

BACHELOR OF PHYSIOTHERAPY

DETAILED SYLLABUS

FIRST YEAR

ANATOMY

Section – I

➤ General Introduction:

1. Histology – Cell, tissues of the body, epithelium, connective tissue, cartilage, bone, lymph, muscle, nerve, etc.
2. Osteology – Formation, function, growth & repair of bones.
3. General Embryology – Ovum, spermatozoa, fertilization, differentiation, development of various systems and fetal circulation.

Section-II

➤ Systems of the Human body:

1. Blood Vascular System – Arteries, capillaries, veins, heart, lymphatic system.
2. Respiratory System – Anatomy of upper & lower respiratory tract including nose, larynx, trachea, bronchi, pleura & lungs.
3. Digestive System – Anatomy of the gastro- intestinal tract.
4. Urogenital System – Anatomy of Urinary system, male and female reproductive system.
5. Endocrine System – The various organs and production of hormones including definition, structures in general, control of secretions and role of hypothalamus.
6. Integumentary System
7. Surface Anatomy

Section-III

➤ Neuro-anatomy : Microscopic and gross study of :-

- | | |
|--------------------------|---------------------------------|
| 1. Peripheral Nerves | 2. Neuromuscular Junction |
| 3. Sensory End Organs | 4. Spinal Cord-segments & Areas |
| 5. Brainstem | 6. Cerebellum |
| 7. Inferior colliculi | 8. Superior colliculi |
| 9. Diencephalon | 10. Hypothalamus |
| 11. Epithalamus | 12. Thalamus |
| 13. Cerebral hemispheres | 14. Corpus striatum |
| 15. Rhinencephalon | 16. Lateral ventricles |
| 17. Meninges | 18. Blood supply of the brain |
| 19. Internal capsule | 20. Visual radiation |
| 21. Auditory radiation | 22. Thalamocortical radiations |
| 23. Pyramidal system | 24. Extra-pyramidal systems |
| 25. Anatomic integration | 26. Intra-cortical integration |
| 27. Sympathetic system | 28. Para-sympathetic system |
| 29. Cranial nerves | |

Section – IV

➤ Musculo Skeletal System

(A) Myology:

1. The fascia and muscles of head, neck & face.
2. The fascia and muscles of trunk.
3. The fascia and muscles of upper limb.
4. The fascia and muscles of lower limb.
5. Muscles of the eye.

(B) Osteology & Arthrology:

1. General structure and forms of all bones of skeleton and its attachments.
2. Classification of Joints.
3. Movements of Joints.
4. Factors permitting and limiting movements of Joints.
5. Joints of Head & Neck and T.M.Joints.
6. Joints of Trunk.
7. Joints of Upper Limb.
8. Joints of Lower Limb.
9. Shoulder girdle
10. Pelvic girdle

Section – V

- Radiological Anatomy: Radiographic appearance of Musculo-skeletal system of Upper limb, Lower limb & Spine.

ANATOMY PRACTICAL

1. Surface Anatomy : To study, identify and mark the surface landmarks on human body.
2. To study the muscles of trunk, lower and upper extremities and face on a dissected human body.
3. To study the Bones of Human body with special emphasis on origin and insertion of muscles & ligaments.

4. To study the anatomy of joints of upper and lower extremities and vertebral column on a dissected human body.
5. To study the anatomy of C.N.S. and P.N.S. on a dissected human body.
6. To study the gross anatomy of Respiratory, Digestive, Endocrine, Urinary and Genital system on a dissected human body.

P H Y S I O L O G Y

Section – I

➤ General Introduction:

1. Cell Introduction:
Outline of basic concepts of cell structure,
Functions of components,
Transport across membranes.
2. Skin : Functions, blood flow and temperature regulation.
3. Blood and Lymph: Cell renewal system, hemoglobin, erythrocyte granulocyte, lymphocyte, coagulation, Regulation of hydrogen within concentration of body fluids, fluid distribution and exchange.

Section – II

➤ Physiology of the systems of the body:

1. Digestion:- Control of food and water intake and secretion and absorption of Digestive juices and process of digestion , movements of the alimentary canal.

2. Circulation:- Cardio-vascular system, mechanical and electro- physiological activity of the heart, regulation of heart, coronary circulation, haemodynamics (cardiac output and venous return), circulation through brain, skin and skeletal muscle.
3. Excretion:- Renal functions including formation of Urine & Micturition
Water and Electrolyte balance.
4. Respiration:- Respiratory gases, pulmonary gas exchange, control and mechanics of breathing, hypoxia, asphyxia, dyspnoea, oxygen therapy and resuscitation
5. Endocrine system:- Outline of various hormones and their actions, pituitary gland, thyroid, parathyroid, adrenal glands & gonads.
6. General Metabolism:- Carbohydrate, Protein & Fat Metabolism.

Section-III

➤ Neuro-physiology.

1. Neuron :- Properties and functions.
2. Action Potential.
3. Special properties of nerve trunks and tracts.
4. Motor units
5. Reflex physiology
6. Synapse and synaptic transmission
7. Supraspinal control
8. Cerebellum and basal ganglia
9. Autonomic nervous system
10. Somatic sensation
11. Pain
12. Taste, Olfaction, Auditory and Vision
13. Neuro physiological psychology

Section-IV

➤ Muscle Physiology:

Gross and Microscopic

1. Structure and function of Muscle tissue – skeletal and cardiac
2. Chemical processes involved in muscle contraction.
3. Physiology of muscle contraction.

Section- V

➤ Physiology of exercise and work

1. Neuromuscular activity, human movement, physiological mechanism in movement behavior, strength, endurance, analysis of movement.
2. Circulatory and respiratory response to exercise including effects on the heart, blood circulation, body fluid changes, pulmonary ventilation, gas exchange and transport, etc.
3. Effects of exercise and work on other body functions.
4. Metabolic and environmental aspects of exercise and work-metabolism, energy requirement, efficiency of muscular work, nutritional aspects, heat and body temperature regulation & environmental factors
5. Effects of Exercise training – endurance, fatigue and recovery.
6. Fitness and health – age, sex, body type, race, stress and medical aspects of exercise.

PHYSIOLOGY PRACTICAL

To study the following Physiological Phenomena:-

1. Identification of blood cells and differential counts
2. W.B.C. Count
3. R.B.C. Count
4. Haemoglobin percentage and color index
5. E.S.R. and Blood groups
6. Bleeding time and clotting time
7. Respiratory efficiency tests
8. Artificial respiration and C.P.R.
9. Pulse rate, Heart rate and measurement of Blood Pressure
10. Respiratory rate and Auscultation
11. Normal E.C.G.
12. Reflexes-Superficial and Deep
13. Sensations
14. Tests for functions of Cerebrum
15. Tests for functions of Cerebellum

PATHOLOGY AND MICROBIOLOGY

Section 1 - Pathology

GENERAL PATHOLOGY

1.Introduction: Concepts Of Disease And Classification Of Lesions

- The Normal Cell – Cell Structures And Functions
- Etiology And Pathogenesis Of Cellular Injury

- Degenerations
- Intracellular Accumulations
- Amyloidosis
- Cell Death

2. Bacterial, Viral And Parasitic Infections – General Outline

- General Considerations
 - ❖ Categories Of Infectious Agents
 - ❖ Barriers To Infection And How They Break Down
 - ❖ Mechanisms Of Injury
 - ❖ Inflammatory Response To Infectious Agents
- Bacterial , Spirochaetal And Mycobacterial Infections
- Diseases Caused By Fungi
- Diseases Caused By Virus
- Diseases Caused By Parasites

3. Inflammation And Repair

➤ Inflammation

- Acute Inflammation
 - ❖ Vascular Changes
 - ❖ Cellular Events
 - ❖ Mediators Of Inflammation
- Chronic Inflammation
- Examples Of Chronic Granulomatous Inflammation
 - ❖ Tuberculosis
 - ❖ Leprosy
 - ❖ Syphilis

- ❑ Role Of Lymphatics
- ❑ Morphological Patterns
- ❑ Systemic Manifestations Of Inflammation

➤ Repair

- ❑ Cell Cycle And Types Of Cells

- ❑ Repair By Connective Tissue
 - ❖ Description Of Healing Wounds
 - ❖ Mechanisms Of Wound Healing
- ❑ Pathological Aspects Of Repair

4. Disorders Of Vascular Flow And Shock

- ❑ Edema
- ❑ Congestion
- ❑ Haemorrhage
- ❑ Thrombosis
- ❑ Embolism
- ❑ Infarction
- ❑ Shock

5. Tuberculosis , Leprosy , Typhoid

- ❑ Causative Organism
- ❑ Transmission And Spread
- ❑ Pathogenesis
- ❑ Clinical Features
- ❑ Pathological Changes :
 - ❖ Gross Changes

- ❖ Microscopically

6. Deficiency Diseases (Nutritional Disorders)

- Normal And Adequate Nutrition
- Pathogenesis Of Deficiency Diseases
- Nutritional Disorders
 - ❖ Starvation
 - ❖ Obesity
 - ❖ PEM
 - ❖ Disorders Of Vitamins

7. Neoplasia

- Definitions And Nomenclature
- Epidemiology
- Characteristics Of Benign And Malignant Neoplasms
- Etiology Of Cancer – Carcinogenic Agents
- Carcinogenesis (Molecular Basis Of Cancer) And Biology Of Tumor Growth
- Tumor Immunity
- Clinical Features
- Some Common Tumors
 - ❖ Skin
 - Squamous Cell Carcinoma
 - Basal Cell Carcinoma

SYSTEMIC PATHOLOGY

8. Blood Vessels, Haemopoietic And Cardiovascular System

Blood Vessels

- Arteries – Normal Structure, Artherosclerosis And Aneurysms
- Veins – Normal Structure, Phlebothrombosis And Thrombophlebitis

Haemopoietic System

- Bone Marrow – Haematopoiesis
- Red Blood Cells
 - ❖ Erythropoiesis
 - ❖ Anemia
 - General Considerations
 - Iron Deficiency And Other Hypochromic Anaemias
 - Megaloblastic Anemia
 - Pernicious Anemia
 - Hemolytic Anemia
 - Aplastic Anaemias And Other Primary Bone Marrow Disorders
- White Blood Cells
 - ❖ Lymphopoiesis And Granulopoiesis
 - ❖ Mature Leukocytes In Health And Disease
 - ❖ Leukaemias
- Platelets And Bleeding Disorders
- Blood Groups And Blood Transfusion

Cardiovascular System

- Normal Structure
- Congenital Heart Disease
 - ❖ Left To Right Shunts (Vsd, Asd And Pda)
 - ❖ Right To Left Shunts (Fallots Tetralogy)

- ❖ Obstructive Non-Cyanotic Congenital Anomalies
- ❖ Malpositions Of The Heart

- Rheumatic Fever And Rheumatic Heart Disease
 - ❖ Etiopathogenesis
 - ❖ Pathological Changes
 - Cardiac Lesions
 - Extra-Cardiac Lesions
 - ❖ Clinical Features

- Ischaemic Heart Disease
 - ❖ Angina Pectoris
 - ❖ Myocardial Infarction

- Valvular Heart Disease (Includes RF And RHD)
- Cor Pulmonale (Pulmonary Heart Disease)
- Congestive Heart Failure
- Hypertensive Heart Disease
- Myocardial And Pericardial Disease
- Tumors

9. Respiratory System

- Pulmonary Infections
 - ❖ Pneumonias
 - ❖ Bacterial Pneumonias
 - Lobar Pneumonia
 - Bronchopneumonia
 - ❖ Primary Atypical Pneumonias

- ❖ Other Types Of Pneumonia
- ❖ Tuberculosis
- ❖ Fungal Infection. Lung Abscess Etc

- Obstructive Lung Disease
 - ❖ Asthma
 - ❖ Chronic Obstructive Lung Disease
 - Emphysema
 - Chronic Bronchitis
 - Bronchiectasis

