

**INSTITUTE OF ADVANCED STUDIES IN  
EDUCATION (DEEMED UNIVERSITY)  
GANDHI VIDYA MANDIR  
SARDARSHAHR**

*DETAILED SYLLABUS*

*FOR*

*DISTANCE EDUCATION*

**Under Graduate Diploma Program**

**DIPLOMA IN PHYSIOTHERAPY  
(DPT)**

**(SEMESTER SYSTEM)**

## FIRST SEMESTER

| S. NO. | PAPER NAME       | PAPER CODE | INTERNAL ASSESSMENT |     | UNIVERSITY EXAMINATION |      |     | TOTAL |
|--------|------------------|------------|---------------------|-----|------------------------|------|-----|-------|
|        |                  |            | Th.                 | Pr. | Th.                    | Viva | Pr. |       |
| 1.     | Human Anatomy    | DPT - 110  | 20                  | 20  | 100                    | 20   | 40  | 200   |
| 2.     | Biochemistry     | DPT - 120  | 20                  | 20  | 100                    | 20   | 40  | 200   |
| 3.     | Human Physiology | DPT- 130   | 20                  | 20  | 100                    | 20   | 40  | 200   |

## SECOND SEMESTER

| S. NO. | PAPER NAME                             | PAPER CODE | INTERNAL ASSESSMENT |     | UNIVERSITY EXAMINATION |      |     | TOTAL |
|--------|--|------------|---------------------|-----|------------------------|------|-----|-------|
|        |  |            | Th.                 | Pr. | Th.                    | Viva | Pr. |       |
| 1.     | Biomechanics                           | DPT - 210  | 20                  |     | 80                     |      |     | 100   |
| 2.     | Pathology & Microbiology               | DPT - 220  | 20                  | 20  | 100                    | 20   | 40  | 200   |
| 3.     | Principles of Bioelectrical Modalities | DPT - 230  | 20                  | -   | 80                     | -    | -   | 100   |

## THIRD SEMSTER

| S. NO. | PAPER NAME       | PAPER CODE | INTERNAL ASSESSMENT |     | UNIVERSITY EXAMINATION |      |     | TOTAL |
|--------|------------------|------------|---------------------|-----|------------------------|------|-----|-------|
|        |                  |            | Th.                 | Pr. | Th.                    | Viva | Pr. |       |
| 1.     | Exercise Therapy | DPT - 310  | 20                  | -   | 80                     | -    | -   | 100   |
| 2.     | Pharmacology     | DPT - 320  | 20                  | 20  | 100                    | 20   | 40  | 200   |
| 3.     | Orthopaedics     | DPT - 230  | 20                  | 20  | 100                    | 20   | 40  | 200   |

## FOURTH SEMESTER

| S. NO. | PAPER NAME                       | PAPER CODE | INTERNAL ASSESSMENT |     | UNIVERSITY EXAMINATION |      |     | TOTAL |
|--------|----------------------------------|------------|---------------------|-----|------------------------|------|-----|-------|
|        |                                  |            | Th.                 | Pr. | Th.                    | Viva | Pr. |       |
| 1.     | Electrotherapy                   | DPT - 410  | 20                  | 20  | 100                    | 20   | 40  | 200   |
| 2.     | Sociology and psychology         | DPT - 420  | 20                  | 20  | 100                    | 20   | 40  | 200   |
| 3.     | Physiotherapeutic in orthopaedic | DPT - 430  | 20                  | 20  | 100                    | 20   | 40  | 200   |

# FIRST SEMESTER

## DPT – 110 HUMAN ANATOMY

Maximum Marks : 100

Duration : 3 hours

### Objectives:

1. To know gross structure of various body parts especially Musculo-skeletal, cardiorespiratory and nervous system.
2. To study effects of physical therapy on body anatomy.

### General Anatomy:

1. Introduction, various terminologies used, anatomical position etc.
2. Regions of Body, cavities and Systems outline.
3. connective tissue & its modification, tendons, membranes, Special connective tissue.
4. Bone structure, blood supply, growth, ossification, and classification.
5. Muscle, Nerve, blood vessels & lymphatics – structure, types & distribution
6. Joints – classification, structures of joints, movements, range, limiting factors, stability, blood supply nerve supply, dislocations and applied anatomy.

### Thorax (In brief):

1. Thoracic cage
2. Pleural cavities & pleura
3. Lungs and respiratory tree
4. Mediastinum & pericardium
5. Heart and great vessels
6. Diaphragm

### Upper extremity :

1. Bones & joints.
2. Muscles – origin, insertion, actions, nerve supply & blood supply.
3. Major nerves – course, branches and implications of nerve injuries.
4. Development of limb bones, muscles and anomalies.

### Lower Extremity:

1. Bones & joints
2. Muscles – origin, insertion, actions, nerve supply & blood supply
3. Major nerves – course, branches and implications of nerve injuries
4. Development of limb bones, muscles and anomalies

### Spine :

1. Back – muscles - Superficial layer, Deep muscles of back, their origin, insertion, action and nerve supply.
2. Vertebral column – Structure & Development, Structure & Joints of vertebra
3. Applied anatomy & Developmental defects.

