FIRST YEAR

S.No.	code	Subject	Theory			Practical			Total marks
			Exam	I. A.	Total	Practical	I. A.	total	
1	PT1	Anatomy	80	20	100	80	20	100	200
2	PT2	Physiology	80	20	100	80	20	100	200
3	PT3	Biochemistry	80	20	100	-	-	-	100
4	PT4	Fundamentals of Exercise Therapy	80	20	100	80	20	100	200
5	PT5	Fundamentals of Electrotherapy.	80	20	100	80	20	100	200
6	PT6	Introduction to Physiotherapy	-	-	-	-	-	-	-
7	PT7	Seminar/ Presentations	-	-	-	-	-	-	-

Passing Criteria – 50 % of total marks each in theory & practical
Eligibility to appear for University exam – 35 % in Internal Assessment.

First year:

6 hrs. /day X 6 days =36 hrs./ Week X 32 weeks = 1152 hrs. per session

32 library hrs. + teaching hrs. as per syllabus =1152 hrs. per session

S.No.	code	Subject	Hours of Study	Theory	Practical	Weekly
1	PT1	Anatomy	288 hrs	192	96	9
2	PT2	Physiology	288 hrs	192	96	9
3	PT3	Biochemistry	128 hrs	128	-	4
4	PT4	Fundamentals of Exercise Therapy	192 hrs	128	64	6
5	PT5	Fundamentals of Electrotherapy.	192 hrs	128	64	6
6	PT6	Introduction to Physiotherapy	32 hrs	32	-	1
		Total	1120	800	320	36

INTRODUCTION TO PHYSICAL THERAPY

Objective:-

By the end of the 32 hrs. of introduction the candidate will:

1. Acquire the geographical orientation of various concerned sections of the college & the clinical training areas.
2. Get the overall idea about the graduate program & its scope in the professional practice.
3. Learn the bed side manners, general ethical code and discipline of the department.
4. Acquire the skill of history taking in general.
5. Overall idea about the graduate programme and its scope in the professional practice.

SYLLABUS

1. Patterns of Health care delivery:
    a. National trends and resources.
    b. Local trend and resources.
    c. Overview of health science Professions.
    d. Introduction of health care.
2. Components of Physiotherapy Profession :
    a. History of Medical Therapeutics.
    b. Information of Education department, training and course detail.
    c. Information for new student commencing physiotherapy.
    d. Why to select physiotherapy.
3. Role of physiotherapy in meeting healthcare needs in India:
    a. Needs versus demands.
    b. Physiotherapist as 'Educator'.
    c. Educational Resources.
    d. Common Problems and solutions.

CLINICAL OBERSVATION POSTING

Student will be posted in rotation in the following areas/wards. The students will be observing and assisting physiotherapist to provide physiotherapy care for the patients.

1. General Physiotherapy OPD.
2. Orthopaedic Physiotheapy OPD
3. Neuro physiotherapy OPD

HUMAN ANATOMY

Method of assessment: Written, oral, practical.

S.No.		Hours	Weekly	University Exam	Internal Assessment	Minimum Pass Marks	Time
1	Theory	144	4.5	80	20	50	3 hrs
2	Practical/ Laboratory	96	3	80	20	50	
	Seminar	48	1.5				
	Total	288	9	160	40	100	

Passing Criteria – 50 % of total marks each in theory & practical
Eligibility to appear for University exam – 35 % in Internal Assessment.

THEORY- Model question paper— [80 MARKS]

Section A)

M.C.Q.-based on Single best response – [20 x 1] 20marks[20 minutes]

Section B)

S.A.Q.- Q.1) Answer any Five out of Six [3 X 5] 15marks

Based on

a) Upper limb
b) Lower limb
c) Genetics
d) Systems (Urogenital, Digestive, Endocrine)
e) Systems (Urogenital, Digestive, Endocrine)
f) Histology

Q.2) Answer any 3 out of 4 [5 X 3] 15 marks

Based on

a) Respiratory system & Cardiovascular system
b) General Anatomy
c) Head / Face / Neck
d) Brain

Section C)

#-L.A.Q- Q.No.3 - based on Musculo-Skeletal system
Upper limb/Lower limb 15 marks

Q. No.4 - based on Neuro Anatomy 15 marks

OR

Q. No.4 - based on Neuro Anatomy 15 marks

#- Each LAQ should give break up of 15 marks-e.g.-[3 + 5 + 7] etc

Practical 80 Marks
Internal assessment 20 marks
TOTAL-100 Marks

Should include

1. Spots 60 marks (12 x 5)
   Based on
   i. 3 bones
   ii. 3 organs (GIT, RS, CVS, Urogenital)

iii. Head, Face, Neck
iv. Brain, , Soft
v. 1 Superior extremity (Soft part)
vi. 1 Inferior extremity (Soft part)
vii. Radiology & Histology

2. Viva 15 marks –
   i. 8 Soft parts
   ii. 7 Hard parts
3. Journal 05 Marks

INTERNAL ASSESSMENT -

One Terminal & one Prelim having 80 marks each in theory & practical.
I.A. marks out of 20 for theory & 20 for practical.

Student will be eligible to appear for University examination if he/she gets Minimum 35% marks.

Goals:

To provide the student with the necessary anatomical knowledge & skills to practice as a qualified physiotherapist.

Objectives:

1. Understanding of gross anatomy of various body parts.
2. Application of Knowledge of anatomy to learn evaluation and application of physical therapy.
3. MUSCULO- SKELETAL
   a. The student should be able to identify & describe anatomical aspects of muscles, bones & joints & to understand and analyze movements.
   b. To understand the anatomical basis of various clinical conditions e.g. trauma, deformities pertaining to limbs & spine.
   c. To be able to localize various surface landmarks.
   d. To understand & describe the mechanism of posture & gait & the anatomical basis of abnormal gait.
4. NEURO-Anatomy
   a. to identify & describe various parts of C.N.S.-Forebrain, Midbrain, Hind-brain, Brain-stem, courses of cranial nerves; functional components, course distribution, anatomical basis of clinical lesions, Ventricular system and CSF circulation.
   b. to describe the source & course of spinal tracts
   c. to describe blood circulation of C.N.S.& spine
5. THORAX-to identify & describe various components of the contents of the Thorax- with special emphasis to cardio- vascular system & Respiratory system.
6. CIRCULATORY- be able to identify & describe the source & course of major arterial, venous & lymphatic system, with special emphasis to extremities, Spine & Thorax.

SYLLABUS

1. GENERAL ANATOMY:

1.1. Introduction to the subject, Subdivisions of anatomy, Anatomical position, Descriptive terms
1.2. Osteology- Definition of bone, Classification, ossification, epiphysis Functions, Blood supply & applied anatomy
1.3. General Arthrology, Definition, Classification, Body lever system, Applied anatomy.

1.4. General Myology, Definition, Classification- morphological, functional, Innervations, Swing, shunt & spin component of muscles, Applied Anatomy

1.5. Integumentary system, Skin & its appendages, flexion creases, Langer's lines, Superficial and Deep Fascia, Tendons, Ligaments, aponeuroses, bursae:-communicating, non-communicating, adventitious etc.

2. REGIONAL ANATOMY:

2.1. Upper Limb

Bones: Scapula, Clavicle, Humerus, Radius, Ulna, Articulated hand, Fascia, Muscles, Vessels, Nerves, Lymphatics Shoulder region, Axilla, Arm, Cubital fossa, Forearm, Hand, Joints of the upper limb, Applied Anatomy of - Erb's and Klumpke's paralysis, wrist drop, carpal tunnel, claw hand, Winging of scapula.

2.2. Lower Limb:

Bones – Hip,femur, Tibia, Fibula, Patella, Articulated foot, Fascia, Muscles, Vessels, nerves & Lymphatics, Thigh and Gluteal Region, Popliteal Fossa, Leg, Foot, Joints of lower limb, Applied anatomy of- Femoral sheath, femoral canal, Sciatic nerve, Foot drop, varicose veins, Hip joint, Knee joint, arches of Foot.

2.3. Thorax:

Thoracic Wall: Bones: Ribs, Sternum, Thoracic Vertebrae, Joints, Muscles, Nerves, Blood, Vessels, Lymphatics, thoracic cavity, intercostal spaces, Movements of Respiration, Mediastinum-Boundaries & contents, Pleura & Lungs, Pericardium, Heart & Great Vessels, Diaphragm, Azygous vein, Oesophagus, Trachea. Thoracic duct

2.4. Abdomen:

Bones: Lumbar vertebrae, Pelvis (Male & Female), Sacrum, Joints Anterior abdominal wall, Rectus sheath, external genitalia, Inguinal canal. Organs- stomach, small intestine, large intestine, liver, pancreas, spleen, urinary system, reproductive systemmale, female. Perineum: Male, Female, Anatomy of family planning.

2.5. Back:

Vertebral column, Curvatures, Movements, Muscles of Back, Thoracolumbar Fascia, Spinal cord & Meninges – (Tracts, Blood supply), Posture & Gait, line of gravity, centre of gravity. Applied anatomy - abnormal curvatures, P.I.D., lumbar puncture.

2.6. Head, Face & Neck:

Articulated skull & mandible, Cervical vertebrae, Foetal skull, Joints Scalp, Face, Oral Cavity, Tongue & Teeth, Tonsil, Nasal cavity & Paranasal sinuses, Ear. Fascia of neck, muscles of neck, cranial cavity, Dural venous sinuses, meninges, cranial nerves, muscles of mastication. Thyroid ,Parotid, submandibular gland, Larynx, pharynx, palate, Trachea, Oesophagus,

2.7. Brain

Meninges, Cerebrum, Cerebellum, Brainstem, Motor and sensory tracts including optic, Auditory, Gustatory pathways, Ventricular system of brain and CSF, Blood supply. Applied anatomy of – Hemiplegia, Internal capsule, Medial and Lateral medullary syndromes.

3. EMBRYOLOGY:

General : Early embryogenesis, Development of nervous system

4. HISTOLOGY

Microscope

7.1. General Histology

i. Cytology

ii. Basic Tissues :
   1. Epithelia including Glandular epithelium
   2. Connective tissue including cartilage & bone.
   3. Muscular tissue
   4. Nervous tissue

iii. Blood vessels

iv. Lymphoid tissue – Lymph node, spleen, Thymus, Tonsil
v. Skin & its appendages

7.2. Systemic Histology

i. Respiratory system –Trachea, lung.
ii. Nervous system
    1. Spinal cord –
        a. Cervical
        b. Thoracic
        c. Lumbar
    2. Cerebrum, Cerebellum

5. GENETICS

5.1. Introduction to human genetics – mitosis, meiosis ,Mendel's laws,
5.2. Cytogenetics - karyotype , karyotyping , Barr-body.
5.3. Modes of Inheritance – Autosomal dominant and recessive, Y- linked inheritance, Xlinked
5.4. dominant and recessive, pedigree charting
5.5. Medical Genetics: Chromosomal aberrations, -
5.6. Structural: Deletion, duplication, translocation etc.,
5.7. Numerical: Down, Turner, Klinefelter syndromes
5.8. Clinical Genetics: Prenatal diagnosis, Genetic Counselling.

6. RADIOLOGICAL ANATOMY

7.1. Introduction

Principles of Radiography, identification of gross anatomical features in plain radiographs.

7.2. Radiographs of :

i. Upper Limb
Shoulder region
Elbow region
Wrist and hand

ii. Lower Limb
Hip region
Knee region
Ankle region,
Foot

iii. Abdomen
Plain Radiograph, AP, Lat.

iv. Thorax
Plain Radiograph: male, female

v. Head, Face & Neck
Plain Radiograph skull, AP, Lat.
Plain Radiograph Neck, AP, Lat.

