Elsevier
<b>Paper III : First Aid, Disaster Management, Anatomy and Physiology as Relevant to Physiotherapy, Medical and Surgical Nursing</b>		
1.	Introduction to First Aid – Meaning, importance, principles, methods, approaches.	03
2.	Dressing – first field dressing, shell dressing, routine dressing. Bandaging and triangular bandage importance.	10
3.	Fractures – types and their corresponding symptoms, treatment as per requirement, Thomas Splint	10

4.	Wounds – Types and their corresponding symptoms and treatment	03
5.	Bites – Bite by snake, animals or by sting of any insect with their symptom and treatment. Classification of poisons and their treatment	05
6.	Heamorrhage – Types and handling ways.	05
7.	Other Emergencies – Burn injuries, shock, effects of heat and cold	03
8.	General Life Support Ways – BLS, ATLS, ACLS, artificial respiration.	10
9.	Disaster Management – Meaning, importance, principles, outline plan and disaster cycle	02
10.	NBC Warfare	02
11.	Phases of Disaster Handling – Pre-hospital, hospital and Triage phase	03
12.	Supportive Services – Responsibilities of various organizations (their effects and management)	02
13.	Prevention and mitigation, preparedness and response. Present setup of handling disaster	05
14.	Anatomy – Definition of bone. Classification of bones with their morphological, structural, macroscopic & microscopic, developmental, regional structure. Parts of long bone. Ossification- Primary and secondary centers, law of ossifications, blood supply and functions.	10
15.	Cartilage – Definition, classification, structure and distribution.	05
16.	Joints – Types, movements and their limitation, muscles acting on various joints, ligaments, tendons, cartilages and blood supply of joints	15
17.	Muscles – Definition, types (skeletal, cardiac, visceral). Skeletal Muscle – Origin, insertion, morphological classification and functional classification. Muscle fibres, action of muscles (isotonic, isometric, eccentric).	10
18.	Skin – Thin and thick skin, appendages, dermatomes, tension lines, flexure lines, Langer's lines	05
19.	Ligaments – Definition, importance, types (according to structure and according to relation to joints)	05
20.	Regional Anatomy – Upper Limb	30

	<p>Regions (breast, shoulder region, axilla, arm, cubital fossa, forearm, hand, grips of hand, forearm spaces, radial bursa, ulnar bursa, palmar spaces),</p> <p>Bones (scapula, clavicle, humerus, radius, ulna, articulated hand),</p> <p>Joints (shoulder girdle, shoulder joint, elbow, radio-ulnar joints, wrist, first carpo-metacarpal joint)</p> <p>Muscles (trapezius, serratus anterior, latissimus dorsi, pectoralis major, deltoid, biceps brachii, triceps brachii, rotator cuff muscles brachioradialis, brachialis, coracobrachialis, pronator teres, pronator quadratus, supinator, flexor digitorum profundus, flexor digitorum, superficialis, flexor pollicis longus, palmaris longus, flexor carpi radialis, flexor carpi ulnaris, extensor digitorum, extensor indicis, abductor pollicis longus and brevis, extensor carpi radialis, extensor carpi ulnaris, intrinsic muscles of the hand)</p> <p>Nerves (dermatomes)</p> <p>Vessels (palpation of axillary artery, brachial artery, radial artery)</p> <p>Others (Axillary groups of lymph nodes, anatomical snuff-box)</p>	
21.	<p>Regional Anatomy – Lower Limb</p> <p>Bony Landmarks (anterior superior iliac spine, iliac crest, tubercle of the iliac crest, ischial tuberosity, greater trochanter, adductor tubercle, head and neck of fibula, lateral and medial malleoli, tibial tuberosity, subcutaneous surface of tibia, patella)</p> <p>Joint (hip, knee, ankle, subtalar joints)</p> <p>Muscles (sartorius, quadriceps, femoris, psoas major, gluteus maximus, gluteus medius, hamstring muscles, gastrocnemius, soleus, popliteus, tibialis (anterior, tibialis posterior, peroneus longus &amp; peroneus brevis), hip (flexors, extensors, abductors, adductors), knee (flexors, extensors) ankle- dorsiflexors, plantar flexors, subtalar (invertors, evertors)</p> <p>Nerves (dermatomes)</p> <p>Vessels (femoral, popliteal, dorsalis pedis, posterior tibial)</p> <p>Others (ligamentum patellae, inguinal lymph nodes).</p> <p>Tendons (semitendinosus, semimembranosus, biceps femoris, iliotibial tract)</p>	20
22.	<p>Regional Anatomy – Abdomen</p> <p>Regions and Organs (anterior abdominal wall rectus sheath, quadrants, inguinal canal its location, extent, boundaries and contents), inguinal herniae)</p> <p>Organs (morphology, relations, blood supply, lymphatic drainage)</p> <p>Nerve supply of stomach, spleen, liver, pancreas, small intestine, large intestine, vermiform appendix, kidneys, supra</p>	20

