

**SYLLABUS**  
**for Courses affiliated to the**  
**Kerala University of Health Sciences**  
**Thrissur 680596**



**BACHELOR OF**  
**PHYSIOTHERAPY (BPT)**

**Course Code: 011**  
**(2024-25 Academic year onwards)**

**2024**

## 2. COURSE CONTENT

### 2.1 Title of course:

#### **BACHELOR OF PHYSIOTHERAPY**

### 2.2 Objectives of course

As per WHO's International Classification of Health Workers, based on the International Standard Classification of Occupations (ISCO, 2008 revision) – “Physiotherapists assess, plan and implement rehabilitative programs that improve or restore human motor functions, maximize movement ability, relieve pain syndromes, and treat or prevent physical challenges associated with injuries, diseases and other impairments. They apply a broad range of physical therapies and techniques such as movement, ultrasound, heating, laser and other techniques. They may develop and implement programmes for screening and prevention of common physical ailments and disorders.”

This undergraduate course in Physiotherapy (BPT) aims to impart in depth knowledge and skill to a student to become competent in the techniques and develop the proper attitude required for the independent and autonomous practice of Physiotherapy. Specific objectives are:

- i. Acquisition of adequate theoretical and the practical knowledge and foundation in the basic medical subjects.
- ii. Proficiency in the skills of basic Physiotherapy procedures and techniques with adequate theoretical basic of allied sciences.
- iii. Ability to detect patho-physiological impairment of structural and functional deviations by using methodology of physical diagnosis to evaluate the disability prognosis.
- iv. Competency in imparting the physiotherapeutic measure of specific choice towards preventive, curative, symptomatic and restorative or rehabilitative goals.
- v. Acquisition of moral and ethical codes and conduct of professional practice in a dedicated manner with the patient welfare as the primary responsibility.

- vi. After achieving competency and skill, a Physiotherapist should practice Physiotherapy, and carry out treatment as an independent practitioner or in consultation & reference with other medical practitioners.

### **2.3 Medium of instruction:**

Medium of instruction and examinations shall be in English.

### **2.4 Course outline**

The Bachelor of Physiotherapy degree program is a four year program with an additional six months of compulsory rotating internship. The professional degree program consists of classroom lectures, practical and laboratory demonstrations, bed side clinics, self directed academic activities and clinical postings.

In the first year theoretical and practical basis of fundamental health care subjects such as anatomy, physiology, biochemistry, human biomechanics and kinesiology, psychology and sociology are learnt.

In the second year, the students learn the disease processes through pathology and microbiology, apart from pharmacology and the theoretical and practical basis of exercise therapy and electrotherapy. The students will also be posted on rotating basis in various departments of the hospitals for clinical observation so as to gain an insight into various areas of functioning of a health care institution.

During the third year the students will be trained in the theoretical, practical and clinical basis of physiotherapy assessment and treatment of various clinical conditions in cardio respiratory medicine and surgery, general medicine and surgery, paediatrics, women's health, burns and skin diseases, intensive care units and community medicine. They will also be posted on a rotating basis in the above mentioned departments for gaining hands on experience in assessing and treating patients.

During the fourth year the students will be trained in the theoretical, practical and clinical basis of physiotherapy assessment and treatment of various clinical conditions in orthopaedics and trauma, rheumatology, sports medicine, neurology and neurosurgery and community health. They will also be posted on a rotating basis in the above mentioned departments for gaining hands on experience in assessing and treating patients.

## 2.5 Duration

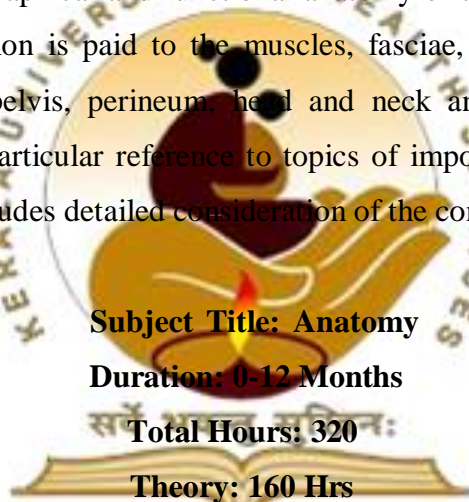
The duration of the course shall be four and half years including Compulsory Internship of six months.

## 2.6 Syllabus

### ANATOMY

#### Course Description

It is designed to provide students with the working knowledge of the structure of the human body which is an essential foundation for their clinical practice. Studies are concerned with the topographical and functional anatomy of the limb's, thorax and head & neck. Particular attention is paid to the muscles, fasciae, bones and joints of these regions. The abdomen, pelvis, perineum, head and neck and central nervous system (CNS) are studied with particular reference to topics of importance to physiotherapists. The study of the CNS includes detailed consideration of the control of motor function.



**Subject Title: Anatomy**

**Duration: 0-12 Months**

**Total Hours: 320**

**Theory: 160 Hrs**

**Practical: 160 Hrs**

**Total Hours/Week: 8 Hrs**

**Method of Assessment: Written, Oral, Practical**

**\*\*\* - Must Know    \*\* - Desirable to know    \* - Nice to know**

### THEORY

#### 1. Histology [5 Hours] \*\*

General histology, study of the basic tissues of the body; Microscope, Cell, Classification of epithelial & connective tissues, Cartilage, Bone, Muscular Tissue-TS & LS, Circulatory system-Large sized artery, medium sized artery, large sized vein, Nervous tissues, Skin and its appendages.

## **2. Embryology [5 Hours]\***

Ovum, Spermatozoa fertilization and formation of the Germ layers and their derivations (brief outline). b) Development of bones, axial and appendicular skeleton and muscles, c) Neural tube and spinal cord, d) Development of brain and brain stem structures.

## **3. Regional Anatomy**

### **Thorax: [20 Hours]**

#### **a. Cardio-vascular System\*\*\***

Mediastinum: Divisions and contents Pericardium : Thoracic Wall: position, shape and parts of the heart; conducting System; blood Supply and nerve supply of the heart; names of the blood vessels and their distribution in the body- region wise.

#### **b. Respiratory system**

Outline of respiratory passages\*\* Pleura and lungs: position, parts relations, blood supply and nerve supply;\*\* Lungs- emphasize on broncho-pulmonary segments.\*\*\*

Diaphragm: Origin, insertion, nerve supply and action, openings in the diaphragm.\*\*\*

\*\*\*Intercostals muscles and Accessory muscles of respiration; Origin, insertion, nerve supply and action.

### **Abdomen [ 5 Hours]**

c. Peritoneum: Parietal peritoneum, visceral peritoneum, folds of peritoneum, functions of peritoneum.\*

d. Large blood vessels of the gut\*\*

e. Location, size, shape, features, blood supply, nerve supply and functions of the following: stomach, liver, spleen, pancreas, kidney, urinary bladder, intestines, gall bladder.\*\*

### **Pelvis: [5 Hours]**

Position, shape, size, features, blood supply and nerve supply of the male and female reproductive system. Pelvic girdle (joints) and muscles at the pelvic floor, Comparison of female and male pelvis. \*\*

### **Endocrine glands (Brief outline): [5 Hours]**

Position, shape size function blood supply and nerve supply of the following glands:



Hypothalamus and pituitary gland\*\*, thyroid glands\*\*, parathyroid glands\*\*, Adrenal glands\*\*, pancreatic islets\*, ovaries and testes\*\*, pineal glands\*, thymus\*.

#### **4. Musculo Skeletal Anatomy-(All the topics to be taught in detail) [15 Hours]**

- \*\*\* a) Anatomical positions of body, axes, planes, common anatomical terminologies (Groove, tuberosity, trochanters etc)
- c) Bones Composition & functions, classification and types according to morphology and development.
- d) Joints-definition-classification, structure of fibrous, cartilaginous joints, synorrial joints blood supply and nerve supply of joints.
- e) Muscles - origin, insertion, nerve supply and actions.
- f) Applied clinical anatomy related to the above topics.
- g) Anatomy of the fascial layers of human body

#### **5. Upper Extremity: [30 Hours]**

- a. Osteology: Clavicles, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals, Phalanges.\*\*\* Ossification of individual bones.\*
- b. Soft parts: \*Breast, pectoral region, axilla, front of arm, back of arm, cubital fossa, front of fore arm, back of fore arm, palm, dorsum of hand, muscles, nerves, blood vessels and lymphatic drainage of upper extremity.
- c. Joints: \*\*\*Shoulder girdle, shoulder joint, elbow joints, radio ulnar joint, wrist joint and joints of the hand.
- d. Superficial & Deep palmer arches of hand, skin of the palm and dorsum of hand.\*\*
- e. Applied/Clinical anatomy related to the above topics.\*\*

#### **6. Lower Extremity: [30 Hours]**

- a. Osteology : \*\*\*Hip bone, femur, tibia, fibula, patella, tarsals, metatarsals\*\* and phalanges\*\*. Ossification of individual bones.\*
- b. Soft parts:\*\*\* Gluteal region, front and back of the thigh (Femoral triangle, femoral canal and inguinal canal), medial side of the thigh (Adductor canal), lateral side of the thigh, popliteal fossa, anterior and posterior, compartment of leg, sole of the foot, lymphatic drainage of lower limb, venous drainage of the lower limb, arterial supply of the lower limb, arches of foot\*\*\*, skin of foot\*.
- c. Joints: \*\*\*Hip Joint, Knee joint, Ankle joint, joints of the foot. d. Applied/Clinical anatomy related to the above topics.\*\*



## **7. Head, Neck and Spine [20 Hours]**

- a. Osteology: \*\*\* Mandible and bones of the skull, paranasal sinuses (Brief outline)
- b. Soft parts: \*\*Muscles of the face and neck and their nerve and blood supply-extra ocular muscles, triangles of the neck,
- c. Gross anatomy of eyeball, nose, ears and tongue \*(Brief outline).
- d. Spine. \*\*\*– Structure and function, Lumbo Pelvic Rhythm\*\* a. Osteology: \*\*\*Cervical, thoracic, lumbar, sacral and coccygeal vertebrae and ribs b. Soft tissue:\*\*\* Pre and Para vertebral muscles, intercostals muscles, anterior abdominal wall muscles, Inter-vertebral disc & joints. e. Applied/ Clinical related to Anatomy above topics.\*\*

## **8. Neuro Anatomy [20 Hours]**

- a. Organization of Central Nervous system -Spinal nerves and autonomic nervous system mainly pertaining to cardiovascular, respiratory and urogenital system \*\*\*
- b. Cranial nerves (II,V,VII,XI \*\*\*) (I,III,IV,VI,VIII,IX,X,XII\*\*)
- c. Peripheral nervous system\*\*\* 1. Peripheral nerves 2. Neuromuscular junction 3. Sensory end organs
- d) Central Nervous System 1. Spinal segments and areas\*\*\* 2. Brain Stem\*\* 3. Cerebellum\*\* 4. Inferior colliculi\* 5. Superior olliculi\* 6. Thalamus\*\* 7. Hypothalamus\*\*
- 8. Corpus striatum\* 9. Cerebral hemisphere\*\*\* 10. Lateral ventricles\*\* 11. Blood supply to brain\*\*\* 12. Basal nuclei \*\* 13. The pyramidal system\* 14. Pons, medulla, extra pyramidal systems\*\* 15. Anatomical integration.\* 16. Applied /Clinical Anatomy related to the above topics.\*\*

## **PRACTICAL [160 Hours]**

List of Practical / Demonstrations

**\* Topics – With Emphasis on Structure and Function of Joints, Muscles and on Human body as a Kinematic chain.**

- 1. Upper extremity Anatomy
- 2. Lower extremity Anatomy
- 3. Head & Spinal cord and Neck and Brain including surface Anatomy
- 4. Thorax including surface anatomy, abdominal muscles, joints, Diaphragm

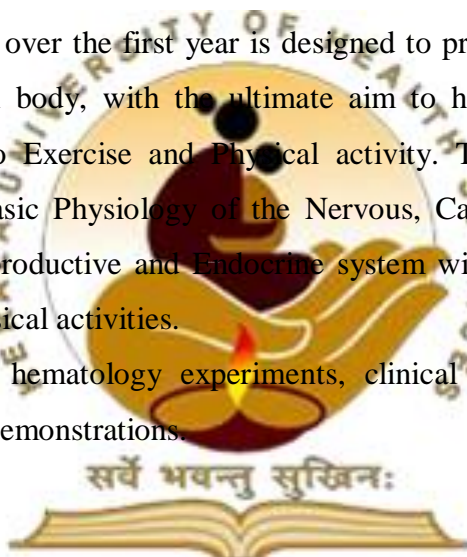
5. Embryology- Histology-Elementary tissue including surface Anatomy
6. a. Demonstration of the muscles of the whole body and organs in Thorax and Abdomen in a cadaver b. Demonstration of movements & discuss about the range of motion (ROM) in important joints. c. Surface marking of the lung, pleura, fissures and lobes of lungs, heart, liver, spleen and muscles. d. Kidney, cranial nerves, spinal nerves and important blood vessels. e. Identification of body prominences on inspection and by palpation especially of extremities. f. Points of palpation of muscles, tendons, bones, joints, ligaments, nerves and arteries

## **PHYSIOLOGY**

### **Course Description**

The course in Physiology over the first year is designed to provide an understanding of the physiology of human body, with the ultimate aim to have a firm knowledge of physiological reactions to Exercise and Physical activity. The major topics covered include the following: Basic Physiology of the Nervous, Cardiovascular, Respiratory, Digestive, Excretory, Reproductive and Endocrine system with focus on the effects of various exercises and physical activities.

Practical classes include hematology experiments, clinical examinations, amphibian chart, and recommended demonstrations.



**Subject Title: PHYSIOLOGY**

**Duration: 0- 12 Months**

**Total Hours: 320**

**Theory: 160Hrs**

**Practical: 160 Hrs**

**Total Hours / Week: 8 Hrs**

**Method of Assessment: Written, Oral, Practical**

**(Note: Must Know \*\*\*, Desirable to Know\*\*, Nice to Know\*)**



## THEORY

### **General Physiology [3 Hrs] \***

- Cell: Morphology. Organelles: their structure and functions \*
- Transport Mechanisms across the cell membrane \*
- Body fluids: Distribution, composition. Tissue fluid - formation.

### **\* Blood [10 Hrs]**

- Introduction: Composition and functions of blood. \*
- Plasma : Composition, formation, functions. Plasma proteins. \*
- RBC : Count and its variations. Erythropoiesis-stages, factors regulating. \*
- Reticulo-endothelial system (in brief) Hemoglobin - Anaemia (in detail), types of Jaundice. Blood indices, PCV, ESR. \*
- WBC: Classification. Morphology, functions, count, its variation of each. Immunity \*\*
- Platelets: Morphology, functions, count, its variations \*\*
- Haemostatic mechanisms: Blood coagulation factors, mechanisms. Their disorders. Anticoagulants. \*\*
- Blood Groups: Landsteiner's law. Types, significance, determination, Erythroblastosis foetalis. \*\*
- Blood Transfusion: Cross matching. Indications and complications. \*
- Lymph: Composition, formation, circulation and functions. \*

### **Nerve Muscle Physiology [25 Hrs] \*\*\***

- Introduction: Resting membrane potential. Action potential - ionic basis and properties.
- Nerve: Structure and functions of neurons. Classification, Properties and impulse transmission of nerve fibres. Nerve injury -degeneration and regeneration.
- Neuroglia: Types and functions.
- Muscle: Classification. Skeletal muscle: Structure. Neuromuscular junction : Structure. Neuromuscular transmission, myasthenia gravis. Excitation- Contraction coupling. Rigormortis. Motor unit. Properties of skeletal muscles, Strength- Duration curve, Length-tension relationship, fatigue, load.
- Smooth muscle: Structure, types, mechanism of contraction. Plasticity.

### **Cardiovascular System [15 Hrs] \*\*\***

- Introduction: Physiological anatomy and nerve supply of the heart and blood vessels. Organization of CVS. Cardiac muscles: Structure. Ionic basis of action potential and pacemaker potential. Properties.
- Conducting system: Components. Impulse conduction, Cardiac Cycle: Definition. Phases of cardiac cycle. Pressure and volume curves. Heart sounds - causes, character. ECG: Definition. Different types of leads. Waves and their causes. P-R interval. Heart block.
- Cardiac Output: Definition. Normal value. Determinants. Stroke volume and its regulation. Heart rate and its regulation. Their variations
- Arterial Blood Pressure: Definition. Normal values and its variations. Determinants. Regulation of BP.
- Arterial pulse.
- Shock - Definition. Classification-causes and features
- Regional Circulation: Coronary, Cerebral and Cutaneous circulation..

### **Respiratory System [15Hrs] \*\*\***

- Introduction: Physiological anatomy - Pleura, tracheo-bronchial tree, alveolus, respiratory membrane and their nerve supply. Functions of respiratory system. Respiratory muscles.
- Mechanics of breathing: Intrapleural and Intrapulmonary pressure changes during respiration. Chest expansion. Lung compliance: Normal value, pressure-volume curve, factors affecting compliance and its variations. Surfactant - Composition, production, functions. RDS
- Spirometry: Lung volumes and capacities. Timed vital capacity and its clinical significance. Maximum ventilation volume. Respiratory minute volume.
- Dead Space: Types and their definition.
- Pulmonary Circulation. Ventilation-perfusion ratio and its importance.
- Transport of respiratory gases: Diffusion across the respiratory membrane. Oxygen transport -Different forms, oxygen-hemoglobin dissociation curve. Factors affecting it. P50, Haldane and Bohr effect. Carbon dioxide transport: Different forms, chloride shift.
- Regulation of Respiration: Neural Regulation. Hering-breuer's reflex. Voluntary control. Chemical Regulation.
- Hypoxia: Effects of hypoxia. Types of hypoxia, Hyperbaric oxygen therapy. Acclimatization Hypercapnoea. Asphyxia. Cyanosis - types and features. Dysbarism

- Disorders of Respiration: Dyspnoea. Orthopnoea. Hyperpnoea, hyperventilation, apnoea, tachypnoea. periodic breathing - types
- Artificial respiration

### **Digestive System [5 Hrs]**

- Introduction: Physiological anatomy and nerve supply of alimentary canal. Enteric nervous system\*
- Salivary Secretion: Saliva: Composition. Functions. Regulation. Mastication (in brief)\*
- Swallowing : Definition Different stages, Functions.\*
- Stomach: Function, Gastric Juice: Gland, composition, function, regulation. Gastrin: PRODUCTION, FUNCTION AND REGULATION. Peptic ulcer, Gastric motility. Gastric emptying. Vomiting.\*
- Pancreatic Secretion: Composition, production, function..\*\*
- Liver: Function of liver. Bile secretion: Composition, functions and regulation. Gall bladder: Functions. \*\*
- Intestine: Succus entericus: Composition, function of secretion. Intestinal motility and its function and regulation.\*
- Mechanism of Defaecation. \*



### **Renal System [5 Hrs]**

- Introduction: Physiological anatomy, Nephrons – cortical, and juxtamedullary. Juxta glomerular apparatus. Glomerular membrane. Renal blood flow and its regulation. Functions of kidneys. \*\*\*
- Mechanism of urine Formation: Glomerular Filtration: GFR – normal value and factors affecting.. Renal clearance. Insulin clearance.\*\*\*
- Tubular Reabsorption: Reabsorption of Na<sup>+</sup>, glucose,, HCO<sub>3</sub><sup>-</sup>. Urea and water. Filtered load,Renal tubular transport maximum. Glucose clearance. .Renal threshold for glucose. \*\*\*
- Tubular Secretion: Secretion of, H<sup>+</sup> and K<sup>+</sup>, PAH Clearance. \*\*\*
- Micturition: Mechanism of micturition. . Atonic bladder, automatic bladder. \*\*\*
- Acid – Base balance (very brief) \*\*\*
- Skin and temperature regulation. \*\*\*

## **Endocrine System [5 Hrs] (Emphasis on regulation and functions only)**

- Introduction: Major endocrine glands. Hormone: classification, mechanism of action. Functions of hormones.\*\*

- Pituitary Gland: Anterior Pituitary and Posterior pituitary hormones: Secretory cells, action on target cells, regulation of secretion of each hormone. Disorders: Gigantism, Acromegaly, Dwarfism,\*

- Diabetes Insipidus. Physiology of growth and development: hormonal and other influences.\*\*

- Thyroid Gland: Thyroid hormone and calcitonin: secretory cells, synthesis, storage, action and regulation of secretion. Disorders: Myxoedema, Cretinism, Grave's disease.

\*\*

- Parathyroid hormones: secretory cells, action, regulation of secretion: Disorders: Hyperparathyroidism.\*\*

- Adrenal Gland: Adrenal Cortex: Secretory cells, synthesis, action, regulation of secretion of Aldosterone, Cortisol,. Disorders: Addison's disease, Cushing's syndrome, Conn's syndrome, Adrenogenital syndrome. Adrenal Medulla: Secretory cells, action. Disorders: Pheochromocytoma.\*

- Endocrine Pancreas: Secretory cells, action,. Regulation of secretion of insulin and glucose, Glucose metabolism and its regulation. Disorder: Diabetes mellitus.\*\*\*

## **Reproductive System [5 Hrs]**

- Introduction: Physiological anatomy reproductive organs. Sex determination. Sex differentiation. Disorder \*\*\*

- Male Reproductive System: Functions of testis. Pubertal changes in males. Spermatogenesis.\*\*\*

- Testosterone: action.\*\*

- Female Reproductive System: Functions of ovaries and uterus. Pubertal changes in females. Oogenesis. Hormones: estrogen and progesterone-action.. Menstrual Cycle. Hormonal, basis. Menarche. Menopause. Pregnancy: Pregnancy tests. Physiological changes during pregnancy. Functions of placenta. Lactation. Contraception methods.\*\*\*

## **Special Senses [7 Hrs]**

- Vision: Introduction: Functional anatomy of eye ball. Functions of cornea, iris, pupil, aqueous

humor- glaucoma, lens- cataract, vitreous humor, rods and cones. Photopic vision. Scotopic vision. \*\*

- Visual pathway and the effects of lesions\*\*
- Refractive Errors: Myopia,. Hypermetropia, presbyopia and astigmatism.\*\*
- Visual Reflexes. Accommodation, papillary and light. Visual acuity and Visual field. Light adaptation. Dark adaptation. Color vision –color blindness. Nyctalopia.\*\*
- Audition: Physiological anatomy of the ear. Functions of external ear, middle ear and inner ear Structure of Cochlea and organ of corti. Auditory pathway. Types of Deafness. Tests for, hearing. Audiometry.\*\*
- Taste: Taste buds. Primary tastes. Gustatory pathway.\*
- Smell: Olfactory membrane. Olfactory pathway.\*
- Vestibular Apparatus: Crista Ampullaris and macula. Functions and its Disorders.\*\*\*

### \*\*\*Nervous System [25 Hrs]

- Introduction: Organization of CNS - central and peripheral nervous system. Functions of nervous system. Synapse: Functional anatomy, classification, Synaptic transmission. Properties. • Sensory Mechanism: Sensory receptors: function, classification and properties. Sensory pathway: The ascending tracts — Posterior column tracts, lateral spinothalamic tract and the anterior spinothalamic tract - their origin, course, termination and functions. The trigeminal pathway. Sensory cortex. Somatic sensations: crude touch, fine touch, tactile localization, tactile discrimination, stereognosis, vibration sense, kinesthetic sensations. Pain sensation: mechanism of pain. Cutaneous pain -slow and fast pain, hyperalgesia. Deep pain. Visceral pain - referred pain. Gate control theory of pain, tabes dorsalis, sensory ataxia.\*\*\*
- Motor Mechanism: Motor Cortex. Motor pathway: The descending tracts – pyramidal tracts, extrapyramidal tracts - origin, course, termination and functions. Upper motor neuron and lower motor neuron. Paralysis, monoplegia, paraplegia, hemiplegia and quadriplegia.\*\*\*
- Reflex Action: components, Bell-Magendie law, classification and Properties. Monosynaptic and polysynaptic reflexes, superficial reflexes, deep reflexes. Stretch reflex structure of muscle spindle, pathway, higher control and functions. Inverse stretch reflex. Muscle tone - definition, and properties hypotonia, atonia and hypertonia. UMNL and LMNL\*\*\*



- Spinal cord Lesions: Complete transection and Hemisection of the spinal cord.\*\*\*
- Cerebellum: Functions. Cerebellar ataxia.\*\*\*
- Posture and Equilibrium: Postural reflexes -spinal, medullary, midbrain and cerebral reflexes.\*\*\*
- Thalamus and Hypothalamus: Nuclei. Functions. Thalamic syndrome\*\*\*
- Reticular Formation and Limbic System: Components and Functions.\*\*\*
- Basal Ganglia: Structures included and functions. Parkinson's disease.\*\*\*
- Cerebral Cortex: Lobes. Brodmann's areas and their functions. Higher functions of cerebral cortex - learning, memory and speech.\*\*\*
- EEG : Waves and features. Sleep: REM and NREM sleep.\*\*\*
- CSF: Formation, composition, circulation and functions. Lumbar puncture and its significance. Blood brain barrier. Hydrocephalus. \*\*\*
- ANS: Features and actions of parasympathetic and sympathetic nervous system.\*\*\*

### **Physiology of Exercise [20 Hrs] \*\*\***

#### **A. Effects of exercise and physical activities on**

- 1) O<sub>2</sub> transport
- 2) Muscle strength/power/endurance
- 3) Basal Metabolic Rate / Respiratory Quotient
- 4) Hormonal and metabolic effect
- 5) Cardiovascular system
- 6) Respiratory system
- 7) Body fluids and electrolyte

#### **B. Effect of gravity / altitude /acceleration / pressure on physical parameters**

#### **C. Energy expenditure and fatigue**

#### **D. Body Composition**

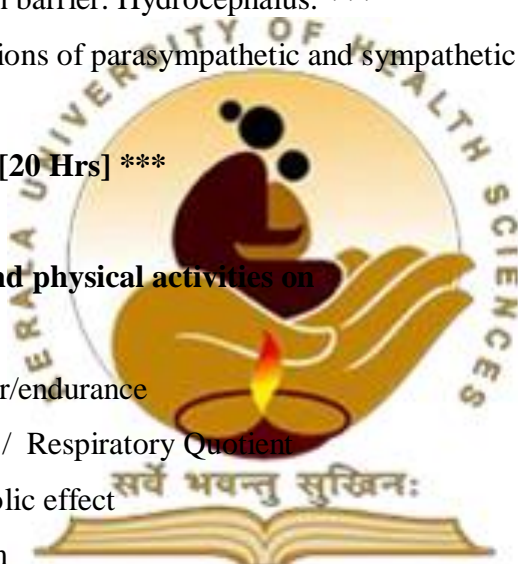
#### **E. Physical Activity for Health and Fitness**

#### **F. Physiology of Exercise in various age groups and diseases**

#### **G. Criteria for prescription of exercises**

### **Applied Physiology [20 Hrs]**

More detailed study of the physiology and practical applications of the following selected topics with emphasis on aspects, which should help in understanding the nature and





treatment of common clinical situations of interest in Physiotherapy.