7. LIVING ANATOMY

7.1. Upper Limb

i. Bony Landmarks(PALPATION OF): Clavicle; Spine, Inferior angle, Coracoid process of scapula, Epicondyles of humerus, Olecranon process of ulna; Head and styloid processes of radius and ulna, Heads of metacarpals (knuckles), Pisiform, Hook of Hammate
ii. Joints (DEMONSTRATION OF MOVEMENTS): Shoulder girdle, Shoulder joint, Elbow joint, Radio-ulnar joints, Wrist joint, 1st carpo-metacarpal joint, MP and IP joint
iii. Muscles (DEMONSTRATION OF ACTION): Principle of testing: Trapezius, Serratus anterior, Latissimus dorsi, Pectoralis major, Deltoid, Biceps Brachii, Brachioradialis, Brachialis, Extensors at the elbow, Supinators, Wrist extensors, Wrist flexors, Small muscles of the hand
iv. Nerves: Dermatomes. Ulnar nerve thickening in Leprosy

v. Vessels (PALPATION OF): Axillary artery, Brachial artery, Radial artery
vi. Others: Axillary groups of lymph nodes; Anatomical snuff-box (boundaries)

7.2. Lower Limb

i. Bony Landmarks (PALPATION OF): Anterior superior iliac spine, Iliac crest,tubercle of the iliac crest, Ischial tuberosity, Greater trochanter, Adductor tubercle, Head and neck of fibula, Lateral and medial malleoli, Tibial tuberosity, Subcutaneous surface of tibia, Patella
ii. Joints (DEMONSTRATION OF MOVEMENTS): Hip , Knee , Ankle , Subtalar Joints Muscles (DEMONSTRATION OF ACTION): Principles of testing-sartorius, quadriceps femoris, psoas major, Gluteus maximus gluteus medius, hamstring muscles, Gastrocnemius, soleus, popliteus, tibialis-anterior, tibialis posterior, peroneus longus & peroneus brevisTHip-Flexors, Extensors, Abductors, Adductors; Knee - Flexors, Extensors; Ankle - Dorsiflexors, Plantar flexors; Subtalar - Invertors, Evertors
iii. Nerves: Dermatomes, Thickening of common peroneal nerve in Leprosy
iv. Vessels (PALPATION OF): Femoral, Popliteal, Dorsalis pedis, Posterior tibial
v. Others: Ligamentum patellae, Inguinal lymph nodes
vi. Tendons: Semitendinosus, Semimembranosus, Biceps femoris, Iliotibial tract

7.3. Abdomen

i. Bony Landmarks (PALPATION OF): Anterior superior iliac spine, Pubic tubercle
ii. Joints (DEMONSTRATION OF MOVEMENTS): Intervertebral
iii. Nerves: Dermatomes

7.4. Thorax

i. Bony Landmarks (PALPATION OF): Sternal angle, Counting of ribs, Inter costal spaces, locating thoracic spines
ii. Joints (DEMONSTRATION OF MOVEMENTS): Intervertebral
iii. Others: Apex beat, Apices of the lungs, Triangle of auscultation

7.5. Head, Face, Neck

i. Bony Landmarks (PALPATION OF): Nasion, Glabella, Inion, Mastoid process, Suprameatal triangle, Zygoma, Zygomatic arch, Angle of mandible, Head of mandible, Symphysis menti, Hyoid bone, Thyroid cartilage, Cricoid cartilage, Tracheal rings, Suprasternal notch, Transverse process of atlas, Spine of C7
ii. Joints (DEMONSTRATION OF MOVEMENTS): Temporomandibular joint, Atlantooccipital joint, Cervical joints
iii. Muscles (DEMONSTRATION OF ACTION): Of Mastication, Face, Sternocleidomastoid, Neck flexors and extensors
iv. Cranial nerves : testing of oculomotor, trochlear, trigeminal, abducent, facial, glossopharyngeal, accessory, hypoglossal.
v. Others: Thyroid gland, Cervical lymph nodes, (Horizontal and vertical), Midline structures in the neck.

Textbooks:

Gross Anatomy (Any One):

1) Human anatomy for physiotherapy students by I.B. Singh.
2) Human Anatomy B.D. Chaurasia Vol. I, II, III

General Anatomy (Any One):

1) Essentials of General Anatomy by Sushil Kumar
2) Handbook of General Anatomy by B.D. Chaurasia 3rd ed. CBS publishers & Distributors, 1996.
3) Principles of General Anatomy by A.K. Datta 5th ed. Current books International, 2000

Microanatomy (Any One):

1) Text book of Human Histology with colour Atlas. Inderbir Singh 4th ed. Jaypee, 2002.

2) Histology by Krishna Garg

Neuroanatomy:
1) Text book of Human Neuroanatomy by Inderbir Singh 6th ed. Jaypee, 2002.
2) Clinical Neuroanatomy for medical students by Vishram Singh Genetics (Any One)

Genetics:
1) Essentials of Human Embryology by Bhatnagar, Kothari, Mehta, 5th ed. Orient Longman Ltd. 1999
2) Human Genetics by S.D. Gangane, 2nd ed. Elsevier, 2000

SAQ's:
SAQs in Anatomy – V.G. Sawant , 2nd Edition, Jaypee brothers.

Reference Books:
Gross Anatomy:
1) Clinical Anatomy for students by Neeta Kulkarni.
2) Clinically oriented Anatomy by K.L.Moore 4th ed. LWW. 1999
3) Clinical Anatomy for Medical students by Richard Snell, 7th ed. LWW, 2003
4) Gray's Anatomy by Williams, 39th ed. IA Elsevier, 2005

Microanatomy:
1) Di Fiore's Atlas of Human Histology with functional correlation Victor P. Croschenko 9th ed. LWWR, 2000

Neuroanatomy
1) Clinical Neuroanatomy for Medical students by Richard Snell 5th ed. LWWW,2001

M.C.Q's:
1) Prevalidated MCQs in Anatomy along with practice sheets, Bhuiyan, Rajgopal, Shyam Kishore Bhalani Medical Book House, 2001
2) J.S.P. Lumbley et al – M.C.Q.'s in Anatomy

Medical Dictionary:
1) Dorland's illustrated medical dictionary, 29th ed. Elsevier 2001.
2) Understanding Anatomical Terms by Mehta, Natarajan, Kothari. Bhalani Medical Book House, 2nd ed. 2004

HUMAN PHYSIOLOGY

Method of assessment: Written, oral, practical.

S.No.		Hours	Weekly	University Exam	Internal Assessment	Minimum Pass Marks	Time
1	Theory	144	4.5	80	20	50	3 hrs
2	Practical/ Laboratory	96	3	80	20	50	
	Seminar	48	1.5				
	Total	288	9	160	40	100	

Passing Criteria – 50 % of total marks each in theory & practical
Eligibility to appear for University exam – 35 % in Internal Assessment.

THEORY- Model question paper— [80 MARKS]

Section-A

MCQ.Q-1] Based on single Best answer [20 x 1] 20 marks(20 minutes)

Section-B

SAQ-Q-2] Answer any Five out of Six [5 X 3] 15 marks

Should include : General physiology, Blood, G.I. system, Endocrine system, Excretory system, Temperature regulation, Reproductive system, Special senses [eye/ear/ skin], Nervous system

Q-3] Answer any Three out of four [3 X 5] 15 marks

Should include

1. Cardio- vascular system
2. Respiratory system
3. Exercise Physiology
4. Nerve / Muscle

Section-C

L.A.Q. [LAQ May be given break up of 15 marks]

Q-4] based on Nerve / Muscle 15 marks

Q-5] based on Nervous system 15 marks

OR

Q-6] based on CVS / Respiratory system 15marks

Practical-: 80 Marks

Internal Assessment 20 Marks

Total : 100 Marks.

I. Spots-based on 1 to 8 mentioned in practical syllabus [3x5] 15 marks
II. Viva- based on 1 to 8 mentioned in practical syllabus 20 marks
III. Clinical Physiology based on CVS, Respiratory system, Nervous system, Abdomen [4x10] 40 marks
IV. Journal 05 marks

INTERNAL ASSESSMENT (I.A.)

One Terminal & one Prelim having 80 marks each in theory & practical. I.A. marks out of 20 for theory & 20 for practical.

Student will be eligible to appear for University examination if he/ she gets minimum 35% marks.

Goals:

To provide the student with the necessary Physiology knowledge of normal human physiology of various body systems and understand the alternation in disease and practice of physiotherapy as applicable for each systemic disorder & skills to practice as a qualified physiotherapist.

Objectives:

At the end of the course, the candidate will-

1. Acquire the knowledge of the relative contribution of each organ system in maintenance of the milieu interior [Homeostasis]
2. Be able to describe physiological functions of various systems with special reference to Musculoskeletal, Neuro-motor, Cardio-respiratory, Female urino-genital function, & Alterations in function with aging
3. Analyse physiological responses & adaptation to environmental stresses-with special emphasis on physical activity, temperature
4. Acquire the skill of basic clinical examination, with special emphasis to Peripheral & Central Nervous system, Cardiovascular & Respiratory system, & Exercise tolerance/Ergography.

Syllabus

1. **GENERAL PHYSIOLOGY:**
   Introduction to the subject, cell physiology, cell structures, functions and homeostasis, cell membrane permeability and transport mechanisms, bio electric potentials.
2. **Muscle and NERVE:**
   a. General Introduction types of response by living organism essentials of a system, to produce movements, structure of neurons neuromuscular junction and synapse.
   b. Electrophysiology of nerve and muscle, generation, conduction and transmission of nerve impulse.
   c. Classification of nerve fibers.
   d. Properties of nerve fibers, strength duration curve, accommodation.
   e. Structure and properties of different types of muscle.
   f. Physiology of neuromuscular transmission, site and mode of action of blocking substance of neuromuscular transmission, excitation-contraction coupling and molecular basis of muscle contraction, mechanisms of muscle contraction twitch summation, length tension relationships –isotonic and isometric contraction factors affection muscle tension energetic of muscle contraction,
   g. Degeneration and regeneration of nerve, lower motor neuron and its lesions, nutrition of muscle and effect of training electromyography, path physiology paralysis, paresis, peripheral neuritis, deficits of neuromuscular transmission.
3. **Blood**
   a. Composition and function of blood plasma proteins.
   b. Red blood cell – site of production, function, composition, count and variation.
   c. WBC: classification, morphology, functions, count, its variation of each. Immunity.
   d. Platelets: Morphology, functions, count, its variations
   e. Erythropoiesis and regulation physiological and pathological variations, retuculo endothelial system (in Brief), Anemia, jaundice, blood indices, PVC, ESR.
   f. Haemoglobin function abnormal haemoglobin, haemolysis and jaundice, leucocytes, functions and leucopoiesis platelets role in haemostasis, coagulation of blood, anticoagulants and fibrinolysis system, bleeding disorders, thrombosis.
   g. Inflammation, Lymphocytes and cellular immunity.
   h. Blood groups : landsteiner's law, types significance, determination. Erythroblastosis foetalis.

i. Blood transfusion: Cross matching, indications and complications,
j. blood volume and methods of measurement.
k. Lymph: composition, formation, circulation and functions.

4. Nervous system

a. General

i. Functional organization of nervous system, encephalizaion and role in homeostasis.
ii. CSF site and mechanism of formation, circulation, functions and blood brain barriers- clinical significance.
iii. Synapse-properties, neuro-transmitters, pre and post synaptic events.

b. Sensory

i. Receptors, definition, classification, transducer action, generator potentials, properties, stimulus and strength relationship, modality of sensations and classification of sensations.
ii. Specific sensations, sensory and other ascending pathways, somesthetic sensations, proprioception's and kinesthesia, path physiology of pain and headache.
iii. Thalamus-organization, connections, role in sensory functions, motor co-ordinations, autonomic and emotional behaviour, sleep consciousness and thalamic syndrome.
iv. Cerebral cortex-sensory and motor organization, somatotopic representation, tactile localization and discrimination, stereognosis.

c. Motor

i. Functional organization of motor system reflex action properties and their significance, stretch reflex, muscle spindle role of gama motor neuron static and dynamic responses, polysynaptic reflexes reciprocal innervations crossed extensor reflex, positive and negative supporting reaction, cortical motor areas pyramidal and extra pyramidal systems.
ii. Reticular formation organization ascending and descending components.
iii. Basal ganglia organization, circuits functions and disorders role of bio-amines.
iv. Regulation of tone and posture- postural reflexes spinal decerbrate thalamic and decorticate preparations.
v. Cerebellum- functional anatomy, functions and pathology of sensory motor mechanism spinal cord lesions transaction, hemi-section, upper motor neuron lesion posterior column defects.
vi. Hypothalamus- functional anatomy, connections and functions role in homeostasis, limbic system- components role in visceral, somatic and endocrinal activities, preservation of self and species and psychosomatic implications.

d. Higher Nervous function

i. Conditions reflex properties neural basis, relation to learning memory and habit formations learning and memory higher intellectual functions, communication and speech and disorders.
ii. Electroencephalogram- neurophysiologic basis relation to sleep and wakefulness and clinical applications.
iii. Eye-functional anatomy, intra-ocular fluid pressure and clinical significance of vision, schematic eye, accommodation, errors of refraction and aberrations. Photoreceptor mechanisms, theories of vision, dark and light adaptions and colour vision, visual pathways, central mechanism of vision and visual reflexes, field of vision, lesions of optic pathways.

iv. Ear-Central functional anatomy, sound wave characteristics, transmission of sound attenuation reflex physiology of internal ear, organ of corti, analysis of pitch and loudness cochlear micro phonics, auditory pathways, central mechanism of hearing, auditory cortex, hearing defects, vestibular apparatus, clinical significance nystagmus, motion sickness, physiology- taste and smell.

e. Autonomic nervous system

i. Sympathetic and parasympathetic Nervous system.
ii. Transmission at ganglia and postganglionic terminals and autonomic reflexes.