- Restrictive Lung Diseases

- Tumors
 - ❖ Bronchogenic Carcinoma

10. Skeletal System And Autoimmune Diseases

Bones

- Metabolic Diseases
 - ❖ Osteoporosis
 - ❖ Rickets And Osteomalacia

- Pyogenic Diseases
 - ❖ Pyogenic Osteomyelitis
 - ❖ TB Bone

- Pagets Disease
- Fibrous Dysplasia
- Hypertrophic Osteoarthropathy

- Hereditary And Congenital Disorders

- Tumors

- ❖ Osteochondroma
- ❖ Chondroma
- ❖ Osteoid Osteoma
- ❖ Giant Cell Tumor
- ❖ Osteosarcoma
- ❖ Chondrosarcoma
- ❖ Ewings Sarcoma

Joints

- Osteoarthritis – Degenerative Joint Disease
- Suppurative Arthritis
- Lyme Disease
- Bursitis

Autoimmune Diseases

- Mechanisms Of Autoimmune Diseases
- SLE
- Rheumatoid Arthritis
- Spondyloarthropathies
- Sjogrens Syndrome
- Ssystemic Sclerosis (Scleroderma)
- Polymyositis

11. The Skin

- Normal Structure

□ Dermatoses

❖ Genetic Dermatoses

❖ Non Infectious Inflammatory Dermatoses

- Dermatitis
- Urticaria
- Acne Vulgaris

❖ Infectious Dermatoses

- Impetigo
- Warts

❖ Granulomatous Diseases

- Leprosy
- Lupus Vulgaris (Variety Of Skin Tb)
- Syphilis
- Granuloma Annulare

❖ Connective Tissue Diseases

- Lupus Erythematosus

❖ Non Infectious Bullous Dermatoses

❖ Scaling Dermatoses

- Psoriasis

□ Tumors

12.The Urinary System

□ Clinical Manifestations Of Renal Disease

- ❑ Renal Failure
- ❑ Congenital Malformations
- ❑ Cystic Diseases Of The Kidney
- ❑ Diseases Affecting Tubules And Interstitium

- ❖ Tubulointerstitial Nephritis

- Acute Pyelonephritis
- Chronic Pyelonephritis And Reflux Nephropathy
- Drug Induced Interstitial Nephritis

- ❖ Acute Tubular Necrosis

- ❖ Diffuse Cortical Necrosis

- ❑ Renal Hypertension
- ❑ Urinary Outflow Obstruction
 - ❖ Renal Stones
 - ❖ Hydronephrosis
- ❑ Tumors
 - ❖ Wilms Tumor
 - ❖ Renal Cell Carinoma

- ❑ Glomerular Diseases

- ❖ Pathogenesis Of Glomerular Diseases
 - Immunological Mechanisms
 - Non Immunological Mechanisms
- ❖ Nephrotic Syndrome
- ❖ Nephritic Syndrome
- ❖ Specific Type Of Glomerular Disease

- ❑ Primary Glomerulonephritis
- ❑ Secondary Glomerular Diseases

13. Central Nervous System

□ Infections

- ❖ Meningitis
 - Acute Purulent Meningitis
 - Acute Viral Meningitis
 - Chronic Meningitis
- ❖ Poliomyelitis
- ❖ Encephalitis
- ❖ Other Infections

□ Vascular Disease

- ❖ Ischaemic Encephalopathy
- ❖ Cerebral Infarction
- ❖ Intracranial Haemorrhage

□ Common Pathophysiological Conditions

- ❖ Cerebral Herniation
- ❖ Cerebral Oedema
- ❖ Hydrocephalus

□ Tumors

- ❖ Astrocytoma
- ❖ Medulloblastoma

□ Degenerative Diseases

- ❖ Alzheimer's
- ❖ Parkinsonism
- ❖ Huntingtons
- ❖ Motor Neuron Disease

- Demyelinating Disease
 - ❖ Multiple Sclerosis

- Peripheral Nervous System
 - ❖ Landry – GBS
 - ❖ Diabetic Neuropathy

14. Rheumatoid Arthritis

15. Scleroderma and Psoriasis

16. Diseases Of Muscle

- Skeletal Muscle
 - ❖ Muscle Atrophy
 - ❖ Poliomyelitis
 - ❖ Myositis
 - ❖ Myopathy
 - ❖ Muscular Dystrophy
 - ❖ Myasthenia Gravis
 - ❖ Trichinosis

- Soft Tissue Tumors

17. Volkmann's Ischaemia

Microbiology

GENERAL MICROBIOLOGY

1. Introduction And History Of Microbiology

- ❑ Important Microbiological Landmarks
- ❑ Louis Pasteur – Important Contributions
- ❑ Robert Koch – Important Contributions
 - ❖ Koch's Postulates
- ❑ Development Of Chicken Pox Vaccine By Pasteur
- ❑ Work Of Other Scientists In The Field Of Microbiology
- ❑ Relevance of Microbiology to the health professionals

2. Micro-Organisms

➤ Classification and Microscopic Identification of Microorganisms

- ❑ Concept Of Bacterial Species
- ❑ Classifications –
 - ❖ Phylogenetic
 - ❖ Adansonian
 - ❖ Molecular/Genetic Classification
 - ❖ Intraspecies Classification

➤ Introduction to Bacterial Anatomy

➤ Brief explanation of Shape And Arrangement of:

- ❖ Cocci
- ❖ Bacilli
- ❖ Spirilla
- ❖ Spirochaetes
- ❖ Actinomycetes
- ❖ Mycoplasmas

➤ Special Characteristics – (Spores, Capsules, Enzymes, Motility)

➤ Growth And Multiplication Of Bacteria

- ❖ Total And Viable Count
- ❖ Bacterial Growth Curve

➤ Understanding the bacterial metabolism: Oxygen Requirement, Effects of Carbon Dioxide, Temperature, Moisture, pH , Light Osmotic Effect , Mechanical And Sonic Stress.

➤ Introduction to Bacterial Genetics

3. Disinfection And Antibiotics –

4. Sterilisation And Asepsis

5. Antibacterial Agents – Fundamental Aspect, Susceptibility Tests

- ❑ Sterilization And Disinfection – Definitions
- ❑ Agents Used In Sterilization
 - ❖ Physical Agents
 - ❖ Chemical Agents
- ❑ Testing Of Disinfectants

6. Infection

- ❑ Sources Of Infection In Man
 - ❖ Man , Animals, Insects, Soil And Water, Food
- ❑ Methods Of Transmission Of Infection
 - ❖ Contact , Inhalation, Ingestion, Inoculation, Insects, Congenital , Iatrogenic And Laboratory Infections

- Factors Predisposing To Microbial Pathogenicity
- Types Of Infectious Diseases

IMMUNOLOGY

7.Immunity – Natural (specific and non- specific) and Acquired

- Immunity – Definition
- Types – Innate And Acquired
 - ❖ Innate Immunity
 - Innate Immunity At Level Of Species, Race And Individual
 - Factors Influencing Innate Immunity
 - Mechanisms Of Innate Immunity
 - ❖ Acquired Immunity (Of 2 Types –Active And Passive)
 - Passive Acquired Immunity
 - Active Acquired Immunity
- Measurement Of Immunity (brief)
- Introduction to Local Immunity and Herd Immunity
- A Brief Understanding of Immuno-deficiency Diseases, Auto-immunity , Immunology Of Transplantation And Malignancy

9.Allergy And Hypersensitivity

- Brief Classification Of Hypersensitivity Reactions
 - Type I – Anaphylactic , Reagin Dependent
(Anaphylaxis – brief introduction to types and mediators of anaphylaxis)
 - Type II– Cytotoxic / Cell Stimulating
 - Type III- Immune Complex Disease

- Type IV –Delayed Or Cell Mediated Hypersensitivity

BACTERIOLOGY

10. Outline Of Common Pathological Bacteria And Diseases Produced by them / Treatment And Prevention

- ❑ Study Of Various Groups Of Infections And Their Causative Agents (their characteristics, reservoir, transmission and Incubation period):
 - ❖ Respiratory Tract Infections – Non specific, viral, Specific bacterial and fungal
 - ❖ Meningitis
 - ❖ Enteric Infections
 - ❖ Anaerobic Infections-normal anaerobic flora in humans and sites of infection
 - ❖ Urinary Tract Infections
 - ❖ Leprosy, Tuberculosis And Miscellaneous Infections
 - ❖ Wound Infections
 - ❖ Sexually Transmitted Infections
 - ❖ Hospital Acquired Infections
 - Sources and Common Types of hospital acquired infections
 - Microbiology Of Hospital Acquired Infections
 - Diagnosis And Control Of Hospital Infections

MYCOLOGY

11.Mycology – An Introduction to Pathogenic Fungi

- ❑ Classification Of Fungi Based On Morphology :
 - ❖ Yeasts
 - ❖ Yeast Like Fungi
 - ❖ Moulds

❖ Dimorphic Fungi

- Fungal Infections (Mycoses) – Brief outline of Superficial And Deep mycoses (subcutaneous systemic and opportunistic)

VIROLOGY

An Introduction to the Pathogenesis, Immunity and diagnosis of Viral Infections - With Special Mention of Hepatitis, Poliomyelitis And Rabies

- General Properties Of Viruses
- Virus -Host Interaction – Immunity against Virus Infections
- Special Mention
 - ❖ Hepatitis Virus
 - ❖ Aids Virus
 - ❖ Miscellaneous Virus
 - ❖ Oncogenic Viruses

* Parasitology

PHARMACOLOGY AND BIOCHEMISTRY

Section 1 – Pharmacology

General Pharmacological Principles

- ❖ 1. General Action Of Drugs (Pharmacodynamics).
 - Principles Of Drug Action

- Mechanisms Of Drug Action
 - ◆ Physical Action
 - ◆ Chemical Action
 - ◆ Action Through Enzymes
 - ◆ Action Through Receptors
 - ◆ Dose Response Relationship
 - ◆ Drug Potency And Efficacy
 - ◆ Combined Effects Of Drugs
 - Synergism
 - Antagonism
 - ◆ Drug Dosage
 - ◆ Factors Modifying Drug Action

❖ 2. Drug Allergy And Idiosyncrasy (Adverse Drug Effects)

- Adverse Effects Can Be Classified as
 - ◆ Predictable
 - ◆ Unpredictable

- Various Types Of Adverse Effects
 - ◆ Side Effects
 - ◆ Secondary Effects
 - ◆ Toxic Effects
 - Poisoning
 - Drug Toxicity
 - ◆ Intolerance
 - ◆ Idiosyncrasy
 - ◆ Drug Allergy
 - Mechanism And Types Of Reactions
 - Humoral

- Cell Mediated
 - ◆ Photosensitivity
 - ◆ Drug Dependence
 - ◆ Drug Withdrawl Reactions
 - ◆ Teratogenicity
 - ◆ Carcinogenicity And Mutagenicity
 - ◆ Drug Induced Diseases

- ❖ 3. Drug Toxicity (Included Under Toxic Effects Of Drugs In The Above Chapter)

- ❖ 4. Drug Metabolism (Pharmacokinetics)
 - Transport Of Drug Across Biological Membrane
 - Absorption Of Drug
 - Bio-availability
 - Distribution Of Drug
 - Bio-transformation (Metabolism) Of Drug
 - Concept Of First Pass Metabolism

 - Excretion Of Drug
 - ◆ Drugs And Their Metabolites Maybe Excreted Via
 - Urine
 - Faeces
 - Exhaled Air
 - Saliva And Sweat
 - Milk
 - ◆ Renal Excretion
 - Glomerular Filtration
 - Tubular Reabsorption
 - Tubular Secretion

 - Kinetics Of Elimination

➤ Prolongation Of Drug Action

❖ 5. Methods Of Administration Of A Drug And Some Definitions

➤ Definitions

- ◆ Pharmacology
- ◆ Pharmacodynamics
- ◆ Pharmacokinetics
- ◆ Pharmacotherapeutics
- ◆ Clinical Pharmacology
- ◆ Chemotherapy
- ◆ Pharmacy
- ◆ Toxicology