**a. Pulmonary Functions \*\*\***

1. Properties of gases, Mechanics of respiration, Diffusion capacity, special features of pulmonary circulation and their application.
2. Respiratory adjustments in exercises.
3. Artificial respiration
4. Breath sounds.

**b. Cardio vascular Functions\*\*\***

1. Blood flow through arteries, arterioles, capillaries, veins and venules.
2. Circulation of Lymph, Oedema
3. Factors affecting cardiac Output
4. Circulatory adjustment in exercise and in postural and gravitational changes,
5. Patho physiology of fainting and heart failure.

**c. Muscles and Nervous System Functions \*\***

1. Peripheral nervous system, Neuromuscular transmission, Types of nerve fibres.
2. Action potential, Strength-duration curve, ECG, EMG, VEP, NCV
3. Degeneration and regeneration of nerve, Reactions of denervations.
4. Synaptic transmission, Stretch reflex-Mechanism and factors affecting it.
5. Posture, Balance and Equilibrium/Coordination of voluntary movement
6. Voluntary motor action, clonus, Rigidity, incoordination,
7. Special senses- Vision, taste, hearing, vestibular, Olfaction
8. Sympathetic and Parasympathetic regulation, Thermoregulation.

**d. Blood functions\*\***

1. Thalassemia Syndrome, Hemophilia, VWF
2. Anemia, Leucocytosis
3. Bone marrow transplant

**e. Metabolic Functions \*\***

Diabetes Mellitus\*\*\*, Physiological basis of Peptic Ulcer, Jaundice, GIT disorders and Dietary fiber, Thyroid functions, Vitamins deficiency.

## **PRACTICAL 160 Hrs**

### **I. Haematology**

#### **To be done by the students**

1. Study of Microscope and its uses
2. Determination of blood groups
3. Determination of bleeding time
4. Determination of clotting time

#### **Demonstrations only**

1. Determination of ESR
2. Determination of PC V

### **II. Clinical Examination**

#### **To be done by the students**

1. Examination of Radial pulse,
2. Recording of blood pressure
3. Examination of CVS
4. Examination of Respiratory system
5. Examination of sensory system
6. Examination of Motor System
7. Examination of reflexes

#### **III. Demonstrations**

1. Spirometry, Body Composition, Exercise testing.
2. Ergometry, Artificial Respiration
3. ECG, EEG



## **BIOMECHANICS**

### **Course Description**

Kinesiology and Biomechanics involves the study of basic concepts of human movement, and application of various biomechanical principles in the evaluation, diagnosis and treatment of movement and structural disorders of musculoskeletal system. Students are taught to understand the various quantitative and qualitative methods of evaluation of movement. Mechanical principles of various treatment methods are studied. Study and management of deviations in posture, ADL and gait are also an integral part.

**Title: Biomechanics**

**Duration: 0-12 Months**

**Total Hours: 320 Hrs**

**Theory: 160 Hrs**

**Practical: 160 Hrs**

**Total Hours/week: 8**

**Method of Assessment: Written**

## **THEORY**

### **1. Basic Concepts in Biomechanics: Kinematics and Kinetics [25Hrs]**

- a) Types of Motion
- b) Location of Motion
- c) Direction of Motion
- d) Magnitude of Motion
- e) Definition of Forces
- f) Force of Gravity
- g) Reaction forces
- h) Equilibrium
- i) Objects in Motion
- j) Force of friction
- k) Concurrent force systems
- l) Parallel force systems
- m) Work
- n) Moment arm of force
- o) Force components
- p) Equilibrium of levers



### **2. Joint structure and Function [20 Hrs]**

- a) Joint design
- b) Materials used in human joints
- c) General properties of connective tissues
- d) Human joint design
- e) Joint function

- f) Joint motion
- g) General effects of disease, injury and immobilization.

### **3. Muscle structure and function [15 Hrs]**

- a) Mobility and stability functions of muscles
- b) Elements of muscle structure
- c) Muscle function
- d) Effects of immobilization, injury and aging

### **4. Biomechanics of the Thorax and Chest wall [10 Hrs]**

- a) General structure and function
- b) Rib cage and the muscles associated with the rib cage
- c) Ventilatory motions: its coordination and integration
- d) Developmental aspects of structure and function
- e) Changes in normal structure and function in relation to pregnancy, scoliosis and COPD

### **5. The Temporomandibular Joint [5 Hrs]**

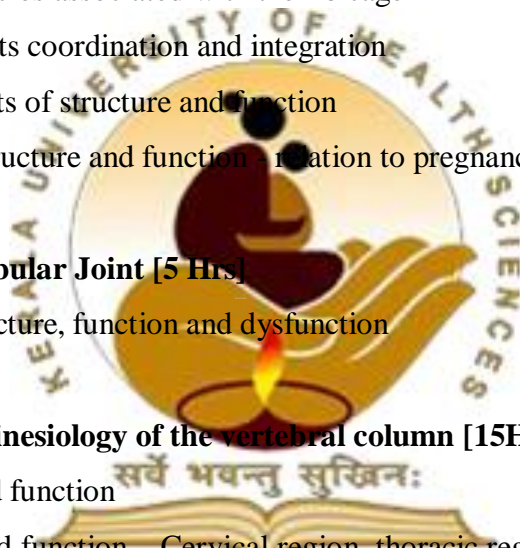
- a) General features, structure, function and dysfunction

### **6. Biomechanics and kinesiology of the vertebral column [15Hrs]**

- a) General structure and function
- b) Regional structure and function – Cervical region, thoracic region, lumbar region, sacral region
- c) Muscles of the vertebral column
- d) General effects of injury and aging

### **7. Biomechanics and kinesiology of the peripheral joints [45 Hrs]**

- a) The shoulder complex: Structure and components of the shoulder complex and their integrated function.
- b) The elbow complex: Structure and function of the elbow joint – humeroulnar and humeroradial articulations, superior and inferior radioulnar joints; mobility and stability of the elbow complex; the effects of immobilization and injury.
- c) The wrist and hand complex: Structural components and functions of the wrist complex; structure of the hand complex; prehension; functional position of the wrist and



hand.

d) The hip complex: structure and function of the hip joint; hip joint pathology- arthrosis, fracture, bony abnormalities of the femur.

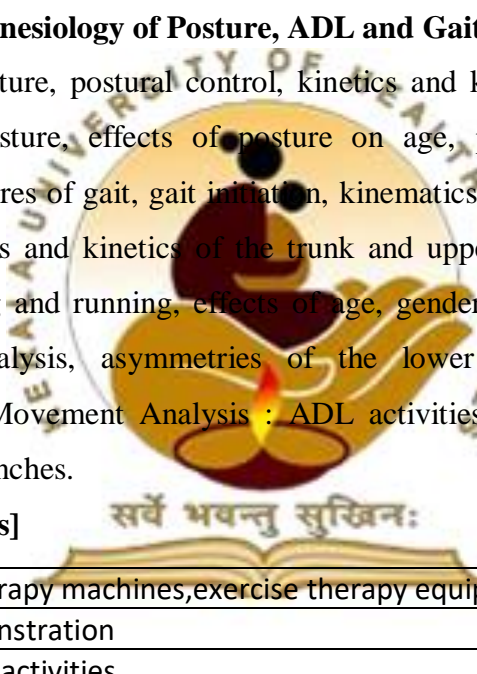
e) The knee complex: structure and function of the knee joint – tibiofemoral joint and patellofemoral joint; effects of injury and disease.

f) The ankle and foot complex.: structure and function of the ankle joint, subtalar joint, talocalcaneonavicular joint, transverse tarsal joint, tarsometatarsal joints, metatarsophalangeal joints, interphalangeal joints, structure and function of the plantar arches, muscles of the ankle and foot, deviations from normal structure and function – Pes Planus and Pes Cavus

### **8. Biomechanics and kinesiology of Posture, ADL and Gait [25 Hrs]**

Static and dynamic posture, postural control, kinetics and kinematics of posture, ideal posture analysis of posture, effects of posture on age, pregnancy, occupation and recreation; general features of gait, gait initiation, kinematics and kinetics of gait, energy requirements, kinematics and kinetics of the trunk and upper extremities in relation to gait, stair case climbing and running, effects of age, gender, assistive devices, disease, muscle weakness, paralysis, asymmetries of the lower extremities, injuries and malalignment in gait; Movement Analysis : ADL activities like sitting – to standing, lifting, various grips , pinches.

### **PRACTICAL: [160 Hrs]**



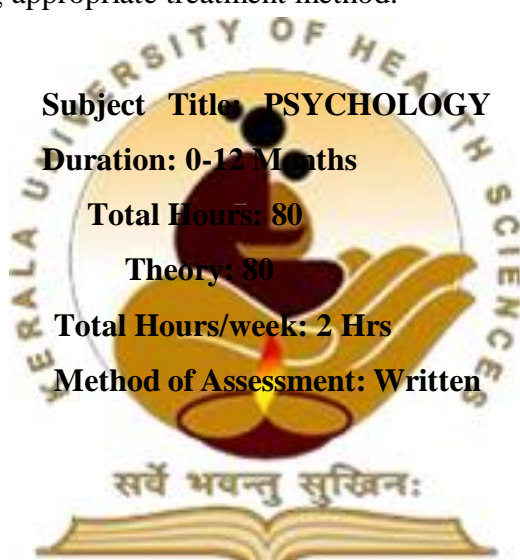
1	Spotters & viva (electrotherapy machines, exercise therapy equipments, Bones, joints)
2	Concave convex rule demonstration
3	Close chain and open chain activities
4	Joint palpation (Shoulder, Elbow, IP, Hip, Knee and Ankle mortise)
5	Movements of vertebral column
6	Prehension -demonstration
7	Functional position of hand
8	Demonstration of shoulder movements
9	Demonstration of elbow movements
10	Demonstration of wrist movements
11	Demonstration of hip movements
12	Demonstration of knee movements
13	Demonstration of ankle movements
14	TMJ movement during mouth opening and closing
15	Demonstration on movements during sitting to standing
16	Plumb line analysis
17	Postural deformities

18	Gait analysis
19	Demonstration of abnormal gait patterns
20	Axis and planes

## PSYCHOLOGY

### Course description

Human Psychology involves the study of various behavioural patterns of individuals, theories of development, normal and abnormal aspects of motor, social, emotional and language development, communication and interaction skills appropriate to various age groups. The study of these subjects will help the student to understand their clients while assessment and planning appropriate treatment method.



**Subject Title: PSYCHOLOGY**

**Duration: 0-12 Months**

**Total Hours: 80**

**Theory: 80**

**Total Hours/week: 2 Hrs**

**Method of Assessment: Written**

### Theory

#### 1. Introduction to Psychology [8 Hrs]

- a. Schools: Structuralism, functionalism, behaviorism, psychoanalysis.
- b. Methods: Introspection, observation, inventory and experimental method.
- c. Branches: Pure psychology and applied psychology
- d. Psychology and Physiotherapy

#### 2. Growth and Development [5 Hrs]

- a. Life span: different stages of development (Infancy, childhood, adolescence, adulthood, middle age, old age).
- b. Heredity and environment: role of heredity and environment in physical and psychological development, —"Nature v/s Nurture controversy"



### **3. Attention and perception [8 Hrs]**

- a. Sensation: Vision, Hearing, Olfactory, Gustatory and Coetaneous sensation, movement, equilibrium and visceral sense.
- b. Attention: Types of attention, Determinants ,Span of Attention
- c. Perception: Gestalt principles of organization of perception (principle of figure ground and principles of grouping), factors influencing perception (past experience and context)
- d. Illusion and hallucination: different types

### **4. Motivation (5 Hours)**

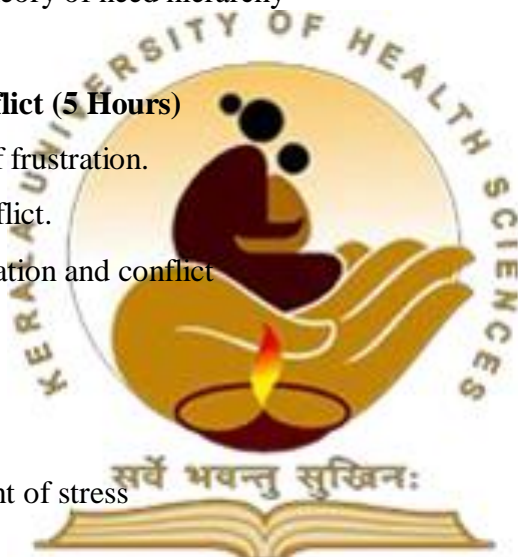
- a. Motivation cycle (need, drive, incentive, reward).
- b. Classification of motives.
- c. Abraham Maslow's theory of need hierarchy

### **5. Frustration and conflict (5 Hours)**

- a. Frustration: sources of frustration.
- b. Conflict: types of conflict.
- c. Management of frustration and conflict

### **6. Emotions (6 Hours)**

- a. Theories of emotion
- b. Stress and management of stress



### **7. Intelligence (6 Hours)**

- a. Theories of intelligence.

### **8. Memory**

- a. Types of memory
- b. Methods to improve memory

### **9. Forgetting**

- a. Common Reasons for forgetting
- b. Theories of Forgetting

## **10. Thinking (5 Hours)**

- a. Different Types of Thinking
- b. Abstract thinking,
- c. Reflective thinking
- d. logical thinking
- e. Creative thinking
- f. Problem solving

## **11. Learning (8 Hours)**

- a. Factors effecting learning.
- b. Types of Learning
- c. Theories of learning: trial and error learning, classical conditioning, Operant conditioning, insight learning, social learning theory.

## **12. Personality (8 Hours)**

- a. Personality definition
- b. Theories of Personality (Type theories b. Trait Theory, Humanistic Theories ,Developmental Theories and Social learning Theories ) Type Theories - Hippocrat, Kretchmer's, Jung and Type A & B Trait Theory Cattle Humanistic Theory Cal Rogers and Maslow Developmental Theory Sigmund Freud Social Learning Theory Millar and Bandura
- c. Personality assessment: observation, situational test, questionnaire, rating scale, interview, and projective techniques.
- d. Defense Mechanisms: denial of reality, rationalization, projection, reaction formation, identification, repression, regression, intellectualization, undoing, introspection, acting out.

## **13. Social psychology (4 Hours)**

- a. Leadership: Different types of leaders. Different theoretical approaches to leadership.
- b. Attitude: development of attitude. Change of attitude.

## **14. Clinical Psychology (12 Hours)**

- a. Psychosomatic disorders – Definition and Basic Concepts
- b. Coping strategies
- c. Psychological counseling



## **SOCIOLOGY**

### **Course description**

Sociology will introduce student to the basic sociology concepts, principles and social, emotional and language development, communication and interaction skills appropriate to various age groups. Sociology will introduce student to the basic sociology concepts, principles and social process social institutions [in relation to the individual, family and community] and the various social factors affecting the family in rural and urban communities in India will be studied.

**Subject Title:**

**SOCIOLOGY**

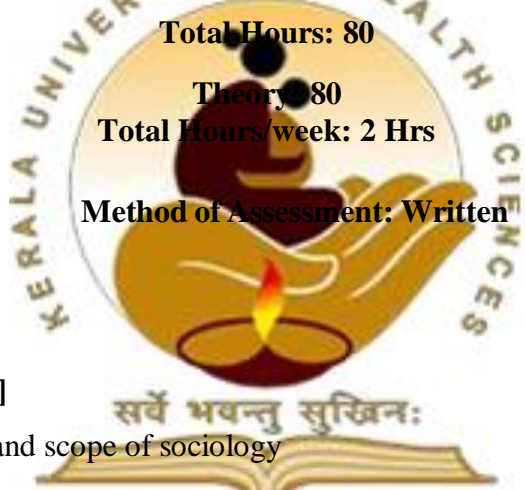
**Duration: 0-12 Months**

**Total Hours: 80**

**Theory: 80**

**Total Hours/week: 2 Hrs**

**Method of Assessment: Written**



### **THEORY**

#### **1. Introduction: [8 Hrs]**

1. Meaning- Definition and scope of sociology
2. Its relation to Anthropology, Psychology, Social Psychology.
3. Methods of Sociological investigations- Case study, social survey, questionnaire, Interview and opinion poll methods.
4. Importance of its study with special reference to Health Care Professionals.

#### **2. Social Factors in Health and disease situations: [3 Hrs]**

1. Meaning of social factors
2. Role of social factors in health and illness

#### **3. Socialization: [5 Hrs]**

1. Meaning and nature of socialization
2. Primary, Secondary and Anticipatory socialization
3. Agencies of socialization

#### **4. Social Groups: [5 Hrs]**

1. Concepts of social groups, influence of formal and informal groups on health and sickness.
2. The role of primary groups and secondary groups in the hospital and rehabilitation setup.

#### **5. Family: [8 Hrs]**

1. The family, meaning and definitions.
2. Functions of types of family
3. Changing family patterns
4. Influence of family on the individuals health, family and nutrition, the effects of sickness in the family and psychosomatic disease and their importance to Physiotherapy.

#### **6. Community: [5 Hrs]**

1. Rural community: Meaning and features- Health hazards of ruralities, health hazards to tribal community.
2. Urban community: Meaning and features- Health hazards of urbanities.
3. Tribal community-meaning and features. Health problems associated with tribals.
4. Role of Rural and Urban communities in public health.

#### **7. Culture and Health: [8 Hrs]**

1. Concept of Health
2. Concept of Culture
3. Culture and Health
4. Culture and Health Disorders
5. concept of cultural lag.



#### **8. Social change: [10 Hrs]**

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

### **9. Social Problems of disabled: [15 Hrs]**

**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
8. Geriatric problems
9. Problems of underprivileged.

### **10. Social Security: [5 Hrs]**

Social security and social legislation in relation to the disabled.

### **11. Social worker: [8 Hrs]**

1. Meaning of Social Work
2. The role of a Medical Social Worker



### **Course Description**

At the completion of this course the student will have a basic knowledge about the importance of Biochemistry, such that he/ she shall be able to utilize it in the practice of Physiotherapy.

**Subject: BIOCHEMISTRY**

**Duration: 0 – 12 months**

**Total hours: 80**

**Theory: 80**

**Total hours/ week: 2 hour**

**Method of Assessment: Written**

### **THEORY**

#### **1. Cell (3 hours)**

Introduction, Cell structure, Cell membrane structure & function, various types of

absorption. Intracellular structure & their function.

## **2. Carbohydrates (10 hours)**

Definition, General Classification with examples, Sources & Functions, Digestion and absorption, metabolism of carbohydrates, with emphasis on glycolysis, gluconeogenesis, HMP shunt pathway. Inborn errors associated with carbohydrates metabolism, regulation of blood glucose level, diabetes mellitus (aetiology, biochemical abnormalities, biochemical basis of complications, lab diagnosis).

## **3. Lipid chemistry (10 hours)**

Definition, General Classification with examples, Sources & Functions, Digestion and absorption, metabolism of Lipids (fatty acid oxidation-beta and alpha oxidation, cholesterol synthesis,) Phospholipids, inborn errors, Atherosclerosis.

## **4. Proteins and amino acids (10 hours)**

Definition, General Classification with examples, & Functions, Digestion and absorption, metabolism of Proteins - glycine, phenylalanine, tyrosine, Aminoacidurias

## **5. Integration of metabolism and Electron Transport Chain (4 hour)**

## **6. Vitamins (4 hours)**

Definition, classification according to solubility, Major Individual vitamins – sources, digestion, absorption, deficiency.

## **7. Mineral metabolism (4 hours)**

Definition, Digestion, absorption, function. Examples of Disorders of individual Minerals – Iron, Copper

## **8. Water and Electrolyte Balance (5 hour)**

Water distribution in the body, Body water, water turn over, Regulation of water balance, Distribution of electrolytes Electrolyte balance, Acid-base balance

## **9. Nucleotide, nucleic acid chemistry (5 hour)**

Nucleotide chemistry, nucleotide composition and function of free nucleotides in the body, nucleic acid (DNA and RNA) chemistry, difference between DNA and RNA, structure and function of DNA, structure and function of RNA.

## **10. Clinical Bio chemistry (8 hours)**

Normal level of blood & urine constituents, Relevance of blood & urine level of glucose, Renal and Liver function tests

## **11. Detoxification (3 hour)**

## **12. Enzymes (4 hour)**





Definition, classification, factors affecting enzyme activity, diagnostic enzymology

**13. Hormones (4 hour)**

Definition, classification, mechanism of action

**14. Procedures in Bio chemistry (3 hour)**

Electrophoresis, Chromatography, RIA, ELISA

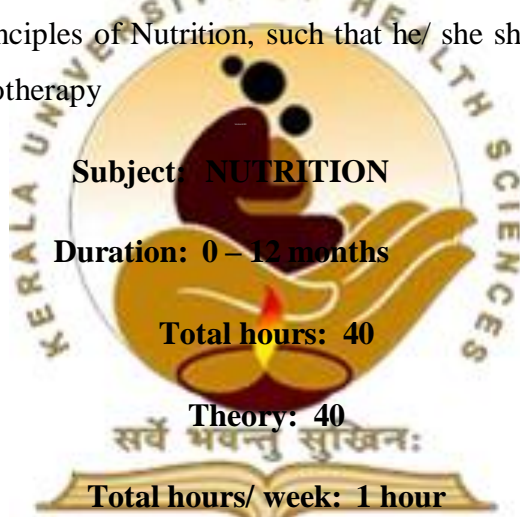
**15. Radioactivity (3 hour)**

Diagnostics, Research & therapeutic applications, Radiation hazards

## NUTRITION

### Course Description

At the completion of this course the student will have a basic knowledge and understanding of Principles of Nutrition, such that he/ she shall be able to utilize it in the practice of Physiotherapy



**Method of Assessment: Written**

### THEORY

**1. Introduction to nutrition,** Role of nutrition in maintaining health. Nutritional problems in India. Factors affecting food and nutrition: socio - economic, cultural, tradition, production, system of distribution, life style and food habits etc. (5 Hrs)

**2. Classification of foods.** Food standards. Elements of nutrition: macro and micro. Energy, Unit of Energy – Kcal. Energy requirements of different categories of people. Measurements of energy. Body Mass Index (BMI). Basal Metabolic Rate (BMR) – determination and factors affecting. Respiratory Quotient (RQ), Specific Dynamic Action (SDA). (4 hrs)

**3. Carbohydrates :** Caloric Value, Recommended daily allowances. Dietary sources. Functions. Malnutrition: Deficiencies and Over consumption. (5 hrs)

**4. Fats:** Caloric Value, Recommended daily allowance. Dietary sources, Functions. Malnutrition: Deficiencies and Over consumption. (5 hrs)

**5. Proteins:** Caloric Value, Biological Value (BV), Recommended daily allowance. Dietary sources. Functions. Malnutrition: Deficiencies and Over consumption. (5 hrs)

**6. Vitamins:** Caloric Value, Biological Value (BV), Recommended daily allowance. Dietary sources. Functions. Malnutrition: Deficiencies and Over consumption. (3 hrs)

**7. Minerals Caloric Value,** Biological Value (BV), Recommended daily allowance. Dietary sources. Functions. Malnutrition: Deficiencies and Over consumption. (3 hrs)

**8. Balanced diet:** Elements, Food groups, Recommended Daily Allowance. Nutritive value of foods. Understanding of balanced diet for different categories of people and patients Planning menu. (3 Hrs)

**9. Assessment of nutritional status- Objectives.** Diet survey – objectives and methods. (2 hrs)

**10. Introduction to therapeutic diets:** Types of Modification in diets. Diets in fever, Diarrhoea, Constipation, Ulcers, Diabetes, atherosclerosis, Renal Failure and Obesity. (5 hrs)



## **FIRST AID & NURSING**

### **Course Description**

At the completion of this course the student of First Aid and CPR must be able to identify and manage situation of common emergencies.

**Subject Title: FIRST AID & NURSING**

**Duration: 0-12 Months**

**Total Hours: 80**

**Theory: 60**

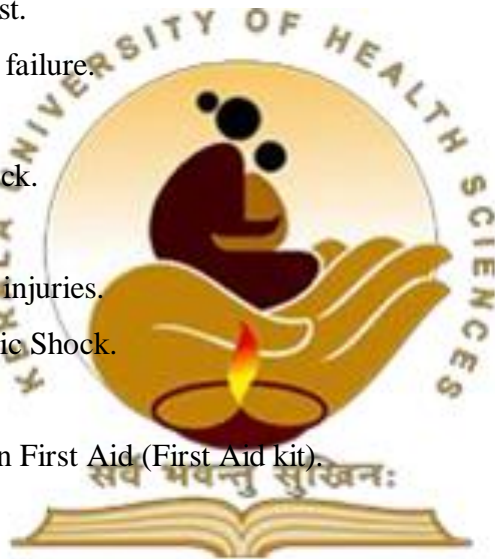
**Practical: 20**

**Total Hours/week: 2 Hr**

**Method of Assessment: Written**

**THEORY (FIRST AID) [30 Hrs]**

1. Importance of First Aid in Physiotherapy
2. Examination of Vital Signs.
3. First Aid in cardiac arrest.
4. First Aid in Respiratory failure.
5. First Aid in Burns.
6. First Aid in Electric shock.
7. First Aid in Drowning.
8. First Aid in Spinal cord injuries.
9. First Aid in Hypovolemic Shock.
10. First Aid in Poisoning
11. Instrumentation used in First Aid (First Aid kit).
12. First Aid in RTA.
13. Indication of CPR.
14. Assessment and technique of CPR.
15. Artificial ventilation.