5. Respiratory system

a. Introduction, functional anatomy, functions respiratory and non respiratory.
b. Mechanics of respiration inspiration expiration inter-alveolar and intra-pleural pressures, pneumo-thorax, pulmonary ventilation, airways resistance, compliance work of breathing.
c. Lung volumes and capacities, gas law partial pressures, gas tension, alveolar ventilation, composition of inspired alveolar and expired gases.
d. Dead space of anatomical and physiological perfusion-ventilation relationship and diffusion capacities, oxygen transport and oxygen dissociation curve, carbon dioxide transport and factors affecting control of respiration, organization of respiratory centres, neural regulation.
e. Control of respiration chemical apnoea, hypoxia, asphyxia, hyperpnoea, cheyne stokes breathing hypercapnia, hypocapnia, respiratory failure, dyspnoea and cyanosis.

6. Cardiovascular system

a. Properties of cardiac muscles, functional tissues, effects of ions on cardiac muscle origin and spread of cardiac impulse resting membrane potential pace maker potential and action potential.
b. Electrocardiography.
c. Cardiac cycle and pressure, Volume changes heart sounds, pulse arterial and venous relationships with cardiac cycle cardiac output determination, regulation, heart rate, its regulation.
d. Haemodynamics.
e. Blood pressure, measurement, regulation short term, intermediate and long term regulatory mechanisms, venous circulation flow, pressure and factor affecting venous circulation, central venous mechanisms, venous circulation flow, pressure, factor affecting, central venous pressure, microcirculation, coronary circulation and pathophysiological considerations, regional circulation- pulmonary cerebral, fetal, placental, shock, syncope, heart failure, hypertension and hypotension.
f. Physiology of exercise, the lymphatic system interstitial fluid dynamics and edema.

7. Gastrointestinal system

a. Introduction, functional anatomy, mastication and swallowing, Physiology of gastro-intestinal secretions in general, functions and regulation of gastric, Pancreatic, intestinal and bile secretions, movement of alimentary canal, gastric emptying and intestinal movements.
b. Defecation assessment of functions, gastric, pancreatic and intestinal juice, vomiting peptic ulces, dumping syndrome, diarrhoea and constipation.

8. Kidney and body fluids

a. Introduction, functional anatomy and functions in general including non-excretory function.

b. Glomelular functions, filtration and its regulation, function of renal tubule, reabsorption, secretions, renal clearance, transport mechanism, role of kidney in fluid balance electrolytes and non electrolytes ph and osmolarity, physiology of micturition, renal function tests, body fluid distribution, volume and regulation, path physiology of kidney-renal failure, artificial kidney diruetics.

9. Endocrinology

a. Introduction, hormone- definition.
b. Method of study.
c. Role of endocrine system in homeostasis hypothalamic hypophyseal axis, target tissue-negative and positive feed back control system, influence of external environments on the endocrine system, physiology of pituitary gland, adenohypophysis, neurohypophysis, physiology of thyroid gland, thyroid function tests, physiology of adrenal gland, adrenal cortex function and function tests, adrenal medullary hormone, functions parathyroid regulation, hypo and hyperactive parathyroid states, pancreas-insulin, glycogen, somatostain(physiological aspects) pineal gland, Thymus, local hormones prostaglandin.

10. Reproduction

a. Introduction, an overview of preservation of species as against preservation of self, puberty , sex drive, menopause, cyclic activities in females, spermatogenesis, ovulation, fertilization, implantation, pregnancy, lactation, parental behaviour.
b. Reproduction in males, testis structure spermatogenesis, seminal fluid, ejaculation, testicular hormones- functions and regulation, hyper and hypoactive states of male gonad.
c. Ovarian function- structure, congenesis follicular growth, ovulation function of corpus lutem, female sex hormone, function and regulation, menstrual cycle, neurohormal basis, hypothalamic hypophyseal, gonodal axis changes accessory organs effect on behaviour.
d. Fertilization, implantation, functions of placenta, physiology of pregnancy and parturition, changes in reproductive organs and different systems of the body.
e. Physiology of lactation, mammogenesis, galactopoiesis, secretion and ejection of milk, lactation, amenorrhea, fetal and placental circulation.

11. Skin

a. Structure, Blood circulation, functions, temperature regulation physical.

12. Environmental physiology

a. Attitude, space and under water physiology.

13. Applied physiology

a. Effects of heat and cold(localized and generalized).
b. Effects of electrical stimulation on skin, muscle and nerves, effects of mechanical pressure.
c. Effect of local and general exercise, compensation and training in nervous system.
d. Effects of various sensory proprioceptive stimuli etc.

PRACTICAL

1] **Hematology-[demonstration only]** 10 hrs

RBC Count, WBC Count, Differential Count, Bleeding & Clotting Time, Hb Estimation, ABO & Rh Blood Group, PCV, ESR, Calculation of blood indices.

2] Graphs 8 hrs

i] skeletal muscle-properties

ii] Cardiac muscle- properties, effect of ACh & Adrenaline.

3] Physical fitness 6 hrs

i] breath holding

ii] mercury column test ;

iii] cardiac efficiency test-Harvard, step test- Master step test
iv] Examination of CVS, Respiratory system, Sensory system,Motor system , Reflexes, Cranial nervers, BP, Pulse

4] Blood pressure–effects of change in posture & exercise 6 hrs

5] Stethography 2 hrs

i] effect of deglutination;
ii] voluntary hyperventilation

6] Spirometry 2 hrs

i] Lung volumes
ii] timed vital capacity

7] Mosso`s finger ergography 2 hrs

8] Perimetry 2 hrs

9] Clinical examination 22 hrs

respi/cvs/higher functions /memory/time /orientation/reflexes/motor & sensory system/abdomen, Cranial nerves

TEXT BOOKS

1. Course in Medical Physiology—Vol-I & II-by Dr Chaudhari
2. Medical Physiology by Dr. Bijlani
3. Text book on Medical Physiology-By Guyton

REFERENCE BOOKS

1. Prep Manual for undergraduate physiology by Dr. Vijaya Joshi
2. Practical Physiology by Dr. Vijaya Joshi & Dr. S.D. Joshi

CLINICAL BIOCHEMISTRY

Method of assessment: Written, oral, practical.

S.No.		Hours	Weekly	University Exam	Internal Assment	Minimum Pass Marks	Time
1	Theory	140	4	80	20	50	3 hrs
	Seminar	30	1				
	Total	250	8	160	40	100	

Passing Criteria – 50 % of total marks each in theory & practical
Eligibility to appear for University exam – 35 % in Internal Assessment.

THEORY- Model question paper— [80 MARKS]

Section-A

MCQ - Q-1] Single best answer [20 x 1] 20 marks

Section-B

SAQ - Q-2] To attempt any FIVE out of Six answers- [5 x 3] 15 marks
Based on cell, Carbohydrates, lipids, proteins, Nucleic acid, Biophysics, isotopes

SAQ- Q-3] To attempt any THREE out of Four answers- [3 x 5] 15 marks
Based on metabolism of carbohydrate, lipid, protein & Mineral.

Section-C

L.A.Q. [LAQ May be given break up of 15 marks]

Q-4] based on connective tissue, Nerve Tissue, biological oxidation & Bioenergetics 15 marks

Q-5] based on Investigation, water & electrolytes 15 marks

OR

Q-6] based on Nutrition, vitamins, enzymes 15marks

INTERNAL ASSESSMENT

One Terminal & one Prelim having 40 marks each in theory. I.A. marks out of 10 for theory.
Student will be eligible to appear for University examination if he/ she gets minimum 35% marks.

Goals:

To provide the student with the necessary Biochemistry knowledge to understand biochemical basis of life sciences & skills to practice as a qualified physiotherapist.

Objectives:

At the end of the course, the candidate will-

1. be able to describe structures & functions of cell in brief.
2. be able to describe normal functions of different components of food, Enzymes
3. define Basal metabolic rate & factors affecting the same [in brief], with special reference to obesity

4. be able to discuss nutritional aspects of carbohydrates, lipids, proteins & vitamins & their metabolism with special reference to obesity
5. define enzymes, discuss in brief, factors affecting enzyme activity
6. Interpretation of common clinical biochemical investigations.
7. describe in details biochemical aspects of muscle contraction.

SYLLABUS

1. **Cell:**
   Structure and function of Cell & sub-cellular organelles, biochemical characteristics of living mater, physiochemical phenomena and their significance[osmosis, Diffusion, Donnam Membrane equilibrium], structure organization of plasma membrane and transport system.
2. **Carbohydrates:**
   Definition sources, functions, classifications, Mono saccharides, Disaccharides, Polysaccharides, Muco-polysaccharides and its importance.
3. **Lipids:**
   Chemistry, Definition sources, functions, classifications, Simple lipids, compound Lipids, Derived Lipids, Saturated and unsaturated fatty acid & their Importance, Blood Lipids and their implications, cholesterol and its importance.
4. **Proteins:**
   Chemistry- Definition sources, functions, classifications, Structure, amino acid, simple protein, conjugated proteins and derived proteins, properties and reaction of proteins, effect of temperatureon proteins, denaturation, coagulation, isoelectric pH & its importance.
5. **Nucleic Acids:**
   Structure and functions of DNA & RNA, Nuceosides, Nucleotide, genetic code Biologically important Nucliotides, catabolism of purine-Gout.
6. **Enzymes:**
   Chemistry, Defination Classification & Mechanism of action , factors affecting enzyme activity, co-enzymes and isoenzymes with their significance, inhibition & Types of inhibitors, clinical and therapeutic use of enzymes.
7. **Vitamins:**
   Definition, Classification, Fat soluble vitamins 'A', 'D','E','K', water soluble vitamins- B complex and vitamin 'C' Daily requirement, Physiological functions(absorption and transport) and diseases of vitamins deficiency & toxicity.
8. **Biological oxidation & Bioenergetics:**
   Concepts of free energy change, Exergonic and endergonic reactions, Biological oxidation, Electron transport chin, oxidative phosphorylation, inhibitors and un-couplers of electron transport chain & oxidative phosphorylation.
9. **Carbohydrate Metabolism:**
   Carbohydrate metabolic pathways such as Glycolysis, Glyconeogenesis, TCA Cycle, HMP shunt pathway, Glucuronic acid pathway and Glycogen metabolism with their physiological importance, inter-conversion of different sugars, Metabolic integration, Regulation of blood glucose level, hormonal regulation of blood sugar, metabolic disorder of glycogen, lactose intolerance, DM.
10. **Metabolism of Lipids and Lipoproteins:**
    Beta-oxidation of fatty acids and its energetics, ketone bodies formation & Utilization, Functions of Lipo-proteins, Classification & Sources, Fatty acid oxidation, fatty acid synthesis, Metabolism of cholestro-ketone bodies, atherosclerosis and obesity, liver and lipo tropic factors, Fate of Acetyl-CoA(in brief), fate of Glycerol(in brief).
11. **Protein Metabolism:**
    Transamination, Transmethylation, Deamination, Fate of ammonia, Urea synthesis(urea Cycle) and synthesis of creatinine, inborn errors of metabolism.