➤ Drug Nomenclature

➤ Routes Of Drug Administration

- ◆ Factors Governing Choice Of Route
- ◆ Routes For Local Action
 - Topical
 - Deeper Tissues – Intrathecal Injection, Intra-Articular Injection, Retrobulbar Injection
 - Arterial Supply – Intra-Arterial Injections Of Contrast Media For Angiography, Anticancer Drugs In Limb Malignancy
- ◆ Routes For Systemic Action
 - Oral
 - Sublingual
 - Rectal
 - Cutaneous
 - Inhalation

- Nasal
- Parentral
 - Subcutaneous
 - Intramuscular
 - Intravenous

❖ 6. Chemical Character Of Drugs

Pharmacology of Each System

❖ 7. Drugs Acting On CNS - Anaesthetics, Alcohols, Alkaloids, Narcotics, Antipyretics, Hypnotics, Anticonvulsants, Sedatives, Stimulants, Psychotherapeutic Agents

➤ General Anaesthetics

- ◆ Historical Aspects And Theories Of Anesthesia
- ◆ Stages Of Anesthesia
- ◆ Classification Of Various Anaesthetic Agents Used
- ◆ Pre-anaesthetic Medication

➤ Ethyl And Methyl Alcohols

➤ Sedative – Hypnotics

➤ Anti-epileptic Drugs

➤ Anti-Parkinsonism Drugs

➤ Drugs Used In Mental Illness

- ◆ Anti-Psychotic Drugs
- ◆ Anti-Anxiety Drugs
- ◆ Drugs For Affective Disorders

- Antidepressants

- Tricyclic Antidepressants
- MAO Inhibitors

- Antimanic Drugs
 - ◆ Hallucinogens
- Opioid Analgesics And Antagonists
- Non-Opioid Analgesics And NSAIDs
- Other Drugs For Arthritis
 - ◆ Suppressive And Reserve Drugs In Rheumatoid Arthritis
 - ◆ Drugs Used In Gout
- CNS Stimulants And Cerebroactive Drugs
 - ◆ Convulsants
 - ◆ Analeptics
 - ◆ Psychostimulants
 - ◆ Cerebroactive Drugs
- ❖ 8. Drugs Acting On Peripheral Nervous System

(Drugs Stimulating And Inhibiting Cholinergic And Anti-Cholinergic Activity Are Included In Autonomic Nervous System – Discussed Below)

 - Skeletal Muscle Relaxants
 - ◆ Peripherally Acting Muscle Relaxants
 - Neuromuscular Blocking Agents
 - Competitive Blockers
 - Depolarising Blockers
 - Directly Acting Muscle Relaxants
 - ◆ Centrally Acting Muscle Relaxants
 - Mephenesin Group
 - Benzodiazepines
 - GABA Derivatives

- Local Anesthetics
 - ◆ Classification
 - ◆ Chemistry
 - ◆ Mechanism Of Action
 - ◆ Local And Systemic Effects
 - ◆ Pharmacokinetics
 - ◆ Adverse Effects
 - ◆ Some Individual Compounds
 - ◆ Uses And Techniques Of Local Anesthesia

❖ Drugs Acting On Neuromuscular Junction And Muscles – Included Above.

❖ 9. Drugs Acting On Autonomic Nervous System

- General Considerations
 - ◆ Organization And Function Of Autonomic Nervous System
 - ◆ Neurohumoral Transmission

- Cholinergic System And Drugs
 - ◆ Cholinergic Transmission
 - ◆ Cholinoreceptors
 - Muscarinic
 - Nicotinic
 - ◆ Cholinergic Drugs
 - ◆ Cholinomimetic Alkaloids
 - ◆ Anticholinesterases

- Anticholinergic Drugs

- Adrenergic System And Drugs
 - ◆ Adrenergic Transmission
 - ◆ Adrenergic Receptors

◆ Adrenergic Drugs

- Anti-adrenergic Drugs
- Drugs Acting On Autonomic Ganglia

❖ 10. Autacoids And Related Drugs

- Introduction
- Histamine, 5-HT And Their Antagonists
- Plasma Kinins, Angiotensin, A.C.E Inhibitors
- Prostaglandins, Leukotrienes And Platelet Activating Factor

❖ 11. Drugs Acting On Cardiovascular System

- Heart – Physiological Considerations
- Cardiac Glycosides And Drugs For Congestive Heart Failure
- Anti-arrhythmic Drugs
- Anti-anginal And Other Anti-Ischaemic Drugs
- Anti-hypertensives

❖ 12. Drugs Acting On Respiratory System

- Drugs For Cough
 - ◆ Pharyngeal Demulcents
 - ◆ Expectorants (Mucokinetics)
 - Directly Acting
 - Reflexly Acting
 - Mucolytics
 - ◆ Antitussives
 - Opioids
 - Non Opioids
 - Antihistaminics

- Drugs For Bronchial Asthma
 - ◆ Approaches To Treatment
 - ◆ Drugs Used
 - Bronchodilators
 - Mast Cell Stabilisers
 - Corticosteroids
 - Miscellaneous

❖ Chemotherapeutic Agents (Antimicrobial Drugs)

- General Considerations
 - Classification
 - Problems With Uses Of Antimicrobial Agents
 - Toxicity
 - Hypersensitivity Reactions
 - Drug Resistance
 - Suprainfection
 - Nutritional Deficiencies
 - Masking Of An Infection
 - Choice Of Antimicrobial Agent
 - Combined Use Of Antimicrobial Agents
 - Prophylactic Use Of Antimicrobial Agents
- Sulfonamides And Trimethoprim
- Beta Lactam Antibiotics
- Tetracyclines And Chloramphenicol
- Aminoglycoside Antibiotics
- Macrolide, Polypeptide, Quinolone And Other Antibacterial Agents

- Anti-tubercular Drugs
- Anti-leprotic Drugs
- Anti-fungal Drugs
- Antiviral Drugs
- Anti-malarial Drugs
- Anti-amoebic And Other Anti-protozoal Drugs
- Anti-helminthic Drugs

❖ 13. Hormones And Drugs Affecting Endocrine Functions

- Introduction – Anterior Pituitary Hormones
- Thyroid Hormones And Thyroid Inhibitors
- Insulin, Oral Hypoglycemic Agents And Glucagon
- Corticosteroids
- Gonadal Hormones
- Oxytocin And Drugs Acting On Uterus
- Drugs Affecting Calcium Balance

❖ 14. Vitamins (Chemistry , Source , Absorption And Fate, Physiological Role And Actions, Deficiency Symptoms, Therapeutic Uses And Adverse Effects Of Each)

- Fat Soluble Vitamins
 - ◆ Vitamin A
 - ◆ Vitamin D
 - ◆ Vitamin E
 - ◆ Vitamin K
- Water Soluble Vitamins
 - ◆ The Vitamin B Complex Group
 - Thiamine (B1)

- Riboflavin (B2)
- Niacin (B3)
- Pyridoxine (B6)
- Pantothenic Acid
- Biotin
- Cyanocobalamine (B12)

- ◆ Vitamin C (Ascorbic Acid)

- ❖ 15. Metabolic and Other Inorganic Compounds

- ❖ 16. Immunologic Agents

- Immunosuppressants

- ◆ Common preparations and doses

- ◆ Classification of vaccines

- Common preparation and doses

- ❖ 17. Diagnostic Agents

- Drugs used in common diagnostic procedures

- ❖ Drugs Acting On Kidney

- ❖ Drugs Affecting Blood And Blood Formation

- ❖ Gastrointestinal Drugs

- ❖ Chemotherapy Of Neoplastic Diseases

- ❖ Miscellaneous Drugs

- Drugs Affecting Skin And Mucous Membranes

- Antiseptics, Disinfectants And Ectoparasiticides

- Chelating Agents
- Vaccines And Sera

Biochemistry

❖ **1. Introduction to Biochemical characteristics of living matter**

- The Few Elements that combine to form a great variety of molecules
 - ◆ Major elements – Carbon, Hydrogen, Oxygen and Nitrogen
 - ◆ Five Major Complex bio-molecules – DNA RNA ,Proteins, Polysaccharides and Complex Lipids
 - ◆ Chief components of the Human body - Protein, Fats, Carbohydrate , Water and Minerals
 - ◆ Biochemistry and Medicine

❖ **2. Biochemistry Morphology of cell**

- Cell as the basic Unit of Life
- Major Organelles found in the cell – their markers and major functions

❖ **3. Nucleic Acids & Chromatin**

- Nucleotides and nucleosides: classification and functions
- Chemistry of DNA – Brief introduction to structure, denaturation and functions
- Chemistry of RNA- Brief introduction to structure and types.

❖ **4. Proteins**

- Definition
- Classification
- Structure of Proteins
- Metabolism of proteins in human body
- Denaturation of Proteins

- Important tests for proteins
- Estimation of Proteins
- Special emphasis on albumin

- Amino Acids and Peptides-Properties and function

❖ 4. Carbohydrates

- Glycolysis and regulation of glycolysis
- Kreb's cycle and shuttle systems
- Mono-, Di-saccharides etc.
- Clinical aspects

❖ 5. Lipids

- Classification of lipids – emphasis on plasma lipids and adipose tissue
- Essential Fatty acids
- Steroids

❖ 6. Enzymes and Coenzymes

- Introduction and Definitions
- Classification of Enzymes
- Properties of Enzymes
- Enzyme Specificity
- Factors influencing Action of enzymes
- Coenzymes
- Lysozymes
- Isoenzymes
- Mechanism of Enzyme Action- with details of inhibition and feedback etc.
- Clinical aspects with special emphasis on
 - ◆ Coenzyme A
 - ◆ Lactic Dehydrogenases

- ◆ Transaminases
- ◆ Creatine kinase
- ◆ Carbonic anhydrase

❖ 6. Metabolism

- Metabolism of Carbohydrates
- Metabolism of Proteins
- Metabolism of Lipids
- Regulation of Carbohydrate and Lipid Metabolism
- Overview of intermediary Metabolisms
- Inter-relationship in metabolism of Protein , fats and Carbohydrates

7. Hormones

- General Characteristics of Hormones
- Mechanism of Action of hormones
- Assay of hormones
- Chemistry and Function of hormones
- Individual Glands and their hormones
 - ◆ Anterior Pituitary gland
 - TSH, ACTH, LH, FSH, GH, PL
 - ◆ Posterior Pituitary
 - Oxytocin
 - Vasopressin
 - ◆ Middle Lobe of Pituitary
 - MSH
 - ◆ Adrenal Cortex
 - ◆ Adrenal medulla
 - ◆ Sex hormones
 - ◆ Thyroid
 - ◆ Parathyroids
 - ◆ Pancreas
 - Insulin

- Glucagon
- ◆ Pineal Body

❖ 8. Nutrition

- Principles of Nutrition
- Biological Value of proteins
- Balanced Diet
- Nutritive Value of foods
- Food Toxins and Additives
- Applied Nutrition
 - ◆ Starvation and Anorexia nervosa, Obesity, Kwashiorkar and Marasmus, Goitre, Xerophthalmia, Rickets and Osteomalacia , Beri-beri, Alcoholic neuropathy, Wernicke-Korsakoff syndrome, Pellagra, Scurvy
 - ◆ Hyperlipidaemia, Familial hypercholesterolemia
 - ◆ Diabetes mellitus and Ketoacidosis
 - ◆ Other diseases
- Toxicants in foods
 - ◆ Lathyrism
 - ◆ Goitrogens
 - ◆ Toxicants from micro-organisms
 - ◆ Parasitic Infection

❖ 9. Biochemistry of connective tissues, nerve and muscle

- Muscle
 - ◆ Chemistry
 - ◆ Muscle Structure
 - ◆ Protein in muscle
 - ◆ Molecular events in muscle contraction
 - ◆ Muscle phosphagens

- ◆ Inorganic Constituents of muscle
- ◆ Cell motility and cytoskeleton
- ◆ Collagen
- Nerve Tissue
 - ◆ Structural and functional Units
 - ◆ Structure of Neuron
 - ◆ Neurofibrillae
 - ◆ Myelin sheath, myelinogenesis
 - ◆ Structure of typical nerve
 - ◆ Metabolism of nerve tissue
 - ◆ Action Potential
 - ◆ Transmission of nerve impulse from one neuron to another
 - ◆ Transmission of an impulse from a nerve to a skeletal muscle