**PRACTICAL [10 Hrs]**

**THEORY (NURSING) [30 Hrs]**

1. What is Nursing? Nursing principles. Inter-Personnel relationships. Bandaging: Basic turns; Bandaging extremities; Triangular Bandages and their application.
2. Nursing Position: Environment safety; Bed making, prone, lateral, dorsal, dorsal recumbent, Flower's positions, comfort measures, Aids for rest and sleep,
3. Lifting and Transporting Patients: Lifting Patients up in the bed. Transferring from bed

to wheel chair. —Transferring from bed to stretcher||.

4. Bed side Management: Giving and taking Bed pan, Urinal : Observation of stools, urine. Observation of sputum, Understand use and care of catheters, enema giving.

5. Methods of Giving Nourishment: Feeding, Tube feeding, drips, transfusion

6. Care of Rubber Goods: Observation, Reporting and Recording Temperature, Respiration and Pulse, Simple aseptic Technique, Sterilization and Disinfection.

7. Surgical Dressing: Observation of dressing procedures

## **PRACTICAL [10 Hrs]**

### **ORIENTATION TO PHYSIOTHERAPY**

**Subject Title: Orientation to Physiotherapy**

**Duration: 0 - 12 Months**

**Total Hours: 40**

**Theory: 40 Hrs Total**

**Hours/week: 1 Hr**

**Method of Assessment: Written**

## **THEORY**

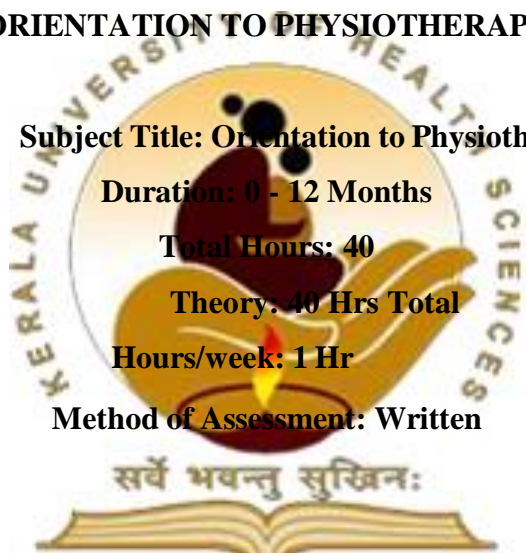
### **I. Patterns of Health Care Delivery: (5 Hrs)**

- a. National Trends and resources
- b. Local trends and resources
- c. Overview of Health Science Professions

### **II. Components of Physiotherapy Profession: (15 Hrs)**

- a. History of Medical Therapeutics
- b. History of Physiotherapy – World and India
- c. Overview of Health Science Professions

### **III. Role of Physiotherapy in meeting Health Care Needs in India. (15 Hrs)**



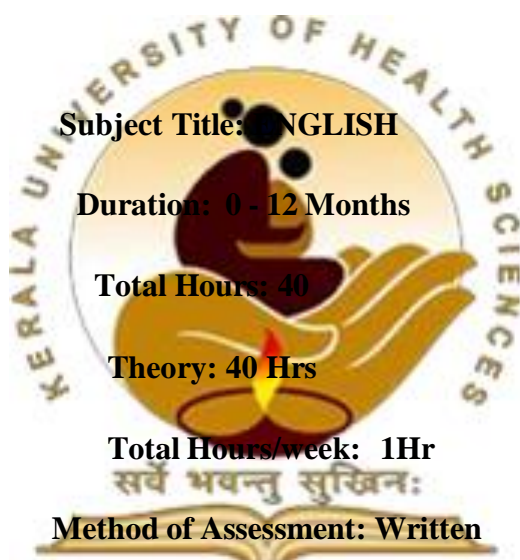
- a. Needs versus Demands
- b. Physiotherapist as “Educator“
- c. Typical Job settings
- d. Common problems and solutions.
- e. Introduction of Physical Assessment, Physical Diagnosis and Differential Diagnosis

#### **IV. Responsibility Characteristics of being a professional (5 Hrs)**

### **COMMUNICATIVE ENGLISH**

#### **Course description:**

This course is designed to help the student acquire a good command and comprehension of the English language through individual, papers and conferences.



#### **THEORY**

##### **Behavioral Objectives:**

The student at the end of training is able to

1. Read and comprehend English language
2. Speak and write grammatically correct English
3. Appreciates the value of English literature in personal and professional life,

#### **Unit-I: [4 Hrs]**

##### **Introduction:**

Study Techniques

Organization of effective note taking and logical processes of analysis and synthesis

The use of the dictionary

Enlargement of vocabulary Effective diction

### **Unit - II: [4 Hrs]**

#### **Applied Grammar:**

Correct usage

The structure of sentences

The structure of paragraphs

Enlargements of Vocabulary

### **Unit - III: [4 Hrs]**

#### **Written Composition:**

Precise writing and summarizing

Writing of bibliography

Enlargement of Vocabulary

### **Unit – IV [4 Hrs]**

Reading and comprehension

Review of selected materials and express oneself in one's words.

Enlargement of Vocabulary

### **Unit –V [4 Hrs]**

The Study of Various Forms of Composition Paragraph, Essay, Letter, Summary,

Practice in writing

### **Unit – VI [20 Hrs]**



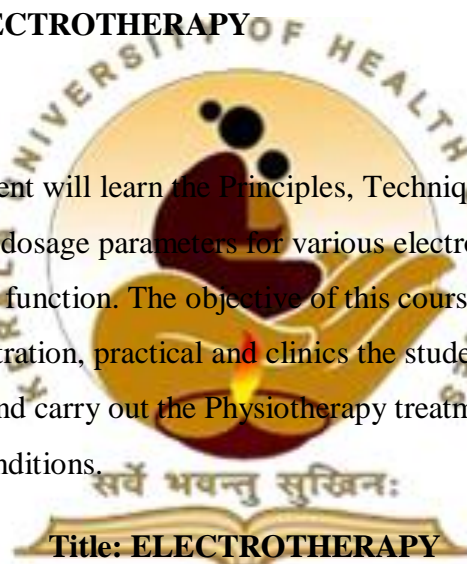


**Verbal communication:**

Discussions and summarization, Debates, Speech and Oral Verbal Communication:  
Discussions and report making and their use in teaching.

**II BPT****ELECTROTHERAPY****Course Description**

In this course the student will learn the Principles, Techniques, Effects, Indications, Contra-indication and the dosage parameters for various electrotherapeutic modalities in the restoration of physical function. The objective of this course is that after specified hours of lectures, demonstration, practical and clinics the student will be able to independently prescribe and carry out the Physiotherapy treatment using electrotherapy aids in various clinical conditions.

**Duration: 13-24 Months****Total Hours: 320Hrs****Theory: 120 Hrs****Practical: 200 Hrs****Total Hours/week: 8****Method of Assessment: Written, Oral, Practical****THEORY**

## Section I – Introductory Physics and Electrotherapy [10 Hrs]

1. History of Electrical Modalities and Electrotherapy
2. Electricity definition, types Static electricity
  - a. Production of electrical charges.
  - b. Characteristics of charged body.
  - c. Characteristics of lines of force.
  - d. Potential difference and EMG.

### 3.Current Electricity

- a. Units of Electricity, Faraday, volt, ampere, coulomb, watt.
- b. Resistance in series and parallel.
- c. Ohms law and its application to DC/AC.
- d. Fuse.
- e. Shock: Micro/Macro shocks, safety precaution and management, earthing techniques & precautions.
- f. Burns: electrical & chemical burns, prevention and management.
- g. Condensers Valves, transformers: types, principles, construction and working.

**4.Magnetism:** Definition, properties, electromagnetic induction, electromagnetic spectrum.

**5. Ionization:** Principles, effects of various technique of medical ionization.

**6. Extracorporeal Shock wave therapy(ESWT):**

Principles and mechanism of action of SWT,Treatment parameters, physiological and therapeutic effects, indications and contraindications of SWT



## Section II – Therapeutic Electricity

### Section II A – Low frequency Currents [40 Hrs]

#### 1. Basic types of current.

**a. Direct Current:** types, physiological & therapeutic effects.

**b. Alternating Current**

#### 2. Types of current used in therapeutics

## **Modified DC**

Faradic Current

Galvanic

Current

## **Modified AC**

Sinusoidal Current

Diadynamic

Current

**3. Faradic Current:** Definition, Modifications, Techniques of application of individual, muscle stimulation, Physiological & Therapeutics effects of faradic Current, Precautions, Indications, & Contra indications, Dangers.

**4. Galvanic Currents:** Definition, Modifications, Physiological & Therapeutics effects of Galvanic Current, Indications, & Contraindications, Dangers. Effects of Interrupted galvanic current on normally innervated and denervated muscles and partially denervated muscles

**5. HVPGS - Parameters & its uses.**

**6. Ionization / Iontophoresis :** Techniques of Application of Iontophoresis, Indications, Selection of Current, Commonly used ions (drugs) for pain, hyperhydrosis, wound healing, calcium deposits, sclerolytic action, fungal infection, edema reduction, inflammation & plantar warts. Current Amplitude and Treatment duration iontophoresis

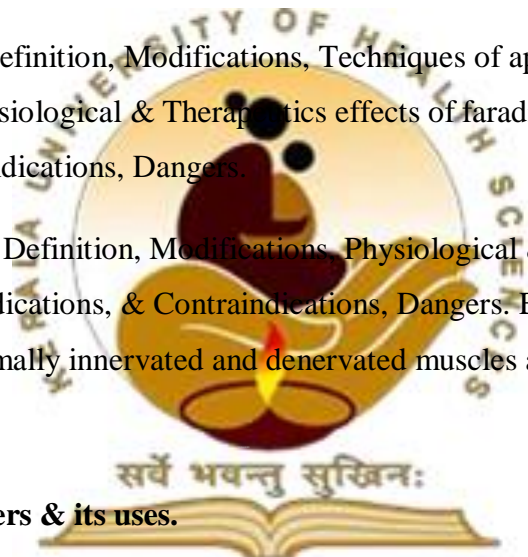
**7. Cathodal/ Anodal galvanism.**

**8. Micro Current & Macro Current**

**9. Types of Electrical Stimulators**

NMES- Construction component

Neuro muscular diagnostic stimulator-construction component



## Components and working Principles

**10. Principles of Application:** Electrode- tissue interface, Tissue Impedance. Types of Electrode Size & Placement of Electrode: Waterbath, Unipolar, Bi-polar, Electrode coupling, Current flow in tissues, Lowering of Skin Resistance.

**11. Nerve Muscle Physiology:** Action Potential, Resting membrane potential, Propagation of Action Potential, Motor unit. Synapse, Accommodation, Stimulation of Healthy Muscle, Stimulation of Denervated Muscle, Stimulation for Tissue Repair.

**12. TENS:** Define TENS, Types of TENS, Conventional TENS, Acupuncture TENS. Burst TENS, Brief & Intense TENS, Modulated TENS. Types of Electrodes & Placement of Electrodes, Dosage parameters, Physiological & Therapeutic effects, Indications & Contraindications.

**13. Pain:** Define Pain. Theories of Pain (Outline only), Pain Gate Control theory in detail.

### Section II B - Electro-diagnosis [15 hrs]

**1. FG Test**

**2. SD Curve:** Methods of Plotting SD Curve. Apparatus selection, Characters of Normally innervated Muscle. Characters of Partially Denervated Muscle, Characters of Completely denervated Muscle. Chronaxie & Rheobase.

**3. Nerve conduction velocity studies**

**4. EMG: Construction of EMG equipment.**

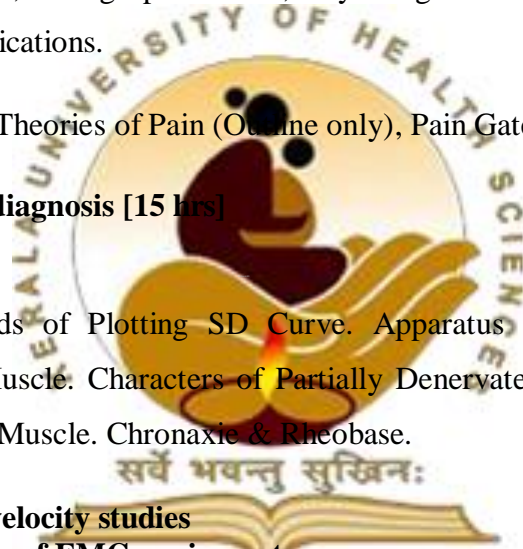
**5. Bio-feed back.**

### Section II C - Medium Frequency [10 Hrs]

**1. Interferential Therapy:** Define IFT. Principle of Production of Interferential current, Static Interference System, Dynamic Interference system. Dosage Parameters for IFT, Electrode placement in IFT. Physiological & Therapeutic effects, Indications & Contraindications.

**2. Russian Current**

**3. Rebox type Current**



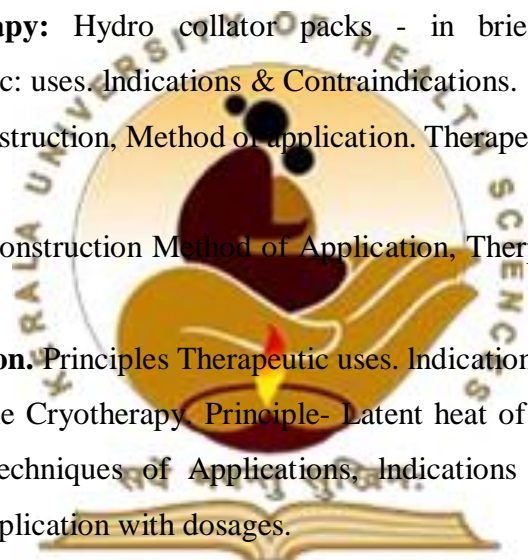
### **Section III - Thermo & Actinotherapy (High Frequency Currents) [25 Hrs]**

- 1. Physical Principles of Thermal energy:** Specific heat, Modes of heat transfer, Effects, contraindications, precautions & adverse effects of Thermotherapy
- 2. Electro Magnetic Spectrum.**
- 3. SWD:** Define short wave, Frequency & Wavelength of SWD, Principle of Production of SWD, Circuit diagram &: Production of SWD. Methods of Heat Production by SWD treatment. Types of SWD Electrode, Placement & Spacing of Electrodes, Tuning-Testing of SWD Apparatus, Physiological & Therapeutic effects, Indications & Contraindications, Dangers, Dosage parameters.
- 4. Pulsed Electro Magnetic Energy:** Principles, Production & Parameters of PEME. Uses of PEME.
- 5. Micro Wave Diathermy:** Define Microwave, Wavelength & Frequency, Production of MW Applicators, Dosage Parameters, Physiological Therapeutic effects. Indications & Contraindications. Dangers of MWD.
- 6. Ultrasound:** Define Ultrasound. Frequency, Piezo Electric effects: Direct. Reverse, Production of US, Treatment Dosage Parameters: Continuous & Pulsed mode intensity. US Fields: Near Field- Far Field Half Value distance. Attenuation, Coupling Media Thermal Effects. Non-thermal effects. Principles - Application of US: Direct contact. Water bag, Water bath. Solid sterile gel pack method for wound. Uses of US, Indications & Contraindications. Dangers of Ultrasound. Phonophoresis: Define Phonophoresis, Methods of application, Commonly used drugs. Uses. Dosages of US.
- 7. IRR:** Define IRR, wavelength & parameters Types of IR generators, Production of IR, Physiological & Therapeutic effects, Duration frequency of treatment. Indication & Contraindications
- 8. UVR:** Define UVR- Types of UVR, UVR generators: Types of lamps, Therakatin tunnel. Psoralen Photochemotherapy, Mechanism of action, PUVA apparatus, PUVA regimen. Physiological & Therapeutic Effects.
- 9. LASER:** Define LASER. Types of LASER . Principles of Production. Production of

LASER by various methods. Methods of application of LASER. Dosage of LASER. Physiological & Therapeutic effects of LASER. Safety precautions of LASER. Classifications of LASER. Energy density & power density.

#### **Section IV - Superficial heating Modalities. [15 Hrs]**

- 1. Wax Therapy:** Principle of Wax Therapy application - latent Heat. Composition of Wax Bath Therapy unit Methods of application of Wax, Physiological & Therapeutic effects Indications & Contraindications. Dangers.
- 2. Contrast Bath:** Methods of application. Therapeutic uses, Indications & Contraindications.
- 3. Moist Heat Therapy:** Hydro collar packs - in brief, Methods of applications. Therapeutic: uses. Indications & Contraindications.
- 4. Fluidotherapy:** Construction, Method of application. Therapeutic uses, Indications & Contraindications
- 5. Whirl Pool Bath:** Construction Method of Application, Therapeutic Uses. Indications & Contraindications.
- 6. Magnetic Stimulation.** Principles Therapeutic uses. Indications & contraindications.
- 7. Cryotherapy:** Define Cryotherapy. Principle- Latent heat of fusion. Physiological Therapeutic effects, Techniques of Applications, Indications Contraindications & Dangers. Methods of application with dosages.



#### **Section V (5 Hours)**

1. Prescription and Criteria of selection of modalities

#### **PRACTICAL [200 Hrs]**

The student of Electrotherapy must be able to demonstrate the use of electrotherapy modalities applying the principles of electrotherapy with proper techniques for various parts of the body. Develop rationale for choice of modalities, method of application, dosage and progression parameters and safety precautions.

1. Demonstrate the technique for patient evaluation - receiving the patient and positioning the patient for treatment using electrotherapy.
2. Collection of materials required for treatment using electrotherapy modalities and testing of the apparatus.



3. Demonstrate placement of electrodes; for various electrotherapy modalities
4. Electrical stimulation for the muscles supplied by the peripheral nerves
5. Faradism under Pressure for UL and LL
6. Plotting of SD curve with chronaxie and rheobase.
7. Demonstrate FG test
8. Application of Ultrasound for different regions and various methods of application
9. Demonstrate treatment techniques using SWD. IRR and Microwave diathermy
10. Demonstrate treatment method using IFT for various regions
11. Calculation of dosage and technique of application of LASER
12. Technique of application of Hydrocollator packs, cryotherapy, contrast bath, Wax therapy
13. Demonstrate the treatment method using Whirl pool bath
14. Winding up procedure after any electrotherapy treatment method.
15. Demonstration of methods for basic maintenance and repair of all Electrotherapy Equipment.



### **Course Description**

In this course, the student will learn the principles and effects of exercise as a therapeutic modality and will learn the independent prescription of exercises for restoration maintenance and enhancement of physical function among healthy individuals, among diseased and disabled, across various age groups be it individual, group or mass prescription of therapeutic and fitness exercises.

**Subject Title : EXERCISE THERAPY**

**Duration : 13-24 Months**

**Total hours : 320**

**Theory : 120 hrs**

**Practical : 200 hrs**

**Hours/week : 8 hrs./week**

**Method of Assessment : Written, Oral, Practical**

## **THEORY**

### **1. Mechanical Principles: [ 3 Hrs]**

**Force, Mechanics of Positions** – gravity, COG, LOG, base, equilibrium, fixation, stabilization. **Mechanics of movement** – axis, plane, speed, velocity, work, energy, power, acceleration, momentum, inertia, friction.

**Simple machines, Pendulums & Elasticity** – levers, pulleys, elasticity

### **2. Introduction to Exercise Therapy [5 Hrs]** History and evolution of Exercise therapy

The aims of exercise therapy

The techniques of exercise therapy Approach to patients problems

Assessment of patient's condition Measurements of vital parameters

Starting positions- Fundamental positions & derived positions

Planning of treatment

### **3. Methods of testing [ 11 Hrs]**

a) Functional tests

b) Measurement of joint range: ROM-Definition. Normal ROM for all peripheral joints & spine, Goniometer-parts, types, principles, uses measurements of ROM for all peripheral joints

c) Test for neuromuscular deficiency

\* Manual muscle testing: introduction to MMT principles and aims. Indications and limitation. Techniques of MMT for group and individual muscles: techniques of MMT for upper limb/techniques of MMT for lower limb, techniques of MMT for spine

\* Anthropometric measurements: Muscle girth- biceps, triceps, forearm, quadriceps, calf

\* Static Power Test

\* Dynamic power test

\* Endurance test

\* Speed test



- d) Test for co-ordination
- e) Tests for sensations
- f) Pulmonary function tests
- g) Measurement of Limb Length: True limb length, apparent limb length, segmental limb length.
- h) Measurement of the angle of pelvic inclination

#### 4. Relaxation [ 5 Hrs]

Definitions: Muscle tone, postural tone, voluntary movement, degrees of relaxations, pathological tension in muscle, stress mechanics, types of stresses, effect of stress on the body mechanism, Indications of Relaxations, methods and techniques of relaxation-principles and uses, General, local, Jacobson's, Mitchell's. Traditional Indian methods of Meditation as per Yoga.

#### 5. Passive movements[ 5 Hrs]

Causes of immobility, classification of passive movements, specific definitions related to passive movements, Principles of giving passive movements, Indications, contraindications, effects of uses, techniques of giving passive movements. Dosage and progression of Passive movements

#### 6. Active movements [ 4 Hrs]

- a. Definition of strength, power and work, endurance, muscle actions.
- b. Physiology of muscle performance: structure of skeletal muscle, chemical & mechanical events during contraction and relaxation, muscle fiber type, motor unit, force gradation.
- c. Causes of decreased muscle performance
- d. Physiologic adaptations to training: strength and power, endurance
- e. Facilitation and Inhibition Techniques

##### Types of active movements

**Active Assisted Exercise:** principles, techniques, indications, contraindications, effects and uses  
**Assisted-Resisted Exercise:** principles, techniques, indications, contraindications, effects and uses

**Assisted-resisted exercise:** principles, techniques, indications, contraindications, effects and uses.  
**Free exercise** Classification, principles, techniques, indications, contraindications, effects and uses.

Free exercise: Classification, principles, techniques, indications, contraindications, effects and uses.

- 7. Resisted Exercise[5hrs]:** Definition, principles, indications, contraindications, precautions & techniques, effects and uses. Types of resisted exercise: Manual and mechanical resistance exercise, isometric exercise, Dynamic exercise: concentric and eccentric dynamic exercise: constant versus variable resistance, isokinetic exercise, open-chain and closed-chain exercises. Delayed on set musclesoreness.

**specific exercise Regimens:** Isotonic- de Lormes, oxford, Macqueen, circuit weighttraining, Isometric: BRIME (Brief Resisted Isometric Exercise), Multiple ankle isometric. Isokinetic regimens, Repetition maximum (RM) method, Delorme & Watkins, Macqueen Zinovieff (oxford technique), Plyometric Exercises, Concepts of Mckenzie exercise protocol.

- 8. Grade dre-education technique on different groups of muscle [2 hrs]**

- 9. Breathing Exercises [4 hrs]:** Definition, types, indications & contraindications , Forced Expiratory Techniques Postural Drainage: Types, Positions, indications, contraindications, modifications & manual techniques

- 10. Proprioceptive Neuromuscular Facilitation [ 9 Hrs]**

Definitions and goals

Basic neurophysiologic principles of PNF: Muscular activity, diagonal patterns of movement: upper limb lower limb

Procedure: components of PNF

Techniques of facilitation

Mobility: contract relax, hold relax, rhythmic initiation.

Strengthening: Slow reversals, repeated contractions, timing for emphasis, rhythmic stabilization.

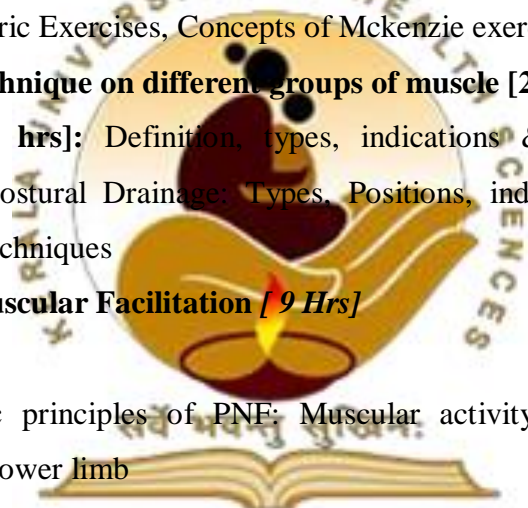
Stability: Alternating isometric, rhythmic stabilization.

Skill: timing for emphasis, resisted progression Endurance: slow reversals, agonist reversal

- 11. Suspension Therapy [ 4 Hrs]**

Definition, principles, equipments & accessories, Indications & contraindications, Benefits of suspension therapy

Types of suspension therapy: axial, vertical, pendular. Techniques of suspension therapy



for upper limb

Techniques of suspension therapy for lower limb

## **12. Functional Re-education [ 8 Hrs]**

Lying to sitting: Activities on the Mat/Bed, Movement and stability at floor level; Sitting activities and gait; Lowerlimb and Upperlimb activities.

## **13. Aerobic Exercise [ 5 Hrs]**

Definition and key terms; Physiological response to aerobic exercise, Examination and evaluation of aerobic capacity - Exercise Testing, Determinants of an Exercise Program. The Exercise Program, Normal and abnormal response to acute aerobic exercise, Physiological changes that occur with training, Application of Principles of an Aerobic conditioning program for patients - types and phases of aerobic training.