12. **Water and Electrolyte metabolism:**
    Acid base balance, water- Electrolyte balance & imbalance, Fluid compartments, daily intake and output, dehydration sodium and potassium metabolism.
13. **Mineral Metabolism:**
    Iron, calcium, phosphorus, fluoride, zinc, copper, selenium, iodine-Sources, RDA, absorbtion, transport, excretion, function & disorder.
14. **Nutrition:**
    Importance of Nutrition, calorimetry, Respiratory quotient & significance, Energy requirement with reference to age, gender, thermogenesis, specific dynamic action of foods, Nutritional aspects of carbohydrates, fats and proteins, balanced diet, role of fibers in diet, nitrogen balance and its significance, deficiency disorder(Protein energy malnutrition), metabolism in exercise and injury, diet of chronically ill and terminally ill patients.
15. **Connective Tissue:**
    Mucopolysacchrides, connective tissue proeins, formation of collagen, glycoproteins, chemistry and metabolis of bone and teeth, metabolism of skin.
16. **Nerve Tissue:**
    Composition, metabolism, chemical mediators of nerve activities.
17. **Muscle Tissue:**
    Structure Metabolism of muscle, muscle contraction,biochemical events during contraction, Energy metabolism in skeletal & Cardiac Muscle.
18. **Isotopes:**
    Isotopes and their role in diagnosis and treatment of disease.
19. **Bio-Physics:**
    Concepts of PH and Buffers, Acid Base equilibrium, osmotic pressure and its physiological applications.
20. **Investigations:**
    Interpretation of common clinical biochemical investigations, sugar, urea, creatinine, proteins, bilirubin, cholesterol(HDL,LDL,VLDL), lipid profile- Tri-glyceride, Enzymes- Amylase, CPK, LDH and iso-enzymes, liver function test and renal function test, Relevance of blood levels of Ca, Phosphorous, uric acid, urea & Glucose.

TEXTBOOKS

1. Biochemistry-by Dr. Deb Jyoti Das,
2. Biochemistry-by-Dr Satyanarayan
3. Text book of Biochemistry for Medical students by-Dr Vasudevan/ Shri kumar.

REFERENCE BOOK

1. Review of Biochemistry [24th edition] by Harpar

FUNDAMENTALS OF EXERCISE THERAPY

Method of assessment: Written, oral, practical.

S.No.		Hours	Weekly	University Exam	Internal Assment	Minimum Pass Marks	Time
1	Theory	140	4	80	20	50	3 hrs
2	Practical/ Laboratory	60	3	80	20	50	
	Seminar	30	1				
	Total	250	8	160	40	100	

Passing Criteria – 50 % of total marks each in theory & practical
Eligibility to appear for University exam – 35 % in Internal Assessment.

THEORY- Model question paper— [80 MARKS]

Section-A

MCQ-Q-1]-based on -Single best answer [20 x 1] 20marks (20 Min.)

Section-B

SAQ- Q-2]-Answer any 5 out of 6— [5 x 3] 15 marks

Q-3]-Answer any 3 out of 4 - [3 x 5] 15 marks

Section-C

L.A.Q. [LAQ May be given break up of 15 marks]

Q-4][compulsory]—based on Biomechanics 15 marks

Q-5] based on any other topic 15 marks

OR

Q-6] based on any other topic 15 marks

Practical-: 80 Marks

Internal Assessment 20 Marks

Total : 100 Marks.

I. Long case-based on Massage / Goniometry/ Suspension Therapy 35 marks.
   a. Cognitive-Bio-physics, Biomechanical principles, Indications, Contra-indications, Documentation of findings etc 20 marks.
   b. Psychomotor & affective-skills 15 marks.
II. Short Case – Any one of the following 20 marks
   a. Passive movements / Relaxation /Limb length/ Girth Measurement/Yoga posture / General fitness/Group Exercises/ Blood Pressure, Pulse Rate / Chest Expansion, Respiratory rate /Sensation /Reflex Testing /Starting OR Derived position
   b. Spots-Based on Therpeutic Gymnasium [Four] [5x4] 20 marks
III. Journal 05 marks

INTERNAL ASSESSMENT (I.A.)

One Terminal & one Prelim having 80 marks each in theory & practical. I.A. marks out of 20 for theory & 20 for practical.

Student will be eligible to appear for University examination if he/ she gets minimum 35% marks.

Goals:

To provide the student with the Knowledge & skills of Exercise therapy. Principles, techniques and effects of exercise as a therapeutic modality in the restoration of physical function. & skills to practice as a qualified physiotherapist.

Objectives:

At the end of the course, the candidate will-

1. Define the various terms used in Mechanics, Biomechanics & Kinesiology, Recall the basic principles of Physics related to mechanics of movement/ motion.
2. Describe & acquire the skill of use of various tools of the Therapeutic gymnasium.
3. Acquire knowledge of Movements – Classification, Principles, Techniques & Uses.
4. Acquire knowledge of different starting & derived positions.
5. Acquire the skill of application of various massage manipulations & Describe Principles, Physiological effects, Therapeutic use, Merits & Demerits.
6. Acquire skill of assessment -Sensations, Superficial & Deep Reflexes, Pulse rate/ Heart rate, Blood Pressure, Chest Expansion, Respiratory Rate, Limb Length & Girth Measurement on Models.
7. Acquire knowledge & skill of Relaxation.
8. Describe the skill & significance of Group & Recreational Exercises & their Advantages & Disadvantages.
9. Be able to describe Principles of Yoga, its types, its physiological & psychosomatic effects & demonstrate standard yoga postures used by the beginners.
10. Be able to demonstrate General Fitness exercises & understand principles of General Fitness.

SYLLABUS

1. **GENERAL BIOMECHANICS:**
    a. Force- Definition, analysis of force, composition of force, parallelogram of force, with example and practical application from the human body.
    b. Mechanics of Position-Gravity, Center of Gravity, Line of Gravity, Base, Equilibrium, Fixation & Stabilisation.
    c. Mechanics of Movement- Axes(Sagittal, Frontal, Transverse, Vertical) & planes(Sagittal, Frontal, horizontal), Speed, velocity, work, Mechanical Advantage, energy, Power, Acceleration, Momentum, Inertia & Friction.
    d. Simple machines
        i. Levers- Types & Uses, Angle of Pull, examples and applications from the human body.
        ii. Pulleys- Types(Fixed, Movable) & Uses
        iii. Pendulum.
        iv. Elasticity- Spring(series, Parallel),[Hooks Law].
    e. Types of Muscle work.
2. **STARTING AND DERIVED POSITIONS:**
   Description of fundamental starting position & Derived Positions, Muscle work, stability, joint position, Effects & Uses.
3. **MOVEMENT**
   Definition, Classification, principle, techniques of application, indication, contraindication, effects and uses.
4. **RANGE OF MOTION:**
   Goniometry- Principle, Technique, Uses & Types of Goniometer, application of Goniometry, testing position, procedure and measurement of ROMof Joint of Upper limb, Lower Limb and trunk.
5. **LIMB LENGTH MEASUREMENT:**
   (Only lower limb- apparent, true, supra-trochanteric) & Girth Measurement.

6. **ASSESSMENT**
   Sensation,Reflexes, BP, Pulse Rate, Respiratory Rate, Chest Expansion.
7. **RELAXATION**
   Definition, muscle fatigue, muscle spasm and tension (mental& Physical).
   Factors contributing to fatigue and tension.
   Techniques of relaxation(Local & General).
   Effect Uses & Clinical application.
   Indication & Contraindication.
8. **MASSAGE MANIPULATIONS**
   Historical background,
   Principles.
   Classification.
   Effects physiological and clinical on circulatory, nervous, musculoskeletal, excretory, respiratory & integumentary system and metabolism.
   Merit, Demerit.
   Indications & Contraindications.
   Skill on extremities, scalp, spine, abdomen, face.
9. **THERAPEUTIC GYMNASIUM**
   Setup of gymnasium & its importance.
   Various equipment in the gymnasium.
   Operation skills effects and uses of each equipment.
10. **SUSPENSION THERAPY**
    Principles, Types, Technique & Uses.
    Uses of accessories such as pulleys, springs, shoulder wheel, finger ladder, therapeutic ball, parallel bars, wall bar etc with applied biomechanical principles.
11. **Hydrotherapy**
    Principles, Description of tank, Application, effects, Indications & Contraindications.
12. **GENERAL FITNESS EXERCISES**
    Principles & Techniques
    Warm-up - Stretching - mobility – strengthening – cool down
13. **GROUP EXERCISES & RECREATIONAL ACTIVITIES**
    Principles, Merits & Demerits.
14. **YOGA**
    Principles of Yoga, basic yogic postures & their physiological Effects
    a. In Standing Position
        i. Padahastasana /Padangusthanasana
        ii. Trikonasana
        iii. Utkatasana
        iv. Tadasana
    b. In Sitting Position
        i. Padmasana /Siddhasana/Sukhasana
        ii. Paschimottanasana
        iii. Yogamudrasana
        iv. Virasana,
        v. Vajrasana
        vi. Gomukhasana
    c. In Supine Lying Position
        i. Ardha Halasana / Halasana
        ii. Setu bandhasana
        iii. Pavan-muktasana
        iv. Sarvangasana

v. Shavasana

d. In Prone Position
   i. Bhujangasana
   ii. Ardha- Shalabhasana / Shalabhasana
   iii. Dhanurasana
   iv. Naukasana.

PRACTICAL

Skills included in Serial no 2 to 14 above to be practiced on self and models.

TEXT BOOKS

1. Principles of Exercise Therapy–Dena Gardiner
2. Massage- Holley & Cook
3. Practical Exercise Therapy—Margaret Hollis
4. Measurement of Joint Motion: A Guide to Goniometry--Cynthia Norkins
5. Measurement of physical function - Cynthia Norkins

REFERENCE BOOKS

1. Therapeutic Exercise Foundations and techniques—Carolyn Kisner & Kolby ; F.A. Davis.
2. Physiotherapy in Orthopaedic conditions-by Jayant Joshi [for the study of Basic Yogic postures]
3. Yoga for Health & Peace- S. Nimbalkar
4. Massage for Therapists – M. Hollis
5. Hydrotherapy, principles ad practice – Champion- Butterworth Heinmann.

FUNDAMENTALS OF ELECTRO THERAPY

Method of assessment: Written, oral, practical.

S.No.		Hours	Weekly	University Exam	Internal Assment	Minimum Pass Marks	Time
1	Theory	140	4	80	20	50	3 hrs
2	Practical/ Laboratory	60	3	80	20	50	
	Seminar	30	1				
	Total	250	8	160	40	100	

Passing Criteria – 50 % of total marks each in theory & practical
Eligibility to appear for University exam – 35 % in Internal Assessment.

THEORY- Model question paper— [80 MARKS]

Section-A

MCQ-Q-1]-based on -Single best answer [20 x 1] 20marks (20 Min.)

Section-B

SAQ- Q-2]-Answer any 5 out of 6— [5 x 3] 15 marks

Q-3]-Answer any 3 out of 4 - [3 x 5] 15 marks

Section-C

L.A.Q. [LAQ May be given break up of 15 marks]

Q-4][compulsory]— based on superficial Thermal agents/ Cryotherapy 15 marks

Q-5] based on Medical Electronics. 15 marks

OR

Q-6] based on Low / Medium / High Frequency Current. 15 marks

Practical-: 80 Marks

Internal Assessment 20 Marks

Total : 100 Marks.

I. Long case-based on superficial thermal agent / Cryotherapy. 35 marks.
   a. [Cognitive–Medical electronics, Physiological /Biophysical principles, Therapeutic effects, Indications & Contraindications] 20 marks.
   b. Psychomotor & affective-skills 15 marks.

II. Short Case – Any one of the following 20 marks.
   a. Spots [Six] –5 Minutes per Spot-Identification of Electronic Equipment/ Component & Panel Diagram of any Two Equipments [5 x 6] 30 marks.
   b. Testing of Equipment — SWD / Ultra Sonic / IFT / Stimulator,TENS Machine [10 minutes] 10 marks.