### Abdomen and pelvis:

1. Abdominal cavity – divisions
2. Muscles of Abdominal wall, pelvic floor
3. Bony Pelvis

4. Digestive system (Liver & pancreas, Alimentary canal).
5. Urinary system. -= Kidney, Urter, bladder, urethra
6. Adrenal gland
7. Genital system – male and female

### **Head and neck :**

1. Cranium
  2. Central nervous system – disposition, parts and functions
  3. Cerebrum (Brief Description)
  4. Cerebellum (\Brief Description)
  5. Midbrain & brain stem (Brief Description)
  6. Blood supply & anatomy of strokes
  7. Spinal cord-anatomy, blood supply, nerve pathways, applied significance
  8. Pyramidal, extra pyramidal system
  9. Thalamus, hypothalamus (Brief Description)
  10. Ventricels of brain, CSF circulation (Brief Description).
  11. Development of nervous system & defects (Brief Description)
  12. Nerve plexuses.
  13. Cranail nerves – special emphasis on V, VII, X, XI, XII (course, distribution and palsies)
  14. Sympathetic nervours system, its parts and components (Brief Description).
  15. Parasympathetic nervours system (Brief Description).
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1. Endocrine – system – Pituitary, Thyroid, parathyroid (Brief Description)
  2. Special senses (Brief Description) : Nerve receptors, Eye, Ear, Labyrinth
  3. Embryology (Brief Description) : - General embrylolgy, placentra, fetal membranes, twining, and teratogenesis.

### **Suggested Readings :**

1. B. D. Chaurasia, “Human Anatomy”.
2. B. D. Chaurasia, “Hand Book of General Anatomy”.
3. B. D. Charasia, “Human Osteology”.
4. Inderbir Singh, “Text Book of Neuranatomy”.
5. Inderbir Singh, “Text Book of Human Histology”
6. inderbir Singh, “Text Book of Human Osteology”.
7. Krishna Garg, “Basics of Anatomy and Physiology”.
8. Gray, “Gray’s Anatomy”.

Maximum Marks : 100      Duration : 3 hours

**A brief outline of metabolic pathways mentioned herein is indicate.**  
**Details and structures are to be avoided.**

1. Carbohydrates : Definition, classification with examples and general functions. Metabolism-Glycolysis, T.C.A. Glycogen metabolism, Blood Sugar regulation Diabetes and diabetic keto-acidosis.
2. Lipids : Definition, classifications and general functions, Essential fatty acids, cholesterol, Blood lipid. Brief \review of lipoproteins. Metabolism-Oxidation of fatty acids, cholesterol synthesis, and fatty liver.
3. Proteins. : Definition, classification, and Bio-medical Imporance. Study of hemoglobin and immunoglobulins.
4. with functions. Plasma Proteins and functions. Metabolism : General reactions of amino acids. Formation and fate of ammonia – Urea cycle.
5. Nucleic Acids : Brief overview of the structure of RNA and DNA including nucleotiedes.
6. Nutritiosn : Basic principles of nutrition of carbohydrates, Proteins and Lipid caloric requirement and balance diet.
7. Enzymes : Definition, classification with examples. Factors affecting enzyme action. Brief study of enzyme inhibition. Clinical importance of enzymes.
8. Vitamins : Definition, classification and functions. Dietary source, Daily requirement and deficiency disorders.
9. Water and Electrolyte Balance : General outline of fluid compartments of the body with their water and electrolyte content and balance, Dehydration.
10. Tissue chemistry : Chemistry of connective tissue, bone and teeth. Composition function and chemical mediators of nerve structure of muscle tissue. General Biochemistry of muscle contraction and relaxation.

**Suggested Readings :**

1. Chatterje & Shinde, “Textbook of Medical Biochemistry”
2. A. C.Deb, “Fundamentals of Biochemistry”
3. lahinger, “Principles of Biochemistry”.
4. Murray, “Harper’s Biochemistry”.

# DPT – 130 HUMAN PHYSIOLOGY

**Maximum Marks : 100      Duration : 3 hours**

**Objectives :** To know the Physiology of human body. To understand the effects of physical therapy on human physiology with major emphasis on cardio-respiratory, Musculo-skeletal and nervous system.

1. Genral Physiology (brief description only)
  1. Structure of cell.
  2. Functional morphology of the cell
  3. Intercellular communication
  4. Homeostasis
2. Cardiovascular System (descriptive)
  1. Anatomical, biophysical consideration of arterial, arteriolar & capillary venous level, Lymphatic circulation
  2. Homodynamics.
  3. Origin and spread of cardiac excitation
  4. Basic idea of Electrocardiogram
  5. Cardiac cycle, Cardiac output, its regulation
  6. Local & systemic regulatory mechanisms of CVS, humeral & neural
  7. Cerebral, coronary, splachnic, skin, Placental & Fetal circulation
3. Respiratory System (descriptive)
  1. Physiological anatomy of lungs, mechanics of respiration
  2. Pulmonary circulation, Ges exchange in lungs
  3. Oxygen & Carbon dioxides transport
  4. Other function of respiratory system
  5. Neural & chemical control of breathing
  6. Regulation of respiratory activity, non-chemical influences on respiratory activity
4. Cardio respiratory adjustments in health & disease (descriptive)
  1. Exercise, high altitude, deep sea diving
  2. Hypoxia, hypercapnia, hypomania, oxygen treatment
  3. Asthma, emphysema, artificial respiration
5. Blood (brief description only)
  1. W.B.C., R.B.C. Platelets formation & functions
  2. Plasma, Blood Groups
  3. Homeostasis, Immunity
6. Digestive System & excretory System (In brief)
7. Nerve (descriptive)
  1. Nerve \_ General Concept
  2. Nerve cell – structure
3. Genesis of resting membrane potential & Action potential
  4. Their ionic basis, All or None phenomenon
  5. Ionic basis of nerve conduction
  6. Classification & types of nerve fibre
  7. Miaxed nerves & compound action potential
  8. Concept of nerve injury & wallerian degeneration
8. Muscle (descriptive)