	<p>renal, ureters, urinary bladder, uterus, uterine tubes, ovaries, testis, prostate, male urethra, rectum and anal canal</p> <p>Bones (lumbar vertebrae, sacrum, differences between male and female pelvis, types of pelvis, sacralization, lumbarization, pelvimetry)</p> <p>Muscles (psoas major, quadratus lumborum, psoas abscess)</p> <p>Nerves (lumbar plexus and sacral plexus)</p> <p>Blood vessels (abdominal aorta, inferior vena cava)</p>	
23.	<p>Regional Anatomy – Thorax</p> <p>Bony Landmarks (sternal angle, counting of ribs, inter costal spaces, locating thoracic spines):</p> <p>Joint (demonstration of movements of intervertebral)</p> <p>Others (apex beat, apices of the lungs, triangle of auscultation).</p>	10
24.	<p>Regional Anatomy – Head, Face, Neck</p> <p>Bony Landmarks (Examination of nasion, glabella, inion, mastoid process, superameatal triangle, symphysis menti, hyoid bone, thyroid cartilage, cricoid cartilage, tracheal rings, suprasternal notch, transverse process of atlas, spine of C7)</p> <p>Joints (Demonstration of movements of temporomandibular joint, atlanto occipital joint, cervical joints)</p> <p>Muscles (Demonstration action of mastication, face, sternocleidomastoid, neck flexors and extensors)</p> <p>Cranial nerves (Testing of oculomotor, trochlear, trigeminal, abducent, facial, glossopharyngeal, accessory, hypoglossal).</p> <p>Others (Thyroid gland, cervical lymph nodes, (horizontal and vertical) midline structures in the neck).</p>	20
25.	<p>Physiology of Brain and Spinal Cord – Terminology, structure, functions, structure of nerve fibers, degeneration and regeneration.</p>	05
26.	<p>Physiology of Muscles – Types of muscles (voluntary, involuntary and cardiac)</p> <p>Striated Muscle – structure and composition, nerve supply, excitability, mechanical changes and properties of muscles.</p>	10
27.	<p>Basic Care in Medical Nursing – Management of temperature (pyrexia and hyper-pyrexia), common treatment related.</p> <p>Oxygen administration</p> <p>Care Procedures Related – Enema (types, way of administration), application of flatus tube, Nasogastric aspiration and gastric lavage, Suction and airway patency</p> <p>Medical Nursing Procedures – Lumbar puncture, bone marrow aspiration, pleural and ascitic taps, preparation of 'procedure</p>	15



	trays' and collection of samples	
28.	<p>Surgical Nursing Basics</p> <p>Sepsis and Anti-sepsis – Definition, principles and methods of handling. Preparation of hands and use of gloves, sterilization of instruments, dressings, care and maintenance (rubber goods, utensils (ligatures and sutures), sponges, mackintosh, towels, trays, syringes).</p>	15

### Reference Books

1.	Hand Book of General Anatomy	B. D. Chaurasia	CBS Publishers & Distributors
2.	Clinical Orientated Anatomy	K. L. Moor	LWW
3.	Handbook of Clinical Nursing: Medical-Surgical Nursing	Ronald Hickman, Celeste M. Alfes, Celeste M. Alfes	Springer Publishing
4.	Trauma: Contemporary Principles and Therapy	Lewis M. Flint	Lippincott, Williams and Wilkins
5.	Disaster Nursing and Emergency Preparedness	Tener Goodwin Veenema	Springer Publishing Company

### Paper IV : Elementary Pharmacology, Human Relations, Community Health Nursing and Communicable Diseases, Equipment Management