❖ 10. Water, Electrolyte and Acid Balance

- Distribution of fluids in the body
- Water metabolism and Balance
- Functions of Water
- Regulation of body water
- Disturbances of Water Balance
 - ◆ Edema
 - ◆ Dehydration
- Electrolyte Balance
- Regulation of Blood pH (Acid Base Balance)
 - ◆ Role of buffers in blood
 - ◆ Role of Respiration
 - ◆ Role of Kidney
- Disturbances in Acid Base balance
 - ◆ Acidosis
 - Respiratory
 - Metabolic

- ◆ Alkalosis
 - Respiratory
 - Metabolic

❖ 11. Chemistry of Biological Materials

❖ 12. Physio-chemical phenomenon (Biophysics)

- Acidity and Alkalinity
- pH
- Buffers
- Diffusion
- Osmosis & Osmotic pressure
- Surface tension
- Adsorption
- Hydrotropy
- Viscosity
- Colloids
- Transport through Biological Membranes
- Isotopes

❖ 13. Common procedures used in biochemistry

- Liver Function Tests
 - ◆ Classification and Interpretation in brief
- Renal Function Tests
 - ◆ Introduction to GFR, RPF and Clearance
- Thyroid Function Tests
 - ◆ Classification of TFTs
 - ◆ Use of various tests under specific thyroid dysfunction
- Cerebrospinal Fluid
 - ◆ Formation and composition of normal CSF
 - ◆ Changes in physical appearance and chemistry in CNS diseases

❖ **14.Hemoglobin, Porphyrin and Bile Pigments**

❖ **15.Biological Oxidation**

- Definition
- Enzymes and Coenzymes involved in Oxidation and reduction
- The Respiratory chain
- Oxidative Phosphorylation
- Transport of Substances into and out of Mitochondria
- Energy Linked Ion transport in Mitochondria
- Anatomy and function of Mitochondrial membranes
- Chemiosmotic Theory

❖ **16. Chemistry of Respiration**

- Transport of Oxygen by the blood
- Transport of Carbon dioxide in blood
- Buffer Systems of blood
- Acid Base Balance
- Hypoxia
- Exercise

❖ **17. Vitamins**

- Definition
- Classification
- Fat Soluble Vitamins
- Water Soluble Vitamins
- Deficiency Diseases

❖ **18. Inborn Errors of Metabolism**

- Hereditary Anemia
- Carbohydrate Metabolic Errors

- Lipid Metabolic Errors
- Protein Metabolic errors
- Nucleic Acid Metabolism
- Exercise

❖ **19. Detoxification**

❖ **20. Immunochemistry**

- Structure of Immunoglobulins
- Classification of Immunoglobulins
- Antigens

❖ **Energy Requirements of the body**

SOCIOLOGY

❖ **1. INTRODUCTION**

- Definitions of sociology
- Sociology as a science of society
- Uses of the study of sociology
- Application of knowledge of sociology in physiotherapy and occupational therapy.

❖ **2. SOCIOLOGY AND HEALTH**

- Social factors affecting health status
- Social consciousness and perception of illness
- Social consciousness and meaning of illness
- Decision making in taking treatment.

- Institutions of health, their role in the improvement of the health of the people.

❖ 3. SOCIALIZATION

- Meaning of socialization
- Influence of social factor on personality
- Socialization in hospitals
- Socialization in the rehabilitation of patients.

❖ 4. SOCIAL GROUPS

- Concept of social groups
- Influence of formal and informal groups on health and sickness
- The role of primary groups and secondary groups in the hospitals and rehabilitation settings.

❖ 5. FAMILY

- Influence of family on human personality
- Discussion of changes in the functions of a family
- Influence of the family on the individual's health
- Family and nutrition, the effects of sickness on family, and psychosomatic disease.

❖ 6. COMMUNITY

- Concept of community
- Role of rural and urban communities in public health
- Role of community in determining beliefs
- Practices and home remedies in treatment.

❖ 7.CULTURE

- Components of culture
- Impact of culture on human behavior
- Cultural meaning of sickness, response of sickness & choice of treatment (role of culture as social consciousness in moulding the perception of reality), culture induced symptoms and disease, sub-culture of medical workers.

❖ 8.CASTE SYSTEM

Features of the modern caste system and its trends.

❖ 9.SOCIAL CHANGE

- Meaning of social change
- Factors of social change
- Human adaptation and social change
- Social change and stress, social change and deviance, social change and health programs, the role of social planning in the improvement of health and in rehabilitation.

❖ 10.SOCIAL CONTROL

- Meaning of social control,
- role of norms, folkways, customs, morals, religion law and other means of social control in the regulation of human behavior
- social deviance and disease.

❖ 11. SOCIAL PROBLEMS OF THE DISABLED

- Consequences of the following social problems in relation to sickness and disability; remedies to prevent these problems:

- Population explosion
- Poverty and unemployment
- Beggary
- Juvenile delinquency
- Prostitution
- Alcoholism
- Problems of women in employment

❖ 12. SOCIAL SECURITY

- Social security and social legislation in relation to the disabled.

❖ 13. SOCIAL WORKER

- Role of a medical social worker.

ENGLISH

1. Grammar

Students will be expected to use the following grammatical features correctly in context:

Verbs: The following forms: simple present, simple past, simple future, present continuous, past continuous, future continuous, present perfect, present perfect continuous, past perfect, future perfect.

Adverbs: Their formation: The position of certain types.

Prepositions: The more common uses of simple prepositions, selected verb-preposition (or verb-adverbial particles).

- Articles
- Conjunctions
- Subject-verb agreement
- Direct and reported speech
- Transformation of sentences: including Active and Passive Voice.

Recommended Books:

- i) Bhaskaran and Horsburgh, Strengthen your English (O.U.P.,1973).
- ii) S.Pit Corder, Intermediate English Practice Book.
- iii) Standard Allen, Living English Structure (Longman,1974).
- iv) F.T.Wood, A Remedial English Grammar for Foreign Students (Machmillan, 1965).
- v) C.D.Sidhu, An Intensive Course an English: A Remedial Workbook (Orient Longman,1978).

2. Comprehension

Students will be expected to answer questions on language and content of the prescribed book. Questions will be related to the text, and will aim at testing student's comprehension of standard English. Questions will be framed in such a way as to discourage cramming.

Prescribed Book:ⁱ

A choice of Short stories, ed. By Shakti Batra and P.S.Sidhu, Qxford University Press.

3. Vocabulary:

Students will be expected to expand their vocabulary through prescribed and general reading.

Recommended Books:

- i) G.A.Pitman Activating Vocabulary.
- ii) Longman's Simplified English Series by late Nineteenth century and twentieth century writers.
- iii) Michael West Series.

4. Composition:

Students will be expected to produce guided compositions, of about 200 words, on a variety of subjects within their experience.

SECOND YEAR

GENERAL & HEALTH PSYCHOLOGY

Section I

General Psychology

1. DEFINITION OF PSYCHOLOGY

- Definition of Psychology
- Basic information in relation to following schools methods and branches.

a. Schools: Structuralism
 Functionalism
 Behaviorism
 Psychoanalysis
 Gestalt Psychology.

b. Methods: Introspection
 Observation
 Inventory
 Experimental

c. Branches:

- ✓ General
- ✓ Industrial
- ✓ Child
- ✓ Clinical
- ✓ Social
- ✓ Abnormal
- ✓ Counseling
- ✓ Educational.

2. HEREDITY AND ENVIRONMENT

Twins, Relative importance of heredity and environment, their role in relation to physical characteristics, intelligence and personality, nature - nature controversy.

3. DEVELOPMENT AND GROWTH BEHAVIOUR

Infancy, Childhood, Adolescence, Adulthood, Middle age, Old age.

4. INTELLIGENCE

Definitions: IQ, Mental Age, List of various intelligence testes- WAIS, WISC, Bhatia's performance test, Raven's Progressive Matrices test.

5. MOTIVATION

➤ Definitions: Motive, drive, incentive and reinforcement, Basic information about primary needs: hunger thirst, sleep, elimination activity, air, avoidance of pain, attitude to sex.

➤ Psychological needs: Information, security, self-esteem, and competence, love and hope.

6. EMOTIONS

➤ Definition: Differentiate from feelings, physiological changes of emotion, Role of RAS, hypothalamus, cerebral cortex, sympathetic nervous system, adrenal gland, heredity and emotion, Nature and control of anger, fear and anxiety.

7. PERSONALITY

➤ Definitions: - List the components: Physical characteristics, character, abilities, temperament interest and attitudes.

➤ Discuss briefly the role of heredity, nervous system, physical characteristics, abilities, family and culture on personality development.

➤ Basic concepts of Freud:

- ✓ unconscious,
- ✓ conscious,
- ✓ Id, ego and superego
- ✓ List and define the oral, anal and phallic stages of personality development
- ✓ List and define the 8 stages as proposed by Erickson,
- ✓ 4 concepts of learning as proposed by Dollard and Miller: Drive, Cue, Response and Reinforcement.

a) Personality assessment:

- ✓ Interview,
- ✓ Standardised,
- ✓ Nonstandardised.
- ✓ Exhaustive and stress interviews,
- ✓ List and define inventories BAI, CPI and MMPI.
- ✓ Projective test: Rorschach, TAT and sentence completion test.

8. LEARNING

- ✓ Definition
- ✓ List the laws of learning as proposed by Thorndike.
- ✓ Types of learning: Briefly describe, classical conditions, operant conditioning, insight, observation and Trial and Error type

- ✓ List the effective ways to learn: Massed Vs. Spaced, Whole Vs. Part, Recitation Vs. Reading, Serial Vs. Free recall, knowledge of results, Association, Organization, Mnemonic methods, incidental Vs. Intentional learning, role of language.

9. THINKING

Definition, concepts, creativity, steps in creative thinking, list the traits of creative people, delusions.

10. FRUSTRATION

- Definition, Sources, Solution.
- Conflict: Approach - approach, Avoidance- avoidance, and approach – avoidance, solution.

11. SENSATION, ATTENTION AND PERCEPTION

- List of senses: Vision, Hearing, Olfactory, Gustatory and cutaneous sensation, movement, Equilibrium and visceral sense
- Define attention and list factors that determine attention: nature of stimulus intensity, colour, change, extensity, repetition, movement size, curiosity, primary motives.
- Define perception and list the principles of perception: Figure ground, constancy, similarity, proximity, closure, continuity values and interests, past experience context, needs, moods, religion, sex and age, perceived susceptibility perceived seriousness, perceived benefits, and socioeconomic status.
- Define illusion and hallucination.

- List visual, auditory, cutaneous, gustatory and olfactory hallucination.

12. DEMOCRATIC AND AUTHORITARIAN LEADERSHIP

- Qualities of leadership: Physical factors, intelligence, self-confidence, sociability, will and dominance.
- Define attitude. Change of attitude by: Additional information, changes in group-affiliation, enforced modification by law and procedures that affect personality. (Psychotherapy, Counseling and religious conversion)

13. DEFENCE MECHANISMS OF THE EGO

- | | |
|-----------------------|------------------------------|
| ➤ Denial | Undoing |
| ➤ Rationalization, | Interjection, |
| ➤ Projection, | Acting out depersonalization |
| ➤ Reaction formation, | Repression |
| ➤ Identification, | Emotional insulation |

Section II

HEALTH PSYCHOLOGY

1. PSYCHOLOGICAL REACTIONS OF A PATIENT

Psychological reactions of a patient during admission and treatment: Anxiety, Shock, Denial, Suspicion, Questioning, Loneliness, Regression, Shame, Guilt, Rejection, Fear, Withdrawal, Depression, Egocentricity, Concern about small matters, Narrowed interests, Emotional over-reactions, Perpetual changes,

Confusion, Disorientation, Hallucinations, Delusions, Illusions, Anger, Hostility,
Loss of hope.