III. Journal 05 marks

INTERNAL ASSESSMENT (I.A.)

One Terminal & one Prelim having 80 marks each in theory & practical. I.A. marks out of 20 for theory & 20 for practical.

Student will be eligible to appear for University examination if he/ she gets minimum 35% marks.

Goals:

To provide the student with the Knowledge & skills of Exercise therapy. Principles, techniques and effects of exercise as a therapeutic modality in the restoration of physical function. & skills to practice as a qualified physiotherapist.

Objectives:

At the end of the course, the candidate will-

1. Understand the physics, principles & Laws of Electricity & Electro-magnetic spectrum
2. Describe in brief, certain common electrical components such as transistors, valves, capacitors, transformers etc & the simple instruments used to test /calibrate these components such as potentiometer, oscilloscope etc of the circuitry, & will be able to identify such components.
3. Describe the mains electrical supply, Electric shock & precautions, Basic electrical components & their functions .
4. Enumerate types of currents & describe production of High Frequency, Medium Frequency & Low Frequency electrical currents. Describe the panel diagrams of the machines.
5. Describe & identify various types of electrodes used in therapeutics, describe electrical skin resistance & significance of various media used to reduce skin resistance.
6. Acquire knowledge of various superficial thermal agents, their physiological & therapeutic effects, Merits & Demerits & acquire the skill of application.
7. Acquire knowledge of Cold Therapy, its physiological & therapeutic effects, Merits & Demerits & acquire the skill of application.
8. Describe effects of environmental & man-made electro- magnetic field at the cellular level & risk factors on prolonged exposure.

SYLLABUS

1. **Physics and Basic Electrical Components:**
    a. Conductors & Insulators,
    b. Static Electricity- Electric Field, Potential Difference and capacitance, factors affecting PD & Capacitance.
    c. Current electricity- EMF, Ohm's law, its application ot AC& DC currents and uses of Ohm law in Physiotherapy.
    d. Rheostat- Types, potentiometer, Ammeter, Oscilloscope, Transformer- Types, Capacitor, Inductor, Thermionic Valves, Transistors, Pulse Generator- Astable Multivibrator.
    e. Main Supply- Fuse, Plug, Switch, wiring of the house, Dynamo, earthing, safety devices;
    f. Dangers of AC & DC :
        i. Short circuits, electric shock, safety, precautions and first aid and initial management of electric shocks.
        ii. Shock- Types, Effects, Precautions & Treatment.
        iii. Electric & chemical burn and their prevention and management.
    g. Resistance & intensity.
    h. Emf : production of an EMF by chemical actions, examples and uses in physiotherapy.
2. **Cellular Biophysics:**
    I. Electricity and its units.
    II. Electron Theory.
    III. Flow of Current/ Heat (Fluid Mossaic Model).
    IV. Polar and chemical effect of Electric currents with examples in physiotherapy.
    V. Ionization: Theory of Ionization, techniques of medical ionization and surgical ionization, uses of ionization in physiotherapy.

3. **Electro- Magnetic Spectrum:**
   Wavelength, velocity & frequency. Laws governing radiation.
4. **Fundamental of Low Frequency Currents:**
   Types of current.
   Characteristics of currents-Pulse- Types of pulses, phase, waveform, Interpulse interval & frequency.
   Types of electrodes, Galvanic Skin Resistance- Significance & Methods to Reduce GSR.
5. **Fundamentals of High Frequency currents:**
   Oscillator circuit, Pulse generator, Circuit of short wave Diathermy.
   Physical Principles, components of panel, Testing of Apparatus- Short Wave Diathermy, Ultrasonic, Ultra violet Rays, interferential Therapy, LASER(Only Physical Principles & Types)
   Hazards of Environment currents.
6. **Magnetism:**
   I. Definition.
   II. Properties of Magnets.
   III. Magnetic effects.
   IV. Molecular theory of Magnetism.
   V. Magnetid fields & MAgnetid Forces.
   VI. Magnetic effect of Electric field.
   VII. Electromanetic induction and its uses in physiotherapy department.
7. **Devices:**
   I. **Condensors:** Types, Construction and working principles, Uses in Physiotherapy department.
   II. Multimmeter: Construction, Working, Uses in Physiotherapy.
   III. Voltmeter: Construction, working and uses in physiotherapy.
   IV. Transformer: Definition, Types, Principle, Construction, Eddy Currents, Working, Uses in physiotherapy
   V. Chokes: Principle, construction and working, uses in physiotherapy.
   VI. **Electric valves or thermionic valves:**
      a. Types : Diode, Triode, Double anode and diode
      b. Principles of thermonic valves.
      c. Construction and working of different valves and their uses in physiotherapy.
   VII. Metal oxide rectifier:
      Definition, construction, working, uses in physiotherapy.
   VIII. Potentiometer: construction and working principles.
   IX. Display devices and indicators used in physiotherapy-analogue and digital.
   X. Fuse: Construction, working and application in physiotherapy.
8. **Biophysics of superficial heat**
   Physical principles, Components of panel physiological effects Therapeutic effects/uses, source, Merits and demerits, Indications and contra-indications, skill of application-
   a. Paraffin wax bath- Composition, physiological and therapeutical effects, methods of applications, mode of heat transfer, depth of penetration , indications, contraindications, precautions, operational skills of equipment and patient preparation.
   b. Whirlpool bath,
   c. Contrast bath,
   d. Hydro-collator/ Hot packs-Moist heat – types, physiological and therapeutical effects methods of applications, mode of heat transfer, depth of penetration, indication, contraindications, precautions, operational skills of equipment and patient preparation.

e. Infra red/ heating pads/fluidotherapy: components, applications methods, physiological & therapeutical effects, precautions, operation skills of equipment and patient preparation.
f. Home Remedies.

9. **Cryotherapy:**
   Sources, Physiological & therapeutic effects, Therapeutic effect/uses, Merits and demerits, indications and contraindications, precautions, skills of application- techniques and patient prepration.
10. **Compression therapy:**
    Therapeutic mechanical pressure(intermittent compression therapy)- Principle, biophysical effects, types therapeutic effects, indications contraindications, precautions, operational skill and patient preparation

PRACTICALS

1. Panel diagrams-identifications of components, Testing the mains supply and machines.
2. Skills of application of superficial thermal agents & cryotherapy- its operation and different methods of application-region-wise.
3. Skill of application to prevent shock and usage of safety devices.
4. Skill of application of intermittent pneumatic therapy unit, its operation and different methods of application-region-wise.

TEXT BOOKS

1. Clayton's Electro therapy – Kitchen-3RD Ed
2. Clayton's Electro therapy – Kitchen-10th Ed
3. Electro therapy explained Principles and practice –by John Low & Ann Reed
4. Electrotherapy : Evidence Based Practice- Kitchen 11th Ed

REFERENCE BOOK

1. Principles & Practice of Electro Therapy –Joseph Kahn
2. Clinical Electro Therapy-by Roger M. Nelson & Dean P. Currier
3. Thermal Agents – by Susan L. Michlovitz
4. Therapeutic heat and cold – Lehmann.
5. Principles & Practice of Electro Therapy- Dr Saeed Anwar
6. Principle and practice of Electrotherapy – Joseph Kahn
7. Electrotherapy: clinics in physical therapy- Wolf

BACHELOR OF PHYSIOTHERAPY - SECOND YEAR

S.No.	code	Subject	Theory			Practical			Total marks
			Exam	I. A.	Total	Practical	I. A.	total	
1	PT-08(a)	1. Pathology	40	10	50	-	-	-	50
	PT-08(b)	2. Microbiology	40	10	50	-	-	-	50
2	PT-09	Pharmacology	80	20	100	-	-	-	100
3	PT-10	Advance Electrotherapy	80	20	100	80	20	100	200
4	PT-11	Advance Exercise Therapy	80	20	100	80	20	100	200
5	PT-12	Biomechanics	80	20	100	-	-	-	100
6	PT-13(a)	1. Sociology	40	10	50	-	-	-	50
	PT-13(b)	2. Psychology	40	10	50	-	-	-	50
7	PT-14	Computer Application	-	-	-	80	20	100	100
	PT-15	Supervised Clinical Practice	-	-	-	-	-	-	-
									900

Passing Criteria – 50 % of total marks each in theory & practical
Eligibility to appear for University exam – 35 % in Internal Assessment.

S.No.	code	Subject	Hours of Study	Theory	Practical	Weekly
1	PT-08(a)	1. Pathology	128	96	32	4
	PT-08(b)	2. Microbiology	64	32	32	2
2	PT-09	Pharmacology	128	128	-	4
3	PT-10	Electrotherapy-II	288	192	96	9
4	PT-11	Exercise Therapy- II	288	192	96	9
5	PT-12	Biomechanics	192	192	-	6
6	PT-13(a)	1. Sociology	96	96	-	3
	PT-13(b)	2. Psychology	96	96		3
7	PT-14	Computer Application	32	-	32	1
8	PT-15	Supervised Clinical Practice	32	-	32	1
		Total	1344	1088	256	42

PAPER CODE- PT-08(a) & PT-08(b)

PATHOLOGY & MICROBIOLOGY [Theory only]

THEORY- Model question paper— [80 MARKS]

Section-A

MCQ-Q-1]-based on -Single best answer [20 x 1] 20marks (20 Min.)

Based on Pathology Must Know area- 10 Questions

Based on Microbiology Must Know area -10 Questions

Section-B

S.A.Q.- Based on Pathology:

Q-2]-Answer any 5 out of 6- [5 x 3] 15 marks

Q-3]-Answer any 3 out of 4 - [3 x 5] 15 marks

Section-C

S.A.Q.- Based on Microbiology:

Q-4]-Answer any 5 out of 6- [5 x 3] 15 marks

Q-5]-Answer any 3 out of 4 - [3 x 5] 15 marks

Emphasis to be given to the topics related to Musculoskeletal/ Neurological/ Cardiovascular/ Respiratory Conditions & Wound /Ulcers/Healing

Emphasis must be given on the must know area.

PAPER CODE- PT-08(a)

PATHOLOGY

S.No.		Hours	Weekly	University Exam	Internal Assessment	Minimum Pass Marks	Max Marks	Time
1	Theory	96	3	40	10	25	50	2 hrs
2	Practical/ Laboratory	32	1					
	Total	128	4	40	10	25	50	

***Course Objective**:* -At the end of the course, the student will be able to

i. Acquire the knowledge of concepts of cell injury and changes Produced there by in different tissues and organs; Capacity of the body in healing Process.

ii. Recall the etio-pathological effects and the Clinico-pathological Correlation of common infection and non-infectious diseases.

iii. Acquire the knowledge of concepts of Neoplasia with reference to the Etiology, gross and microscopic features diagnosis and prognosis in different tissues and organs of the body.

iv. Correlate normal and altered morphology of different organ systems in different diseases needed for understanding disease process and their clinical significance (with special emphasis on neuro-musculoskeletal and cardio-respiratory system).

v. Acquire knowledge of common immunological disorders and their resultant effects on the human body.

vi. Understand in brief, about the Hematological diseases and Investigations necessary to

diagnose them & determine Prognosis.

COURSE DESCRIPTION

This course follows the basic follows the basic courses in anatomy and physiology, and compliments the course in general medicine and surgery being taught concurrently. Particular effort is made in this course to avoid burdening the student with any detail pertaining to diagnosis which will not contribute to their understanding of the limitations imposed by pathology on the functioning of the individual.

1. General Pathology:

A. Cell injury- causes, mechanisms with special reference to Physical, Chemical and toxic injury and ionizing radiation.
B. Reversible cell injury (degenerations)-types, morphology-cellular swelling, fatty change.
C. Intracellular accumulations -hyaline change and mucoid change.
D. Irreversible cell injury, types of necrosis, apoptosis, Gangrene: types and etio-pathogenesis,
E. Pathological calcification-dystrophic and metastasis, pathogenesis and morphology.
F. Extra- cellular accumulation-amyloidosis.
G. Pigments and pigmentations.