1.	Pharmacology – Meaning, importance. Terminologies involved.	01
2.	Pharmacokinetics – Basic concepts, drug –administration (enteral routes and parenteral routes), absorption (biological, physicochemical factors effecting), distribution (compartments, protein binding, apparent volume of distribution), metabolism and excretion	05
3.	Pharmacodynamics – Basic concepts, mechanism of action, organ system effects, adverse drug reaction, drug-receptor interactions, combined drug action	05
4.	Pharmacological Classification of Drugs – Drugs Acting on CNV (Central Nervous System) - General anaesthetics, sedatives and hypnotics, analgesic antipyretics and non-steroidal, anti-inflammatory drugs, anti-rheumatic and	10

	anti-gout remedies, centrally acting muscle relaxants etc., local anesthetics. Drugs acting on autonomic nervous system. Cholinergic drugs, anticholinergic drugs, anticholinesterase drugs. Adrenergic drugs and adrenergic receptor blockers. Neuron blockers and ganglion blockers. Neuromuscular blockers.	
5.	Cardiovascular Drug – Cardiotonics, antiarrhythmic agents, anti-anginal agents, antihypertensive agents, peripheral vasodilators and drugs used in atherosclerosis	10
6.	Drugs Affecting Blood Formation – Coagulants and anticoagulants, antithrombotic & antiplatelet drugs, haematinics, haemostatic, blood substitutes and plasma expanders.	10
7.	Emergency Medicines as described by WHO	02
8.	Human Relations – Introduction, employee behavior, public relations, communication skills, special care of dying and dead. Doctor-Patient Relationship – Introduction, importance, rights and duties of doctor and patient. Behavior of doctor, consent of family, CPA, MLC, medical ethics. Special handling of female patient.	10
9.	Health – Concept, classification and importance, definition, dimension and indicator.	03
10.	Hygiene – Concept, classification (domestic, community and environmental) and importance	03
11.	Environment and Sanitation – Determinants (air, water, light), ventilation, house sanitation, disposal of waste, ecosan system development within community and effects of noise and its reduction. Sanitation and its importance. Issues related to sanitation and environment. Sustainable, effective water management and filtration. Personal hygiene, sustainable solution to WASH issues. Health and hygiene of newborn, children and women. Communicable diseases – Bacterial and viral agents, hosts and carriers, effects and prevention Rodents and arthropods communication, effects and prevention Insect carriers and communication. Parasite Control, effects and prevention. Effects of heat and cold and their prevention.	30

12.	National Policies and Programs – National health policy, national health programs (NAMP, RCH, RNTCP, NACP, Pulse Polio), immunization schedule.	03
13.	Communicable Diseases – Infection, isolation (if required), disinfection methods, nursing care, specific diseases.	05
14.	<p>Equipment Management – Scope, importance.</p> <p>Maintenance and care of general equipment (pulse oximeter, nebulizer, glucometer, ECG machine, cardiac monitor, defibrillator, total patient bed side monitor, SWD, oxygen concentrator.</p> <p>Maintenance and care of physiotherapy equipment (Smart Bristow Faradic Battery, portable galvanic battery, combines treatment table, surgical sinusoidal apparatus, radiant heat cradles (small, medium and large), radiant heat clamp with stand, infra-red lamp with stand, radiant heat cabinet, ultra-violet lamp, shortwave diathermy apparatus, schnee bath (4 cells) with electrodes, zinc electrodes for low tension currents of varying sizes and shapes, protective goggles for ultra-violet ray treatment, flexible drum electrodes for shortwave diathermy, portable vibrator, valves for shortwave diathermy apparatus, carbon filament lamps for radiant heat treatment, paraffin wax bath etc.</p>	20

### Reference Books

1.	An Introduction to Community Health Nursing	Dr. Mrs. Kasturi Sundar Rao	B.I Publications
2.	Treatise on Hygiene and Public Health	Ghosh B.N. A.	Scientific Publishing
3.	Medical Equipment Maintenance: Management and Oversight	Binseng Wang	Morgan & Claypool Publishers
4.	Essentials of Medical Pharmacology	K. D. Tripathi	Jaypee Brothers
5.	Essentials of Pharmacology for Nurses	Paul Barber & Deborah Robertson	Tata Mc Graw Hill