1. Skeletal & cardiac muscle
2. Morphology, properties
3. Electric & Mechanical responses & their basis
4. Concept of isometric & isotonic muscle contraction
5. Pace maker tissues & their potential in cardiac muscle
6. Metabolism
9. Synaptic & Junction Transmission (brief description only)
  1. Functional anatomy of synapses
  2. Electrical events in postsynaptic neurons
  3. Inhibition & facilitation at synapses
  4. Chemical transmission of synaptic activity
  5. Principal neurotransmitter system
  6. Neuromuscular junction, structure & events occurring during excitation
  7. Concept of denervation hypersensitivity
10. Function of Nervous system (descriptive)
  1. Reflexes, monosynaptic, polysynaptic, withdrawal reflex
  2. Properties of reflexes
  3. Sense organ, receptors, electrical & chemical events in receptors
  4. Ionic basis of excitation
  5. Sensory pathways for touch, temperature, pain, proprioception, others
  6. Control of tone & posture: integration at spinal, brain stem, cerebellar, basal ganglion levels, along with their functions & clinical aspects
11. Endocrinology (brief description only)
12. Male & female reproductive system (brief description only)
13. Autonomic nervous system (brief description only)
14. Hypothalamus (brief description only)
15. Higher functions of nervous system (brief description only)
  1. Learning & memory, neocortex, limbic functions, sexual behavior, fear & rage, motivation – brief idea
16. Special senses (brief description only)
17. Arousal mechanisms & sleep (brief description only)

### **Suggested Readings :**

1. C. C. Chatterji, "Human Physiology"
2. Keele, "Samson's Wright's Applied Physiology".
3. Bijlani, "Understanding Medical Physiology".
4. Ganong, "Review of medical Physiology".
5. Guyton, "Textbook of Medical Physiology".
6. A. K. Jain, "Manual of Practical Physiology".

## SECOND SEMESTER

### DPT – 210 BIOMECHANICS

Maximum Marks : 100 Duration : 3 hours

#### **Objectives :**

To understand the basic principles of biomechanics.

#### **All topics are for a brief description only.**

#### **Definition of mechanics and Biomechanics**

Force – Definition, diagrammatic representation, classification of forces, concurrent, coplanar and co-linear forces, composition and resolution of forces, angle of pulls of muscle.

Momentum-principles, and practical application

Friction

Gravity : Definition, line of gravity, Centre of gravity.

Equilibrium : Supporting base, types, and stability of equilibrium.

Energy work and power : Energy (potential and kinetic) work and power.

Levers : Definition, function, classification and application of levers in physiotherapy & order of levers with example of lever in human body.

Pulleys : system of pulleys, types and application.

Elasticity : - Definition, stress, strain, HOOKE'S Law,.

Springs – properties of springs, springs in series and parallel, elastic materials in use.

**Aims and scope of various biomechanical modalities** : Shoulder wheel, shoulder ladder, shoulder pulleys, pronator/supinator instrument, static cycle, rowing machine, ankle exerciser, balancing board, springs, weights, etc.

**Hydrostatics and Hydrodynamics** : Specific gravity, Hydrostatic pressure, Archimedes, principle, Properties of water, and other liquids, Buoyancy-law of floatation, factors determining up-thrust, effect of buoyancy on movements performed in water. Equilibrium of a floating body, Bernoulli's theorem.

**Suspension Therapy** : Principles of suspension, types, components of suspension apparatus, effects and uses of suspension therapy – their therapeutic application.

**Soft tissue manipulation** : History, definition, types and their rationale, general effects, local effects of individual manipulation (physiological effects) and uses, contra-indications and techniques of application.

**Hydrotherapy** : History and introduction, indication and contra-indication dangers and precautions, hydrotherapy regimes of exercises, hydrotherapy exercise for all age groups, different types of pools and baths.