2. Inflammation & Repair

A. Acute inflammations features; causes, vascular & cellular events, morphologic variations.
B. Inflammatory cell & mediators,
C. Chronic inflammation:-causes, types, non-specific & granulomatous with examples.
D. Wound healing by primary & secondary intention factors promoting & delaying healing process, healing at various sites including bones, nerve & muscle.
E. Regeneration &repair.

3. Immuno-Pathology-(Basic concepts)

A. Immune system: - organization, cell- Antibodies- Regulations of immune responses.
B. Hyper-sensitivity.
C. Secondary immune deficiency including HIV.
D. Organ transplantation.

4. Circulatory disturbances

A. Edema- pathogenesis, Types, transudate, exudates.
B. Chronic venous congestion- lung, liver and spleen.
C. Thrombosis- formation fate and effects.
D. Embolism- types clinical effects
E. Infarction- types, common sites.
F. Gangrene- types, aetiopathogenesis.
G. Shocks- Pathogenesis, Types, morphologic changes.

5. Growth Disturbance

A. Atrophy- malformation, agenesis, dysplasia, metaplasia, hypertrophy, hyperplasia.
B. Neoplasia- classification, histogenesis, biologic behavior, differences between benign & malignant tumors.

C. Malignant neoplasm- grades, stages, local invasion &distal spread.
D. Carcinogenesis- environmental carcinogensis
    a. Chemical, viruses, radiations.
    b. Physical.
    c. occupational,
    d. Heredity and miscellaneous factors.
E. Precancerous lesions & carcinoma in situ.
F. Tumor & host interactions- systemic effects- metastasis or spread of tumors especially affecting bones, spinal cord leading to paraplegia etc.

6. Diseases of Blood.

a) Red cell disorders, anemia, polycythemia.
b) Non Neoplastic disorders and neoplastic proliferation of white cell.
c) Bleeding Disorders: - DIC, Thrombocytopenia, coagulation Disorders.

7. Topics in Special Pathology:-

a. Cardio Vascular system: - Atherosclerosis, Ischemic heart disease- (Myocardial infarctions) – Pathogenesis, pathology, hypertension, CCF, RHD, CHD and Peripheral vascular diseases.

b. Respiratory System: - COPD(Obstructive Lung Disorder), pneumonia (lobar, broncho, Restrictive & viral), Tuberculosis: - primary and secondary, morphologic types, pleuritis & its Complications, lung collapses & atelectasis, respiratory Failure.

c. Neuropathology:- reaction of nervous tissue to injury infection- & Ischemia pyogenic tuberculous and viral meningitis, cerebro-vascular diseases, Atherosclerosis, thrombosis, embolism, aneurysm, hypoxia infarction & hemorrhage, effects of Hypotension on CNS, Coma, polio myelitis, leprosy, demyelination diseases, parkinsonism, Cerebral palsy, metachromatic, leucodystrophy, dementia, Hemiplegia and paraplegia, pathogenesis & pathology of Wilson's disease, space occupying lesions (in brief), peripheral nerve injury.

b. Muscle diseases: - muscular dystrophy, hypertrophy, pseudo hypertrophy, atrophy, poliomylelitis, myositis ossificanes, necrosis , regeneration, myotonia, Hyperplasia.

c. Neuro-muscular junction: - myasthenia gravis, myasthenics syndromes.

d. Bone & joints:- Fracture healing, osteomyelitis, rickets, osteomalacia, bone tumors, osteoporosis, spondylosis, PID, Haemarthrosis, gout, T.B. Arthritis, Degenerative and Inflammatory Arthritis, Rheumatoid arthritis, Ankylosis spondylitis, Tenosynovitis.

e. Urinary:- Commonly encountered in paralytic bladder, common urinary tract, infections (brief), urinary calculi.

f. Gastrointestinal system:- Gastric duodenal ulcer, enteric fever, tuberculosis enteritis, gastritis (related to consumption of NSAID)

g. Endocrine:- Thyroid functional disorders, Diabetes.

h. Hepatic diseases:- Cirrhosis and emphasis on systemic effects of portal hypertension.

i. Skin:- melanin pigment disorders, vitiligo, psoriasis, bacterial infection, fungal infections, cutaneous tuberculosis, scleroderma, SLE, leprosy, alopecia.

8. Clinical pathology:- (Including demonstrations)

Anemias, total leucocyte count, differential leucocyte count, eosinophilia, ESR, C P K, Muscle skin & nerve biopsy, Microscopic appearance of muscle necrosis & fatty infiltrations, Laboratory Investigation in liver &renal failure.

9. Brief Medical Genetics: Karyotypic abnormalities, Mandelin disorders & inborn errors of metabolism.

10. Deficiency disorders of Vitamin A, B, C and D.

Text books:-

1. Text book of pathology for dental student by harsh Mohan
2. Basic pathology by cotran Kumar Robbins

PAPER CODE- PT-08(b)

MICROBIOLOGY

S.No.		Hours	Weekly	University Exam	Internal Assessment	Minimum Pass Marks	Max Marks	Time
1	Theory	32	1	40	10	25	50	1hrs
2	Practical/ Laboratory	32	1					
	Total	64	3	40	10	25	50	

Objectives: At the end of the course, the candidate will have sound knowledge of the agents responsible for causing human infections, pertaining to CNS, CVS, Musculo-skeletal and respiratory System.

(Only brief descriptions of the following topics are necessary so that the student get a general idea of the fundamental aspects of the topics elaborate descriptions are to be avoided)

1. **General Microbiology**: Introduction and Scope, importance of medical microbiology in diagnosis & prevention of infectious diseases. Contributions of Antony van leeuwenhock, Louis Pasteur, Robert koch, Fleming, Jenner etc..
   i) Medical microbiology which includes the Bacteriology, Virology, Mycology, Parasitology and Immunology, infection, pathogen, common salsymbiosis, Host vector, contagious disease, infections disease, Epidemic, endemic, pandemic & Zoonosis, normal flora of the human body.
   ii) Source, mode of infection, route of infection and endogenous and exogenous infections, reservoirs of infection.

2. **Classification of Microorganisms and morphology of Bacteria.**

i. Morphology of Bacteria: Bacterial cell, morphological classifications, method of studying of bacteria, staining methods and their principles especially gram and ziehl nelson staining, their importance in presumptive diagnosis.
ii. Physiology of bacteria: Nutritional requirements, growth curve, culture media:-definition, classifications and application.
iii. Identification of bacteria: Specimen collection, transportation and processing of specimens for microbiology, diagnosis which include smear examination culture methods, biochemical reactions, serological tests and animal pathogenicity.

3. **Sterilization and disinfection**: Definition of sterilization disinfection asepsis antisepsis, discussion of physical methods of sterilization which includes principles and their application details On working and efficacy testing of autoclave hot air oven inspissator and koch' s steamer modes of action of chemical.
4. **Immunology:**
   a. Introduction - Definition of immunity, types of immunity, factors influencing mechanism of innate immunity, active and passive immunity, local immunity and herd immunity.
   b. Antigens- Definition, types, antigen, determinants properties of antigen.
   c. Antibodies- Definition, nature, structure, classes, physical and biological properties of immunoglobulin.

d. Serological Reactions Definition of titer sensitivity and specificity, mention about principles types and application of Precipitation gel, diffusion glutination, complement Fixation, ELISA, RIA, immune, fluorescence, neutralization And opsonization.

e. Lymph- Structure of primary and secondary lymphoid organs, Function of immune system, mention about cells of immune system, lymphocytes, T-cells, null cells, antigen presenting cells (APC).

f. Immune response- Humeral CMI

g. Complement- Definition components biological functions.

h. Hypersensitivity- Definition, classification, difference between immediate and delayed reactions, mechanism and manifestation of anaphylaxis, types and tests for anaphylaxis.

i. Vaccination - National immunization programme. nature of vaccines rationale and dosage.

5. Bacteriology:

a. Gram positive cocci- Staphylococcus / Streptococcus/ Pneumococcus: morphology, pathogenesis, laboratory diagnosis.

b. Gram negative cocci - Neisseria-morophology, pathogenesis laboratory diagnosis.

c. Gram positive bacilli –

i. -C. diphtheria:- Morophology, pathogenesis, laboratory diagnosis, treatment, prevention and control.

ii. -Mycobacterium tuberculosis: Classification, morphology, growth on L.J medium, Pathogenesis, laboratory diagnosis, briefly mention National T.B control Programme.

iii. -Atypical mycobacterium: Pathogenesis, laboratory diagnosis of HIV and Mycobacterium.

iv. -M.Leprae: classification morphology pathogenesis,laboratory diagnosis.

d. C I. welchii, C.l. Tetani Classification, morphology, pathogenesis, laboratory diagnosis, prevention and control

e. Entero bacteriaece:General characters classification,(briefly mention about E coli Klebisiella, proteus and shigella)

f. Salmonella: Morphology, pathogenesis, laboratory diagnosis, prevention and control.

g. Vibrio: Morphology pathogenesis, laboratory diagnosis of V. cholera

h. Spirochaetes: Morphology, pathogenesis, laboratory diagnosis, T. pallidum, Bacteriology of Air, mention briefly Water, milk and food

6. Mycology :

a. General mycology.Characterization of fungi, morphological and clinical classification of fungi

b. Superficial mycosis mention briefly.

c. Subcutaneous mycosis Mycetoma- pathogenesis and lab diagnosis.

d. Systemic mycosis Candida Cryptococcus- morphology pathogenesis lab diagnosis with cultural characteristic

e. Opportunistic fungalAspergillosis Infection

7. Virology:

a. General virology morphology, multiplication, classification of viruses, bacteriophase. Laboratory diagnosis of viral infections collection of Samples Transport Cultivation and method of diagnosis.

b. Herpes virus Morphology, classification & pathogenesis.

c. Hepatitis viruses Hepatitis-B, C: Morphology, laboratory diagnosis, prophylaxis in detail, (Mention briefly about the other hepatitis viruses)

d. Picorna viruses:morphology pathogenesis clinical feature Immuno prophylaxis.(Polio virus)
e. Paramyxo viruses Important feature of measles in relation to physiotherapy (SSPE)
f. HIV/AIDS, Morphology, pathogenesis, lab diagnosis, universal precautions, specific precaution and Prophylaxis for Retroviruses

8. Parasitology:

a. Introduction to parasitology Parasite: - their nature, classification, explanation of Terminology, emerging parasitic infections.
b. Malaria Malaria parasities:- Morpology, life cycle, pathogenesis, laboratory diagnosis.
c. Miscellaneous mention briefly about toxoplasma, pathogenic protozoa
d. Cestodes Taenia saginata and solium Echinococcus granulosus: life cycle, morphology, pathogenesis, laboratory diagnosis,
e. Tissue nematodes morphology, life cycle, pathogenesis, laboratory diagnosis, briefly mention about T. Spiralis.

9. Applied Microbiology :

a. Upper respiratory tract infections (sore throat) and their laboratory diagnosis.
b. Lower respiratory tract infections and their laboratory diagnosis.
c. Infection of central nervous system and their laboratory diagnosis
d. Wound infection and pyogenic infections
e. Bone and joint infections and their laboratory diagnosis.
f. Hospital infections role of laboratory in cross infections control policies.

Books recommended:

1. Text book of microbiology for dental student: Baveja.
2. Text book of medical microbiology: Rajesh Bhatia.
3,. Textbook of medical microbiology: Arora &c Arora.
4. Text book of medical parasitology Arora &c Arora.

Reference book:

1, Text book of microbiology –R. Anantha Narayan & C.K Jayaram Paniker

PAPER CODE- PT-09

PHARMACOLOGY [Theory only]

THEORY- Model question paper— [80 MARKS]

Section-A

MCQ-Q-1]-based on -Single best answer [20 x 1] 20marks (20 Min.)
Based on Must know area of Pharmacology.

Section-B

S.A.Q.- based on topics 1-5

Q-2]-Answer any 5 out of 6- [5 x 3] 15 marks

Q-3]-Answer any 3 out of 4 - [3 x 5] 15 marks

Section-C

S.A.Q.- based on topics 6-10

Q-4]-Answer any 5 out of 6- [5 x 3] 15 marks

Q-5]-Answer any 3 out of 4 - [3 x 5] 15 marks

Emphasis to be given to the topics related to Musculoskeletal/ Neurological/ Cardiovascular/ Respiratory Conditions & Wound /Ulcers/Healing

Emphasis must be given on the must know area.