## **14. Stretching [8 Hrs]**

Definition of terms related to stretching; Tissue response towards immobilization and elongation, Determinants of stretching exercise. Effects of stretching, inhibition and relaxation procedures. Precautions and contraindications of stretching, Techniques Dosage and progression of stretching. Facilitated stretching

## **15. Soft tissue & Neural tissue Mobilization and Massage [4 Hrs]**

- A. Basics of Neuro dynamics, Nerve tension testing & Neural tissue Mobilization
- B. History and Classification of Massage Technique Principles, Indications and Contraindications Technique of Massage Manipulations Physiological and Therapeutic Uses of Specific manipulations.

## **16. Basics in Manual Therapy & Applications with Clinical reasoning (6Hrs)**

- a) Examination of joint integrity
  - a) Contractile tissues
  - b) Non contractile tissues
  - c) Mobility - assessment of accessory movement & End feel
  - d) Barrier concepts
- b) Assessment of articular & extra-articular soft tissue status
  - Myofascial assessment
  - Acute & Chronic muscle hold
  - Tightness
  - Movement diagrams

Pain-original & referred

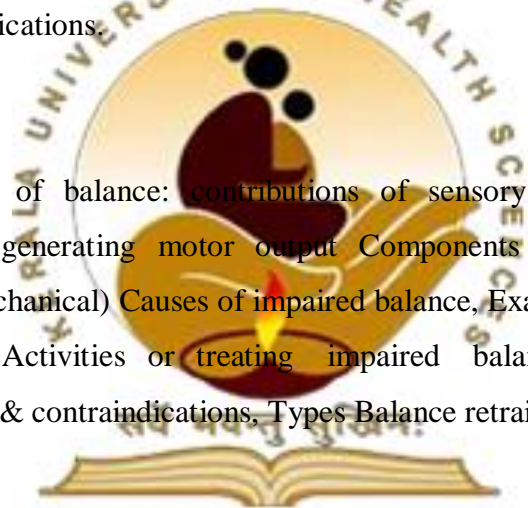
C. Definition of Schools of Manual Therapy, Basic principles, Grades, , Indications & Contra-Indications and techniques of mobilization skills for joints & soft tissues.

- a. Maitland
- b. Mulligan
- c. Mckenzie
- d. Muscle Energy Technique
- e. Myofascial stretching
- f. Trigger point release
- g. Cyriax
- h. Neuro Dynamic Testing

**17.Traction (3 Hours)** – Definition, Principles, Types, Methods of application. Therapeutic uses, Indications & Contraindications.

**18. Balance [ 3 Hrs]**

Definition, Physiology of balance: contributions of sensory systems, processing sensory information, generating motor output Components of balance (sensory, musculoskeletal, biomechanical) Causes of impaired balance, Examination & evaluation of impaired balance. Activities or treating impaired balance: mode, posture, movement, Precautions & contraindications, Types Balance retraining.



**19. Co-ordination Exercise [ 3 Hrs]**

Anatomy & Physiology of cerebellum with its pathways Definitions: Co-ordination, Inco- ordination Causes for Inco-ordination, Test for co-ordination: equilibrium test, non equilibrium test Principles of co-ordination exercise Frenkel's Exercise, Tai Chi etc progression, home exercise.

**20.Posture [ 2 Hrs]**

Definition, Active and Inactive Postures, Postural Mechanism, Patterns of Posture, Kendall's System of Postural Assessment, Principles of re-education: corrective methods and techniques. Patient education.



## **21.Walking Aids [ 5 Hrs]**

Types, Measurements, Prescription, Training & Evaluation: Crutches, Canes, Frames

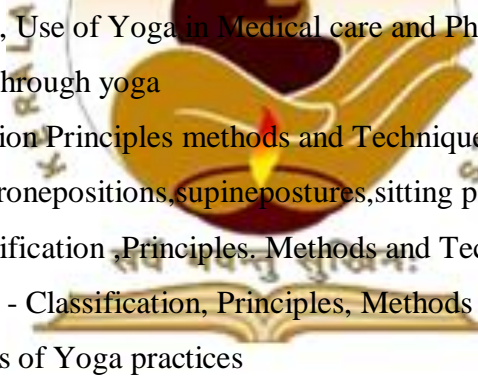
## **22.Hydrotherapy [ 5 Hrs]**

Definitions, Goals and indications. Precautions and Contraindications, Properties of water. Use of special equipments, techniques. Effects and uses, merits and demerits. Limitations and scope of practice.

## **23.Individual and Group Exercises[ 3 Hrs]**

Advantages and Disadvantages, Organisation of Group exercises. Recreational Activities and Sports for groups and mass gathering.

## **24.Introduction to Yoga [ 9 Hrs]**

- 
- a. Philosophy of Yoga, Use of Yoga in Medical care and Physiotherapy,
  - b. Stressmanagement through yoga
  - c. Asanas - Classification Principles methods and Technique
  - d. Standing postures,pronepositions,supinepostures,sitting postures of yogasanas.
  - e. Pranayamas – Classification ,Principles. Methods and Techniques
  - f. Meditation postures - Classification, Principles, Methods and Techniques
  - g. Physiological effects of Yoga practices
    - a. Physiological effects of Shat kriyas
    - b. Physiological effects of Asanas
    - c. Physiological effects of Pranayamas
    - d. Physiological effects of Relaxation techniques and Meditation

## **PRACTICALS [200 Hrs]**

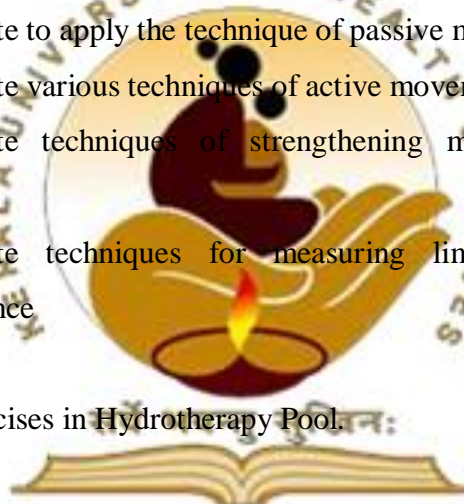
The students of exercise therapy are to be trained in Practical Laboratory work for all the topics discussed in theory. The student must understand how to evaluate and apply judiciously the different methods of exercise therapy techniques on the Patients. They must be able to;

1. Demonstrate the technique of measuring using goniometry

2. Demonstrate muscle strength using the principles and technique of MMT
3. Demonstrate – Basic Asana, Pranayama and Meditation methods
4. Demonstrate the PNF techniques
5. Demonstrate exercises for training co-ordination – Frenkel's exercises
6. Demonstrate the techniques of massage and Soft Tissue manipulations
7. Demonstrate technique for functional re-education
8. Assess and train for using walking aids
9. Demonstrate mobilization of individual joint regions
10. Demonstrate to use the technique of suspension therapy for mobilizing and strengthening joints and muscles
11. Demonstrate the techniques for muscle stretching
12. Assess and evaluate posture and gait
13. Demonstrate to apply the technique of passive movements
14. Demonstrate various techniques of active movements
15. Demonstrate techniques of strengthening muscles using resisted exercises
16. Demonstrate techniques for measuring limb length and body circumference

**Desirable –**

Individual and group exercises in Hydrotherapy Pool.



## **PHARMACOLOGY**

### **Course Description**

This course introduces the student to basic pharmacology of common drugs used, their importance in the overall treatment including Physiotherapy. The student after completing the course will be able to understand the general principles of drug action and the handling of drugs by the body. The student will be aware of the contribution of both drug and Physiotherapy factors in the outcome of treatment.

**Subject title : PHARMACOLOGY**

**Duration : 13 - 24 Months**

**Total Hours : 80**

**Theory : 80 Hrs**

**Total Hours/week : 2 Hrs**

**NOTE – paper setters must restrict Essay questions to the General Pharmacology and other questions also must have relevance to Physiotherapy practice.**

## **THEORY**

### **1. General Principles of Pharmacology (8 Hrs)**

Basic Principles of Pharmacology

Pharmacokinetics I: Drug Administration, Absorption, and Distribution

Pharmacokinetics II: Drug Elimination

Drug Receptors

### **2. Pharmacology of the Central Nervous System (13Hrs)**

General Principles of Central Nervous System

Pharmacology Sedative-Hypnotic and Antianxiety Agents

Drugs Used to Treat Affective Disorders: Depression and Bipolar Syndrome

Antipsychotic Drugs

Antiepileptic Drugs

Pharmacological Management of Parkinson Disease

General Anesthetics

Local Anesthetics

### **3. Drugs Affecting Skeletal Muscle (5 Hrs)**

Skeletal Muscle Relaxants

### **4. Drugs Used to Treat Pain and Inflammation (10 Hrs)**

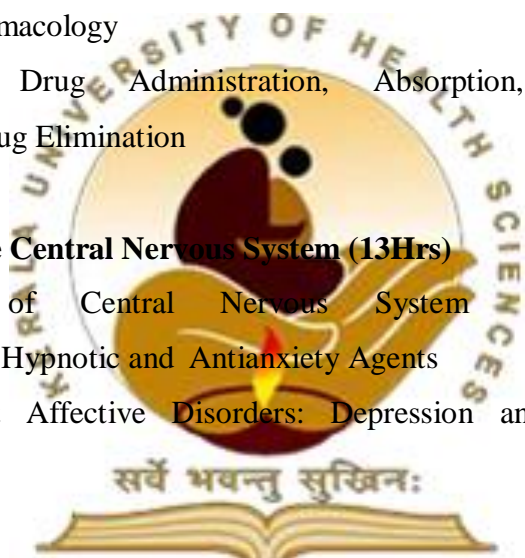
Opioid Analgesics

Non Steroidal Anti-Inflammatory Drugs

Pharmacologic Management of Rheumatoid Arthritis and Osteoarthritis

Patient-Controlled Analgesia

### **5. Autonomic and Cardiovascular Pharmacology (13 Hrs)**



Introduction to Autonomic Pharmacology

Cholinergic Drugs

Adrenergic Drugs Antihypertensive

Drugs Treatment of Angina Pectoris

Treatment of Cardiac Arrhythmias

Treatment of Congestive Heart Failure

Treatment of Coagulation Disorders and Hyperlipidemia

## **6. Respiratory and Gastrointestinal Pharmacology (10 Hrs)**

Respiratory Drugs

Gastrointestinal Drugs

## **7. Endocrine Pharmacology (3 Hrs)**

Introduction to Endocrine Pharmacology

Adreno cortico steroids

Male and Female Hormones

Thyroid and Parathyroid Drugs: Agents Affecting Bone Mineralization

Pancreatic Hormones and the Treatment of Diabetes Mellitus

## **8. Chemotherapy of Infectious and Neoplastic Diseases (8 Hrs)**

Treatment of Infections

I: Antibacterial Drugs Treatment of Infections

II: Antiviral Drugs

Treatment of Infections

III: Antifungal and Antiparasitic Drugs Cancer Chemotherapy

Immuno modulating Agents

Complementary and Alternative Medications

## **9. Drugs Administered by Iontophoresis and Phonophoresis (5 Hrs)**

## **10. Drugs of Abuse in Sports (5 Hrs)**

**11.** Geriatrics

**12.** Disorders of movement



## **MICROBIOLOGY**

### **Course Description**

This subject follows the basics of anatomy, physiology and biochemistry and it forms a vital link between preclinical subjects and clinical subjects. Microbiology involves the study of common organisms causing diseases including nosocomial infections and precautionary measures to protect one from acquiring infections. The knowledge and understanding of microbiology is essential to institute appropriate treatment or suggest preventive measures to the patient.

***NOTE – paper setters must restrict Essay questions to the General Microbiology and other questions also must have relevance to Physiotherapy practice.***

***Subject Title :MICROBIOLOGY***

***Duration : 13-24 Months***

***Total Hours : 80 Hrs***

***Theory : 80 Hrs***

***Total Hours/week : 2Hrs***



## **THEORY**

### **1. General Microbiology [ 10 Hrs ]**

Definitions: infections, parasite, host, vector, fomite, contagious disease, infectious disease, epidemic, endemic, pandemic, Zoonosis, Epizootic, Attack rate.

Normal flora of the human body.

Routes of infection and spread endogenous and exogenous infections source at reservoir of infections.

Bacterial cell Morphology limited to recognizing bacteria in clinical samples Shape, motility and arrangement. Structures, which are virulence, associated

Essentials of bacterial growth requirements.

Sterilization, disinfection and universal precautions in relation to patient care and disease prevention.

Definition of asepsis, sterilization, disinfection. Antimicrobials: Mode of action, interpretation of susceptibility tests, resistance spectrum of activity.

### **2. Immunology [5 Hrs]**

Basic principles of immunity immunobiology : lymphoid organs and tissue Antigen, Antibodies, antigen and antibody reactions with relevance to pathogenesis and serological diagnosis. Humoral immunity and its role in immunity Cell mediated immunity and its role in immunity.

### **3. Bacteriology [15 Hrs]**

**To be considered under the following headings**

Morphology, classification according to pathogenicity, mode of transmission, methods of prevention, transport of samples, interpretation of laboratory reports

Staphylococci. Streptococci and Pneumococci,

Mycobacteria: Tuberculosis. M.leprae. atypical mycobacteria, Enterobacteriaceae

V.cholera

### **4. General Virology [10 hrs]**

a. General properties: basic structure and broad classification of viruses

b. Pathogenesis and pathology of viral infections-(limited to Respiratory and central nervous system infections.)

c. Commonly used anti-viral agents.

### **5. Mycology: [5 Hrs]**

General properties of fungi. Classification based on disease: superficial, subcutaneous, deep mycoses opportunistic infections including Mycotoxins, systemic mycoses. General principles of fungal diagnosis, Antifungal agents.

### **6. Clinical/Applied Microbiology [20 Hrs]**

Streptococcal infections: Rheumatic fever and Rheumatic heart disease. Meningitis. Tuberculosis, Pyrexia of unknown origin, leprosy. Sexually transmitted diseases.

Poliomyelitis.

Hepatitis, Acute-respiratory infections.

Central nervous System infection

Urinary tract infections. Wound infection.

Opportunistic infections,

HIV infection.





Malaria,  
Filariasis,  
Zoonotic diseases.

**Laboratory Works only: [15 Hrs]**

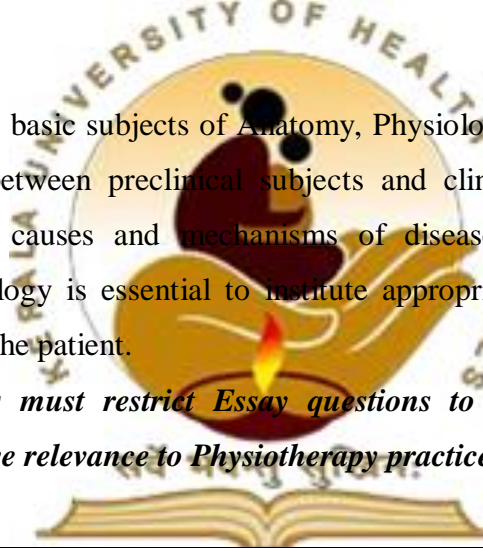
1. Observation and study of common culture media
2. Observation and study of some clinically important bacteria – Staphylococcus, Streptococcus, E.coli , Mycobacterium
3. Observation of equipment and procedures used for sterilization and disinfection
4. Demonstration of stain Gram staining KOH preparation Acid Fast staining

**PATHOLOGY**

**Course Description**

This subject follows the basic subjects of Anatomy, Physiology and Biochemistry and it forms a vital link between preclinical subjects and clinical subjects. Pathology involves the study of causes and mechanisms of diseases. The knowledge and understanding of pathology is essential to institute appropriate treatment or suggest preventive measures to the patient.

**NOTE – paper setters must restrict Essay questions to the pathology and other questions also must have relevance to Physiotherapy practice.**



<b>Subject Title</b>	<b>PATHOLOGY</b>
<b>Duration</b>	<b>13-24 Months</b>
<b>Total Hours</b>	<b>80</b>
<b>Theory</b>	<b>80 Hrs</b>
<b>Total Hours/week</b>	<b>2 Hrs</b>

**THEORY**

**General Pathology**

**1. Introduction to pathology [2 hrs]**

History of Pathology as a subject, Relevance to Physiotherapy practice. Prevention of

communicable diseases Handling of infected material and health education.

## **2. Cell injuries : [5 hrs]**

- Reversible cell Injuries: Types, sequential changes, cellular swellings, Hyaline changes, vacuolation, Mucoïd changes.
- Irreversible cell injuries: Types of necrosis ,gangrene, Autolysis, Apoptosis
- Pathological calcification: Dystrophic and metastatic, intra cellular accumulations.
- Amyloidosis - Classification, Pathogenesis, Pathology including special stains

## **3. Inflammation and repair: [6 Hrs]**

- a. Acute inflammation: Features, causes, vascular & cellular events.
- b. Inflammatory cells and mediators. Chronic inflammation: Causes, types, classification non specific and granulomatous with examples.
- c. Repair wound healing by primary and secondary unions, factors promoting and delaying the process.
- d. Healing in specific site including bone healing.

## **4. Immunopathology: [5 Hrs ]**

Immune system; General concepts. Hypersensitivity: type and examples, antibody and cell mediated tissue injury with examples. Secondary immune deficiency including HIV infection auto immune disorder: Basic concepts and classification, SLE. AIDS – etiology, modes of transmission, diagnostic procedures,

## **5. Infectious disease: [5 Hrs ]**

Mycobacterial diseases: Tuberculosis, leprosy and syphilis. Bacterial disease: Pyogenic, diphtheria, gram negative infection, bacillary dysentery. Viral diseases: poliomyelitis, herpes, rabies, measles, HIV infection. Fungal disease and parasitic diseases: Malaria, filaria, amoebiasis.

## **6. Circulatory disturbances: [5 hrs ]**

Hyperaemia/Ischemia and haemorrhage, Oedema: Pathogenesis and types. Chronic venous congestion: Lung, liver, spleen. Systemic pathology thrombosis and embolism; Formation fate and defects. Infarction; Types, common sites. Shock: Pathogenesis, types.

## **7. Growth disturbances and neoplasia: [5 Hrs]**

- a. Atrophy, Hypertrophy, Hyperplasia, Aplasia, Hypoplasia, Metaplasia,

Malformation, agenesis, dysplasia

- b. Neoplasia: Definition, classification, Characteristics, Biological behaviour : Benign and Malignant, Carcinoma and Sarcoma
- c. Malignant neoplasia: Grades and stages, local and distant spread.
- d. Carcinogenesis: Environmental carcinogens, chemical, viral, occupational, heredity and cellular oncogens and prevention of cancer.

#### **8. Nutritional disorders: [2 Hrs]**

Protein energy malnutrition: Marasmus, kwashiorkor, and vitamin deficiency disorders, Obesity. Bulimia.

#### **9. Genetic disorders: [2 Hrs]**

Basic concepts of genetic disorders and some common examples and congenital malformation and Hemophilia.

#### **10. Hematology: [5 Hrs]**

- a. Anemia: Classification, clinical features & lab diagnosis.
- b. Anemia: Classification, clinical features & lab diagnosis.
  - i. Nutritional anemias: Iron deficiency anemia, Folic acid, Vit. B 12 deficiency anemia including pernicious anemia. Hemolytic Anaemias: Classification and Investigations. Hereditary hemolytic anaemias: Thalassemia, Sickle cell anemia, Spherocytosis and Enzyme deficiencies.
  - ii. Acquired hemolytic anaemias
    - 1. Alloimmune, Autoimmune
    - 2. Drug induced, Microangiopathic Pancytopenia - Aplastic anemia.
  - iii. Hemostatic disorders, Vascular and Platelet disorders & lab diagnosis. Coagulopathies – i. Inherited ii. Acquired with lab diagnosis.
- c. Leukocytic disorders: Leukocytosis, Leukopenia, Leukemoid reaction.
- d. Leukemia: Classification, clinical manifestation, pathology and Diagnosis.
- e. Leukocytic disorders: Leukocytosis, Leukopenias, Leukemoid reaction.
- f. Leukemia: Blood transfusion; Grouping and cross matching, untoward reactions, transmissible infections including HIV & hepatitis.

#### **11. Respiratory System [5 Hrs]**

Pneumonia, Bronchitis, Bronchiectasis, Asthma, Tuberculosis, Carcinoma of lungs,

Occupational lung diseases.

## **12. Cardiovascular Pathology [5 hrs]**

Congenital Heart disease: Atrial septal defect, Ventricular septal defect, Fallot's tetralogy. Patent ductus arteriosus. Endocarditis. Rheumatic Heart disease. Vascular diseases: Atherosclerosis, , Aneurysm and Arteritis and tumours of Blood vessels.

Ischemic heart Disease: Myocardial infarction. Hypertension and hypertensive heart Disease.

## **13. Alimentary tract [2 Hrs]**

- a. Oral Pathology: Ulcers, Carcinoma, Esophagus
- b. Stomach and Intestine: Gastritis, Ulcer & Tumours.

## **14. Hepato-biliary pathology [1 Hrs]**

Jaundice: Types, aetio-pathogenesis and diagnosis. Hepatitis: Acute, Chronic, neonatal. Alcoholic liver disease common clinical conditions

## **15. Lymphatic System [2 Hrs]**

- a. Lymphadenitis - Nonspecific and granulomatous. Causes of Lymph Node enlargements. Reactive Hyperplasia, Primary Tumours - Hodgkin's and Non hodgkin's Lymphomas

## **16. \*\*\*Musculoskeletal System [8 Hrs]**

- a. Arthritis: Suppurative, Rheumatoid. Osteoarthritis, Gout, Tuberculous.
- b. Osteomyelitis, Haemarthropathies
- c. Metabolic diseases: Rickets/Osteomalacia, osteoporosis, Hyperparathyroidism, Paget's disease.
- d. Tumours Classification: Benign, Malignant, Metastatic and synovial sarcoma.
- e. Diseases of Muscles: Myasthenia gravis, Myopathies, Muscular Dystrophies

## **17. Endocrine pathology [2 Hrs]**



- a. Diabetes Mellitus: Types, Pathogenesis, Pathology.
- b. Non neoplastic lesions of Thyroid: Iodine deficiency goiter, autoimmune Thyroiditis, Thyrotoxicosis, myxedema, Hashimoto's thyroiditis

**18. Neuropathology: [5 Hrs]**

- a. Inflammations and Infections: TB Meningitis, Pyogenic Meningitis, viral meningitis and Brain Abscess
- b. Cerebrovascular disease: atherosclerosis, thrombosis, embolism, aneurysm, hypoxia
- c. Peripheral neuropathies Including Diabetic Neuropathy , Parkinsonism , Dementia, Alzheimer's disease
- d. Disorders of spinal cord–Syringomyelia, Tabes dorsalis

**19. Dermatopathology [2 Hrs]**

Acne Vulgaris, Psoriasis, Eczema, Pressure Ulcers

**Practical [5 Hours]**

Demonstration of relevant slides and demonstration of the Lab evidences of common Neuro Musculoskeletal and Cardio Vascular and pulmonary Diseases.



## MEDICAL INSTRUMENTATION

### Course Description

The Subject is designed to provide the history of Electrotherapy modalities and an overview in the basics of the Medical equipment that are seen by the students in their clinical practice. The student is to be able to understand the mechanism of Physiotherapeutic instruments and its repair Calibration and Maintenance.

<b>Subject Title</b>	<b>: MEDICAL INSTRUMENTATION</b>
<b>Duration</b>	<b>: 13-24 Months</b>
<b>Total Hours</b>	<b>: 80</b>
<b>Theory</b>	<b>: 60 Hours</b>
<b>Practical</b>	<b>: 20 Hours</b>
<b>Total Hours / Week</b>	<b>: 2 Hour/ Week</b>

### Theory (60 Hrs)

1. Micro & Macro shock, source of shock, monitoring & interrupting circuit from shock
2. Calibration
3. Maintenance of equipments – Preventive maintenance, break down maintenance
4. Short wave diathermy
5. Muscle and nerve stimulator
6. IR and UV Rays
7. Stimulators including FES
8. Lasers
9. Ultrasound Conventional and Combination varieties
10. ECG EMG and EEG Equipment & Technique
11. Pacemakers, Defibrillators, Ventilators
12. Common machines in ICU

**Practical Demonstration of various parts and working of all instruments [20 Hrs]**





## COMPUTER SCIENCE

### Course Description

At the completion of this course the student will have a basic knowledge about computers and how to deal with different types of programmes, and how to use Computers in education and clinical practice.

**Subject Title : Computer Science**

**Duration : 13-24 Months**

**Total Hours : 80**

**Theory : 40 Hours**

**Practical : 40 Hours**

**Total Hours/week : 2 Hrs**

#### I. [2Hrs]

1. History of computers
2. Type of computer Generation
3. Digital computer Organization
4. Binary number System

#### II [8 Hrs]

- i. Database Management System concepts
- ii. Introduction to computer programming and application software
- iii. Computer Networks
  - a. LAN
  - b. WAN
  - c. MAN
  - d. Internet Concept

#### III [10 Hrs]

1. Current Operating systems
2. Application Software MS OFFICE 2000 (MS WORD, EXCEL, MS POWERPOINT)

#### IV [20 Hrs]



1. Application of computers in Health Education Training and Administration.
2. Application to various aspects of Physiotherapy Practice – Biofeedback, Simulations and virtual reality etc.

#### **V. Practical [40 Hrs]**

Use of computers to search relevant study materials from internet, using computers to make reports and for making presentations

### ***THIRD YEAR BPT***

#### **GENERAL MEDICINE & GENERAL SURGERY**

##### **Subject Description**

This subject follows the basic science subjects to provide the knowledge about relevant aspects of general medicine and surgery. The student will have a general understanding of the diseases and surgeries that the therapist would encounter in their practice. The objective of this course is that after 120 hrs of lectures and discussion the student will be able to list the etiology, pathology, clinical features and treatment methods for various medical conditions and shall be able to enlist the indications for surgery, etiology, clinical features and surgical methods for various conditions.