#### **Suggested Readings :**

1. Hollis & Cook, "Practical Exercise Therapy"
2. Gardiner, "Principles of Exercise Therapy".

**Course objectives** : Brief concept of health and illness, health promotion and diseases prevention.

**Contents** :

1. Immunology: Brief outline of immune system, Immunity, immune responses & immune deficiency. Immunology and exercise with us implications on Physical therapy, Hypersensitivity disorders
2. Infectious diseases: Brief description of classification of microorganisms, morphology, and identification. Sterilization and disinfections.
3. Brief outline of identification, disease produced, prevention and treatment of common pathogens – streptococcus, staphylococci, gonococci, Meningococci, salmonella, V. cholerae, E. coli, shigella, tetanus, Diphtheria, M. leprae, M. tuberculosis, Poliomyelitis, Rabies, Malaria, Amoebiasis, Helminthiasis, Scabies, ringworm, candidiasis.
4. Inflammation, injury and repair (Brief description)
5. Oncology : Classification, general clinical features, relationship with exercise, cancer pain syndrome. (brief Outline only)
6. Skin : (Brief outline only) – Etio – pathogenesis, gross pathology, and clinical features of commonly occurring skin Diseases, Burns, Pressure ulcers.
7. Cardiovascular system : (Brief description only) – Etio – pathogenesis, gross pathology, and clinical features of conditions of aging, IHD, MI, CCF, HT, RHD, Congenital heart disease, Arteriosclerosis, Thrombo-angitis, Vasomotor Raynaud's, venous thrombosis, Gangrene Lymph edema.
8. Haematology : (Brief outline only) – Etio of pathogenesis, gross pathology, and clinical features
9. Respiratory system : (Brief description only) - Etio - pathogenesis, gross pathology, and clinical features of conditions -aging, Pneumonia, Pulmonary TB, Bronchiectasis, COPD, Bronchial Asthma, Restrictive Lung disease, Occupational lung disease.
10. Musculoskeletal system : (Brief description only) - Etio-pathogenesis, gross pathology, and clinical features of conditions - Biological responses to trauma, bone and soft tissue immobilization, osteomalacia, Osteoporosis, Osteomyelitis, Osteoarthritis, rheumatoid arthritis, Gout, spondyloarthropathy, Osteonecrosis, Myofascial pain syndrome.
11. CNS AND PNS: (Brief description only) - Etio-pathogenesis, gross pathology, and clinical features of conditions - aging, meningitis, Encephalitis, Parkinson's, Amyotrophic lateral Sclerosis, stroke, Neuropathies (Charcot Marie Tooth's disease, Compression and entrapments, diabetic, G.B. syndrome) Poliomyelitis and post-polio syndrome, Myasthenia Gravis.

### **Suggested Readings :**

1. P. Chakraborty, "Textbook of Microbiology".
2. Anathnarayan, "Textbook of Microbiology".
3. Harsh Mohan, "Textbook of Pathology".
4. Kumar, Coutran, "Basic Pathology".
5. Nagalotima, "Textbook of Pathology".

## **DPT – 230            PRINCIPALS OF BIO-ELECTRICAL MODALITIES**

**Maximum Marks : 100      Duration : 3 hours**

### **Course Objective:**

To understand the basic electricity, equipments and their application in Electrotherapy.

### **All topics are for a brief description only.**

DC Currents - Modern concept of electricity: fundamental electric charges (protons and electron), bound free electrons, free electron and current, static electric charge, charging of an object potential difference and EMF.

A. C. currents : Sinusoidal wave form, frequency, wavelength, Amplitude and phase of a sine wave, Average & RMS value of a sine wave

Quantity of electricity, magnitude of current, conductors and insulators, resistance of conductor and Ohm's law, resistances in series and parallel.

**Capacitors:** Electric field around a capacitor, charging and discharging a capacitor, types of capacitor with application of each in physiotherapy department.

**Rheostat:** Series and shunt Rheostat with application of each in the Physiotherapy department.

Effects of electric Current: Thermal effect, chemical effect (ionization) and magnetic effect. Electric shock, Earth shock, causes and its prevention.

**Magnetism** : magnetic - non-magnetic substances and their properties, properties of magnet, molecular theory, poles of magnet and its properties, magnetic lines of force and their properties, Electromagnetism, magnetic effects of electric current, Electromagnetic induction, Lenz's law, Inductor and Inductance types of inductor, reactance and impedance.

## **BASIC ELECTRICAL INSTRUMENTATION**

**THERMIONIC VALVES** : Thermionic emission, Diode and Triode valves and their characteristics, Construction and application of Cathode Ray Oscilloscope.

**SEMICONDUCTOR DEVICES** : Intrinsic and extrinsic semiconductors, advantages of diode and transistor devices. Biasing of Diode and their characteristics, Light Emitting Diodes, integrated circuits.

**ELECTRONIC CIRCUITS** : Rectifiers & smoothing circuits, Oscillators - Sinusoidal and nonsinusoidal types.

a.c. AND D.C. METERS : Functions and applications of Ammeter and volt meters, Ohmmeters, Wheat stone bridge

*Emphasis should be given to fundamental part with formulae without mathematical derivations wherever necessary.*

PHYSICAL ENERGY : Definition, description, effects, physiological effects and dangers of heat and Electromagnetic radiations.

MEDICAL INSTRUMENTATION FOR PHYSICAL THERAPY : Brief description of generation, circuit diagrams and testing.

Low frequency currents, Direct currents, Medium frequency currents

Short wave Diathermy-continuous and pulsed

Microwave Diathermy

Ultrasonics

Actino-therapy Infared, UVR and lasers.

NOTE: Emphasis is given only to generation circuit diagram and testing of the various electrotherapy apparatus.