PAPER CODE- PT-09

PHARMACOLOGY

S.No.		Hours	Weekly	University Exam	Internal Assessment	Minimum Pass Marks	Max Marks	Time
1	Theory	128	4	80	20	50	100	3 hrs
	Total	128	4	80	20	50	100	

Course Objective*:* -At the end of the course, the student will be able to

i. Describe Pharmacological effects of commonly used drugs by patients referred for Physiotherapy; list their adverse reactions, precautions to be taken & contraindications, Formulation & route of administration.
ii. Identify whether the pharmacological effect of the drug interferes with the Therapeutic response of Physiotherapy & vice-versa
iii. Indicate the use of analgesics & anti-inflammatory agents with movement disorders with consideration of cost, efficiency & safety for individual needs.
iv. Get the awareness of other essential &commonly used drugs by patients-The bases for their use & common as well as serious adverse reactions.

Syllabus:

A. Must Know-
    a. Drug described in topics 1-6
    b. Pharmacological effects and mechanism, formulation, route of administration, salient pharma-kinetic feature.
    c. Adverse drug reactions.

d. Precautions & contra-indications

B. Desirable
   a. Major group of durgs described in topics 7-10.
   b. Basis of use in indicated conditions.
   c. Common & Serious Adverse Reactions.

1. GENERAL PHARMACOLOGY:

A. Definition division of pharmacology, dosage, forms, drug nomenclature.
B. Routes of administration, advantages & disadvantages of commonly used routes of administration.
C. Factors affecting dose of a drug, bioavailability and other important pharmaco-kinetic parameters.
D. Various mechanism of action of a drug.
E. Adverse drug reaction include drug.
F. Adverse drug reaction including drug allergy idiosyncrasy.
G. Drug interactions synergism antagonism etc.

2. Autonomic Nervous system:

A. Sympathomimetic drug, therapeutic uses of adrenaline etc.
B. Beta adrenergic blockers & alpha adrenergic blockers.
C. Parasympatomimetic drug, their therapeutic uses and uses and adverse effects and treatment of myasthenia gravis.
D. Atropine, Atropine substitute & *treatment* of organ phosphorus poisoning.

3. PERIPHERAL NERVOUS SYSTEM &AUTOCOIDS:

A. Skeletal muscle relaxants.
B. Centrally acting muscle relaxants.
C. Local anaesthetics.
D. Anti histaminics (HI blockers).

4. **Central nervous system:**

A. Pre Anaesthetic medication & G.A. and steps of anaesthesia.
B. Analgesics – NASID's Opioids.etc.
C. Anti - Parkinsonian drug & Treatment of neurodegenerative disorders.
D. Sedative & hypnotics &Treatment of Insomnia.
E. Antiepileptic drug & Treatment of epileptics.
F. Ethyl alcohol drug of addiction treatment of Methyl alcohol poisoning
G. Drug used in common psychiatric disorders.

5. GIT:

A. Laxative & purgative and *treatment* of constipation.
B. Anti diarrhoeal drugs & *treatment* of diarrhoea.
C. Drug for gastric and peptic ulcer.
D. Anti emetics & misc. Drugs digestants etc.

6. CVS

A. Anti hypertensive & *Treatment of* hypertension etc.
B. Antianginal drug & *Treatment of* MI.
C. Drugs used in shock, *Treatment of* anaphylactic shock and Hemorrhagic shock etc.

7. ENDOCRINES:

A. Anti diabetes drug *Treatment of* Diabetes *mellitus &* Diabetic ketoacidosis.
B. Glucocorticoids.

C. Anabolic steroids.
D. Ca++Metabolism, *Treatment of* osteoporosis etc.

8. **HAEMATINICS, Vitamin B; Iron.**
9. **CHEMOTHERAPY:**
   A. Penicillin's & Sulphonamides.
   B. Broad spectrum Antibiotics.
   C. Aminoglycosides *& Treatment of* urinary tract infection.
   D. Macrolides & Misc. AMA.
   E. Quinolones.
   F. Anti TB, HIV, AIDS drugs & Treatment of AIDS.
   G. Anti leprosy drug & *treatment* of anaerobic infections.
   H. Anti cancer drugs.
   I. *Treatment of* amoebiasis, helminthic infection.
   J. Antifungal druges.
   K. Anti septics & disinfectants.
10. **MISC. TOPIC**
   A. Drug acting on skin e.g. Lotions liniments ointments.
   B. Vitamin deficiency.
   C. Heavy metal antagonists & general principles of *treatment* of poisoning.
   D. Immuno stimulants and Immunosuppressant.
   E. Antitussives & Bronchial asthma drugs.
   F. Drugs banned in sports & Athletes.
   G. Vaccines & sera, Immunization schedule.

RECOMMENDED BOOKS:

1. Essentials of Medical Pharmacology – K. D. Tripathi.
2. Pharmacology and Pharmaco therapeutics – R.S. Satoskar.
3. Pharmacology by Gaddum.
4. Medical Pharmacology by Drill.
5. Pharmacology principle of Medical practice – by Krantx& Carr.
6. Pharmacological basis of Therapeutics – by Goodman, L.S.Gilman.
7. Essentials of pharmacology by Surendra Singh.
8. Pharmacology by Bhattacharya Sen ray choice editor P.K. Das.
9. Clinical Pharmacology by Sennet.

PAPER CODE- PT-10

ELECTROTHERAPY-II

THEORY- Model question paper— [80 MARKS]

Section-A

MCQ-Q-1]-based on -Single best answer [20 x 1] 20marks (20 Min.)

Section-B

S.A.Q.-

Q-2]-Answer any 5 out of 6- [5 x 3] 15 marks

Q-3]-Answer any 3 out of 4 - [3 x 5] 15 marks

Section-C

L.A.Q. [LAQ May be given break up of 15 marks]

Q-4][compulsory]— based on Electromagnetic fields, US, UVR, LASER. 15 marks

Q-5] based on DC, Low Frequency currents. 15 marks

OR

Q-6] based on Medium / High Frequency Current. 15 marks

Practical-: 80 Marks

Internal Assessment 20 Marks

Total : 100 Marks.

1. Long case-based on Stimulation of Motor Points/UVR test Dose. 30 marks.
2. [Cognitive–Medical electronics, Physiological /Biophysical principles, Therapeutic effects, Indications & Contraindications] 20 marks.
3. Psychomotor & affective-skills 10 marks.
4. Short Case – I & II Each of 20 marks.
5. Short Case-I- Based on skill of application of SWD, US, UVR for treatment purpose.
6. Short Case-II- Based on skill of application of IFT, TENS, Faradism under pressure/Elevation & Iontophorosis for treatment purpose.
7. Testing of Equipment — SWD / Ultra Sonic / IFT / Stimulator, TENS Machine [10 Minutes] 05 marks.
8. Journal 05 marks

PAPER CODE- PT-10

ELECTROTHERAPY-II

S.No.		Hours	Weekly	University Exam	Internal Assessment	Minimum Pass Marks	Max Marks	Time
1	Theory	192	6	80	20	50	100	3 hrs
2	Practical/ Laboratory	96	3	80	20	50	100	3 hrs
	Total	288	9	160	40	100	200	

Objectives:

At the end of the course, the candidate will be able to-

1. Describe the Production &Physiological effects, Therapeutic uses, merits, demerits indication &contraindications of Various low/medium Frequency Currents modes.
2. Describe the Physiological effects &therapeutic uses of various therapeutic ions & Topical Pharmaco -therapeutic agents to be used for the application of Iontophoresis & sono /phonophoresis
3. Acquire the skill of Application of the Electro therapy modes like UVR and LASER on models, for the purpose of Assessment &Treatment.
4. Acquire an ability to select the appropriate mode as per the tissue specific & area Specific application.

Syllabus:

1. **Basics Review:**
   A. Review of neuro muscular physiology including effects of the body.
   B. Physiological responses to heat gain or loss on various tissues of the body
   C. Therapeutic effects of heat, cold and electrical currents.
   D. Physical principles of electro - magnetic radiation.
   E. Physics of sound including characteristics and propagation
2. **Direct Current:** Polarity testing, Physiological and therapeutic effects of DC & Safety Measures, Cathodal/ Anodal Galvanism, Iontoporesis using various ions and pharmaco-therpeutic drugs-Effects & concentration of Ions, Tap Water Iontophoresis.
3. **Low Frequency Currents:** Physiological and therapeutic Effects/ Uses of Faradic type current, Techniques of Application.
   Interrupted Direct current-Pulse Duration & Types of Pulse, Physiological & Therapeutic Effects/ Uses of Interrupted DC, Techniques of Application, Definition and Stimulation of Motor Points on Models, S.D. Curve and its application and characteristics, Chronaxie, Rheobase & pulse ratio.
   Faradism: Strong surged faradic current under pressure /elevation, Electrical stimulation for re-education – short /long pulse motor points.
   TNS: Types, Physiological effects and uses, techniques of application, contraindications.
   High Voltage Currents- Physiological effects and uses, techniques of application, contraindications.
4. **Medium Frequency currents:** conceptual framework of medium frequency current therapy, production, biophysical effects, types, therapeutic effects, Techniques of application, Endovac Attachment, indication, contraindication, precautions, operational skill and patient preparation, prescription writing for IFT, Advantages of IFT over Low Frequency Currents.
   Didynamic Currents- Physiological effects and uses, techniques of application, contraindications.
   Micro-currents- Physiological effects and uses, techniques of application, contraindications.
   Russian currents- Physiological effects and uses, techniques of application, contraindications.
5. **Electromagnatic Fields:** (SWD and MWD)-production, biophysical effects, types, Therapeutic effects, techniques of application, indication, contraindications, precautions, Operational skills

and patient preparation, dosiometry, prescription writing of SWD & MWD, Advantage of One over the other, Types of Electrode, Continuous/Pulsed.

6. **Therapeutic UltraSound:** Production, Continuous/Pulsed, biophysical effects, types, Therapeutic effects, techniques of application, indication, contraindications, precautions, operational skill and patient preparation, prescription writing for Therapeutic Ultra sound.
7. **Actinotherapy:** with Attention Towards the Care of Wound.
   A. **Infra red rays:** Wavelength, frequency, types & sources of IRR generation, techniques of irradiation, physiological and therapeutic effects, indications, contraindications, depth of penetration, precautions, operational skills of equipments and patient preparation.
   B. **Ultra violet rays (UVR) :** Wavelength, frequency, types & sources of IRR generation, techniques of irradiation, depth Of penetration , physiological and therapeutic effects, indications, contraindications, precautions, operational skills of equipments and patient preparation, dosimetry of UVR.
   C. **LASER :** Therapeutic Light physiotherapy (LASER), Definition, historical background, physical principles, biophysical effects, types, production, physiological Effects, therapeutic effects, techniques of application, Indications, contraindications, precautions, operational skill and patient preparation, dosiometry & prescription writing of LASER.
8. **Bio- feedback** - Instrumentation, principles, therapeutic effects, indications, contraindication, limitations, precautions, operational skill and patient preparation.
9. **Electro- diagnosis** - Instrumentation, definition & basic techniques of E.M.G. and. NCV.

BOOKS RECOMMENDED:

1. Electrotherapy explained-principles &practice by Low & Reed – Butterworth Heinemann.
2. Claytons electrotherapy (3rd edition) Kitchen & Bazin - w.b. Saunders.
3. Claytons electrotherapy (10th edition) Kitchen & Bazin - w.b. Saunders.
4. Therapeutic heat and cold Lehman William & Wilkins.
5. Principles and practice of electrotherapy Kahn Churchill Livingstone.
6. Electrotherapy: clinics in physical therapy- Wolf Churchill Livingstone.
7. Therapeutic Electricity – by Sydney Litch

REFERENCE BOOK

1. Principal & Practice of Electrotherapy – Joseph Kahn.
2. Clinical Electrotherapy- By Nelson & Currier.
3. Thermal Agents- by Susan L. Michlovitz.
4. Principles & Practice of Electrotherapy- By Dr. Saeed Anwar.
5. Thermal Agents in Rehabilitation By Susan L. Michlovitz.