**Subject Title: General Medicine & Surgery**

**Duration: 25 – 36 Months**

**Total Hours: 80**

**Theory / Lecture: 2 Hours /Week**

**Method of Assessment: Written**

#### **GENERAL MEDICINE**

**1. Infection:** Effects of Infection on the body –source and spread of infection – vaccinations–generalized infections–rashes and infection –food poisoning and gastro enteritis – sexually transmitted diseases [4 Hours]

- 2. Food and Nutrition:** Assessment–Nutritional and Energy requirements; Deficiency diseases – clinical features and treatment; Protein – Energy Malnutrition : Clinical features and treatment; Obesity and its related disorders : Causes – Complications – benefits of weight loss – management of Obesity – diet, exercise and medications.[5 Hours]
- 3. Endocrine diseases:** Common presenting symptoms of Endocrine disease – common classical disease presentations, clinical features and management of thyroid and adrenal gland dysfunctions. Diabetes Mellitus: Etiology and pathogenesis of diabetes – clinical manifestations of the disease – management of the disease – Complications of diabetes. [5 Hours]
- 4. Diseases of the blood:** Examinations of blood disorders –Clinical manifestations of blood disease; Anemia –signs and symptoms–types and management; Hemophilia - Cause – clinical features severity of disease – management – complications due to repeated haemorrhages – complications due to therapy. [5 Hours]
- 5. Diseases of the digestive system:** Clinical manifestations of gastro intestinal disease – Aetiology, clinical features, diagnosis, complications and treatment of common conditions: Gastro esophageal reflux disease, Irritable bowel syndrome, Lactose intolerance, Hiatal hernia and Cancer. Infections of Alimentary Tract ; Clinical manifestations of liver diseases - Aetiology, clinical features, diagnosis, complications and treatment of the common conditions [4 Hours]
- 6. Diseases of the Skin:** Examination and clinical manifestations of skin diseases;Causes, clinical features and management of the following skin conditions: Leprosy, Psoriasis, Vasomotor disorders, Dermatitis, Coccal and Fungal Parasitic and Viral infections. [5 Hours]
- 7. Psychiatric Disorders:** Classifications, Causes, Clinical manifestations and treatment methods used in Psychiatry. [2 Hours]
- 8. and treatment methods used in Psychiatry. [2 Hours]**

## **GENERAL SURGERY**

**1. Introduction to surgery:** Fluid, Electrolyte and Acid-Base disturbances–diagnosis and management; Nutrition in the surgical patient; Scars –types and treatment. Hemostasis – components, hemostatic disorders, factors affecting bleeding during surgery. Transfusion therapy in surgery – blood components, complications of transfusion; Surgical Infections ; General Post – Operative Complications and its

management [5 Hours]

Reasons for Surgery; Types of anaesthesia and its effects on the patient; Types of Incisions; Clips Ligatures and Sutures; General Thoracic Procedures – Radiologic Diagnostic procedures, Endoscopy–types, Biopsy–uses and types .Overview and Drainage systems and tubes used in Surgery. [3 Hours]

**2. Surgical Oncology:** Cancer – definition, types, clinical manifestations of cancer, Staging of Cancer, surgical procedures involved in the management of cancer.[8Hours]

**3. Diseases of the Arteries and Veins:** Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following diseases: Arteriosclerosis, Atherosclerosis, Aneurysm, Buerger's disease, Raynaud's Disease, Thrombophlebitis, Deep Vein Thrombosis, Pulmonary Embolism, Varicose Veins. [10Hours]

**4. Abdominal surgery:** Definition, Indication, Incision, Physiological changes and Complications following Common operations like Cholecystectomy, Colostomy, Ileostomy, Gastrectomy, Hernias, Appendicectomy Mastectomy, Nephrectomy, Prostatectomy. [5 Hours]

**5. Burn:** Definition, Classification, Causes, Prevention, Pathological changes, Complications, Clinical Features and Management. Skin Grafts–Types, Grafting Procedures, Survival of Skin Graft ; Flaps – Types and uses of Flaps. [5 Hours]

**6. Women's Health:** Menstrual cycle and its disorders. Hormonal disorders of females- obesity and female hormones. Cancer of the female reproductive organs management. Infections and sexually transmitted disease in female Menopause - its effects on emotions and musculoskeletal system. Malnutrition and deficiencies in females. Maternal physiology in pregnancy. Musculo skeletal disorders during pregnancy. Prenatal complications-investigations- management. Child birth- Stages complications-investigations-management – Pain relief in labour - Puerperium - Post Natal care. Surgical procedures involving childbirth. Incontinence –Types, Causes, Assessment and Management. Definition, Indications and Management of the following surgical procedures – Hystero salphingography, Dilatation and Curettage, Laparoscopy, Colposcopy, Hysterectomy. [10 Hours]

**7. ENT:** Common problems of ear, otitis media, Otosclerosis, functional achonia and deafness, management facial palsyclassification, medical and surgical management of lower motor neuron type of facial palsy. [2 Hours]

**8. Ophthalmology:** Ophthalmologic surgical conditions,refraction's, conjunctivitis, glaucoma,cornealulcer,iritis,cataract,retinitis,detachmentofretina,defectsofextra- ocular muscles surgical management [2 Hours]

## **PHYSIOTHERAPY IN GENERAL MEDICINE AND SURGERY**

### **Subject Description**

The subject is designed to provide knowledge in assessing and planning Physiotherapy interventions for various General, Medical and Surgical conditions. The student must be able to reassess the patient as necessary, to monitor the patient in regard to treatment, to monitor the patient's vital signs, and to provide appropriate Interventions to the patient considering current evidence based guidelines.

**Subject Title: Physiotherapy in General Medicine & Surgery**

**Duration: 25 – 36 Months**

**Total Hours: 120 Hrs**

**Theory: 80 Hours**

**Practical: 160 Hours**

**Total Hours / Week: 6 Hrs**

**Lecture: 3 Hours / Week Practical: 3 Hours / Week**

**Method of Assessment: Written, Oral, Practical**



**1. Management of wound ulcers-** Care of ulcers and wounds - Care of surgical scars using electrotherapeutics for healing of wounds, prevention of Hyper granulated Scars Keloids, Electrotherapeutics measures for relief of pain during mobilization of scars tissues. [6 Hours]

**2. Physiotherapy in dermatology-**Documentation of assessment, treatment and follow up skin conditions. U.V.R therapy in various skin conditions; Vitiligo; Hair loss; Pigmentation; Infected wounds ulcers. Faradic foot bath for Hyperhydrosis. Massage maneuvers for cosmetic purpose of skin Care of anesthetic hand and foot; Laser treatment for skin conditions. (4 Hours)

**3. Leprosy:** Evaluation, planning and management of leprosy-prescription, fitting and



training of devices and prevention of disability [**4 Hours**]

**4. Burns management:** Role of Physiotherapy in the management of burns, post grafted cases-MobilizationandMusculo-skeletalrestorativeexercisesfollowingburns[**5Hours**]

**5. PVD:** Physiotherapy management following PVD[**4Hours**]

**6. Abdominal Surgeries:** Management of Pulmonary Restorative function following surgical procedures on Abdomen and Thorax [**6 Hours**]

**7. Amputations:** Management of Amputations following Diabetes, PVD- Prosthesis in amputations of upper limbs and lower limbs following ulcers and gangrenes [**6 Hours**]

**8. Oncology:** Physiotherapy intervention in the management of Medical, Surgical and Radiation Oncology Cases and PT management for mastectomy [**5 Hours**]

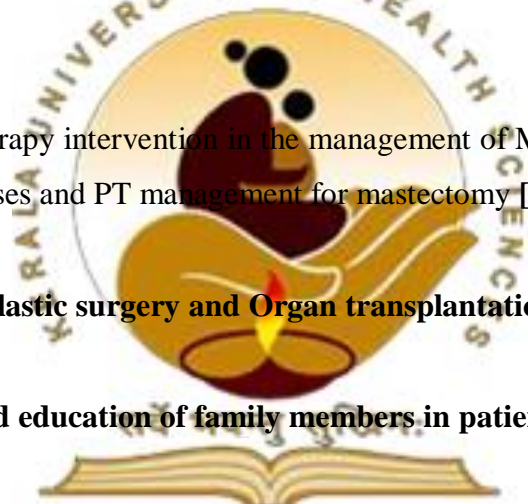
**9. Physiotherapy for Plastic surgery and Organ transplantations** [4 Hrs]

**10. Home program and education of family members in patient care** [2Hours]

**11. Physiotherapy in Obstetrics:** Physiotherapy in pregnancy. Electrotherapy and Exercise Therapy measures for the Women's health issues [**6 Hours**]

**12. Treatment, Response to exercise and Implications of Physiotherapy in the following disease conditions:** Hypertension, Diabetes, Renal Failure and Obesity. [**6 Hours**]

**13. Health Fitness and Promotion:** Fitness Evaluation, Analysis of Body composition, Evaluation and prescription of Exercise, Factors affecting exercise Performance, Exercise Prescription for Specific groups: Women and Children. [**8 Hours**]





**14. Geriatrics:** Role of P. T in management of age related diseases and disorders such as – Osteoporosis, Dementia, Fall prevention and fitness programmes [7 Hours]

**15. Outcome measurement in General surgical and medical Physiotherapy care**[2Hrs]

**16.** Draping for Safety, Dignity and efficient delivery of management of patients during Physiotherapy Procedures[3Hrs]

**17. Physiotherapy management in the ICU** – Common conditions in the ICU: burns, tetanus, spina bifida [2Hrs]

**Practical:160 Hours**

**Practical shall be conducted for all the relevant topics discussed in theory in the following forms:**

1. Bedside case presentations and case discussions in the wards
2. Demonstration of application of general physiotherapeutic techniques on patients
3. Participation under faculty guidance in management.
4. Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions.



## **CARDIO-RESPIRATORY DISORDERS AND SURGERY**

### **Subject Description**

This subject follows the basic science subjects to provide the knowledge about relevant aspects about cardio-respiratory disorders and surgery. The student will have a general understanding of the diseases that the therapist would encounter in their practice. The objective of the course is that after specified hours of lectures and discussion the student will be able to list the aetiology, pathology, clinical features and treatment methods for various cardio-respiratory conditions.

**Subject Title: CARDIO-RESPIRATORY DISORDERS & SURGERY**

**Duration: 25– 36 Months**

**Total Hours: 80**

**Theory: 80 Hours**

**Total Hours/Week: 2 Hours**

**Method of Assessment: Written**

**Theory:**

**1. Cardiovascular Diseases:** Examination of the Cardiovascular System – Investigations : ECG, Exercise Stress Testing, Radiology; Clinical manifestations of Cardiovascular disease; Definition, Aetiology, Clinical features, signs and symptoms, complications, management and treatment of following diseases and disorders of the heart : Pericarditis, Myocarditis, Endocarditis, Rheumatic Fever –resulting in valve disorders, Mitral Stenosis & Insufficiency, Aortic Stenosis and Insufficiency, Cardiac tumors. **[10 Hours]**

Ischemic Heart Disease, Coronary Valve Disease, Congenital Heart diseases – Acyanotic congenital heart disease & Cyanotic congenital heart disease : Patent Ductus Arteriosus, Coarctation of Aorta, Atrial Septal Defect, Ventricular Septal Defect, Tetralogy of Fallot, Transposition of Great Vessels, Cardiac Arrest ; Examination and Investigations of diseases of arteries and veins ; Hypertension : Definition, causes, classification, types, assessment, investigations and management. **[10 Hours]**

**2. Respiratory Diseases:** Examination of the Respiratory System –Investigations: Chest Radiographs, Pulmonary Function Testing, Arterial Blood Gas Analysis ; Clinical manifestations of Lung disease ; Patterns of lung disease – Chronic Obstructive Lung Disease and Restrictive Lung Disease ; Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following lung diseases : Chronic Bronchitis, Emphysema, Asthma, Bronchiectasis, Cystic Fibrosis, Upper Respiratory Tract Infections, Pneumonia, Tuberculosis, Fungal Diseases, Interstitial Lung Diseases, Diseases of the pleura, diaphragm and chest wall, ARDS; Respiratory failure – Definition, types, causes, clinical features, diagnosis and management. **[10 Hours]**

**3. Paediatrics :** Respiratory conditions of childhood –causes, complications, clinical manifestations, diagnosis and treatment. **[5 Hours]**

**4. Disorders of the Chest Wall, Lung and Mediastinum:** Definition, Clinical features, diagnosis and choice of management for the following disorders – chest wall deformities, chest wall tumors, Pleural Effusion, Empyema Thoracis, Lung abscess, Bronchiectasis, Tuberculosis, Bronchogenic Carcinoma, Bronchial Adenomas, Metastatic tumors of the Lung, tracheal Stenosis, Congenital tracheomalacia, Neoplasms of the trachea, Lesions of the Mediastinum. Carcinoma of the female breast. **[10 Hours]**

**5. Thoracic Trauma:** Causes, Clinical Presentation, Diagnosis and treatment of the following Thoracic Trauma situations–Airway obstruction, Pneumothorax, Hemothorax, Cardiac Tamponade, Tracheobronchial disruption, Aortic disruption, Diaphragmatic disruption, Esophageal disruption, Cardiac and Pulmonary Contusions. **[5 Hours]**

**6. Thoracic surgeries:** Thoracotomy–Definition, Types of Incisions with emphasis to the site of incision, muscles cut and complications. Lung surgeries: Pneumonectomy, Lobectomy, Segmentectomy – Indications, Physiological changes and Complications; Thoracoplasty, Pleurectomy, Pleurodesis and Decortication of the Lung. Cardiac surgeries – An overview of the Cardio-Pulmonary Bypass Machine – Extra cardiac Operations, Closed Heartsurgery, Open Heart surgery. Transplant Surgery–Heart, Lung and Kidney – Indications, Physiological changes and Complications. **[15Hours]**

**7. Occupational Lung diseases.[4 Hours]**

**8. Drug therapy:** Drugs to prevent and treat inflammation, Drugs to treat Bronchospasm, Drugs to treat Breathlessness, Drugs to help sputum clearance, Drugs to inhibit coughing, Drugs to improve ventilation, Drugs to reduce pulmonary hypertension, Drug delivery doses, Inhalers and Nebulisers. **[2 Hour]**

**9. Intensive and Emergency care:** First Aid: Trauma – Accidents: explosions, riots, gunshots, burns, septicaemia, acute respiratory failure, pulmonary embolism/pulmonary oedema, cardiac failure/myocardial infarction, unconsciousness/coma, drug overdose, poisoning, tetanus, respiratory paralysis (Polio/G. B. Syndrome). **[5 Hours]**

**10. Mechanical ventilators and Medical gas therapy. [4 Hours]**

## **PHYSIOTHERAPY IN CARDIO-RESPIRATORY DISORDERS & INTENSIVE CARE MANAGEMENT**

### **Subject Description**

The subject is designed to provide knowledge in assessing and planning Physiotherapy interventions for various cardio-respiratory disorders and surgical conditions. The student must be able to assess the patient as necessary, to monitor the patient's vital signs, to monitor the patient in regard to Physiotherapy treatment, and to independently provide appropriate interventions to the patient considering current evidence based guidelines

**Subject Title: PHYSIOTHERAPY IN CARDIO-RESPIRATORY DISORDERS &  
INTENSIVE CARE MANAGEMENT**



**Method of Assessment: Written, Oral, Practical**

**Theory: 80 Hours**

- 1. Bedside assessment of the patient –Adult & Paediatric [4Hours]**
- 2. Cardio respiratory investigations and tests –Exercise tolerance Testing–Cardiac& Pulmonary, Radiographs, PFT, ABG, ECG, Haematological and Biochemical Tests [8 Hours]**
- 3. Physiotherapytechniquesto increaselungvolume–Controlledmobilization, Positioning, Breathing exercise, Neurophysiological Facilitation of Respiration, Mechanical AIDS – Incentive Spirometry, CPAP, IPPB [6 Hours]**

**4. Physiotherapy techniques to decrease the work of breathing** –Measures to optimize the balance between energy supply and demand, positioning, Breathing re-education – Breathing control techniques, Mechanical aids – IPPB, CPAP, BiPAP [6 Hours]

**5. Physiotherapy techniques to clear secretions** – Hydration, Humidification & Nebulisation, Mobilisation and Breathing exercise, Postural Drainage, Manual techniques – Percussion, Vibration and Shaking, Rib Springing, ACBT, Autogenic Drainage, Mechanical aids – PEP, Flutter, IPPB, Facilitation of Cough and Huff, Suctioning [10 Hours]

**6. Neonatal and Paediatric Physiotherapy** – Chest Physiotherapy for children, The neonatal unit, Modifications chest Physiotherapy for specific neonatal disorders, Emergencies in the neonatal unit [4 Hours]

**7. Physiotherapy in Obstructive lung conditions** [5 Hours]

**8. Physiotherapy in Restrictive lung conditions** [5 Hours]

**9. Pulmonary Rehabilitation** [4 Hours]

**10. Physiotherapy following Lung surgeries** [4 Hours]

**11. Respiratory failure – Oxygen Therapy and Mechanical Ventilation** [4 Hours]

**12. Introduction to ICU:** ICU monitoring – Apparatus including Mechanical Ventilators, Airways and Tubes used in the ICU, Physiotherapy in the ICU – Common conditions in the ICU – Tetanus, Head Injury, Lung Disease, Pulmonary Oedema, Multiple Organ Failure, Neuromuscular Disease, Smoke Inhalation, Poisoning, Aspiration, Near Drowning, ARDS, Shock; Dealing with emergency situation in the ICU [8 Hours]

**13. Physiotherapy management following cardiac surgeries** [4 Hours]

**14. Cardiac Rehabilitation** [4 Hours]



## **15. Cardio Pulmonary Resuscitation[4Hours]**

**Practical:160 Hours**

**Practical shall be conducted for all the relevant topics discussed in theory in the following forms:**

1. Bedside case presentations and case discussions in the wards
2. Demonstration of application of cardio-respiratory physiotherapeutic techniques on patients
3. Participation under faculty guidance in management.
4. Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions.

### **Subject Description**

This subject follows the basic science subjects to provide the knowledge about conditions the therapist would encounter in their practice in the community. The objective of this course is that after 80 hrs of lectures and discussion the student will be able to demonstrate an understanding of various aspects of health and disease list the methods of health administration, health education and disease preventive measures.

**Subject Title: COMMUNITY MEDICINE**

**Duration: 25 – 36 Months**

**Total Hours: 80**

**Theory/ Lecture: 2 Hours / Week**

**Method of Assessment: Written**

**1. Health and Disease:** Definitions, Concepts, Dimensions and Indicators of Health, Concept of well-being, Spectrum and Determinants of Health, Concept and natural



history of Disease, Concepts of disease control and prevention, Modes of Intervention, Population Medicine, The role of socio-economic and cultural environment in health and disease. [5 hours]

**2. Epidemiology:** Definition and scope. Principles of Epidemiology and Epidemiological methods: Components and Aims, Basic measurements, Methods, Uses of Epidemiology, Infectious disease epidemiology, Dynamics and modes of disease transmission, Host defenses and Immunizing agents, Hazards of Immunization, Disease prevention and control, Disinfection. Screening for Disease: Concept of screening, Aims and Objectives, Uses and types of screening. [8 hours]

**3. Epidemiology of communicable disease:** Respiratory infections, Intestinal infections, Arthropod borne infections, Zoonoses, Surface infections, Hospital acquired infections Epidemiology of chronic non-communicable diseases and conditions: Cardio vascular diseases: Coronary heart disease, Hypertension, Stroke, Rheumatic heart disease, Cancer, Diabetes, Obesity, Blindness, Accidents and Injuries. [8 hours]

**4. Public health administration-** an overview of the health administration set up at Central and state levels. The national health programme- highlighting the role of social, economic and cultural factors in the implementation of the national programmes. Health problems of vulnerable groups-pregnant and lactating women, infants and pre- school children, occupational groups [5 hours]

**5. Health programmes in India:** Vector borne disease control programme, National leprosy eradication programme, National tuberculosis programme, National AIDS control programme, National programme for control of blindness, Iodine deficiency disorders(IDD) programme, Universal Immunisation programme, Reproductive and child health programme, National cancer control programme, National mental health programme. National diabetes control programme, National family welfare programme, National sanitation and water supply programme, Minimum needs programme [7hours]

**6. Demography and Family Planning:** Demographic cycle, Fertility, Family planning- objectives of national family planning programme and family planning methods, A general idea of advantage and disadvantages of the methods. [5 hours]

**7. Preventive Medicine in Obstetrics, Paediatrics and Geriatrics:** MCH problems, Antenatal, Intranatal and post natal care, Care of children, Child health problems, Rights of child and National policy for children, MCH services and indicators of MCH care, Social welfare programmes for women and children, Preventive medicine and geriatrics. [8 hours]

**8. Nutrition and Health:** Classification of foods, Nutritional profiles of principal foods, Nutritional problems in public health, Community nutrition programmes [6 hours]

**9. Environment and Health:** Components of environment, Water and air pollution and public health: Pollution control, Disposal of waste, Medical entomology. [5 hours]

**10. Hospital waste management:** Sources of hospital waste, Health hazards, Waste management [3 hours]

**11. Disaster Management:** Natural and manmade disasters, Disaster impact and response, Relief phase, Epidemiologic surveillance and disease control, Nutrition, Rehabilitation, Disaster preparedness [5 hours]

**12. Occupational Health:** Occupational environment, Occupational hazards, Occupational diseases, Prevention of occupational diseases. Social security and other measures for the protection from occupational hazard accidents and diseases. Details of compensation acts. [5 hours]

**13. Mental Health:** Characteristics of a mentally healthy person, Types of mental illness, Causes of mental ill health, Prevention, Mental health services, Alcohol and drug dependence. Emphasis on community aspects of mental health. Role of Physiotherapist in mental health problems such as mental retardation. [5 hours]

**14. Health Education:** Concepts, aims and objectives, Approaches to health education, Models of health education, Contents of health education, Principles of health education, Practice of health education [5hours]



# RESEARCH METHODOLOGY AND BIOSTATISTICS

## Course Description

This course will introduce to the student the basic research methodology, statistical concepts: methods of statistical analysis: and interpretation of data.

**Subject Title: RESEARCH METHODOLOGY &  
BIOSTATISTICS**

**Duration: 25 – 36 Months**

**Total Hours: 80**

**Theory: 80**

**Lecture: 2 Hours / Week**

**Method of Assessment: Written**

### **I. Research Methodology [40 Hrs]**

**1. Introduction to Research methodology:** Meaning of research, objectives of research, Motivation in research, Types of research & research approaches, Research methods vs methodology, Criteria for good research, Problems encountered by researchers in India.

**2. Research problem:** Statement of research problem, Statement of purpose and objectives of research problem, Necessity of defining the problem

**3. Research design:** Meaning of research design, Need for research design, Features for good design, Different research designs, Basic principles of research design

**4. Sampling Design:** Criteria for selecting sampling procedure, Implications for sample design, steps in sampling design, characteristics of good sample design, Different types of sample design

**5. Measurement & scaling techniques:** Measurement in research- Measurement scales, sources of error in measurement, Technique of developing measurement tools, Meaning of scaling, its classification, Important scaling techniques.

**6. Methods of data collection:** Collection of primary data, collection data through questionnaires & schedules, Difference between questionnaires & schedules.

**7. Sampling:** Sampling fundamentals, need for sampling & some fundamental definitions, Important sampling distributions

**8. Processing & analysis of data:** Processing operations, problems in processing, Types of analysis, Statistics in research, Measures of central tendency, Dispersion, Asymmetry, relationship.

**9. Testing of hypothesis:** What is hypothesis? Basic concepts concerning testing of hypothesis, Procedure of hypothesis testing, measuring the power of hypothesis test, Tests of hypothesis, limitations of the tests of hypothesis

**10. Computer technology:** Introduction to Computers, computer application in research, computers & researcher.

## **II. Biostatistics [40 Hrs]**

**1. Introduction:** Meaning, definition, characteristics of statistics., Importance of the study of statistics, Branches of statistics, Statistics and health science including Physiotherapy, Parameters and Estimates, Descriptive and inferential statistics, Variables and their types, Measurement scales.

**2. Tabulation of Data:** Basic principles of graphical representation, Types of diagrams histograms, frequency polygons, smooth frequency polygon, cumulative frequency curve, Normal probability curve.

**3. Measure of Central Tendency:** Need for measures of central Tendency, Definition and calculation of mean – ungrouped and grouped, Meaning, interpretation and calculation of median ungrouped and grouped., Meaning and calculation of mode, Comparison of the mean, median and mode, Guidelines for the use of various measures of central tendency.

**4. Probability and Standard Distributions:** Meaning of probability of standard distribution, The binominal distribution, The normal distribution, Divergence from normality – skewness, kurtosis.

**5. Sampling techniques:** Need for sampling - Criteria for good samples, Application of sampling in community, Procedures of sampling and sampling designs errors, Sampling variation and tests of significance.

**6. Analysis of variance & covariance:** Analysis of variance (ANOVA), what is ANOVA?s Basic principle of ANOVA, ANOVA technique, Analysis of Co variance (ANACOVA)

## **ETHICS & MANAGEMENT**

**Subject Title: ETHICS &  
MANAGEMENT**

**Duration: 25 – 36 Months**

**Total Hours: 40**

**Theory / Lecture: 1 Hour / Week**

**Method of Assessment: Written**

### **ETHICS**

**1. History of Physiotherapy, Ethical principles in health care, Ethical principles related to Physiotherapy, Scope of practice, Enforcing standards in health profession promoting quality care, Professional ethics in research, education and patient care delivery, Informed consent issues, Medical ethics and Economics in clinical decision making. [6 hours]**

**2. Rules of professional conduct [6 hours]**

- Physiotherapy as a profession
- Relationship with patients
- Relationship with health care institutions
- Relationship with colleagues and peers
- Relationship with medical and other professional.