**Suggested Reading:**

1. Forster & Palastanga "Clayton's Electrotherapy"
2. Low & Reed, "Electrotherapy Explained"
3. Nelson & Currier, "Clinical Electrotherapy"

## THIRD SEMESTER

### DPT – 310 EXERCISE THERAPY

Maximum Marks : 100 Duration : 3 hours

#### Course Objectives :

1. To understand the principles of exercise therapy & therapeutic massage and its application

#### Contents :

##### Starting positions :

1. Description and muscle work
2. Importance of fundamental and derived types.
3. Effects and uses of individual positions.

##### Movements :

1. Anatomical definition and description
2. Movements and exercise as therapeutic modality and their effects
3. Physiological reaction of exercise

##### Passive movements :

1. Definition
2. Relaxed, forced and stretching type.
3. Indications, contraindications, advantages and Techniques of various passive movements.

##### Muscle Stretching :

1. Special emphasis on stretching of : Pectoral major, biceps brachii, triceps brachii, long flexors of fingers, Rectus Femoris, Ilio-tibial band, gastrocnemius-soleus, hamstrings, hip abductors, ilio-psas. Sternocleidomastoid.

##### Active movements :

1. Free, assisted and resisted
2. Indication, contraindications, advantages and techniques of various types of active exercises.
3. Home programs of strengthening of various muscle group including progressive resisted exercises.
4. Special emphasis on : Shoulder abductors & flexors, Triceps brachii, Hip abductors & flexors, quadriceps femoris, Abdominal and back extensors.

##### Manual Muscle Testing :

1. Concept, introduction, significance and limitations.
2. Grade systems
3. Techniques of Muscle testing
4. Emphasis on skills to grade upper, lower limb, neck and trunk muscles including trick movements.

##### Goniometry

1. Measurement of various joints range in normal and disease condition.
2. Different techniques of goniometry.
3. Limb length measurements.

##### Relaxation

1. Description of fatigue and spasm & factors.
2. General causes, signs and symptoms of fatigue
3. Techniques of Relaxation - local and General with indication
4. Rationale of relaxation Techniques.

**Joint Mobility :**

1. Joint range, stiffness, range and limitations
2. Accessory movements - glides, traction and approximation
3. Mobilization of peripheral joints in detail.

**Re-education of muscles :**

1. Concept, technique, spatial and temporal summation.
2. Various reduction techniques and facilitating methods.
3. Progressive strengthening of various muscle groups in Grade-I-Grade IV.
4. Muscle strengthening technique-PNF

**Crutch Waling :**

1. Description of crutch - components, classification
2. Good crutch, measurements
3. Crutch use - Preparation, Training, counseling.
4. Crutch gaits - types, & significance.
5. Crutch complications, Palsy, dependency etc.

**Normal Posture :**

1. Posture - definition & description, static and dynamic.
2. Posture - alignments of various joints, centre of gravity, planes & muscular moments
3. Analysis of posture.

**Normal Gait :**

1. Normal gait - definition & description, centre of gravity
2. Normal gait - alignments of various joints, centre of gravity, planes & muscle acting mechanisms, pattern, characteristics.
3. Normal gait cycle, time & distance parameters, & determinants of Gait.

**Co-ordinations :**

1. Balance - static and Dynamic
2. Discoordination : LMNL & UMNL, cerebellar lesion, loss of kinesthetic sense ((Tabes dorsalis, leprosy, syringomyelia)
3. Reduction of balance and coordination : PNF and Frenkel's exercise.

Traction : Rationale, Technique, indication & contra- indications.

Yogasana and Pranayama : Physiology and therapeutic principles of yoga, Yogasana for physical culture, relaxation and medication. Application of yogasana in physical fitness, flexibility. Therapeutic application of yoga. Yoga a holistic approach.

**Suggested Readings :**

1. Hollis & Cook, "Practical Exercise Therapy".
2. Gardiner, "Principles of Exercise Therapy".
3. Kolby Kisner, "Therapeutic Exercise".
4. Holey, "Therapeutic Massage".
5. Margret Hollis, "Massage for Therapist".
6. Kendal, "Muscles Testing and Function".
7. Norkin, "Measurement of Joint Motion".

**Maximum Marks : 100      Duration : 3 hours**

**Course Objectives :**

1. To understand the principles of exercise therapy & therapeutic massage and its application
2. To understand the drug actions that may affect the physical therapy treatment.

**Contents :**

**1. Genral Pharmacology (In brief) :**

1. Introduction & genral concepts
2. Pharmaco-kinetics (routes of administration, metabolism & elimination)
3. Pharmaco-dynamics (mechanism of drug action, therapeutic & side effects, toxicity)

**2. Autonomic Nervous System (In brief)**

1. Brief outline of Sympathetic-parasympathetic nervous system
2. Therapeutic agents-uses, effects and interaction with physical therapy

**3. Cardio-vascular System (In brief)**

Drug classification.

Commonly used drugs and its interaction with physical therapy.