2. REACTIONS TO LOSS

- Reactions to loss, death and bereavement
- Shock and disbelief
- Development of awareness, restitution, resolution.
- Stages of acceptance as proposed by Kubler-Ross.

3. STRESS

Physiological and psychological relation to health and sickness:

- Psychosomatic,
- Professional stress
- Burnout.

4. COMMUNICATIONS:

- Types:
 - ✓ Verbal and non-verbal elements in communication
 - ✓ Barriers to good communication
 - ✓ Developing effective communication
 - ✓ Specific communication techniques.
- Counseling: Definition, Aim, Differentiation from guidance, principles in counseling and personality qualities of counsellors.

5. COMPLIANCE

Nature, Factors, contributing to non-compliance, improving compliance.

6. EMOTIONAL NEEDS: Emotional needs and psychological factors in relation to:

- ✓ unconscious patients
- ✓ handicapped patients

- ✓ bed-ridden patients
- ✓ chronic pain
- ✓ spinal cord Injury
- ✓ paralysis
- ✓ cerebral palsy
- ✓ burns
- ✓ amputations
- ✓ disfigurement
- ✓ head injury
- ✓ degenerative disorders
- ✓ Parkinsonism
- ✓ leprosy
- ✓ Incontinence
- ✓ Mental illness

7. GERIATRIC PSYCHOLOGY

Specific psychological reactions and needs of geriatric patients.

8. PAEDIATRIC PSYCHOLOGY

Specific psychological reactions and needs of Pediatric patients.

9. BEHAVIOUR MODIFICATION

Application of various conditioning and learning principles to modify patient behaviors.

10. SUBSTANCE ABUSE: Psychological aspects of substance abuse:

- ✓ smoking,
- ✓ alcoholism
- ✓ drug addiction.

11. PERSONALITY STYLES: Different personality styles of patients.

ORTHOPAEDICS

Section-I

1. INTRODUCTION TO ORTHOPAEDICS

- Introduction to orthopedic terminology.
- Types of pathology commonly dealt with
- Clinical examination,
- Common investigations: X-rays & imaging techniques and outline of non-operative management.

2. PRINCIPLES OF OPERATIVE TREATMENT

List indications, contraindication and briefly outline principles of :

- Arthrodesis
- Arthroplasty
- Osteotomy
- Bonegrafting
- Tendon-Transfers
- Arthroscopy.

3. SPRAINS AND MUSCLE STRAINS

List common sites of sprains and muscle strains and describe the clinical manifestations and treatment. viz Tennis elbow , Golfer's elbow, Dequervain's disease, Tenovaginitis, Trigger finger, Carpal tunnel syndrome and Plantar fasciitis.

4. SPORTS INJURIES

Injuries related to common sports their classification and management

Section II

1. FRACTURES & DISLOCATIONS: General Principles, outline the following:

1. Types of Fractures including patterns. Open and closed fractures and fracture- dislocations.
2. Differences between dislocation and subluxation.
3. General & Local signs & symptoms of fractures dislocation.
4. Principle of management of fractures & dislocations.
5. Prevention & treatment of complications including: Fracture- disease, Volkmann's ischaemic contracture, Sudeck's Atrophy, Carpal Tunnel syndrome. Myositis ossificans, and shoulder-hand syndrome.
6. Fracture healing.

2. UPPER LIMB FRACTURES & DISLOCATIONS

1. Enumerate major long bone fractures and joint injuries.
2. Briefly describe their clinical features. Principles of management and complications.

3. LOWER LIMB FRACTURES & DISLOCATIONS

1. Enumerate major long bone fractures and joint injuries.

2. Briefly describe their clinical features, principles of management and complication.

4. SPINAL FRACTURES AND DISLOCATIONS

Out line the mechanism, clinical features, principles of management and complications of spinal injuries.

5. RECURRENT DISLOCATIONS

Outline the mechanism, clinical features principles of management and complications of recurrent dislocation of the shoulder and patella.

Section III

1. AMPUTATIONS

- a). Classify amputations ; List indications for surgery.
- b). Outline pre-operative, operative and prosthetic management.
- c). Outline prevention and treatment of complications.

2. BONE & JOINT INFECTIONS

Outline the etiology, clinical features, management and complications of:

- ✓ septic arthritis
- ✓ osteomyelitis,
- ✓ Tuberculosis(including spinal T.B.)

3. BONE JOINT TUMORS

Classify and outline the clinical features, management and complications of the following (benign/malignant bone and joint tumors):

- ✓ Osteomas
- ✓ Osteosarcomas
- ✓ Osteblastomas
- ✓ Ewing's sarcoma
- ✓ Multiple myeloma.

Section IV

1. CHRONIC ARTHRITIS

Outline the pathology, clinical features, mechanism of deformities, management and complications of :

- ✓ Rheumatoid arthritis.
- ✓ Osteoarthritis of major joints and spine
- ✓ Ankylosing spondylitis

2. Neck & Back Pain, Painful Arc Syndrome, Tendinitis, Myofascitis & Spasmodic Torticollis.

Outline the above including clinical features and management.

3. SPINAL DEFORMITIES

Classify spinal deformities and outline the salient clinical features, management and complications of :

- ✓ Scoliosis
- ✓ Kyphosis

- ✓ Lordosis.

Section V

1. POLIOMYELITIS

- Pathology, microbiology, prevention, management and complications of polio.
- Treatment of residual paralysis including use of orthoses.
- Principles of muscle transfers and corrective surgery.

2. CONGENITAL DEFORMITIES

- Clinical features and management of
 - ✓ CTEV,
 - ✓ CDH,
 - ✓ Flat foot,
 - ✓ vertical talus,
 - ✓ limb deficiency (Radial and femoral, Tibial and Fibular deficiencies)
 - ✓ Meningomyelocele,
 - ✓ Arthrogryposis multiplex congenita
 - ✓ Osteogenesis imperfecta.

3. PERIPHERAL NERVE INJURIES

Outline the clinical features and management, including reconstructive surgery of:

- a). Radial, median and ulnar nerve lesions.
- b). Sciatic and lateral popliteal lesions.
- c). Brachial Plexus injuries including Erb's, Klumpke's and crutch palsy.

4. HAND INJURIES

Outline of clinical features, management and complications of:
Skin and soft tissue injury, Tendon injury, Bone and joint injury.

5.LEPROSY

Outline of clinical features, management and complications of:

- Neuritis
- Muscle paralysis
- Tropic ulceration and hand & foot deformities.

BIO-MECHANICS & KINESIOLOGY

Section I

Mechanics

- a) Introduction to mechanics including motion, forces, parallel forces system.
- b) Newton's law of motion, concurrent force systems – composition forces, muscle action line etc.
- c) Centre of Gravity, line of gravity, stability and equilibrium.
- d) Introduction to Biomechanics and terminology.

Section II

Joint Structure and function

- a) Basic principles of Joint design and a human joint.
- b) Tissues present in human joint including dense fibrous tissue, bone, cartilage and connective tissue.
- c) Classification of joints.
- d) Joint function, Kinematics chains and range of motion.
- e) Recall anatomy and study the biomechanics of the spine, shoulder girdle, joints of the upper extremity, pelvic girdle and the joints of the lower extremity.

Section III

Muscle structure and function

- a) Mobility and stability functions of muscle.
- b) Elements of muscle structure and its properties.
- c) Types of muscle contractions and muscle work.
- d) Classification of muscles and their functions.
- e) Group action of muscles, Coordinated movement.

Section IV

Posture & gait

- a) Posture- Definition, factors responsible for posture, relationship of gravity on posture.
- b) Postural imbalance - Factors responsible for imbalance in Static and dynamic positions including ergonomics.
- c) Description of Normal gait, determinants of gait, spatial and temporal features, and analysis.
- d) Gait deviations - Types, Causative factors and analysis.

PRACTICAL

1. To study the effects of forces on objects.
2. To find out the C.O.G. of an object.
3. To identify axes and planes of motion at the joints of spine, shoulder girdle, joints of upper extremity, Pelvic girdle and joints of lower extremity.

4. To study the different types of muscle contraction, muscle work, group action of muscles and coordinated movement.
5. Analysis of Normal posture respect to L.O.G. and the optimal position of joints in Antero posterior and lateral views.
6. Analysis of normal gait and measurement of spatio-temporal features.

ELECTROTHERAPY- I

Section I

1. PHYSICAL PRINCIPLES:
 - a. Structure and properties of matter- solids, liquids and gases
 - b. Adhesion, surface tension, viscosity, density and elasticity.
 - c. Structure of atom, molecules, elements and compounds.
 - d. Electron theory, static and current electricity.
 - e. Conductors, Insulators, Potential difference, Resistance & intensity.
 - f. Ohm's Law- Its application to AC & DC currents.
2. PHYSICS OF DEVICES
 - Rectifying Devices- Thermionic Valves, Semiconductors, Transistors, Amplifiers, transducers and Oscillator circuits.
 - Capacitance, condensers and in D.C. and A.C. Circuits.
 - Display devices & indicators-analogue & digital.
3. EFFECTS OF CURRENT:
 - a) Chemical effects- Ions and electrolytes, Ionization, Production of an E.M.F. by chemical actions.
 - b) Magnetic effects, Molecular theory of Magnetism, Magnetic fields, Electromagnetic Induction. Ammeter and Voltmeter, Transformers and Choke Coil.

- c) Thermal Effects-Joule's Law and Heat production.
- 4. Physical Principles of sound and its properties.
- 5. Physical Principles of light and its properties.
- 6. Electromagnetic spectrum – biophysical application.

Section-II

- 1. Electrical supply:
 - a) Brief outline of main supply of electric current.
 - b) Dangers- short circuits, electric shocks.
 - c) Precautions – safety devices, Earthing, fuses etc.
 - d) First aid & initial management of electric shock.

Section – III

Low Frequency Currents:

- 1. Introduction to direct, alternating & modified currents.
- 2. Production of direct current:- Physiological and therapeutic effects of constant current, anodal and cathodal galvanism, Ionisation and their application in various conditions.
- 3. Iontophoresis– Principles of clinical application, indication contraindication, precaution, operational skills of equipment & patient preparation, Dosage and Ion selection.

4. Modified direct current – various pulses, duration and frequency and their effect on Nerve and Muscle tissue. Production of interrupted and surged current & their effects.
5. Modified direct current - Physiological and therapeutic effects, principles of clinical application, indications, contra indications, precautions, operational skills of equipment & patient preparation.
6. Transcutaneous Electric Nerve Stimulation (TENS) :-
 - a) Types of Low Frequency, pulse widths, frequencies & intensities used as TENS applications.
 - b) Theories of pain relief by TENS.
 - c) Principle of clinical application, effects & uses, indications, contraindications, precautions, operational skills of equipment & patient preparation.

Section IV

Electrical Reactions and Electro-diagnostic tests:

- a) Electrical Stimuli and normal behavior of Nerve and muscle tissue.
- b) Types of lesion and development of reaction of degeneration.
- c) Faradic – Intermittent direct current test.
- d) S.D.Curve and its interpretation.
- e) Chronaxie, Rheobase & pulse ratio.

Section – V

Actinotherapy :-

1. Infra red rays –

- Wavelength, frequency, types of IRR
- Sources of IRR generation
- Technique of irradiation
- Physiological & Therapeutic effects
- Indications, contraindications, precautions, operational skills of equipment & patient preparation.

2. Ultra-violet rays (UVR) -

- Wavelength, frequency, types of UVR
- Sources of UVR generation
- Technique of irradiation
- Physiological & therapeutic effects
- Indication, contraindications, precautions, operational skills of equipment & patient preparation.
- Dosimetry of UVR.

Section – VI

Superficial heat – Paraffin wax bath, moist heat, electrical heating pads.

- a) Mechanism of production.
- b) Mode of heat transfer.
- c) Physiological & therapeutic effects.
- d) Indications, contraindications, precautions, operational skills of equipment & patient preparation.