**3. Confidentiality and Responsibility, Malpractice and negligence, Provision of services and, advertising, Legal aspects: Consumer protection act, Legal responsibility of physiotherapist for their action in professional context and understanding liability and obligations in case of medico-legal action [6 hours]**

**4. IAP, CSP, APTA, WCPT– Aims Objectives and Methods of functioning for the betterment of Physiotherapy Profession [6 hours]**

### **MANAGEMENT**

**1] Management studies related to –local health care organization management & structure, planning delivery with quality assurance & funding of service delivery – use of information technology -Time management -career development in Physiotherapy [6 hours]**

**2].Public relations in hospital and human resource management. [5 hours]**

**3] Planning and implementation of commercial projects, including setting up a Physiotherapy Clinic. [5 hours]**





## IV YEAR BPT

### NEUROLOGY AND NEURO SURGERY

#### Subject Description

The subject is to provide the knowledge about relevant aspects about neurological disorders and surgery. The student will have a general understanding of the diseases, The therapists would encounter in their practice .The objective of the course is that after specified hours of lectures and discussions the student will be able to list the aetiology, pathology, clinical features and decide the Physiotherapy treatment methods for various neurological conditions.

#### Subject Title: Neurology and Neuro Surgery



**Theory: 80 hours**

- 1. Introduction to Neurology and Neurosurgery:** Basic Neuro Anatomy and Neurophysiology including development of the nervous system, general clinical assessment and evaluation of patients with neurologic disease **(8 hours)**
- 2. Application of Neuro Physiology in clinical evaluation, investigations, differential diagnosis of Neurological conditions. (6 hours)**
- 3. . Clinical symptomatology in Neurology (6 hours)**
  - a. Pain and Sensory symptoms
  - b. Motor symptoms
  - c. Symptoms from the special organs
  - d. Higher brain functions
  - e. Autonomic Nervous System
  - f. Neurogenic Bladder and Bowel



**4. Definitions, Aetiology, Pathology, Clinical Presentations, Diagnostic approaches including radio diagnosis, Differential Diagnosis, Complication and Medico – Surgical Management of Paediatric Neurological Disorders (11 Hours)**

- a. Cerebral Palsy
- b. Mental Retardation
- c. Developmental Delay
- d. Autism Spectrum Disorders
- e. Down's syndrome
- f. Spina Bifida
- g. Hydrocephalus
- h. Infantile Hemiplegia
- i. Epilepsy
- j. Poliomyelitis
- k. Muscular Dystrophies

**5. Definitions, Aetiology, Pathology, Clinical Presentations, Diagnostic approaches including radio diagnosis, Differential Diagnosis, Complication and Medico – Surgical Management of Infections and Inflammation of the Nervous System (11 Hours)**

- a. Meningitis
- b. Encephalitis
- c. Neuro Syphilis
- d. Poliomyelitis
- e. Peripheral Neuritis
- f. Tetanus
- g. Infective and Post Infective Neuropathies
- h. Infective Myelopathies
- i. Spinal Arachnoiditis
- j. Tabes Dorsalis
- k. Transverse Myelitis



**6. Definitions, Aetiology, Pathology, Clinical Presentations, Diagnostic approaches including radio diagnosis, Differential Diagnosis, Complication and Medico – Surgical Management of Degenerative and Demyelination of CNS (11 Hours)**

- a. Basal ganglia: Parkinsonism, Huntington Disease, Associated Dyskinesia, Dystonia, Rett's Syndrome etc
- b. Cerebellar: Friedrich's and Cerebellar ataxia

- c. Cerebrum: Alzheimer's Disease, Dementia, Multiple Sclerosis
- d. Spinal Cord: Non compressive Myelopathy
- e. Peripheral Nerve: Diabetic, Metabolic Neuropathies, NMJ disorders, Motor Neuron Disease

**7. Definitions, Aetiology, Pathology, Clinical Presentations, Diagnostic approaches including radio diagnosis, Differential Diagnosis, Complication and Medico – Surgical Management of Trauma of Nervous System (7 Hours)**

- a. Head Injury
- b. Spinal Cord Injury
- c. Peripheral Nerve Injury

**8. Definitions, Aetiology, Pathology, Clinical Presentations, Diagnostic approaches including radio diagnosis, Differential Diagnosis, Complication and Medico – Surgical Management of Compression of Nervous System (7 Hours)**

- a. Brain Tumor
- b. Cranio Vertebral Junction anomalies
- c. Spinal Cord Tumor
- d. Syringomyelia
- e. Inter Vertebral Disc Prolapse
- f. Tumors on the peripheral nervous system
- g. Entrapment Neuropathies



**9. Definitions, Aetiology, Pathology, Clinical Presentations, Diagnostic approaches including radio diagnosis, Differential Diagnosis, Complication and Medico – Surgical Management of Vascular Insult to Nervous System (8 Hours)**

- a. CVA
- b. Vertebral Stroke
- c. Moya Moya Disease
- d. VBI

**10. Definitions, Aetiology, Pathology, Clinical Presentations, Diagnostic approaches including radio diagnosis, Differential Diagnosis, Complication and Medico – Surgical Management of Nervous system due to Toxic, Metabolic injuries and Nutritional disorders (5 Hours)**

- a. Metabolic encephalopathies
- b. B12 Deficiency
- c. Alcohol related disorders
- d. Nutritional Polyneuropathies
- e. Neurolathyrism

## **PHYSIOTHERAPY IN NEUROLOGY & NEURO SURGERY**

### **Subject Description**

The subject is designed to provide knowledge in assessment, diagnosis and planning Physiotherapy interventions in various Neurological disorders and Neuro surgical conditions. The student must be able to assess and diagnose the patient as necessary, to monitor the patient's vital signs, to monitor the patient in regard to treatment, and to independently provide appropriate interventions to patient considering current evidence based guidelines.

**Subject : Physiotherapy in Neurology and neurosurgery**

**Duration : 37-48 months**

**Total Hours : 240**

**Theory : 80 hours**

**Practical : 160 hours**

**Total Hours per week : 6 hours**

**Method of Assessment: Written, Oral, Practical**

- 1. Introduction to Motor Control & Motor Learning including theories, Introduction to Neural Plasticity (5 Hours)**
- 2. Introduction to various Neuro Developmental Approaches:** Bobath, Roods, PNF, Brunnstorm, MRP, CIMT, Vojta Therapy, Muscle Strengthening Approach, Virtual Reality, Mental Imagery, Robotics, Body Weight Supported Treadmill Training Techniques, Sensory Integration, Biofeedback in Neuro Rehabilitation, FNMS, Sensory Re-education etc.**(16 Hours).**
- 3. Physiotherapy Evaluation including Neuro developmental Screening& developmental reflexes, differential diagnosis of Paediatric Nervous system and Practical application of various motor control theories in (15 Hours)**

1. Cerebral Palsy
2. Mental Retardation
3. Autism Spectrum Disorders
4. Down's syndrome
5. Spina Bifida
6. Hydrocephalus
7. Infantile Hemiplegia
8. Epilepsy
9. Poliomyelitis
10. Muscular Dystrophies

**4. Physiotherapy Evaluation, outcome measurements, differential diagnosis, Investigations (including Radio diagnosis, electro physiology, lab studies, non invasive procedures) of Nervous system Practical application of Physiotherapeutics in : Inflammation of the Nervous System (8 hours)**

1. Meningitis
2. Encephalitis
3. Neuro Syphilis
4. Poliomyelitis & Post- Polio syndrome
5. Peripheral Neuritis
6. Tetanus
7. Infective and Post Infective Neuropathies
8. Infective Myelopathies
9. Spinal Arachnoiditis
10. Tabes Dorsalis
11. Transverse Myelitis



**Degenerative and Demyelination of CNS (8 hours)**

1. Basal ganglia: Parkinsonism, Huntington Disease, Dyskinesia, Dystonia, Rett's Syndrome etc.
2. Cerebellar: Friedrich's and Cerebellar ataxia
3. Cerebrum: Alzheimer's Disease, Dementia, Multiple Sclerosis
4. Spinal Cord: Non compressive Myelopathy

5. Peripheral Nerve: Neuropathies (Diabetic, Metabolic, Polyneuropathy), NMJ disorders, Motor Neuron Disease

### **Trauma of Nervous System (8 hours)**

1. Head Injury
2. Spinal Cord Injury
3. Peripheral Nerve Injury

### **Compression of Nervous System (8 hours)**

1. Brain Tumor
2. Cranio Vertebral Junction anomalies
3. Spinal Cord Tumor
4. Syringomyelia
5. Inter Vertebral Disc Prolapse
6. Tumors on the peripheral nervous system
7. Entrapment Neuropathies

### **Vascular Insult to Nervous System (8 hours)**

1. CVA
2. Vertebral Stroke
3. Moya Moya Disease
4. VBI



### **Toxic, Metabolic injuries and Nutritional disorders (2 hours)**

1. Metabolic encephalopathies
2. B12 Deficiency
3. Alcohol related disorders
4. Nutritional Polyneuropathies
5. Neurolathyrism

### **5. Practical application of Physiotherapeutics in Neurogenic Bowel and Bladder disorders (2 Hours)**

## **PRACTICALS: 160 hours**

**Practical shall be conducted for all the relevant topics discussed in theory in the following forms:**

1. Bedside case presentations and case discussions in the wards
2. Demonstration of application of Neuro Physiotherapeutic techniques on patients in Physiotherapy O.P.D
3. Participation under faculty guidance in management.
4. Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions:
  - Neurological assessment (Cranial nerve examination, Higher mental functions, Motor & sensory examinations, Functional assessment Reflex examination, Posture, Co-ordination and balance examinations)
  - Assessment and management of Neurological gaits
  - Evaluation & Physiotherapy Assessment with appropriate reasoning for planning & implementation of different treatment techniques (Sensorimotor retraining, Postural exercises, balance & co-ordination exercises, Gait training, functional training) for various Neurological conditions
  - Use of different scales and measures in Neurology
  - Use of assistive devices in different Neurological conditions
  - Application of transfer & functional re-education exercises
  - Application of various therapeutic approaches
  - Care giver/Parent/ patient education and counselling based on Neurological conditions
  - Evidence based practice in Neurological conditions



## **ORTHOPEDICS & SPORTS MEDICINE**

### **Subject Description**

This subject follows the basic science subjects to provide the knowledge about orthopedic conditions the therapists would encounter in their practice. The objective of this course is that after 80hrs of lectures and discussion the student will be able to demonstrate an understanding of orthopedic conditions causing disability, list the aetiology, clinical features and methods of Investigations and management.



**Subject Title: ORTHOPEDICS & SPORTS MEDICINE**

**Duration: 37 – 48 Months**

**Total Hours: 80**

**Theory / Lecture: 2 Hours / Week**

**Method of Assessment: Written**

**1. Introduction [3 Hours]**

- Introduction to orthopaedics.
- Clinical examination in an Orthopedic patient.
- Common investigative procedures.
- Radiological and Imaging techniques in Orthopaedics.
- Inflammation and repair, Soft tissue healing.

**2. Traumatology [5 Hours]**

- Fracture: definition, types, signs and symptoms.
- Fracture healing.
- Complications of fractures.
- Conservative and surgical approaches.
- Principles of management – reduction (open/closed, immobilization etc).
- Subluxation/ dislocations – definition, signs and symptoms, management (conservative and operative).



**3. Fractures and Dislocations of Upper Limb [10 Hours]**

- Fractures of Upper Limb - causes, clinical features, mechanism of injury, complications, conservative and surgical management of the following fractures:
  - a) Fractures of clavicle and scapula.
  - b) Fractures of greater tuberosity and neck of humerus.
  - c) Fracture shaft of humerus.
  - d) Supracondylar fracture of humerus.
  - e) Fractures of capitulum, radial head, olecranon, coronoid, and epicondyles.
  - f) Side swipe injury of elbow.
  - g) Both bone fractures of ulna and radius.
  - h) Fracture of forearm – monteggia, galaezzi fracture – dislocation. Chauffer's fracture, Colle's fracture. Smith's fracture.

- i) Fractures of wrist and finger complex: Scaphoid fracture. Fracture of the metacarpals. Bennett's fracture. Fracture of the phalanges. (Proximal and middle.)

Dislocations of Upper Limb - Anterior dislocation of shoulder – mechanism of injury, clinical feature, complications, conservative management (Kocher's and Hippocrates maneuver), surgical management (putti plat, bankart's) etc.

- a) Recurrent dislocation of shoulder.
- b) Posterior dislocation of shoulder – mechanism of injury, clinical features and management.
- c) Posterior dislocation of elbow – mechanism of injury, clinical feature, complications & management.

#### **4. Fracture of Spine [6 Hours]**

Fracture of Cervical Spine - Mechanism of injury, clinical feature, complications (quadriplegia); Management- immobilization (collar, cast, brace and traction); Management for stabilization, management of complication (bladder and bowel, quadriplegia).

- a) Clay shoveller's fracture.
- b) Hangman's fracture.
- c) Fracture odontoid.
- d) Fracture of atlas.
- e) Fracture of Thoracic and Lumbar Regions – Mechanism of injury, clinical features, management —conservative and surgical of common fractures around thoracic and lumbar regions.
- f) Fracture of coccyx. Fracture of Rib Cage - Mechanism of injury, clinical features, management for Fracture Ribs,
- g) Fracture of sternum.



#### **5. Fractures and Dislocations of Lower Limb [10 Hours]**

Fracture of Pelvis and Lower Limb - causes, clinical features, mechanism of injury, complications, conservative and surgical management of the following fractures: Fracture of pelvis.

- a) Fracture neck of femur – classification, clinical features, complications, management - conservative and surgical.
- b) Fractures of trochanters.
- c) Fracture shaft femur—clinical features, mechanism of injury, complications, management-conservative and surgical.

- d) Supracondylar fracture of femur.
- e) Fractures of the condyles of femur.
- f) Fracture patella.
- g) Fractures of tibial condyles.
- h) Both bones fracture of tibia and fibula.
- i) Dupuytren's fracture.
- j) Pott's fracture – mechanism of injury, management.
- k) Bimalleolar fracture
- l) Trimalleolar fracture
- m) Fracture calcaneum – mechanism of injury, complications and management.
- n) Fracture of talus.
- o) Fracture of metatarsals—stress fractures Jones's fracture.
- p) Fracture of phalanges.

Dislocations of Lower Limb - mechanism of injury, clinical features, complications, management of the following dislocations of lower limb.

- a) Anterior dislocation of hip. Posterior dislocation of hip.
- b) Central dislocation of hip.
- c) Dislocation of patella.
- d) Recurrent dislocation of patella.

## 6. Soft Tissue Injuries [10 Hours]

Definition, Mechanism of injury of each, clinical features, managements- conservative and surgical of the following soft tissue injuries

- a) Meniscal injuries of knee.
- b) Cruciate ligament injuries of knee.
- c) Medial and lateral collateral ligament injuries of knee.
- d) Lateral ligament of ankle.
- e) Wrist sprains. Strains- quadriceps, hamstrings, calf, biceps, triceps etc.
- f) Contusions- quadriceps, gluteal, calf, deltoid etc.
- g) Tendon ruptures- Achilles, rotator cuff muscles, biceps, pectorals etc.
- h) Flexor and extensor injuries of hand.
- i) Burn injuries of hand.

## 7. Amputations [7 Hours]

Definition, levels of amputation of both lower and upper limbs, indications, complications.

Prosthesis used for different level of amputation

## 8. Deformities [6 Hours] –

Definition, Clinical features, complications, medical and surgical management of the following Congenital and Acquired deformities.

### Congenital Deformities

- a) CTEV.
- b) CDH.
- c) Torticollis.
- d) Scoliosis.
- e) Flat foot.
- f) Vertical talus.
- g) Hand anomalies-syndactyly, polydactyly and ectrodactyly.
- h) Arthrogryposis multiplex congenita(amyoplasiacongenita).
- i) Limb deficiencies- Amelia and Phocomelia.
- j) Klippel-Feil syndrome.
- k) Osteogenesis imperfecta(fragile ossium).
- l) Cervical rib.

### Acquired Deformities

- a) Acquired Torticollis.
- b) Scoliosis.
- c) Kyphosis.
- d) Lordosis.
- e) Genu varum.
- f) Genu valgum.
- g) Genu recurvatum
- h) Cox vara.
- i) Pes cavus.
- j) Hallux rigidus.
- k) Hallux valgus.
- l) Hammer toe.
- m) Metatarsalgia.



## 9. Disease of Bones and Joints [6 Hours]:

Definition, Causes, Clinical features, Complications, Management- medical and surgical of the following conditions Infective conditions

- a) Osteomyelitis (Acute / chronic).

- b) Brodie's abscess.
- c) TB spine and major joints like shoulder, elbow, hip, knee, ankle etc.
- d) Arthritic conditions: Pyogenic arthritis, Septic arthritis.
- e) Syphilitic infection of joints.
- f) Bone tumours: classification, clinical features, management - medical and surgical of the following tumors :Osteoma. Osteosarcoma, Osteochondroma. Enchondroma. Ewing's sarcoma. Giant cell tumor. Multiple myeloma. Metastatic tumors.
- g) Perthe's disease
- h) Slipped Capital Femoral Epiphysis and Avascular Necrosis.
- i) Metabolic Bone Diseases: Rickets. Osteomalacia, Osteopenia, Osteoporosis.

### 10. Inflammatory and Degenerative Conditions [6 Hours]

Definition, Causes, clinical feature, complications, deformities, radiological features, management- conservative and surgical for the following conditions

- a) Osteoarthritis.
- b) Rheumatoid arthritis.
- c) Ankylosing spondylitis
- d) Gouty arthritis.
- e) Psoriatic arthritis.
- f) Hemophilic arthritis.
- g) Still's disease (juvenile rheumatoid arthritis).
- h) Charcot's joints.
- i) Connective Tissue Disorders- Systemic Lupus Erythematosus, Scleroderma, Dermatomyositis, Poliomyelitis, Mixed connective tissue Disease (MCTD)



### 11. Syndromes [3 Hours]:

Definition, Causes, Clinical features, complications, management conservative and surgical of the following :

- a) Cervico brachial syndrome.
- b) Thoracic outlet syndrome.
- c) Vertebro- basilar syndrome.
- d) Scalenus syndrome.
- e) Costoclavicular syndrome.
- f) Levator scapulae syndrome.
- g) Piriformis syndrome

## **12. Orthopedic Surgeries [3 Hours]:**

- a) Procedure(briefly), Indications, Classification, Types, Principles of management of the following Surgeries.
- b) Arthrodesis.
- c) Arthroplasty (partial and total replacement).
- d) Osteotomy External fixators.
- e) Spinal stabilization surgeries (Harrington's, Luque's, Steffi plating) etc.

## **13. Regional Conditions [5 Hours]:**

Definition, Clinical features and management of the following regional conditions

- a. Shoulder: Periarthritic shoulder (adhesive capsulitis). Rotator cuff tendinitis. Supraspinatus Tendinitis. Infraspinatus Tendinitis. Bicipital Tendinitis. Subacromial Bursitis.
- b. Elbow: Tennis Elbow. Golfer's Elbow. Olecranon Bursitis (student's elbow ). Triceps Tendinitis.
- c. Wrist and Hand: De Quervain's Tenosynovitis. Ganglion. Trigger Finger/ Thumb. Mallet Finger, Carpal Tunnel Syndrome, Dupuytren's Contracture.
- d. Pelvis and Hip: IT Band Syndrome, Piriformis Syndrome. Trochanteric Bursitis. e. Knee: Osteochondritis Dissecans. Prepatellar and Suprapatellar Bursitis. Popliteal Tendinitis. Patellar Tendinitis. Chondromalacia Patella. Plica Syndrome. Fat Pad Syndrome (Hoffa's syndrome).
- f. Ankle and Foot: Ankle Sprains. Plantar Fasciitis / Calcaneal Spur. Tarsal Tunnel Syndrome. Achilles Tendinitis. Metatarsalgia. Morton's Neuroma

## **PHYSIOTHERAPY IN ORTHOPEDICS & SPORTS**

### **Subject Description**

The subject serves to integrate the knowledge gained by the students in orthopedics and traumatology with skills to apply these in clinical situations of dysfunction and musculoskeletal pathology. The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to identify, assess and diagnose movement dysfunction and functional limitations due to musculoskeletal diseases, independently plan and set treatment goals and apply the skills gained in exercise therapy and electrotherapy in these clinical situations to restore musculoskeletal function considering current evidence based guidelines.



**Subject Title: PHYSIOTHERAPY IN ORTHOPEDICS & SPORTS**

**Duration: 37-48 months**

**Total Hours: 240**

**Theory: 80 hours**

**Practical: 160 hours**

**Total Hours per week: 6 hours**

**Method of Assessment: Written, Oral, Practical**

**1. PT assessment for Orthopedic conditions** - SOAP format. Subjective - history taking, informed consent, personal, past, medical and socioeconomic history, chief complaints, history of present illness. Pain assessment- intensity, character, aggravating and relieving factors, site and location. Objective- on observation - body built swelling, muscle atrophy, deformities, posture and gait. On palpation- tenderness-grades, muscle spasm, swelling- methods of swelling assessment, bony prominences, soft tissue texture and integrity, warmth and vasomotor disturbances. On examination – ROM – active and passive, resisted isometric tests, limb length apparent, true and segmental , girth measurement, Muscle imbalance and muscle length testing-tightness, contracture and flexibility, manual muscle testing, peripheral neurological examination dermatomes, myotomes and reflexes, special tests and functional tests. Physical diagnosis and differential diagnosis, Prescription of home program. Documentation of case records, and follow up. **[6 Hours]**

**2. Fractures** - types, classification, signs and symptoms, complications. Fracture healing - factors affecting fracture healing. Principles of fracture management - reduction - open and closed, immobilization - sling, cast, brace, slab, traction - manual, mechanical, skin, skeletal, lumbar and Cervical traction, external fixation, functional cast bracing. PT management in complications - early and late - shock, compartment syndrome, VIC, fat embolism, delayed and mal union, RSD, myositis ossificans, AVN, pressure sores etc. Physiotherapy assessment in fracture cases. Aims of PT management in fracture cases - short and long term goals. Principles of PT management in fractures - Guidelines for fracture treatment during period of immobilization and guidelines for treatment after immobilization period. **[4 Hours]**

**3. Specific fractures and dislocations:** PT assessment and management of upper limb fractures and dislocations. PT assessment and management of lower limb fractures and

dislocations including pelvis. PT assessment and management spinal fractures. [4 Hours]

**4. Selection and application of physiotherapeutic techniques, maneuver's, modalities for preventive, curative and rehabilitative means in all conditions. [2 Hours]**

**5. Principles of application of various schools of thought in manual therapy:**  
Briefly Maitland and Mckenzie. [2 Hours]

**6. Degenerative and Inflammatory conditions:** Definition, signs and symptoms, clinical features, patho physiology, radiological features, deformities, medical, surgical management. Describe the PT assessment and management and home program for the following conditions – Osteoarthritis - emphasis mainly on knee, hip and hand, Rheumatoid Arthritis, Ankylosing spondylitis, Gout, Perthes disease, Periarthritic shoulder. [3 Hours]

**7. Infective conditions:** Definition, signs and symptoms, clinical features, pathophysiology, radiological features, medical, surgical management. Describe PT assessment and management for following conditions – Osteomyelitis – acute and chronic, Septic arthritis, Pyogenic arthritis, TB spine and major joints - knee and hip. [2 Hours]

**8. Define, review the postural abnormalities of spinal column, clinical features, deformities, medical and surgical management. Describe PT assessment and management and home program. [2 Hours]**

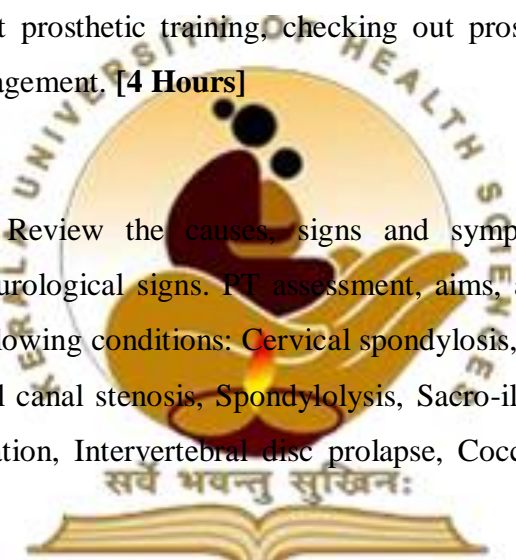
**9. Deformities:** Review in detail the causes, signs and symptoms, radiological features, medical and surgical management. Describe the PT. assessment and management of the following conditions : Congenital : CTEV, CDH, Torticollis, pes planus, pes cavus and other common deformities. Acquired: scoliosis, kyphosis, coxa vara, genu varum, valgum and recurvatum. [3 Hours]

**10. Poliomyelitis:** Definition, etiology, types, pathophysiology, clinical features, deformities, medical and surgical management. PT. assessment and management after surgical corrections and reconstructive surgeries - emphasis on tendon transfer and home program. [2 Hours]

**11. Leprosy:** Definition, cause, clinical features, medical and surgical management. PT assessment, aims, and management after surgical procedures such as tendon transfer both pre and post operatively. [2 Hours]

**12. Amputations:** Definition, levels, indications, types, PT assessment, aims, management pre and post operatively. PT management with emphasis on stump care and bandaging. Pre and post prosthetic training, checking out prosthesis, complications of amputations and its management. [4 Hours]

**13. Spinal conditions:** Review the causes, signs and symptoms, investigations, radiological features, neurological signs. PT assessment, aims, and management and home program of the following conditions: Cervical spondylosis, Lumbar spondylosis, Spondylolisthesis, Spinal canal stenosis, Spondylolysis, Sacro-iliac joint dysfunction, Sacralisation, Lumbarisation, Intervertebral disc prolapse, Coccydynia, Spina bifida occulta. [7 Hours]



**14. Traction:** Effects of spinal traction, types of traction, modes of application, indications for spinal traction, contraindications, precautions, limitations of traction. [2 Hours]

**15. Osteoporosis-** Causes, predisposing factors, investigations and treatment. [1 Hour]

**16. Orthopedic surgeries:** Pre and post operative PT assessment, goals, precautions and PT management of following surgeries such as : Arthrodesis, Osteotomy, Arthroplasty-partial and total - Excision arthroplasty, excision arthroplasty with implant, interpositional arthroplasty and total replacement; Tendon transplant, Soft tissue release-tenotomy, myotomy, lengthening; Arthroscopy, Spinal stabilization, Re- attachment of

limbs, External fixators, Synovectomy. [5 Hours]

**17. Shoulder joint:** Shoulder instabilities, TOS, RSD, Impingement syndrome – conservative and Post operative PT management. Total shoulder replacement and Hemi replacement. - Post operative PT management. AC joint injuries - rehabilitation. Rotator cuff tears conservative and surgical repair. Subacromial decompression - Post operative PT management. [3 Hours]

**18. Elbow and forearm:** Excision of radial head - Post operative PT management. Total elbow arthroplasty- Post operative PT management. [2 Hours]

**19. Wrist and Hand:** Total wrist arthroplasty. Repair of ruptured extensor tendons. Carpal tunnel syndrome. Flexor and extensor tendon lacerations - Post operative PT management. [3 Hours]

**20. Hip:** Joint surgeries - hemi and total hip replacement - Post operative PT management. Tendonitis and bursitis. - Management. [2 Hours]

**21. Knee:** Lateral retinacular release, chondroplasty- Post operative management. Realignment of extensor mechanism. ACL and PCL reconstruction surgeries - Post operative rehabilitation. Meniscectomy and meniscal repair - Post operative management. Plica syndrome, patellar dysfunction and Hoffa's syndrome- conservative management. TKR- rehabilitation protocol. Patellar tendon ruptures and Patellectomy- rehabilitation. [5 Hours]

**22. Ankle and foot:** Ankle instability. Ligamentous tears- Post operative management. [2 Hour]

**23. Sports Physiotherapy:** Physical fitness tests. Sports nutrition, Stages of soft tissue healing. Treatment guidelines for soft tissue injuries- Acute, Sub acute and chronic stages. Repair of soft tissues- rupture of muscle, tendon and Ligamentous tears. Soft tissue injuries- prevention and rehabilitation of, Lateral ligament sprain of ankle. Rotator cuff

injuries. Collateral and Cruciate injuries of knee. Meniscal injuries of knee. Supraspinatus and Bicipital tendonitis . Pre patellar and Subacromial bursitis. Tennis and Golfer's elbow. Hamstring strains, Quadriceps contusion, TA rupture. Dequervain's tenosynovitis. Trigger and Mallet finger. Plantar fasciitis. Wrist sprains. Prevention of sports injuries, Doping [12 Hours]

**Practical: 160 Hours**

**Practical shall be conducted for all the relevant topics discussed in theory in the following forms:**

1. Bedside case presentations and case discussions in the wards
2. Demonstration of application of Physiotherapeutic assessment and treatment techniques on students models in the lab and on patients in Physiotherapy Out Patient Department
3. Participation in patient care under supervision and guidance of faculty.