**4. Glucocorticoids, thyroxin-uses, side effects and interaction with physical therapy (In brief)**

**5. Central Nervous System (In brief)**

1. Anaesthetic agents - uses, side effects and interaction with physical therapy
2. Sedatives and hypnotics - uses, side effects and interaction with physical therapy
3. Anti epileptic drugs - uses, side effects and interaction with physical therapy
4. Analgesics - uses, side effects and interaction with physical therapy
5. Anti inflammatory drugs - uses, side effects and interaction with physical therapy
6. Psychotherapeutic agents - uses, side effects and interaction with physical therapy
7. Alcoholism and drug dependence and interaction with physical therapy
8. Therapeutic agents used for movement disorders - uses, side effects and interaction with physical therapy.

**6. Respiratory system (In brief)**

1. Therapeutic agents - uses, side effects and interaction with physical therapy

**7. Goniometry**

1. Therapeutic agents in Peptic ulcer, diarrhoea - uses, side effects and interaction with physical therapy

**8. Diabetes mellitus (In brief)**

1. Drug therapy and its interaction with physical therapy

**9. Geriatric (In brief)**

Pharmacological challenges in geriatric are group and its effects on physical therapy.

1. K. D. Tripathi, "Essentials of Med Pharmacology".
2. Larence & Bennett, "Clinical Pharmacology".
3. Lynne Eddy, "Physical Therapy in Pharmacology".
4. F. S. K. Barar, "Essentials of Pharmacotherapeutics".

Maximum Marks : 100      Duration : 3 hours

**Course objectives :**

To know common orthopaedic conditions and procedures and applications of physical therapy in various orthopaedic conditions.

**Contents :**

1. Introduction : history taking, clinical features, clinical examination, and investigation.
2. The Musculo-skeletal system : Gross anatomy of bones, joints, muscles and nerves in brief. Skeletal growth and development (normal & pathological) in brief. Fracture healing (Normal & pathological) in brief. Types of muscle contracture. nerve-muscle physiology in brief. Calcium-phosphorus metabolism-normal and pathological states.
3. Congenital malformations :  
Brief descriptions of following congenital conditions along with the outline of treatment :  
    Congenital Hip Displasia, Congenital Talipes Equinovarus / Calcaneo valgus, Arthrogyrosis Multiplex Congenita, Congenital Torticollis, Acromelia, phocomelia, amelia. Spina Bifida: all types, clinical presentation sequel & management.
4. Development diseases of skeleton : (Brief description only)  
    Chondro-osteodystrophy, Osteogenesis imperfecta, Osteopetrosis, heterotopic ossification, Osteochondritis, (Perthes' disease, tibial epiphysitis, Cong. Coax vara)
5. Neuromuscular diseases : (Brief descriptions only)  
    Muscular dystrophies, infantile hypotonia, Volkmann's Ischaemic contracture, obstetrical paralysis, and peroneal muscular atrophy.  
    Cerebral palsy, Poliomyelitis - full description including management, (surgical management - outline only)
6. Spinal deformities : Brief description & Conservative management of Scoliosis, Kyphosis, and traumatic deformities.
7. Infections of Musculoskeletal system : Bacterial infections of bones & joints with conservative management (in brief); Tubercular infections of bones & joints with conservative management (in brief); Leprosy, Pott's paraplegia (Brief Description)
8. Arthritis & Rheumatic Diseases : Clinical features, evaluation & conservative management of various categories of arthritis e.g. Rheumatoid arthritis, Juvenile Ch. Arthritis, Reiter's diseases, polymyalgia rheumatica, Gout, Osteoarthritis, Ankylosing spondylitis, Neuropathic - joints, haemophilic arthropathy, Avascular necrosis.
9. Neuro-vascular Diseases (brief Description): Clinical features, evaluation and conservative management of various conditions e.g. Nerve injuries, (general & specific), Plexus injuries, vascular ailments (Raynaud's, Thrombangitis obliterans, Frostbite, Diabetic foot).
10. Bony & Soft tissue injuries : Injury & repair, Clinical presentation, evaluation & general principles of rehabilitation management. (Brief Description)
11. Spine : Brief anatomy & mechanics, clinical presentation evaluation and conservative management of affections in various regions of spine - (disc prolapse, cord compression, spondylosis, Ankylosing spondylosis, etc.) and Spinal injury.
12. Upper Limbs : Brief anatomy & mechanics of upper limb joints. Clinical presentation, evaluation & conservative management of affections in various regions of Upper limb

(sprain of shoulder joint, bursitis, tendonitis, shoulder dislocation, snapping & winged scapula, tennis elbow, bursitis, Bony & soft tissue injuries Arthritic conditions, tenosynovitis, Carpal tunnel syndrome, deformities Dupuytren's contracture, VIC, reflex sympathetic dystrophy).

13. Lower Limb: Brief anatomy and mechanics of Lower Limb Joints. Clinical presentation, evaluation and conservative management of affections in various regions of lower limb (Arthritic conditions, Injuries bony & soft tissue, deformities, reflex sympathetic dystrophy, neuropathic Joints)
14. Amputations-Justification, outline of surgical approaches, incisions, procedures, indications, contraindications, complications & management.

**Suggested Readings:**

1. Joshi & Kotwal, "Essentials of Orthopaedics".
2. Magee, "Orthopaedic & Physical Assessment".
3. Adams, "Outlines of Fractures".
4. J. maheshwari, "Essential orthopaedics".
5. Louis Solomon, "Apley's System of Orthopaedics & Fractures".
6. Brown & Newman, "Orthopaedic Secrets".