ELECTRO THERAPY-I (PRACTICAL)

1. To study the basic operation of electric supply to the equipment & safety devices.

2. To experience sensory and motor stimulation of nerves and muscles by various types of low frequency currents on self.
3. To locate and stimulate different motor points regionwise, including the upper & lower limb, trunk & face.
4. Therapeutic application of different low frequency currents, Faradic foot bath, Faradism under pressure, Iontophoresis.
5. To study the reaction of degeneration of nerves. To plot strength duration curves. To find chronaxie and Rheobase.
6. To study a hydrocollator unit, its operation and therapeutic application of Hot packs – regionwise.
7. To study various types of Infrared lamps and their application to body – regionwise.
8. To study a paraffin wax bath unit, its operation and different methods of application – regionwise.
9. To study different types of Ultra violet units, their operation, assessment of test dose and application of U.V.R. – regionwise.
10. To study a TENS Stimulator, its operation and application - regionwise.

Exercise Therapy-I

Section-I

- a) Introduction to Exercise therapy, Principles, techniques and general areas of its application. Assessment & its importance.
- b) Description of fundamental starting positions and derived positions including joint positions, muscle work, stability, effects and uses.
- c) Introduction to Movement including analysis of joint motion, muscle work and Neuro-muscular co-ordination.
- d) Classification of movements - Describe the types, technique of application, indications, contra-indications, effects and uses of the following :
 - a) Active movement
 - b) Passive movement
 - b) Active assisted movement
 - d) Resisted movement.
- e) Suspension Therapy.

To study the principles, techniques of application indication, Contra-indication, precautions, effects and uses of Suspension Therapy.

Section-II

MANUAL MUSCLE TESTING

- a) Principles and applications techniques of Manual muscle testing.
- b) Testing position, procedure and grading of muscles of the upper limb, lower limb, facial and trunk etc.

Section III

GONIOMETRY

- a) Goniometer and its types.

- b) Principles, techniques and application of Goniometry.
- c) Testing position, procedure and measurement of R.O.M. of the joints of upper limbs, lower limbs and trunk.

Section IV

Soft Tissue Manipulation. (Therapeutic Massage)

- a) History, various types of soft tissue manipulation techniques.
- b) Physiological effects of soft tissue manipulations on the following systems of the body:
Circulatory, Nervous, Musculoskeletal, Excretory, Respiratory, Integumentary system and metabolism.
- c) Classify, define and describe : Effleurage, Stroking, Kneading, Petrissage, Deep friction, vibration and shaking etc.
- d) Preparation of the patient : Effects, uses, indications and contraindications of the above manipulations.

Section-V

MOTOR LEARNING

- i) Introduction to motor learning
 - a) Classification of motor skills.
 - b) Measurement of motor performance.
- ii) Introduction to motor control
 - a) Theories of motor control.
 - c) applications.
- iii) Learning Environment
 - a) Learning of Skill.

- b) Instruction & augmented feed back.
- c) Practice conditions.

Section-VI

Relaxation & Therapeutic Gymnasium

- a) Relaxation
 - 1. Describe relaxation, muscle fatigue, muscle spasm and tension (mental & physical).
 - 2. Factors contributing to fatigue & tension.
 - 3. Techniques of relaxation (local & general).
 - 4. Effects, uses & clinical application.
 - 5. Indication & contraindication.

- b) Therapeutic Gymnasium:
 - i) Set-up of a gymnasium & its importance.
 - ii) Various equipment in the gymnasium.
 - iii) Operational skills, effects & uses of each equipment.

EXERCISE THERAPY-I (PRACTICAL)

- 1) To practice all the soft tissue manipulative techniques regionwise-upper limb, lower limb, neck, back and face.
- 2) To practice the measurement of R.O.M. of joints-upper limb, lower limb & trunk.
- 3) To practice the grading of muscle strength regionwise-upper limb, lower limb and trunk.
- 4) To study the position of joints, muscle work, and stability of various fundamental and derived positions.
- 5) To study the different types of muscle contraction, muscle work, group action of muscles and co-ordinated movement.

- 6) To practice the various types of suspension therapy and its application on various parts of the body-regionwise.
- 7) To study & practice local & general relaxation techniques.
- 8) To study the structure & function alongwith application of various equipment in a gymnasium.

THIRD YEAR

GENERAL MEDICINE

Section-I

1. Introduction to modes of transfer of communicable diseases & general preventive measures.
2. Bacterial Diseases:- Tuberculosis, Leprosy, Rheumatic fever, Tetanus, Typhoid fever, Diphtheria, Pneumonia, Bacillary Dysentery and Measles.
3. Viral Diseases:- Herpes-simplex and zoster, Varicella, Measles, Mumps, Hepatitis B & C, AIDS & influenza.
4. Metabolic and Deficiency Diseases:- Diabetes, Anaemia, Vitamin & Nutritional Deficiency diseases, diseases of the endocrine glands.

Section-II

1. Diseases of Respiratory System:-

- Asthma
- Bronchitis
- Massive collapse of lungs
- Bronchiectasis
- Bronchial pneumonia
- Lung abscess
- Emphysema
- Empyema
- Paralysis of diaphragm & vocal cords
- Chronic infection of larynx and trachea
- Abnormalities of trachea
- Infarct of lungs
- Chronic passive congestion, chronic obstructive pulmonary disease, chest wall deformities.

2. Diseases of Circulatory System :-

- Thromobsis, Embolism, Gangrene, Hemorrhage
- Valvular diseases
- Heart Malformation
- various diseases of arteries
- Diseases of blood forming organs
- Anaemia, Leukemia Leucocytosis
- Peripheral Vascular diseases and diseases of the lymphatic system.
- Diseases of the heart – Hypertension, Hypotension, Aortic aneurysm, Endocarditis, Pericarditis, Aortic Regurgitation, Cardiac failure, coronary heart diseases, congenital heart malformation and its manifestation.

Section-III

1. Diseases of Digestive System :-

- Pharyngitis
- spasm of the Oesophagus, Diverticulum stenosis
- Gastric ulcer
- Hemetemesis
- Pyloric stenosis
- Dyspepsia, Vomiting
- Diarrhoea
- Duodenal ulcer, etc.

2. Disease of Liver:- Jaundice, Cirrhosis of liver, Abscess of liver, Ascites

3. Diseases of Kidney :-

- Polyuria
- Haematuria, Uremia, Anuria
- Nephritis
- Urinary infections
- Urinary calculi.

Section-IV

Diseases of Skin:-

1. Characteristics of normal skin, abnormal changes, types of skin lesions.

2. Conditions –

- Leprosy
- Acne
- Boil, Carbuncles
- Impetigo
- Infections of skin
- Herpes
- Urticaria
- Psoriasis
- Skin disorders associated with circulatory disturbances
- Warts, Corn

- Defects in pigmentation
- Leucoderma
- Fungal infections
- Alopecia,
- Dermatitis
- Eczema and Skin-allergies
- Venereal diseases.

Section-V

Psychiatry:

1. Introduction: Definition, defense mechanism, symptomatology, types & causes of mental disorders, psychosomatic disorders.
2. Disorders :-
 - a) Psychosis – Schizophrenia (including paranoid), Manic Depressive psychosis, involmental psychosis
 - b) Psychoneurosis – Anxiety, hysteria, anxiety states, neurasthesis, reactive depression, obsessive -compulsive neurosis.
 - c) Organic reaction to – Toxins, Trauma, & Infection.
 - d) Senile dementia.
3. Mental retardation– Definition, causes, manifestation and management.
4. Therapies –
 - (a) Psychotherapy–Group therapy, Psychodrama, behavior modification, family therapy, play therapy, psychoanalysis, hypnosis.
 - (b) Drug therapy
 - (c) Electro convulsive therapy

GENERAL SURGERY

Section-I

1. Introduction to principles of surgery and its procedure.
2. Shock-Definition, types, clinical feature, pathology & management.
3. Hemorrhage – common sites, complication, clinical features & management.
4. Blood Transfusion – Blood group matching, indication & complication.
5. Anaesthesia – Principles of anaesthesia, types & procedure.

Section-II

1. Wounds, Tissue repair, Classification – Acute Wounds, Chronic wounds, Scars & their Management.
2. Wound infections: Physiology and manifestation, Types of Infections & their Management.
3. Tumors and Ulcers:- (a) Tumors – Types & Management
(b) Ulcers – Types & Management
4. Burns – Causes, Classification, Clinical features & Management.
5. Skin Grafting – Indications, Types & procedures.
6. Hand infections – Types & Management.
7. General Injuries – Types & Management.

Section-III

1. Complications of Surgery.
2. Abdominal Surgery – Types of incisions & common surgical procedures.
3. Thoracic and Cardiac Surgery – Types of incisions & common surgical procedures.

Section-IV

OBSTETRICS AND GYNECOLOGY

1. Pregnancy, stages of labour & its complications, indications & types of surgical Procedures.

2. Gynecological disorders – Salpingitis, parametritis, retro-uterus, prolapse of Uterus, pelvic inflammatory diseases, urinary incontinence.

Section-V

OPHTHALMOLOGY

1. Common inflammations and other infections of eye.
2. Ptosis.
3. Blindness – common causes & management.
4. Refractions – testing, errors & remedies.
5. Strabismus – types, features & corrective measures.

Section-VI

EAR, NOSE & THROAT (ENT)

1. Introduction – Outline, mechanism of audition, olfaction & speech.
2. Classify causes of hearing impairment, assessment techniques, conservative & surgical management.
3. Hearing aids – types & indications.
4. Outline common ENT infections & lesions, which affect hearing, breathing, speech & their management.
5. Outline the function of vestibular apparatus, its common disorders & their management.

PAEDIATRICS AND GERIATRICS

Section-I

PAEDIATRICS

1. Review normal fetal development & child birth, including assessment of a neonate.
2. Development of a normal child – neuromotor, physical growth, cognitive, intellectual, social, etc.
3. The examination & assessment of a Paediatric patient.
4. Congenital & acquired musculo skeletal disorders – etiogenesis, clinical manifestations & principles of management.
5. Congenital & acquired Cardio-pulmonary disorders – etiogenesis, clinical manifestations & principles of management.
6. Congenital & acquired neurological disorders (CNS & PNS) etiogenesis, clinical manifestations & Principles of management.
7. Hereditary disorders – etiogenesis, clinical manifestations & Principles of management.
8. Nutritional Vitamins Deficiency & development disorders etiogenesis, clinical manifestations & Principles of management.
9. Burns, injuries & accident – Types & principles of management, including preventive care.
10. Surgical intervention – Indications & common surgical procedures.

Section-II

GERIATRICS

1. Normal aging – definition, the anatomical, physiological and cognitive changes related to aging.

2. Epidemiology and socio-economic impact of aging.
3. The examination & assessment of a geriatric patient.
4. Musculo skeletal disorders – etiogenesis, clinical manifestations & principles of management.
5. Cardio pulmonary disorders - etiogenesis, clinical manifestations& principles of management.
6. Neurological disorders (CNS & PNS) - etiogenesis, clinical manifestations & principles of management.
7. Diet & Nutritional requirement of the elderly. Nutritional disorders & their management.
8. Burns, injuries & accident as related to the elderly & preventive care.
9. Dementia – types & principles of management.
10. Overview of depressive disorders in the elderly

ELECTROTHERAPY – II

Section-I

1. Review of Neuro-muscular Physiology including effects of electrical stimulation.
2. Physiological responses to heat gain or loss on various tissues of body.
3. Therapeutic effects of heat, cold and electrical currents.
4. Physical principles of Electro-magnetic radiation.
5. Physics of sound including characteristics and propagation.

Section-II

1. High frequency currents (S.W.D. and M.W.D.) – Production, biophysical effects, types, therapeutic effects, techniques of application, indications, contra-indications, precautions, operational skills and patient preparation, Dosage and Prescription.

2. Medium frequency currents (Interferential Therapy) – Conceptual framework of medium frequency current therapy, production, biophysical effects, types, therapeutic effects, techniques of application, indications, contra-indications, precautions, operational skills and patient preparation, Dosage and Prescription.
3. High frequency sound waves (ultrasound) – Production, biophysical effects, types, therapeutic effects, techniques of application, indications, contra-indications, precautions, operational skills and patient preparation.