**Subject Title: PHYSIOTHERAPY IN COMMUNITY HEALTH**

**Duration: 37 – 48 Months**

**Total Hours : 240**

**Theory : 80 Hours**

**Practical : 160 Hours**

**Total Hours / Week : 6**

**Method of Assessment: Written, Oral, Practical**

**Theory [80 Hours]**

**1] Concepts of community health** [preventive, promotive, restorative and rehabilitative] [2 Hours]

**2] a) Introduction to rehabilitation**

Philosophy and need of rehabilitation. Principles of Physical medicine. Role of members of rehabilitation team. Basic Principles of Administration and Organization [2 Hours]

**b) Disability Prevention and Rehabilitation:** Concepts of impairment, disability and functional limitations or Handicap. Disability evaluation methods and purposes.[2 Hours]



**3] Principles of Community based Rehabilitation:** WHO definition of health and disease, Health delivery system – strategies of 3tier health delivery system, Disability types (Physical & Psychological), evaluation, prevention & Legislation related to Persons with Disability (PWD) **[4 Hours]**

**4] Introduction to CBR :** Definition, principles, types {institutional, reach out and community), concepts, WHO policies, principles of Team work of medical practitioner, Physiotherapist, Occupational Therapist, Speech & Audiology Therapist, Prosthetist & Orthotist, Clinical psychologist, vocational counsellor and social worker, Role of PT in team, concept of multi –purpose health worker. **[6 Hours]**

**5] Role of Physiotherapy in CBR:** Screening for disabilities, Prescribing exercise programme, Prescribing and devising low cost locally available assistive aids, Modifications physical and architectural barriers for disabled, Disability prevention, Strategies to improve ADL, Rehabilitation programmes for various neuromusculoskeletal and cardiothoracic disabilities. **[5 Hours]**

**6] Legal aspects of disability:** Compensation and benefits. Government's policies and rehabilitation Council. Concept of Barrier free environment **[1 Hour]**

Role of voluntary Organizations in CBR: Charitable Organizations, Voluntary health agencies –National level and International NGO's, Multilateral and Bilateral agencies. International Health Organizations. **[3 Hours]**

National District Level Rehabilitation Programme: Primary rehabilitation unit, Regional training center, District rehabilitation center, Primary Health center, Village rehabilitation worker, Anganwadi worker **[3 Hours]**

Vocational training in rehabilitation: Introduction, Need, Vocational evaluation, Vocational rehabilitation services**[1 Hours]**

**7] Role of Other Allied Therapies in Rehabilitation: [4 Hours]**

**(a)Occupational therapy:** Introduction to Occupational therapy, Philosophy and principles of Occupational Therapy, Therapeutic Media and Modalities in O.T, Role of O.T in Mental Health Physical Function and well-being.

**(b) Speech and Language disorders and rehabilitation:** Brief description of Anatomy and physiology, Classification of the disorders and respective management strategies.

**8] Principles of Othotics, Prosthetics, Mobility Aids and Assistive Devices. [8**



**Hours]**

**(a) Principles of Orthotics:** Indications Prescription and training in usage Lower Extremity Orthotics, Upper Extremity Orthotics and Spinal Orthotics

**(b) Principles of Prosthetics:** Indications Prescription and training in usage Lower Extremity Prosthetics and Upper Extremity Prosthetics

**(c) Mobility aids and assistive devices:** Principles involved in prescribing, Classification, and Levels and Methods of training in use.

**9] Community Health Care – [8 Hours]**

Prevention, Promotion & Restoration

- a. In Peri Pubertal age group
- b. In neuromusculoskeletal,
- c. In Obese / Over weight
- d. In Cardiovascular conditions
- e. In Pulmonary,
- f. In metabolic and degenerative conditions
- g. In Diabetes
- h. In Sport Person (Identify risk factor & type of training)
- i. Health Promotion for All



**10] Woman and child care – [8 Hours]**

- a. Antenatal exercises , Specific Breathing exercises, Relaxation, Postural Training, Pelvic floor stretching and strengthening exercises with clinical reasoning
- b. Physiotherapy during labour
- c. Postnatal exercises program after normal labor / labor with invasive procedures with clinical reasoning
- d. Menopause -Osteoporosis, Mental health, Physiotherapy management
- e. Preterm babies
- f. Adolescent age group
- g. Nutritional disorders in women and children

**11] Geriatrics – [8 Hours]**

Physiology of Aging, Environmental changes and adaptations, Balance and falls, Physiotherapy management, Role of Physiotherapy in prolonged bed rest and in home

for aged. Active aging and Aging with disabilities – WHO, Care for People with Dementias.

## **12] Industrial health and Occupational Diseases– [15 Hours]**

### **I. Ability Management –**

Job analysis: - Job description, Job demand Analysis, Task Analysis, Ergonomic Evaluation including Anthropometric data collection, Injury Prevention, Employee Fitness Programme. Disability Management: - Acute care, Concept of Functional Capacity Assessment, Work Conditioning, Work Hardening

### **II. Environmental stress in the industrial area –**

A. Physical agents e.g. heat / cold, light, noise, vibration, UV radiation, ionizing radiation

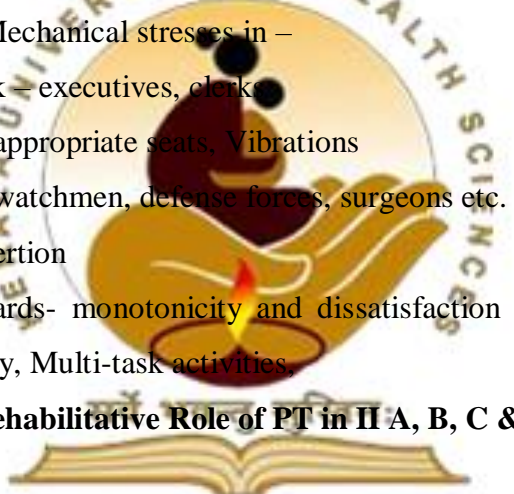
B. Chemical agents-inhalation, local action and ingestion

C. Mechanical hazards-overuse/fatigue injuries due to ergonomic alternation and Mechanical stresses. Mechanical stresses in –

- i. Sedentary table work – executives, clerks
- ii. Vehicle drivers - Inappropriate seats, Vibrations
- iii. Constant standing-watchmen, defense forces, surgeons etc.
- iv. Labourers- Overexertion

D. Psychological hazards- monotonicity and dissatisfaction in job, anxiety of work completion with quality, Multi-task activities.

### **III Preventive and Rehabilitative Role of PT in II A, B, C & D**



**Practical: 160 Hours**

Project – Survey/Retrospective study in community

Documentation of 2 cases each in

- a) Women's Health
- b) Geriatrics &
- c) Industrial Health (Musculoskeletal / Pulmonary conditions)
- d) Health promotion –

1 case each in

- a. Obesity
- b. Peri-pubertal age group
- c. Sports person
- d. Diabetes / Cardio-Pulmonary conditions

There shall be participation of students in health camps and projects in final year and during internship with a view to expose the students to problems of rural and semi urban areas.

The concept of health care counselling shall be incorporated in all relevant areas.

## **2.7 Total number of hours**

Total number of hours will be 4320 hours during the four years of study.

## **2.8 Branches if any with definition**

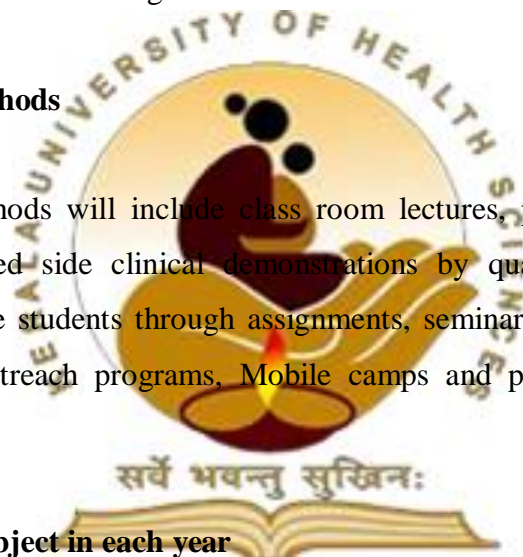
There are no branches for B.P.T. degree course

## **2.9 Teaching learning methods**

Teaching learning methods will include class room lectures, practical and laboratory demonstrations, and bed side clinical demonstrations by qualified faculty and self directed learning by the students through assignments, seminar and case presentations, Institutional Visits, Outreach programs, Mobile camps and project works under the faculty guidance.

## **2.10 Content of each subject in each year**

As in 2.6 above











**2.11 No: of hours per subject**

**TABLE I**

FIRST YEAR BPT (DURATION 0 – 12 MONTHS)					
S No.	Subjects	Teaching hours			
		Hours/Week	Theory	Practical	Total
Main subjects: For University Examination					
01	Anatomy	8	160	160	320
02	Physiology	8	160	160	320
03	Biomechanics & Kinesiology	8	160	160	320
04	Psychology	2	80	-	80
05	Sociology	2	80	-	80
Subsidiary subjects: Not for University Examination					
06	Biochemistry	2	80	-	80
07	First Aid & Nursing	2	60	20	80
08	Nutrition	1	40		40
09	Orientation to Physiotherapy	1	40	-	40
10	Communicative English	1	40	-	40
11	Seminar	1	40	-	40
12	Total	36	910	530	1440

**TABLE II**

SECOND YEAR BPT (DURATION 13 – 24 MONTHS)					
S No.	Subjects	Teaching hours			
		Hours/Week	Theory	Practical/Clinical	Total
Main subjects: For University Examination					
01	Electrotherapy	8	120	200	320
02	Exercise therapy	8	120	200	320
03	Pharmacology	2	80	-	80
04	Microbiology	2	80	-	80
05	Pathology	2	80	-	80
Subsidiary subjects: Not for University Examination					
06	Computer Science	2	40	40	80
07	Medical Instrumentation	2	60	20	80
08	Seminar	2	80	-	80
09	Supervised Clinical Observation	8	-	320	320
10	Total	36	660	780	1440

**TABLE III**

THIRD YEAR BPT (DURATION 25 – 36 MONTHS)					
S No.	Subjects	Teaching hours			
		Hours/Week	Theory	Practical/Clinical	Total
Main subjects: For University Examination					
01	General Medicine & General Surgery	2	80	-	80
02	Physiotherapy in General Medicine & General Surgery	6	80	160	240
03	Cardio- Respiratory disorders & Surgery	2	80	-	80
04	Physiotherapy in Cardio-Respiratory disorders & Intensive Care management	6	80	160	240
05	Community Medicine	2	80	-	80
Subsidiary subjects: Not for University Examination					
06	Research methodology & Biostatistics	2	80	-	80
07	Ethics and Management	1	40	-	40
08	Seminar	1	40	-	40
09	Supervised Clinical Practice	14	-	560	560
10	Total	36	560	880	1440

**TABLE IV**

FORTH YEAR BPT (DURATION 37– 48 MONTHS)					
S No.	Subjects	Teaching hours			
		Hours/Week	Theory	Practical/Clinical	Total
Main subjects: For University Examination					
01	Neurology & Neurosurgery	2	80	-	80
02	Physiotherapy in Neurology & Neurosurgery	6	80	160	240
03	Orthopedics & Sports Medicine	2	80	-	80
04	Physiotherapy in Orthopedics & Sports	6	80	160	240
05	Physiotherapy in Community Health & Project	6	80	160	240
Subsidiary subjects: Not for University Examination					
06	Supervised Clinical Practice	14	-	560	560
07	Total	36	400	1040	1440

### 2.12 Practical training

Practical training should be imparted under laboratory conditions for the basic science subjects with emphasis on carrying out the experiments and tests through demonstration by relevant faculty and repeated practice by the students. For physiotherapy assessment and treatment techniques, these should be first demonstrated on human models and the students should practice on human models repeatedly until proficiency is gained. Later the techniques should be demonstrated on patients during bed side clinics and the students are encouraged to carry out the techniques on patients under strict and close supervision of faculty.

### **2.13 Records**

In all subjects with practical components meticulous records should be kept regarding the topic of the practical training, procedure, materials and methods used, results and outcomes. The records should be submitted for inspection during practical or viva examination.

### **2.14 Dissertation: As per Dissertation Regulations of KUHS**

### **2.15 Specialty training if any**

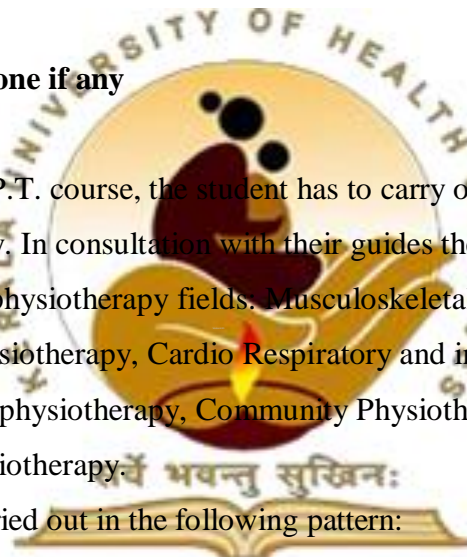
Not applicable

### **2.16 Project work to be done if any**

In the final year of the B.P.T. course, the student has to carry out a project work under the guidance of the faculty. In consultation with their guides they have to select a topic in any one of the following physiotherapy fields: Musculoskeletal and sports physiotherapy, Neuro physiotherapy, Cardio Respiratory and intensive care physiotherapy, Paediatric physiotherapy, Community Physiotherapy and General medical and surgical physiotherapy.

The project should be carried out in the following pattern:

1. Introduction
2. Aims or objectives of the project
3. Review of literature
4. Methodology: Case studies / Survey
5. Summary and Conclusion
6. References
7. Appendices



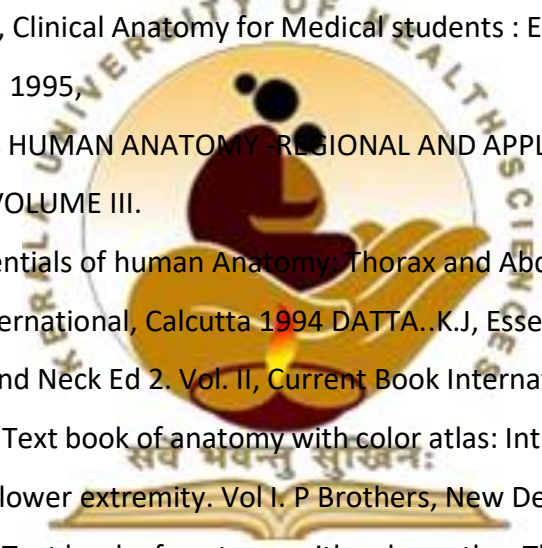
The completed project and bound report should be submitted 3 months before final university examination. The project will be evaluated through a viva examination conducted during the practical and viva examination of the subject Physiotherapy in community health.

### **2.17 Any other requirements [CME, Paper Publishing etc.]**

The third and final year students and interns should attend at least one CME program each year preferably conducted in their own institution.

### **2.18 Prescribed/recommended textbooks for each subject**

#### **ANATOMY**

- 
2. SNELL [Richard S], Clinical Anatomy for Medical students : Ed. 5. Little Brown and Company Boston. 1995,
  3. B.D CHAURASIA'S HUMAN ANATOMY -REGIONAL AND APPLIED; VOLUME 1, VOLUME II AND VOLUME III.
  4. DATTA [A.K], Essentials of human Anatomy: Thorax and Abdomen Ed 2. Vol. I Current. Book International, Calcutta 1994 DATTA..K.J, Essentials of human Anatomy: Head and Neck Ed 2. Vol. II, Current Book International, Culcutta 1995
  5. SINGH [Inderbir], Text book of anatomy with color atlas: Introduction, Osteology, upper extremity, lower extremity. Vol I. P Brothers, New Delhi 1996
  6. SINGH [Inderbir], Text book of anatomy with colour atlas: Thorax and abdomen. Vol II. JP Brothers, New Delhi 1996
  7. SINGH [Inderbir], Text book of anatomy with color atlas: Head and Neck Central Nervous system. Vol III. JP Brothers, New Delhi 1996
  8. SINGH [Inderbir], Human Osteology. JP Brothers, New Delhi 1990

#### **PHYSIOLOGY**

1. Concise medical physiology - Chaudhuri Sujit K.
2. Human Physiology — Chatterjee C. C.
3. Text book of practical Physiology - Ranade.



4. Text of Physiology-A.K.Jain.

## **BIOMECHANICS AND KINESIOLOGY**

1. Joint Structure and Function – A comprehensive Analysis, JP Bros Medical Publishers, New Delhi.
2. Clinical Kinesiology for Physical Therapist Assistants, JP Bros Medical Publishers, Bangalore, 1st Indian Ed 1997
4. Textbook on kinesiology by D.A. Neuman.

## **PSYCHOLOGY**

1. Morgan et al (2003). Introduction to Psychology. New Delhi: Tata McGraw hill.
2. Mangal, S.K (2002). Advanced Educational Psychology. New Delhi: prentice hall.

## **SOCIOLOGY**

1. Sachdeva and Vidyabushan, Introduction to the study of sociology
2. INDRANI T K, Text Books of Sociology for Graduates Nurses and Physiotherapy Students, JP Brothers, New Delhi

## **BIOCHEMISTRY**

1. Text of Biochemistry for Medical students by Vasudevan & Sreekumari.
2. Text book of Dietetics by Sreelexmi. B
3. Handbook of food & Nutrition, Dr. Swaminathan M. The Bangalore Printing & Publishing Co, Lts.
4. Food & Nutrition facts & figures, Gupta L C, et al. New Delhi, Jaypee.
5. Text book of Foods, Nutrition & Dietetics, Raheena Beegam. M. A. New Delhi, Sterling Publishers Pvt. Ltd.

## **FIRST AID AND NURSING**

1. First aid in emergency – St. John's Ambulance Association.
2. First aid & management of general injuries & common ailments-Gupta & Gupta

## **COMMUNICATIVE ENGLISH**



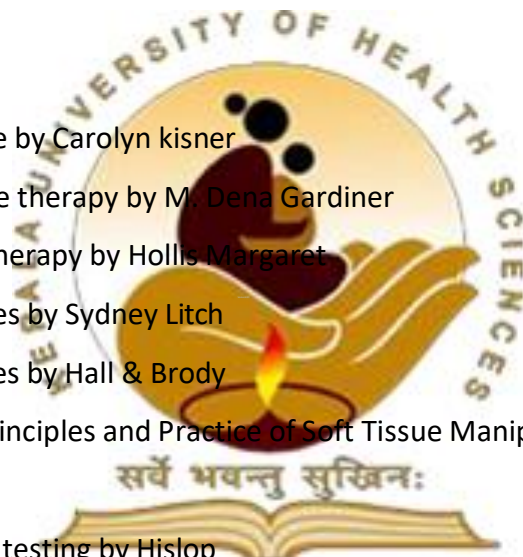
1. English Grammar Collins, Birmingham University, International Language Data Base, Rupa & Co. 1993
2. Wren and Martin - Grammar and Composition, 1989, Chanda.& Co, Delhi
3. Spoken English, V Shasikumar and P V Dhanija\_ Pub. By: Tata Mcgraw Hill, New Delhi

## **ELECTROTHERAPY**

1. Claytons Electrotherapy by Forster Plastangs
2. Electrotherapy Explained by Low & Reed
3. Clinical Electrotherapy by Nelson
4. Physical agents by Michile Cameroon

## **EXERCISE THERAPY**

1. Therapeutic exercise by Carolyn kisner
2. Principles of exercise therapy by M. Dena Gardiner
3. Practical exercises therapy by Hollis Margaret
4. Therapeutic exercises by Sydney Litch
5. Therapeutic exercises by Hall & Brody
6. Beard's Massage: Principles and Practice of Soft Tissue Manipulation, Giovanni DeDomenico
7. Principles of muscle testing by Hislop



## **PHARMACOLOGY**

1. Pharmacology in Rehabilitation 4th Edition - Charles D. Ciccone, PT, PhD
2. Pharmacology for the physical therapist - Peter C. Panus, PhD, PT Bertra, latzing MD,
3. Essential of Medical Pharmacology by Tripathi
4. Text book of Medical Pharmacology by Padmaja Udayakumar
5. Pharmacology by N. Murugesh
6. Pharmacology & Pharmacotherapeutics by Sadoskar.

## **MICROBIOLOGY**

1. Short text book of Medical Microbiology by Sathish Gupta
2. Text book of Microbiology by Anantha Narayanan
3. Microbiology by Baveja

### **PATHOLOGY**

1. Text book of pathology by Harshmohan
2. Text book of pathology by Robbins

### **MEDICAL INSTRUMENTATION**

1. Handbook Of Biomedical Instrumentation – R.S Khnadpur.
2. Biomedical Instrumentation – Dr. M. Arumugham.

### **COMPUTER SCIENCE**

1. Computer Network - Andrew S. Tanenbaum

### **GENERAL MEDICINE & GENERAL SURGERY**

1. Davidson's Principles and Practice of Medicine
2. Harrison's Internal Medicine

### **GENERAL SURGERY**

1. General Surgical Operations – by Kirk / Williamson
2. Bailey and Love's – Short Practice of Surgery
3. Patricia A Downie, Text book of Heart, Chest Vascular Disease for physiotherapists, JP Bros.

### **PHYSIOTHERAPY IN GENERAL MEDICINE AND SURGERY**

1. Tidy's Physiotherapy.
2. Physical Rehabilitation Assessment and Treatment – O'Sullivan Schmitz
3. Cash's Text book of General Medicine and Surgical conditions for Physiotherapists.

### **CARDIO-RESPIRATORY DISORDERS & SURGERY**

1. General Surgical Operations – by Kirk / Williamson



2. Surgery by Nan
3. Bailey and Love's – Short Practice of Surgery
4. Chest Disease by Crofton and Douglas.
5. Text book of Heart, Chest Vascular Disease for physiotherapists- Patrica A Downie, JP Bros.

### **PHYSIOTHERAPY IN CARDIO-RESPIRATORY DISORDERS & INTENSIVE CARE MANAGEMENT**

1. Tidy's Physiotherapy.
2. Cash's Text Book of Chest, Heart, Vascular Disorders for Physiotherapists.
3. Cardio pulmonary Symptoms in physical Therapy practice Cohen and Michel
4. Chest Physiotherapy in Intensive Care Unit by Mackenzi
5. Cash's Text book of General Medicine and Surgical conditions for Physiotherapists.