## FOURTH SEMESTER

### DPT –410 ELECTROTHERAPY

Maximum Marks: 100 Duration : 3 hours

#### Objectives:

1. To list indications and contraindications of various Modalities.
2. To understand different techniques of applications, their justification and effects.
3. Demonstration of individual techniques of applications of various modalities.

#### Contents:

##### A. *Low Frequency Currents:*

1. Nerve Muscle Physiology: brief outline
2. Faradic current.
  1. Indications, contraindications, Techniques, parameters, Group muscle stimulation.
  2. Faradic footbath, Faradism under pressure and muscle re-education.
  3. Dosimetry
3. Galvanic current.
  1. Indications, contraindication, precautions and therapeutic effects of stimulation
  2. Techniques, parameters, Dosimetry
4. Electro-Diagnosis :
  1. S. D. Curve, Reaction of degeneration, chronaxie & Rheobase
  2. Outline of EMG & Nerve conduction velocity
5. Iontophoresis :
  1. Definition and principles & factors
  2. indications, effects, techniques, contraindications, precautions and Potetial harmful effects.
6. TENS therapy :
  1. Principle of therapy, Parameters and therapeutic uses.
  2. Theories of pain and pain control.
  3. Indications and contra-indications, Dosimetry.

##### B. *Infrared Therapy.*

1. Therapeutic effects and uses, Techniques of application.
2. Theories of pain and pain control.
3. Indications and contra-indications, Dosimetry.

##### C. *Heating Modalities :*

1. Therapeutic effects and uses, Techniques and applications
2. Indications, contraindications, precautions and Potential harmful effects of various heat modalities :

Paraffin wax bath therapy, Hydro collator packs, Whirlpool and moist heat Heating pads, hot air chambers.

##### D. *Cold-therapy :*

1. Indications, contraindications and therapeutic effects.
5. Technique, precautions and Potential harmful effects of treatment, Dosimetry.

##### E. *Medium frequency currents :*

Definitions, effects, indications, techniques of application, contraindications.

##### *Interferential therapy :*

1. Physiological, therapeutic effects & dangers, Indications & contra indications.
2. Technique and method of applications, Dosimetry.

*F. High Frequency currents:*

Short wave Diathermy: Continuous & Pulsed

1. Indications, contraindications and therapeutic effects.
6. Methods of application-capacitor and induction electrode, precautions and Potential harmful effects of treatment, Dosimetry.

Microwave Diathermy:

1. Characteristics and therapeutic effects.
2. Application techniques, indications, contraindications, precautions and potential harmful effects, Dosimetry.

*G. Ultrasonic Therapy:*

7. Physiological and therapeutic effects & potential harmful effects.
1. Indications, contraindications, methods of application and precautions, Dosimetry.

*H. Laser*

8. Introduction, effects and potential harmful effects.
1. Indication, contraindications, precautions, method of application, dosimetry.

*H. Ultraviolet therapy:*

2. Physiological and therapeutic effects - photosensitization
9. Indications and contraindications and Potential harmful effects.
3. Methods of application, Sensitizes, Filters, Dosage, wavelength, penetration. Tolerance, Treatment / Application condition wise
4. Comparison between UVR & IR Therapy.

*I. Advanced electrotherapy:*

1. Computerization of modalities
2. Programming of parameter.
3. Selection and combination of parameters.
4. Combined therapy-U.S.+TENS-Principles, uses, indications etc.
5. Principles of Bio-feed back. indications & uses.

*J. Traction instruments :*

Rationale, technique, indications, contraindications, precautions of electric traction equipments.

**Suggested Readings :**

1. Forster & Palastanga, "Clayton's Electrotherapy".
2. Low & Reed, "Electrotherapy Explained".
3. Gersh, "Electrotherapy in Rehabilitation".
4. Cameron, "Physical Agents in Rehabilitation".
5. Susan Michloviz, "Thermal Agents in Rehabilitation".

**Course Objectives:**

Two know various psychological factors and effects in physical illness and its application while dealings with patients during admission, treatment, rehabilitation and discharge.

**PART - A**  
**PSYCHOLOGY**

1. Definition and Fields of application of psychology.
2. The influences heredity and environment on the individual.
3. Development and growth of behavior in infancy and childhood.
4. Intelligence, theories of intelligence and Intelligence testing. Intelligence and occupation.
5. Motivation, theories of Motivation. Primary and Secondary motives. Frustration and conflict.
6. Emotions, theories of Emotions and emotional development.
7. Personality, theories of personality, factors influencing personality. personality Assessment.
8. Memory, Forgetting, theories of memory and foregting, thinking, methods to improve memory.
9. Learning: theories, methods of learning. interest and motivation in learning.
10. Sensation, perception-depth, form, brightness. (In brief)
11. Social psychology, influence, individual or groups have on behavior of others,
  1. Leadership, and group psychology.
12. Behavior : normal and abnormal. Paadigms in psychopathology and therapy. Behavioral assessment.
13. Emotional and behavioral disorders of childhood and adolescence - (In brief)
  1. Disorders of under and over controlled behavior
  2. Eating disorders
14. Maturation - with special reference to learning.
15. Cmmuniation : Types and development, Effective communciation.
16. Counseling: Defiaition, Aims and principles
17. Compliance: nature and factors of compliance, Non-compliance, Improving complainece including factors
18. Psychological need of children and geriatric patients
19. Mental deficiency - (descriptive)
  1. Mental retardation.
  2. Learning disabilities
  3. Autistic behavior.
20. Anxiety Disorders - (brief outline)
  1. Phobias, panic disorder, Generalized Anxiety disorder, Obsessive Compulsive Disorder, Post - traumatic Stress Disorder.
21. Somatoform and Dissociate Disorders. (Brief outline)
22. Conservation Disorder, Somatization Disorder, Dissociate Amnesia, Dissociate Fugue
23. Personality Disorder (definitions only)