Section-III

1. Therapeutic light in Physiotherapy (LASER) – Definition, historical background, physical principle, biophysical effects, types, production, therapeutic effects, indications, contra-indications, precautions, operational skills and patient preparation.
2. Therapeutic cold (Cryotherapy) – Sources, biophysical effects, types, therapeutic effects, indications, contra-indications, precautions, application techniques and patient preparation.
3. Therapeutic mechanical pressure (Intermittent compression therapy) – Principle, biophysical effects, therapeutic effects, indications, contra-indications, precautions, operational skills and patient preparation.

Section-IV

1. Electro-diagnosis – Instrumentation, definition & basic techniques of E.M.G. and E.N.G.
2. Bio-feed back – Instrumentation, principles, therapeutic effects, indications, contra-indications, limitations, precautions, operational skills and patient preparation.

ELECTRO THERAPY – II PRACTICAL

1. To study a Short wave diathermy unit, its operation and different methods of application – regionwise.
2. To study a Micro wave diathermy unit, its operation and different methods of application – regionwise.
3. To study a Ultrasound unit, its operation and different methods of application – regionwise.
4. To study a Laser unit, its operation and different methods of application – regionwise.
5. To study various forms of therapeutic cold application regionwise including – ice, cold packs, vapour coolant sprays, etc.
6. To study a Intermittent pneumatic therapy unit, its operation and different methods of application – regionwise.
7. To study a Interferential therapy unit, its operation and different methods of application – regionwise.
8. To observe various Electro-myography (EMG) procedures.
9. To observe various Electro neurography (ENG) procedures.
10. To study a Bio feed back unit, its operation and different methods of application – regionwise.

EXERCISE THERAPY – II

Section-I

Therapeutic Exercises:

1. Principle, classification, techniques, physiological & therapeutic effects, indications & contraindications of therapeutic exercises.
2. Assessment & evaluation of a patient (regionwise) to plan a therapeutic exercise program.

3. Joint Mobility - Etiogenesis of Joint stiffness, general techniques of mobilization, effects, indications, contraindications & precautions.
4. Muscle Insufficiency – Etiogenesis of muscle insufficiency (strength, tone, power, endurance & volume), general techniques of strengthening, effects, indications, contraindications & precautions.
5. Neuromuscular In co-ordination – Review normal neuromuscular co-ordination. Etiogenesis of neuromuscular in co-ordination & general therapeutic techniques, effects, indications, contraindications & precautions.
6. Functional re-education – General therapeutic techniques to re-educate ADL function.

Section-II

Posture ,Balance and Gait:

1. Posture – Overview of the mechanism of normal posture.
2. Abnormal posture – Assessment, types, etiogenesis, management, including therapeutic exercises.
3. Static & Dynamic Balance – Assessment & management including therapeutic exercises.
4. Gait – Overview of normal gait & its components.
5. Gait deviations - Assessment, types, etiogenesis, management, including therapeutic exercises.
6. Types of walking aids, indications, effects & various training techniques.

Section-III

Hydrotherapy:

1. Basic principles of fluid mechanics, as they relate to hydrotherapy.
2. Physiological & therapeutic effects of hydrotherapy, including joint mobility, muscle strengthening & wound care etc.
3. Types of Hydrotherapy equipment, indications, contraindications, operational skills & patient preparation.

Section-IV

Special Techniques:

1. MOBILIZATION AND MANIPULATION:
Introduction to special mobilization & manipulation techniques, effects, indications & contraindications.
2. PNF: Conceptual framework, principle of proprioceptive neuromuscular facilitation (PNF) techniques, including indications, therapeutic effects and precautions.
3. TRACTION: Principles of traction, physiological & therapeutic effects classification, types, indications, contraindications, technique of application, operational skills & precautions.
4. BREATHING EXERCISES Review normal breathing mechanism, types, techniques, indications, contraindications, therapeutic effects & precautions of breathing exercises.
5. GROUP THERAPY – Types, advantages & disadvantages.
6. EXERCISES FOR HEALTHY INDIVIDUALS – Importance and effects of exercise to maintain optimal health & its role in the prevention of diseases. Types, advantages, disadvantages, indications, contraindications & precautions for all age groups.

7. INTRODUCTION TO YOGA – Conceptual framework, various “asanas”, the body-mind relationship, effects & precautions.

EXERCISE THERAPY – II PRACTICAL

1. To practice assessment & evaluative procedures, including motor, sensory, neuro-motor co-ordination, vital capacity, limb length & higher functions.
2. To study & practice the various techniques of mobilization of joints regionwise.
3. To study & practice the various techniques of progressive strengthening exercises of muscles regionwise.
4. To study & practice the use of various ambulation aids in gait training.
5. To assess & evaluate ADL's and practice various training techniques.
6. To study & practice mat exercises.
7. To assess & evaluate normal & abnormal posture & practice various corrective techniques.
8. To assess & evaluate equilibrium/balance & practice various techniques to improve balance.
9. To study the structure & functions of hydrotherapy equipments & their applications.
10. To study & practice various traction techniques, including manual, mechanical & electrical procedures.
11. To study & practice various group exercise therapies.
12. To practice & experience effects of basic yoga “asanas”.
13. To study, plan & practice exercise programmes for normal persons of various age groups.

FOURTH YEAR

NEUROLOGY

Section-I

1. Neuroanatomy :-

- ◆ Review the basic anatomy of the brain and spinal cord including
 - ◆ Blood supply of the brain and spinal cord
 - ◆ Anatomy of the visual pathway
 - ◆ Connections of the cerebellum and extrapyramidal system
 - ◆ Relationship of the spinal nerves to the spinal cord segments
 - ◆ Long tracts of the spinal cord
 - ◆ The brachial and lumbar plexuses, and cranial nerves.
2. Neurophysiology:-
 - ◆ Review in brief the Neurophysiological basis of: tone and disorders of tone and posture, bladder control, muscle contraction, movement and pain
 3. Assessment and evaluative procedures for the neurological patient.
 4. Review of the principles of management of a neurological patient.

Section-II

Briefly outline the etiology, clinical features and management of the following Neurological Disorders:

1. Congenital and childhood disorders –
 - Cerebral palsy
 - Hydrocephalus
 - Spina Bifida.
2. Cerebrovascular accidents –
 - General classification
 - Thrombotic, embolic, haemorrhagic & inflammatory strokes
 - Gross localisation and sequelae.

3. Trauma – localisation, first aid and management of sequelae of head injury and spinal cord injury.
4. Diseases of the spinal cord – Craniovertebral junction anomalies, Syringomyelia, Cervical and lumbar disc lesions, Tumours and Spinal arachnoiditis.
5. Demyelinating diseases (central and peripheral) – Guillain – Barre syndrome, Acute disseminated encephalomyelitis, Transverse myelitis and Multiple sclerosis.

Section-III

Briefly outline the etogenesis, clinical features and management of the following Neurological Disorders:

1. Degenerative disorders – Parkinson’s disease and Dementia.
2. Infections – Pyogenic Meningitis sequelae, Tuberculous infection of central nervous system and Poliomyelitis.
3. Diseases of the muscle – Classification, signs, symptoms, progression and management.
4. Peripheral nerve disorders – Peripheral nerve injuries, Entrapment neuropathies and Peripheral neuropathies.

Section-IV

1. Epilepsy – Definition, classification and management.
2. Myasthenia Gravis – Definition, course and management.
3. Intracranial tumours – Broad classifications, signs and symptoms.
4. Motor neuron disease - Definition, classification and management.
5. Cranial nerve – Types of disorders, clinical manifestation & management.

Section-V

1. Introduction to neuropsychology.
2. General assessment procedures and basic principal of management

RESEARCH METHODOLOGY AND BIOSTATISTICS

Section-I

1. Introduction: Importance of research in clinical practice, scientific approach, characteristics, purposes, and limitations.
2. Ethical issues in research, elements of informed consent.
3. Structure of a research proposal.

Section-II

1. Research Question including literature review.
2. Measurement: Principles of measurement, reliability and validity.
3. Experimental sampling and design.
4. Descriptive research

Section-III

Biostatistics:

1. Descriptive statistics.
2. Comparison of means, T-tests.
3. Analysis of Variance.
4. Multiple comparisons.
5. Non-parametric statistics
6. Correlation.

PHYSIOTHERAPY IN MEDICAL CONDITIONS

Section-I: General Medicine

Review of the Pathological changes and principles of management by Physiotherapy in the following conditions:

1. Inflammation-acute, chronic and suppurative.
2. Oedema-Traumatic, obstructive, Paralytic, Oedema due to poor muscle and laxity of the fascia.
3. Arthritis and Allied Conditions (in details) –
 - a) Osteo-arthritis-generalised, Degenerative and traumatic, Spondylosis and disorders.
 - a) Rheumatoid Arthritis, Still's disease, infective Arthritis.
 - b) Spondylitis, Ankylosing Spondylitis.
 - c) Non-Articular Rheumatism-Fibrositism, Myalgia, bursitis, Peri-arthritis etc.
4. Common conditions of Skin – Acne, Psoriasis, Alopecia, Leucoderma, Leprosy, Sexually transmitted diseases.
5. Deficiency Diseases – Rickets, Diabetes, Obesity, Osteoporosis & other deficiency disorders related to Physiotherapy.
6. Psychiatric Disorders – Psychosis, Psycho-neurosis, Senile dementia.

Section-II Respiratory

- A.
 - (1) Review of mechanism of normal respiration.
 - (2) Chest examination, including auscultation, percussion.
 - (3) Knowledge of various investigative procedures (invasive & noninvasive) used in the diagnosis of various respiratory disorders.

- B. Review of the pathological changes and principle of management by physiotherapy of the following conditions:
 - (1) Bronchitis, Asthma, Lung abscess, Bronchiectasis, Emphysema, COPD.
 - (2) Pleurisy and Empyema, Pneumonia.
 - (3) Bacterial Disease.
 - (4) Rheumatic fever, Carcinoma of respiratory tract.
 - (5) Paralysis of diaphragm & vocal cords.
 - (6) Chest wall deformities.

Section-III Cardiovascular

- A. (1) Review of anatomy & physiology of the Cardiovascular system.
- (2) Knowledge of various investigative procedures (invasive & noninvasive) used in the diagnosis of various Cardiovascular disorders.
- (3) Review of the pathological changes & principles of management by physiotherapy of the following conditions:
 Thrombosis, Embolism, Buerger's diseases, Arteriosclerosis,
 Thrombophlebitis, Phlebitis, Gangrene, Congestive Cardiac failure,
 Hypertension, Hypotension, aneurysm.

Section-IV Neurology

1) EXAMINATION OF NEUROLOGICAL DISORDERS:

- Sensory assessment
- Motor assessment
- Coordination assessment
- Functional assessment

B. PRINCIPLES OF TREATMENT:

- Techniques of facilitation, inhibition and excitation
- Sensory stimulation
- Motor control training
- Problems like spasticity, rigidity, deformity etc.

C. KNOWLEDGE OF VARIOUS INVESTIGATIVE PROCEDURES(INVASIVE AND NON INVASIVE) AND THEIR USE DIAGNOSIS OF VARIOUS NEUROLOGICAL DISORDERS:

- CT Scan
- MRI
- EEG
- NCV and EMG

II) REVIEW OF PATHOLOGICAL CHANGES AND PRINCIPLES OF MANAGEMENT BY PHYSIOTHERAPY OF FOLLOWING CONDITIONS:

A. STROKE HEWMIPLEGIA:

- Review of etiopathogenesis and classification of CVA
- Clinical manifestations (sensory , motor, speech and language, perceptual deficits, cognitive/behavioural, bladder/bowel, oropharyngeal)
- Other manifestations and complications
- Physiotherapy:

General considerations: synergy patterns, muscle tone, spasticity etc.

Assessment

Principles of various therapeutic techniques (Bu\runnstrom, Bobath ,MRP,Rood, PNF etc.)