### **COMMUNITY MEDICINE**

1. Textbook of Preventive & Social Medicine, Dr. J E Park

### **RESEARCH METHODOLOGY AND BIOSTATISTICS**

1. Elements of Health Statistics by Rao.N.S.N
2. An introduction of Biostatistics by Sunder Rao. P.S.S.
3. Methods in Bio-Statistics 6th Edn. 1997 by B.K. Mahajan
4. Biostatistics : A manual of Statistics Methods by K. Visweswara Rao

### **ETHICS & MANAGEMENT**

1. Medical Ethics by C M Francis.
2. Management principals and application for physiotherapists

### **NEUROLOGY AND NEURO SURGERY**

1. Victor Adams-neurology
2. Haerer: Neurological examinations
3. Neurological examination made easy

### **PHYSIOTHERAPY IN NEUROLOGY & NEURO SURGERY**



1. Patrica Downie: Cash's book of neurology.
2. Ida Bromely : Tetraplegia & Paraplegia
3. Thomson – Tidy's Physiotherapy
4. Susan B O' Sullivan – Physical rehabilitation
5. Darcy Umphred – Neurological rehabilitation
6. Berta Bobath – Adult hemiplegia

## **ORTHOPEDICS & SPORTS MEDICINE**

1. Text book of Orthopedics.—Maheswari.
2. Apley's Orthopedics.
3. Textbook of Orthopedics and Traumatology— M.N.Natarajan

## **PHYSIOTHERAPY IN ORTHOPEDICS & SPORTS**

1. Tidy's Physiotherapy.
2. Textbook of orthopedics- Cash.
3. Clinical orthopedic rehabilitation- Brotzman.
4. Orthopedic Physiotherapy - Jayant Joshi.
5. Orthopedic Physical Assessment-David J Magee



## **PHYSIOTHERAPY IN COMMUNITY HEALTH**

1. Industrial Therapy – Glenda Key
2. Geriatric Physical therapy - Andrew Guccione
3. P.S.M. - Park
4. Textbook of Women's Health – Ruth Sapsford
5. Physiotherapy in obstetrics & Gynecology -J. Mantle
6. Ergonomics- Karen Jacobs
7. Textbook of preventive & Social Med – Gupta & Mahajan

## **2.19 Reference books**

### **ANATOMY**

1. MOORE [Keith L], Clinically Oriented Anatomy. Ed. 3., Williams and Wilkins, Baltimore, 1992
2. Drake, Vogl & Mitinell, GRAY'S Anatomy for students, 2nd Edition, 2010 Church II Livingstone.
3. SNELL, Clinical Anatomy, 7th edition 2004 Lippincott, Williams & Wilkins.

## **PHYSIOLOGY**

1. Text book of medical physiology - Guyton Arthur
2. Manipal Manual of Physiology - Prof. C N Chandrashekar
3. Basics of Medical histology- Venkatesh D & SudhakarHH

## **BIOMECHANICS AND KINESIOLOGY**

1. Brunnstrom, Clinical Kinesiology, JP Bros Medical Publishers, Bangalore, 5th Ed 1996, 1st Indian Ed 1998.

## **PSYCHOLOGY**

1. Lefton. Psychology. Boston: Alwin & Bacot Company.
2. Feldman R.H (1996). Understanding Psychology. New Delhi: Tata McGraw hill.
3. Atkinson (1996). Dictionary of Psychology.

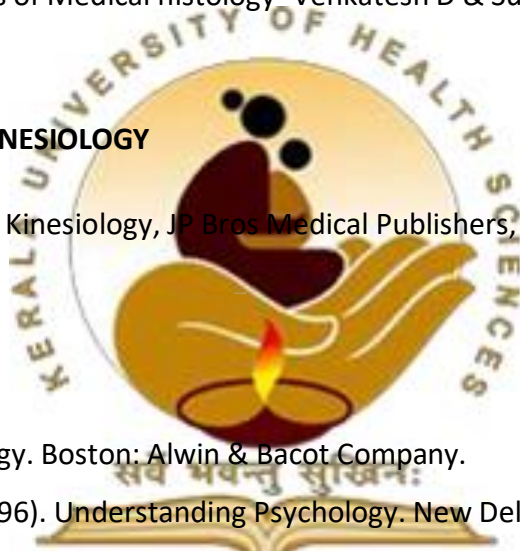
## **SOCIOLOGY**

3. INDRANI T K, Text Books of Sociology for Graduates Nurses and Physiotherapy Students, JP Brothers, New Delhi

## **BIOCHEMISTRY**

6. Nutrition & Dietetics for Health care. Barrer M Helen.
7. Harper's Biochemistry by Robert K. Murray, Daryl K. Granner and Victor W. Rodwell.

## **FIRST AID AND NURSING**





3. Physiotherapy for burns & Reconstruction - Glassey.
4. Surgical & Medical Procedures for Nurses & Paramedical staff- Nathan.

### **COMMUNICATIVE ENGLISH**

4. Letters for all Occassions.A S Myers. Pub - Harper Perennial
5. Journalism Made Simple, D Wainwright
6. Writers Basic Bookshelf Series, Writers Digest series
7. Interviewing by Joan Clayton Platkon
8. Penguin Book of Interviews

### **ELECTROTHERAPY**

5. Electrotherapy Evidene based practice by Sheila Kitchen
6. Principles of Electrotherapy by Michile Camreoon
7. Thermal agents by Susan Michlovitz.
8. Therapeutic modalities for physical therapists by William E Prentice

### **EXERCISE THERAPY**

8. Physical rehabilitation by O. Sullivan
9. Muscles: Testing and Function, with Posture and Pain: by Kendall& Kendall
10. Manual mobilization of the Joints: the kaltenborn method of Joint Examination and treatment; Vol.1 – Extremities, Vol.2 – Spine: by F kaltenborn and Olaf Evjenth
11. Facilitated Stretching by Robert E McAtee and Jeff Charland
12. Light on Yoga by BKS Iyengar
13. Manual Therapy “NAGS”, “SNAGS”, “ MWMS” etc by Brian R. Mulligan
14. Myofascial Release Manual by Carol J. Manheim
15. Mobilization of Nervous System by David Butler
16. The Cervical and Thoracic spine Mechanical Diagnosis and Therapy by R A McKenzie
17. The Lumbar spine Mechanical Diagnosis and Therapy by R A McKenzie
18. Muscle energy techniques by Leon Chaitow
19. Therapeutic exercises by Barbara Bandi
20. Therapeutic exercises by Basmajjian



## **MICROBIOLOGY**

4. Text book of Microbiology by Chakraborty
5. Text book of Microbiology by Jayaram Panicker
6. Microbiology and Parasitology by Rajeshwar Reddy

## **PATHOLOGY**

3. Pathological Implications for Physical Therapists by Catherine Cavallaro Goodman ,  
Kenda S Fuller

## **MEDICAL INSTRUMENTATION**

3. Handbook Of Analytical Instruments – R.S Khnampur.
4. Biomedical Instruments and Measurements - Cromwell

## **COMPUTER SCIENCE**

2. Health Information management of a Strategic Resource - Mervat Abdelhak

## **GENERAL MEDICINE & GENERAL SURGERY**

3. Braunwald Text of Cardiology
4. Text Book of Cardiology by Hurst



## **GENERAL SURGERY**

4. Chest Disease by Crofton and Douglas.
5. Surgery by Nan

## **PHYSIOTHERAPY IN GENERAL MEDICINE AND SURGERY**

4. Physical Therapy for the Cancer patient by M.C Garvey
5. Physiotherapy in Obstetrics and Gynecology by Polden
6. Saunders Manual of Physical Therapy Practice

## **CARDIO-RESPIRATORY DISORDERS & SURGERY**

## **PHYSIOTHERAPY IN CARDIO-RESPIRATORY DISORDERS & INTENSIVE CARE MANAGEMENT**

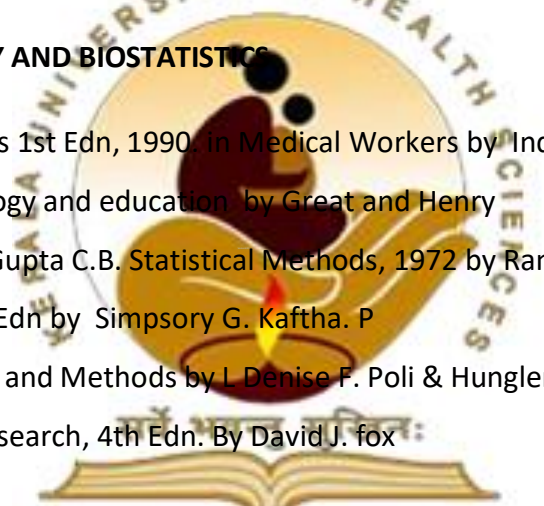
6. The Brompton Guide to chest Physiotherapy DU Gasket [Completed]
7. Cardiopulmonary Physical Therapy: a guide to practice- Irwin S, Techlin JS
8. Essentials of Cardiopulmonary Physical Therapy- Hillegass, Ellen
9. Essentials of Cardio Pulmonary Physical Therapy by Hillegass and Sadowsky
10. musculoPhysical Rehabilitation Assessment and Treatment – O'Sullivan Schmitz
11. Elements in Paediatric Physiotherapy – Pamela M Eckersley

## **COMMUNITY MEDICINE**

1. Textbook of preventive & Social Med – Gupta & Mahajan

## **RESEARCH METHODOLOGY AND BIOSTATISTICS**

5. Elementary Statistics 1st Edn, 1990 in Medical Workers by Inderbir Singh
6. Statistics in Psychology and education by Great and Henry
7. An Introduction to Gupta C.B. Statistical Methods, 1972 by Ram Prasad & Sons
8. Basic Statistics, 3rd Edn by Simpsory G. Kaftha. P
9. Research; Principles and Methods by L Denise F. Poli & Hungler
10. Fundamentals of Research, 4th Edn. By David J. fox



## **ETHICS & MANAGEMENT**

3. Health Services Management, Analysis & Application, Wadsworth Publishing Company, Belmont
4. Davies, R and Macaulay, BMC – Hospital Planning and Administration
5. George V Lobo – Current Problems in Medical Ethics
6. Consumer Protection Act – 1986, Government of India, New Delhi.
7. Francis C M – Hospital Administration

## **NEUROLOGY AND NEURO SURGERY**

4. Davidson: Principle and practice in medicine

5. John Walton: Brains Diseases of the nervous system
6. Baily & Love: Short practice of surgery
7. Hutchisons clinical methods.

### **PHYSIOTHERAPY IN NEUROLOGY & NEURO SURGERY**

7. Braddom – Physical medicine & rehabilitation
8. Swaner – Brunnstorms movement therapy
9. Robbert Carr & Shapperd – Motor relearning Programme
10. Robbert Carr & Shapperd- Neurological rehabilitation
11. Ecker- Elements of pediatric Physiotherapy
12. Barbara- Physiotherapy for cerebral palsy children.
13. Adal Cuning – Key Issues in neurological Physiotherapy.
14. Physical management in neurological rehabilitation- Stokes M
15. Physical Therapy for Children- Campbell SK, Palisano RJ, Orlin M
16. Motor Control: Theory and Practical Applications- Anne Shumway-Cook, Marjorie H. Woollacott
17. Differential Diagnosis for Physical Therapists-Goodman & Snyder

### **ORTHOPEDICS & SPORTS MEDICINE**

4. Outline of Fractures—John Crawford Adams.
5. Outline of Orthopedics.— John Crawford Adams.

### **PHYSIOTHERAPY IN ORTHOPEDICS & SPORTS**

6. Management of Common Musculoskeletal Disorders- Hertling D, Kessler RM
7. Physical Rehabilitation Assessment and Treatment – O’Sullivan Schmitz
8. Sports Physiotherapy- Maria Zuluaga
9. Differential Diagnosis for Physical Therapists-Goodman & Snyder

### **PHYSIOTHERAPY IN COMMUNITY HEALTH**

2. ACSM (set of 3 books)
3. Legal Rights of Disabled – RCI
4. Textbook of Work Physiology – Astrand

5. Exercise Physiology - Mc Ardle
6. Ergonomics: Man in working environment – Mural
7. Occupational injuries – Herrington
8. Musculoskeletal disorders in the work place – Nordin
9. Exercise testing & Exercise prescription for special cases - J. Skinner
10. Sports Injuries - Zuluaga
11. Rehab Medicine-Part I/II – Delisa
12. Rehabilitation Medicine by Howard A Rusk.
13. Rehabilitation Medicine by Joel A De lisa
14. Text book of O.T – Pedretti
15. Normal Human Locomotion - Published by ALIMCO
16. Atlas of Prosthetics and Orthotics – ALIMCO

## **2.20 Journals**

1. Journal of Physical Therapy
2. Physiotherapy
3. Australian Journal of Physiotherapy
4. Indian Journal of Physiotherapy

## **2.21 Logbook**



Every student shall maintain a record of skills (Log book) he/she has acquired during each year of training period certified by the various heads of the department where he/she has undergone training. The Head of the department shall scrutinize the log book once in every three months. At the end of each year, the candidate should summarize the contents and get the log book certified by the Head of the Institution.

### 3. Examinations

#### 3.1 Eligibility to appear for exams

There shall be 80% attendance in theory and practical/clinical to appear for the University examination as specified in the respective course regulations. Condonation of shortage of attendance on genuine grounds, for subject/subjects (in theory or in practical or both) up to a maximum of 5% can be granted once during the entire course period. The Principals/ Heads of Institutions are empowered for granting condonation for shortage of attendance on recommendation by Head(s) of the Department under intimation to KUHS with the prescribed fee.

The candidate must secure the minimum marks of 50% in internal assessment in theory/ or practical in a particular subject as per the course regulations in order to be eligible to appear in the university examination of the subject.

#### 3.2 Schedule of Regular/Supplementary exams

There will be two examinations in a year (regular and supplementary), to be conducted as per notification issued by university from time to time. First, second, third and final Examinations of the BPT course shall be held at the end of first year, second year, third year and fourth year respectively. Supplementary examination shall be conducted by the university for the benefit of unsuccessful candidates. The supplementary examination shall be conducted within six months from the date of announcement of results.

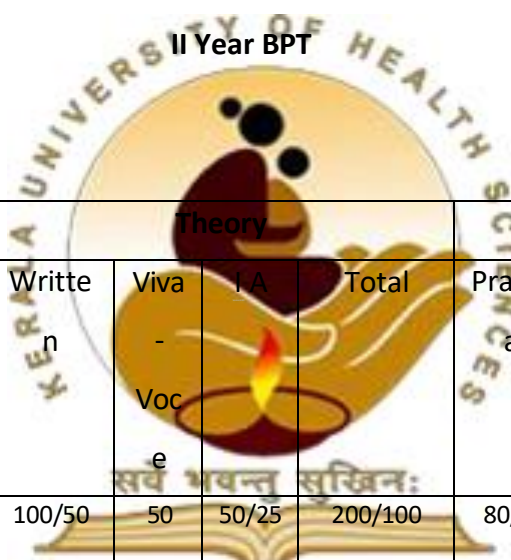
#### 3.3 Scheme of examination showing maximum marks and minimum marks

##### I Year BPT

S No.	Subject	Duration	Theory				Practical			Total
			Written	Viva-Voce	I A	Total	Practical	I A	Total	
01	Anatomy	3 Hrs	100/50	50	50/25	200/100	80/40	20/10	100/50	300/150



02	Physiology	3 Hrs	100/50	50	50/25	200/100	80/40	20/10	100/50	300/150
03	Biomechanics & Kinesiology	3 Hrs	100/50	-	50/25	150/75	-	-	-	150/75
04	Section-A Psychology	3 Hrs	50	-	25	75	-	-	-	150/75
	Section-B Sociology		50	-	25	75	-	-	-	
	Total		100/50	-	50/25	150/75	-	-	-	



S N o.	Subject	Durati on	Theory				Practical			Total
			Writte n	Viva - Voc e	I A	Total	Practic al	I A	Total	
01	Electrotherap y	3 Hrs	100/50	50	50/25	200/100	80/40	20/10	100/50	300/150
02	Exercise Therapy	3 Hrs	100/50	50	50/25	200/100	80/40	20/10	100/50	300/150
03	Pharmacolog y	3 Hrs	80/40	-	20/10	100/50	-	-	-	100/50
04	Section-A Pathology	3 Hrs	50	-	25	75	-	-	-	150/75
	Section-B Microbiology		50	-	25	75	-	-	-	
	Total		100/50	-	50/25	150/75	-	-	-	

### III Year BPT

S No.	Subject	Duration	Theory				Practical			Total
			Written	Viva-Voce	I A	Total	Practical	I A	Total	
01	General Medicine & General Surgery	3 Hrs	100/50	-	50/25	150/75	-	-	-	150/75
02	Physiotherapy in General Medicine & General Surgery	3 Hrs	100/50	50	50/25	200/100	80/40	20/10	100/50	300/150
03	Cardio respiratory disorders and surgery	3 Hrs	100/50	-	50/25	150/75	-	-	-	150/75
04	Physiotherapy in Cardio respiratory and Intensive care management	3 Hrs	100/50	50	50/25	200/100	80/40	20/10	100/50	300/150
05	Community Medicine	3 Hrs	100/50	-	50/25	150/75	-	-	-	150/75

## IV Year BPT

S No .	Subject	Duration	Theory				Practical			Total
			Written	Viva - Voce	I A	Total	Practical	I A	Total	
01	Neurology & Neurosurgery	3 Hrs	100/50	-	50/25	150/75	-	-	-	150/75
02	Physiotherapy in Neurology & Neurosurgery	3 Hrs	100/50	50	50/25	200/100	80/40	20/10	100/50	300/150
03	Orthopedics & Sports Medicine	3 Hrs	100/50	-	50/25	150/75	-	-	-	150/75
04	Physiotherapy in Orthopedics & Sports	3 Hrs	100/50	50	50/25	200/100	80/40	20/10	100/50	300/150
05	Physiotherapy in Community Health & Project	3 Hrs	100/50	50	50/25	200/100	80/40	20/10	100/50	300/150

### 3.4 Papers in each year

As in 3.3

### 3.5 Details of theory exams

#### Question paper pattern for BPT theory examination

Subjects having maximum marks = 100		
Type of question	Number of questions	Marks for each question
Structured Essays	2	15
Brief structured essay	4	10
Short Answers	10	3

Subjects having maximum marks = 80		
Type of question	Number of questions	Marks for each question
Structured Essays	2	15
Brief structured essay	2	10
Short Answers	10	3



Subjects having maximum marks = 50		
Type of question	Number of questions	Marks for each question
Structured Essays	1	15
Brief structured essay	2	10
Short Answers	5	3

In the subject Anatomy - Essay Questions should be from the Upper limb and Lower limb, and from the basic Neuro Anatomy, Cardio vascular & Respiratory System.

In the subject Physiology - Essay Questions should be from Musculoskeletal, Nervous system, Respiratory System, Cardio vascular System and Exercise physiology.

In Sociology & Psychology, Pathology, Microbiology, Pharmacology and all Clinical Subjects - Essay Questions should be from areas relevant to practice of Physiotherapy.

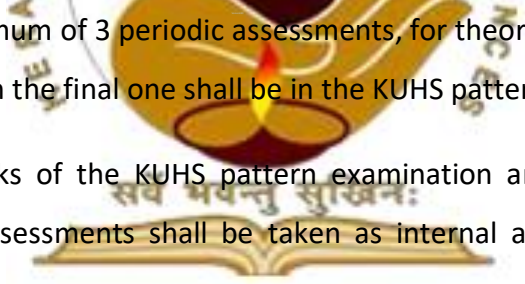
## **BROAD GUIDELINES**

Structured Essay should be explanatory. Brief structured Essay should be descriptive and short answers should be based on direct recollection.

### **3.6 Model question paper for each subject with question paper pattern**

Annexure - I

### **3.7 Internal assessment component**

- 
- a. There shall be a minimum of 3 periodic assessments, for theory and practical including viva separately, of which the final one shall be in the KUHS pattern and is mandatory.
  - b. Average of the marks of the KUHS pattern examination and the best out of the remaining periodical assessments shall be taken as internal assessment mark of the candidate
  - c. The class average of internal assessments mark of theory and practical should not exceed 75% of Maximum marks
  - d. The class average of internal assessment for an examination shall be calculated based on the total number of candidates in a particular batch appearing for that internal assessment examination.
  - e. The candidate must secure the minimum marks of 50% for internal assessment in theory, practical and viva voce in a particular subject order to be eligible to appear in the university examination of the subject.

### 3.8 Details of practical/clinical practical exams

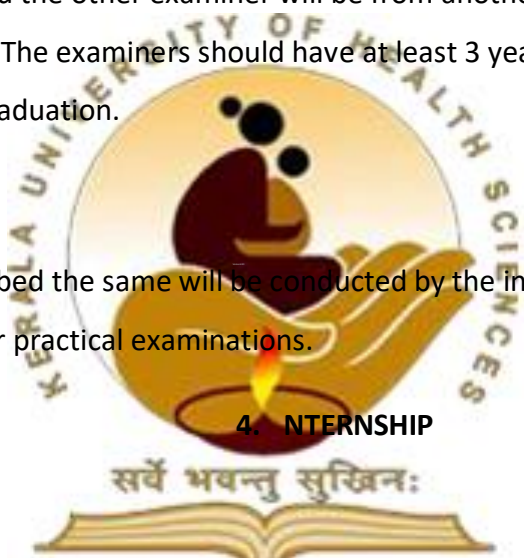
Type of Question	Maximum Marks
Two Long Case (40 Marks each)	80
Viva	50

### 3.9 Number of examiners (Internal & External) and their qualifications

There will be two examiners for each subject where practical/ or viva to be conducted. One examiner (INTERNAL EXAMINER) is preferably from the same institution or as decided by the KUHS and the other examiner will be from another zone of KUHS (EXTERNAL EXAMINER). The examiners should have at least 3 years of teaching experience after post graduation.

#### 3.10 Details of viva:

Wherever viva is prescribed the same will be conducted by the internal and external examiners appointed for practical examinations.



#### 4.1 Eligibility for internship

A candidate becomes eligible for internship only after successfully passing all the examinations prescribed by KUHS including internal examinations conducted for subsidiary subjects.

#### 4.2 Details of Internship Training

Every candidate admitted BPT degree course shall undergo 180 days of compulsory rotating internship after passing of the final year examinations. No candidate shall be awarded degree certificate without successfully completing six months of internship.



The internship should be rotated essentially involving posting to Physiotherapy Out-patient department, and Community Physiotherapy. It should cover clinical branches concerned with Physiotherapy such as Orthopaedics and sports, Cardio respiratory, neurology and neurosurgery, paediatrics, general medicine, general surgery, OBG and respective ICU & Prosthetics and orthotics.

#### **4.3 Model of Internship Mark lists**

Marks will be awarded for regularity, punctuality, responsibility, dedication, subject knowledge, assessment and treatment skills, interpersonal relationship, leadership skills and ability to function in a multi specialty team.

#### **4.4 Extension rules**

The interns will be allowed to take leave as per KUHS regulations. However, the candidate should undergo minimum of 180 days of internship. Extension will be applicable for the period of absence.

#### **4.5 Details of training given**

The internship should be rotating, essentially involving posting to departments which refer in and out patients for physiotherapy care. It includes Physiotherapy Out-patient department, Community Physiotherapy, Orthopaedics and sports medicine, rheumatology, cardio respiratory medicine and surgery, various ICU's, neurology and neurosurgery, paediatrics, general medicine, general surgery, OBG, burns and dermatology, geriatrics and prosthetics and orthotics.

The candidate should carry out assessment, treatment planning, and implementation of treatment, reassessment, and follow up. The candidate should also take part in journal presentation, case presentation, and seminars as per the institutional guidelines is mandatory.

For successful completion, the student must maintain a log book. On completion of each posting the same will have to be certified by the faculty in-charge of the posting for both




attendance as well as work done. On completion of all postings, the duly completed log book will be submitted to the Principal / Head of the Institution to be considered as having successfully completed the internship program.

## 5. ANNEXURES

**5.1 Check Lists for Monitoring:** Log Book, Seminar, Assessment etc. to be formulated by the curriculum committee of the concerned Institution

### 5.2 Qualification for Teachers and Examiners in BPT course.

The teachers and examiners should possess qualifications acquired from a University / Institution recognized by K.U.H.S. The teachers should possess post graduate degree from a university recognized by KUHS. To become external/internal examiner a teacher should possess a minimum of three years of post P.G teaching experience in the concerned subject. The following are the faculty qualifications for teaching and becoming and Examiner.



S. No.	Subject	Qualification
01	Anatomy	M D/ M Sc Anatomy/MPT
02	Physiology	M D/M Sc Physiology/MPT
03	Biomechanics & Kinesiology	MPT
04	Psychology	M A Psychology/MPT
05	Sociology	M A Sociology/MPT
06	Pathology	M D Pathology/MPT/MMLT
07	Microbiology	M D/ M Sc Microbiology /MPT
08	Pharmacology	M Pharm / MD Pharmacology /MPT
09	Electrotherapy	MPT

10	Exercise Therapy	MPT
11	General Medicine and general surgery	MD/ MPT
12	Physiotherapy in General Medicine & General Surgery	MPT
13	Cardio respiratory disorders and surgery	DM Cardiology/ DM Pulmonology/ MCh Cardio thoracic Surgery / MPT (Cardio Resp)
14	Cardio respiratory and Intensive care Physiotherapy	MPT (Cardio Resp)
15	Community Medicine	MD (Com Med)/MPT
16	Ethics and Management	MPT
17	Neurology & Neuro surgery	DM Neurology / MCh Neurosurgery / MPT (Neuro)
18	Physiotherapy in Neurology & Neuro surgery	MPT (Neuro)
19	Orthopaedics and Sports Medicine	M S Orthopaedics / D. Ortho / MPT (Ortho & Sports)
20	Orthopaedics and Sports Physiotherapy	MPT (Ortho & Sports)
21	Physiotherapy in Community Health	MPT

### Question Paper setting and evaluation

Question Paper setting and evaluation for all papers in BPT course should be done by concerned subject experts with 3 year post PG experience OR MPT degree holders with minimum 3 years post P.G teaching experience in the concerned subject.