## **PART - B** **SOCIOLOGY**

### A-Introduction

1. Definition and scope of Sociology
2. Its relation with Anthropology, Psychology, Social Psychology and ethics.
3. Methods of Sociology-case study, Social Survey, Questionnaire, interview and opinion poll methods.
4. Importance of its study with special reference to health care professionals.

### B-Social Factors in health and Disease :

1. The meaning of Social Factors.
2. The role of Social factors and illness.

### C-socialization :

1. Concepts of social groups.
2. Influence of formal and informal groups on health and sickness.
3. The roll of primary groups and secondary groups in the hospital and rehabilitation setting.

### E - Family:

1. The family.
2. Meaning and definition.
3. Functions.
4. Changing family Patterns.
5. Influence of family on the individual health, family, and nutrition. The effects of sickness of family and psychosomatic disease and their importance to Physiotherapy.

### F-Community:

1. Rural community-Meaning and features-Health hazards of ruralities.
2. Urban community-meaning and features-Health hazards of urbanites.

### G-Culture and Health:

1. Concept of culture.
2. Cultures and Behaviour.
3. Cultural meaning of sickness.
4. Culture and health disorders.

### H-Social change:

1. Meaning of social changes & Factors of social changes
2. Human adaptation and social change.
3. Social change and stress.
4. Social and deviance.
5. Social change and health Program.
6. The role of social planning in the improvement of health and in rehabilitation.

### I-Social problems in disabled:

Consequences of the following social problems in relation to sickness and disability, remedies to prevent these problems.

1. Population explosion.
2. Poverty and unemployment.
3. Beggary.
4. Juvenile delinquency.

5. Prostitution.
6. Alcoholism.
7. Problems of women in employment.

J-Social security: Social security and social legislation in relation to the Disabled.

K-Social work : Meaning of social work ; the role of a medical social worker.

**Suggested Readings :**

1. Morgan & King, "Introduction to Psychology".
2. Manju Mehta, "Behavioral sciences in Medical practice".
3. Davison, "Abnormal Psychology".
4. Vidya Bhushan, "Introduction to Sociology".
5. Turner, "The Structure of Sociological Theory".
6. Cuff, Shaerock, Perspectives in Sociology

**DPT – 430                      PHYSIOTHERAPEUTIC IN ORTHOPAEDIC**

**Maximum Marks: 100              Duration: 3 hours**

**Course objectives:**

1. To identify various Musculo Skeletal dysfunction clinically
2. To set goals and apply therapeutic skills in different orthopaedic conditions.

**Traumatology :**

1. Physical evaluation of an orthopedic patient
2. General principles of physiotherapy in fracture management including complications at different stages.
3. General principles of physiotherapy in dislocations management including complications.
4. specific assessment and management of : Fractures of upper limb, lower limb
5. Specific assessment and management of : Fractures of spine with or without neurological involvement
6. Assessment and therapeutic management of:
7. Soft tissue injuries - Sprains, strains, ligament and cartilage tear/rupture.

**Orthopaedic surgery:**

General principles of assessment, physiotherapy management in surgical conditions like:

1. Bones and joint surgeries: joint replacements, orthopedics, illizarov's technique, etc.
2. Tendon transplant, soft tissue release.
3. Spinal stabilization, surgeries in C.P. & Polio

**Assessment, management and treatment goals of:**

1. Osteoarthritis
2. Spondylosis, spondylolisthesis
3. PIVD
4. Periarthritides, rotator cuff lesion of shoulder.
5. Tuberculosis of the spine, bone and major joints
6. Avascular bony necrosis at different joints.
7. Rheumatoid arthritis.

8. Ankylosing spondylitis, etc.
9. Deformities: (Congenital - Torticollis, cervical rib, CTEV, pes cavus, pes planus, etc., Acquired-Scoliosis, kyphosis, lordosis, coxa vara, genu valgum-varum-recurvatum)

**Amputation:**

1. Levels of amputation of lower and upper extremities.
2. Stump care : bandaging, pre and post prosthetic assessment and training.
3. Complications of amputation and their management.

**Manipulation therapy:**

1. Introduction to manipulation therapy.
2. Assessment, principles of various schools of manipulation

**Suggested Readings:**

1. Thomson, "Tidy's Physiotherapy".
2. Kolby Kisner, "Therapeutic Exercise".
3. Joshi & Kotwal, 'Essentials of Orthopedics'.