B. POLYNEUROPATHY:

- Formation ,anatomy and function of peripheral nerve.
- Etiopathogenesis of various polyneuropathies with special reference to Guillian Barre Landry Syndrome
- Clinical manifestations and diagnosis of polyneuropathy
- Patient assessment
- Physiotherapy management:
 - In the intensive care unit.
 - In the recovery stage

C. PARKINSONISM:

- Relevant anatomy
- Etiology and Pathophysiology
- Symptomatology and sequelae of parkinson's disease
- Evaluative procedures and patient assessment
- Physiotherapy : aims and objectives, principles of management, tequines etc.

D. CEREBELLAR ATAXIA:

- Relevant anatomy
- Symptomatology and sequelae of parkinson's disease
- Evaluative procedures and assessment
- Physiotherapy : aims and objectives, principles of management,

E. TABES DORSALIS:

- Etiology
- Pathogenesis
- Symptoms : in the pre ataxic, ataxic and paralytic stage
- Physiotherapy management

F. EXTRA PYRAMIDAL LESIONS:

- Etiology
- Symptomatology
- Physiotherapy management

G. SPINAL CORD LESIONS, PARAPLEGIA:

- Various causes of paraplegia with special reference to spinal cord injuries and Pott's disease
- Clinical presentation and assessment of patient at each level of injury
- Physiotherapy and rehabilitation

III) A. MULTIPLE SCLEROSIS:

- Etiology and pathophysiology
- Clinical features, course and prognosis
- Diagnosis and differential diagnosis
- Patient assessment
- Principles and techniques of physiotherapy management

B. MOTOR NEURONE DISEASE :

- Muscular atrophy, progressive bulbar palsy
- Etiology and pathology
- Symptoms and sequelae
- Assessment and diagnosis
- Physiotherapy management

C. SYRINGOMYELIA:

- Etiology and pathology
- Signs and Symptoms
- Diagnosis and assessment
- Physiotherapy management

D. SUBACUTE COMBINED DEGENERATION OF SPINAL CORD VIT B 12 NEUROPATHY

- Etiology and pathology
- Symptoms
- Diagnosis and assessment
- Physiotherapy management

E. PERIPHERAL NERVE LESIONS

- Structure and function of peripheral nerve
- Mechanism of injury
- Symptoms of various nerve injuries specific to level and site of injury
- Examination : sensory and motor assessment, deformities etc.
- Physiotherapy:
 - Electrotherapeutic management
 - Exercise therapy
 - Splintage

V) NEURITIS AND NEURALGIA :

Brachial, sciatic, facial and trigeminal

- Etiopathogenesis
- Classification
- Symptomatology

Physiotherapy :

- In acute stage
- In subacute stage
- In Convalescent stage

VI) A. POLIOMYELITIS :

- Etiology and pathology
- Clinical features in acute (pre paralytic and paralytic) and chronic stage
- Patient assessment
- Principles of physiotherapy treatment
- Special emphasis on types of orthosis prescribed and their importance

B. MENINGITIS AND ENCEPHALITIS:

- Etiopathogenesis
- Clinical features
- Assessment and diagnosis
- Principles of treatment

C. MYOPATHIES:

- Etiopathogenesis
- Signs and symptoms; sequel of disease
- Diagnosis and patient assessment
- Principles of physiotherapy management

VII) TRAUMATIC HEAD INJURIES AND SPINAL CORD INJURIES:

Section-V Paediatric

- A. (1) Review of the examination & assessment of a Paediatric patient.
- B. Review of the pathological changes & principles of management by physiotherapy of the following conditions:
- (1) Common congenital & acquired musculo skeletal disorders.
 - (2) Common congenital & acquired neurological disorders (CNS & PNS).
 - (3) Common hereditary disorders.
 - (4) Common nutritional, metabolic & vitamin deficiency disorders.

Section-VI: Geriatrics

- A. (1) Review of the examination & assessment of a geriatric patient.
- B. Review of the pathological changes & principles of management by Physiotherapy of the following conditions of the ages:
- (1) Musculo skeletal disorders.
 - (2) Cardiopulmonary disorders.
 - (3) Neurological disorders (CNS & PNS).
 - (4) Injuries & accidents specific to the aged.

PHYSIOTHERAPY IN SURGICAL CONDITIONS

SECTION -I

ORTHOPAEDICS:

I) UPPER LIMB FRACTURES AND DISLOCATIONS:

Pathological changes, complications and principles of management by physiotherapy: after conservative and / or post operative treatment of following:

- a) Fractures of phalanges, metacarpals and carpal bones
- b) Fractures of forearm bones
- c) Fractures of condyles of humerus
- d) Fractures of humeral shaft
- e) Fractures of head and neck of humerus
- f) Fractures of clavicle and scapula
- g) Shoulder and elbow dislocations
- h) A-C joint, MCP joint and IP joint dislocations.

II) LOWER LIMB FRACTURES AND DISLOCATIONS:

Pathological changes, complications and principles of management by physiotherapy: after conservative and / or post operative treatment of following:

- a) Fractures of metatarsals
- b) Fractures of and around ankle
- c) Fractures of tibia and fibula
- d) Fractures of femoral shaft
- e) Fractures of femoral neck and head
- f) Fractures of patella
- g) Patellar and hip joint dislocations.

III) FRACTURES OF PELVIS, RIBCAGE AND SPINE:

Pathological changes, complications and principles of management of :

- a) Fractures of acetabulum, ilium, pubis etc.
- b) Fractures of ribcage
- c) Fractures and dislocation of vertebrae

IV) SOFT TISSUE INJURIES:

- Clinical types of soft tissue injuries: sprain, strain, contusion, haematoma etc.
- Pathological changes and repair and recovery pattern and Clinical assessment of:
 - a) Synovitis
 - b) Muscle injuries
 - c) Ligament injuries: especially knee and ankle ligaments
 - d) Tendon injuries: biceps brachii , supraspinatus, patellar, biceps femoris etc
 - e) Bursitis and tenosynovitis
 - f) Crush injuries : pathophysiology, complications and principles of treatment.
- Repair of injured tendons and ligaments: post surgical physiotherapy management

V) COMMON CONGENITAL AND ACQUIRED MUSCULOSKELETAL DISORDERS:

Etiopathogenesis, clinical features, assessment and management (physiotherapeutic and orthotic) of:

- Torticollis
- Cervical rib
- Sprengel's shoulder
- Spina bifida

- CTEV
- CDH
- Arthrogyrosis
- Proximal femoral focal deficiency
- Pes cavus, pes planus etc.
- Scoliosis
- Kyphosis
- Exaggerated lordosis
- Coxa vara
- Genu valgum and varum
- Genu recurvatum

VI) AMPUTATIONS:

- Traumatic and elective amputations of lower and upper extremity
- Common sites of amputation, complications (phantom limb pain etc.)
- Characteristics of an ideal stump
- Management of a stump
- Physiotherapy and prosthetic training to the amputee : special emphasis on gait training.

VII) COMMON BONE AND JOINT TUMORS

Pathology of bone tumors, complications, surgical management and principles of post operative physiotherapy

VIII) CORRECTIVE SURGERIES:

- Introduction to procedures like Arthroplasty, Arthrodesis, Osteotomy, tendon transplant, soft tissue release and grafting.
- Principles of physical therapy as applicable to the above surgeries.

Section-II

Thoracic Surgery

Review of the pathological changes & principles of pre & post operative management by physiotherapy of the following conditions:

- (1) Lobectomy, Pneumonectomy, Thoracotomy, thoracoplasty, Endoscopic & Eye hole surgeries.
- (2) Corrective surgeries of congenital heart defects, angioplasties, blood vessel grafting, open heart surgeries & heart transplant.

Section-III

General, Gynaecology & Obstetrics, and ENT.

Review of the pathological changes & principles of pre & post operative management by physiotherapy of the following conditions:

- (1) Common abdominal surgeries, including GIT, liver, spleen, kidney, bladder ,etc.
- (2) Common operation of reproductive system, including surgical intervention for child delivery. Antenatal & postnatal physiotherapy management.
- (3) Common operations of the ear, nose, throat & jaw as related to physiotherapy.
- (4) Common organ transplant surgeries – heart, liver, bone marrow, etc.

Section-IV

Wounds, Burns & Plastic Surgery

Review of the pathological changes & principles of pre & post operative management by physiotherapy of the following conditions:

- (1) Wounds, ulcers, pressure sores.
- (2) Burns & their complications.

- (3) Common reconstructive surgical procedures for the management of wounds, ulcers, burns & consequent contractures & deformities.

Section-V

Neurosurgery

Review of the pathological changes & principles of pre & post operative management by physiotherapy of the following conditions:

- (1) Common surgeries of the cranium & brain.
- (2) Common surgeries of the vertebral column & spinal cord.
- (3) Common surgeries of the peripheral nerves.
- (4) Surgical interventions in traumatic head injuries.

REHABILITATION, ORGANISATION AND ADMINISTRATION

Section I

1. Conceptual framework of rehabilitation, roles of rehabilitation team members, definitions and various models of rehabilitation.
2. Epidemiology of disability with emphases on locomotor disability its implications- individual, family, Social, economic and the state.
3. Preventive aspects of disability and organisational skills to manage it.
4. Community Based Rehabilitation and out reach programmes to rehabilitate persons with disabilities living in rural areas.
5. Statutory provisions, Schemes of assistance to persons with disability.
6. Role of N.G.Os in rehabilitation of the persons with disabilities.
7. Basic principles of Administration and finance including personnel management and budget preparation and procurement etc.

Section II

1. Principles of Orthotics, types, indications, contra-indications, assessment (check out), uses and fitting-regionwise.
2. Fabrication of simple splints and self help devices for upper and lower extremity- indications, and application.
3. Principles of Prosthetics –types, indications, contra-indications, assessment (check out), uses and fitting-upper and lower extremity.

Section III

1. Principles and mechanisms of Communication including speech and hearing.
2. Common disorders of speech and hearing- etiology, clinical features, assessment and principles of management.
3. Principles in the management of vocational problems, including evaluation and vocational goals for people with disability.
4. Principles of Rehabilitation Nursing, including function of Nursing personnel and Nursing practice in rehabilitation.

Section IV

1. Identification, assessment and classification of mentally subnormal.
2. Etiogenesis and principles of management including prevention.
3. Rehabilitation of the mentally subnormal, including vocational training & a home education programme.

Section V

1. Definition, scope & importance of Activities of Daily Living (ADLs).
2. The teaching and training of (a) wheel chair activities, (b) bed activities (c) transfer activities (d) Locomotor activities, (e) self care activities, such as toilet, eating, dressing etc.

PRACTICAL: COMPUTER APPLICATION

1. To study the various components of a personal computer.

2. To have a working knowledge of hardware & software.
3. To practice the operational skills of common computer applications, including word processing & spread sheet software.
4. To have a basic knowledge of utility of multi media.
5. To learn skills of web surfing – For literatures, researches relevant to the field of medicine.

PHYSICAL THERAPY PRACTICAL EXAMINATION

1. To examine, assess and evaluate a patient.
2. To set Physiotherapy Treatment goals.
3. To devise and implement treatment plan.
4. Examination & Assessment should include the following and additional evaluative procedures should be applied as required.
 - a) Motor:
 - Muscle Tone
 - Muscle Strength
 - Measurement of girth
 - b) Range of Motion:
 - c) Sensory:
 - Touch, pain, Temperature, Pressure and Kinesthetic sense.
 - d) Neurological:
 - Primitive Reflexes, Motor development, Superficial and Deep tendon reflexes.
 - Involuntary movements.
 - In-coordination.
 - Gait.
 - e) Respiratory System:
 - Measurement of chest expansion.
 - Patter of Breathing, Diaphragmatic, localized costal breathing.

- f) Functional evaluation of A.D.L's:
- i) The aims and plan of treatment of the patients suffering from the diseases as per Theory syllabus.
 - ii) To operate the electro-therapeutic and mechano-therapeutic equipments for treatment of patients as per Electro therapy and Exercise therapy practical syllabus of First Year.

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