Electrotherapy-II (Practical)

1. To study a short wave diathermy unit, its operation and different methods of application-region wise.
2. To study a microwave diathermy unit its operation and different methods of application region Wise.
3. To study an ultrasound unit its operational and different methods of application-region wise.
4. To study a Interferential therapy unit its operation and different methods of application region wise

5. To observe various electro- myography (EMG) procedures.
6. To observe various electro - neurography (ENG/ NCV) Procedures.
7. To study a bio feedback unit, its operation and different methods of application-region wise.
8. To study LASER unit its operation and different methods of application region wise.
9. To study the different types of Ultra violet units, their operation, and assessment of test dose and application of U.V.R. - region wise.
10. To study the various types of Infrared lamps and their application to body region wise.

PAPER CODE- PT-11

EXERCISE THERAPY-II

THEORY- Model question paper— [80 MARKS]

Section-A

MCQ-Q-1]-based on -Single best answer [20 x 1] 20marks (20 Min.)

Section-B

S.A.Q.-

Q-2]-Answer any 5 out of 6- [5 x 3] 15 marks

Q-3]-Answer any 3 out of 4 - [3 x 5] 15 marks

Section-C

L.A.Q. [LAQ May be given break up of 15 marks]

Q-4][compulsory]— based on Muscle strength/Endurance/power/hydrotherapy. 15 marks

Q-5] based on Gait/deviation/posture. 15 marks

OR

Q-6] based on Mobility/ Pulmonary Function/ Balance/coordination. 15 marks

LAQ should give breakup of 15 marks e.g. –[3+5+7] etc.

Practical-: 80 Marks

Internal Assessment 20 Marks

Total : 100 Marks.

1. Long case-based on Stimulation of Muscle strength/ mobility/ Pulmonary function test. 35 marks.
    a. [Cognitive–Kinesiological &/ or Physiological principles of application, indicaton & contraindications of skills] 20 marks.
    b. Performance of skills and home exercise, ergonomic advice, Method of documentation Etc[Psychomotor & Affective] 15 marks.
2. Short Case – I & II Each of 20 marks. 40 Marks
3. Short Case-I- Based on skill of MMT/Posture/Gait.
4. Short Case-II- Based on skill of Coordination/ Functional Re-education/ Breathing Exercises/Postural Drainage.
5. Journal 05 marks

PAPER CODE- PT-11

EXERCISE THERAPY-II

S.No.		Hours	Weekly	University Exam	Internal Assessment	Minimum Pass Marks	Max Marks	Time
1	Theory	192	6	80	20	50	100	3 hrs
2	Practical/ Laboratory	96	3	80	20	50	100	3 hrs
	Total	288	9	160	40	100	200	

Objectives:

At the end of the course, the candidate will be able to-

1. Analyze Normal human posture [static &dynamic] & various Normal Musculo skeletal movements during Gait, activities of daily living, & describe the movements of the Thorax during breathing.
2. Assessment and training methods for mobility, Muscle strength and gait training.
3. Describe the physiological & Therapeutic uses, merits /demerits of various exercise modes.
4. Demonstrate various therapeutic exercises on self & acquire the application skill on models.
5. Acquire the skill of assessment of isolated & group muscle strength, Endurance & Range of motion of the joints subjectively & objectively.
6. Describe the pattern of normal and abnormal movements of various joints and activities.
7. Understand different techniques to Improve Pulmonary Function.
8. Accuiree Knowledge of neural control and methods of training Co-ordination and balance.

Syllabus:

1. **Therapeutic exercises:**
    A. Principal classification techniques physiological &therapeutic effects indications & contraindications of therapeutic exercises.
    B. Assessment & evaluation of a patient (region wise) to plan a therapeutic exercise program.
    C. Joint mobility etiogenesis of joint stiffness general techniques of mobilization, effects, indications, contraindication & precautions.
    D. Muscle strength: Assessment of muscle strength subjective and objective methods[group & Individual method], Factors influence the strength of normal muscle, changes seen in muscle after training Hypertrophy, Hyperplasia, Principle of Strength training- overload(Intensity, duration & Frequency)/ Motivation/Learning/Reversibility/ Specificity, Training Program- Isokinetic, Isoinertial etc.
    E. Types of Muscle work-Isometric, Concentric & Eccentric.
    F. Muscle insufficiency -etiogenesis of muscle insufficiency (strength *tone* power, endurance & volume), general techniques of strengthening effects indication, contraindications & precautions.
    G. Muscle endurance: Assessment, Principle of Training, Training Program.
    H. Neuromuscular inco-ordination-review normal neuromuscular coordination, etiogenesis of neuromuscular inco-ordination & general therapeutic techniques effects

indications, Contraindication& precautions.

I. Functional re-education- general therapeutic techniques *to* re-educate ADL function, MAT Activites.

J. Principle of Home Program, Postural & Ergonomics Advices.

2. Posture Gait:

A. Normal posture-overview of the mechanism of normal posture.

B. Abnormal posture -assessment types aetiogenesis management including therapeutic Exercise.

C. Physiological deviations of the posture.

D. Gait-overview of normal gait &its components.

E. Gait-deviations-assessment, types, aetiogenesis, management including therapeutic exercise.

F. Types of walking aid indications effects & various training techniques.

3. Cordination & Balance :

A. Static and dynamic balance- assessment & management including therapeutic exercise.

B. Neural Control, Methods & Principles of Co-ordination Exercises- Frenkel's exercises.

4. Technique to improve pulmonary function

A. Breating Exercises : Goals , Types- Inspiratory, Expiratory, Segmental. Forced expiratory techniques- Huffing/ coughfing, incentive spirometry, Bladder Balloon, Flutter, Threshold loading device, peak flow meter.

B. Postural drainage, Humidification, Nebulisation, Active Cycle of Breathing(ACB), Autogenic Drainage.

C. Posture to promote relexation.

5. Hydrotherapy:

A. Basic principles of fluid mechanic as they relate to hydrotherapy.

B. Physiological & therapeutic effects of hydrotherapy including joint mobility, muscle strengthening & wound care etc

C. Types of hydrotherapy equipment, indications, contraindications, operations skill & patient preparation.

6. Special techniques:

A. Introduction to special mobilization & manipulation techniques effects indication & contraindications.

B. Conceptual framework, principle of proprioceptive neuromuscular facilitation (PNF) techniques including indication therapeutic effects and precautions.

C. Principles of traction physiological & therapeutic effects classification types indications contraindications techniques of application operational skill & precautions.

D. Review normal breathing mechanism, types, techniques, indication, contraindications, Therapeutic effects & precautions of breathing exercise.

E. Group theory –types, advantages & disadvantages.

F. Exercise for the normal person -importance and effects of exercise to maintain optimal health & its role in the prevention of diseases Types advantages, disadvantages, indications, contraindications & precautions for all age group.

G. Introduction to yoga - conceptual framework various assnas the body mind relationship effects & precautions.

BOOKS RECOMMENDED:

1. Principle of exercise therapy- by Dena Gardiner cbs Delhi.
2. Therapeutic exercises foundations and techniques- by Carolyn kisner & Colby La Davis .
3. Practical exercise therapy –by Margaret Hollis Blackwell scientific publication.

REFERENCE BOOKS:

1. Therapeutic exercises basmajian William & Wilkins.
2. Proprioceptive neuromuscular facilitation - Voss et.al - Williams and Wilkins.
3. Orthopedic physical therapy woods Churchill Livingstone.
4. Manipulation ad mobilization extremities and spinal techniques Edmond.
5. Aquatic exercise therapy bates and Hanson wb Saunders.
6. Manual examination and treatment of spine and extremities wads worth.
7. Hydrotherapy: principles and practice –by campion Butterworth Heinemann.
8. Muscle Testing by Kendall.
9. Manual Muscle Testing By Daniel.
10. Clinical Evaluation- By Lacote(For Assesment of Abdominal Muscles).
11. Orthopaedic Physical Examination By David J. Magee

Exercise therapy -II (practical)

Maximum Marks: 80

1. To practice assessment & evaluative procedures including motor, sensory, neuromotor, co-ordination, vital capacity, limb length & higher functions.
2. To study & practice the various techniques *of* progressive strengthening exercise *of* muscles
3. To study & practice the various techniques *of* progressive strengthening exercise *of muscles* region wise.
4. To study & practice the use *of* various ambulation aids in gait training.
5. To assess & evaluate ADL's and practice various training techniques.
6. To study practice mat exercise.
7. To assess & evaluate normal & abnormal posture & practice various corrective techniques.
8. To assess & evaluate equilibrium balance & practice various techniques to improve balance.
9. To study the structure & functions *of* hydrotherapy equipment & their application.
10. To study & practice various traction techniques including manual mechanical & electrical procedures.
11. To study & practice various group exercise therapies.
12. To practice & experience effects *of* basic yoga asanas.
13. To study plan & practice exercise programs for normal person *of* various age group.

PAPER CODE- PT-12

BIOMECHANICS

THEORY- Model question paper— [80 MARKS]

Section-A

MCQ-Q-1]-based on -Single best answer [20 x 1] 20marks (20 Min.)

Section-B

S.A.Q.-

Q-2]-Answer any 5 out of 6- [5 x 3] 15 marks

Q-3]-Answer any 3 out of 4 - [3 x 5] 15 marks

Section-C

L.A.Q. [LAQ May be given break up of 15 marks]

Q-4][compulsory]— based on Biomechanics of Vertebral Column. 15 marks

Q-5] based on Biomechanics of Any joint of UL. 15 marks

OR

Q-6] based on Biomechanics of Any joint of LL. 15 marks

LAQ should give breakup of 15 marks e.g. –[3+5+7] etc.

PAPER CODE- PT-12

BIOMECHANICS

S.No.		Hours	Weekly	University Exam	Internal Assessment	Minimum Pass Marks	Max Marks	Time
1	Theory	192	6	80	20	50	100	3 hrs
	Total	192	9	80	20	50	100	

Objectives:

The objective of this course is that after 192 hours of lectures, demonstration practical and clinical the' student will be able to demonstrate an understanding of the principles of biomechanics and kinesiology and their application in health and disease:-

In addition the student will be able to fulfill with 75% accuracy the following objective of the course-

1. To acquire the knowledge of axis and plane.
2. To review the anatomy of each joint.
3. Learn thoroughly about each movement occurring at each joint.
4. To acquire the knowledge of forces acting at various joints.
5. To acquire the knowledge of muscles and joint work in activities of daily living.
6. Analyze Normal human posture [static &dynamic] & various Normal Musculo skeletal movements during Gait, activities of daily living, & describe the movements of the Thorax during breathing.
7. Describe the Biophysical properties of connective tissue, effect of mechanical loading, factors influencing the Muscle strength, mobility of articular & peri-articular soft tissues.

8. Analyse the Biomechanical principles on the human body[Static & Dynamic].

COURSE DESCRIPTION

This Course Supplements the Knowledge of anatomy and enables the student to have a better understanding of the principles of biomechanics and their application in musculoskeletal and dysfunction.

COURSE OUTLINE:

A. MECHANICS

1. Describe Types of Motion planes of motion direction of motion and quantity of motion.
2. Define forces force vectors components of forces.
3. Describe gravity segmental centers of gravity centers of gravity line of gravity of the human body stability and centers of gravity relocation of the centers of gravity.
4. Describe reaction forces Newton low of reaction.
5. Describe equilibrium - low of inertia and establishing equilibrium of an object.
6. Describe objects in motion low of acceleration joint distraction in a linear *force* system and force of friction.
7. Describe concurrent *force* system: composition of forces muscle action lines total muscle force vector divergent muscle pulls anatomic pulleys.
8. Describe parallel force systems: First class levers second class levers- Third class levers - Torque- Mechanical Advantage.
9. Define moment arm. Moment arm of a muscle force. Moment arm of gravity and Anatomic pulleys.
10. Describe equilibrium of a lever.

DESCRIBE THE FOLLOWING:

a) Three type of motion.
b) The plane in which a given joint motion occurs, and the axis around which the motion occurs.
c) The location of the center of gravity of a solid object, the location of the center of gravity of the human body.
d) The action line of single muscle.
e) The name, point of application direction, and magnitude of any inter force, given its reaction force.
f) A liner force system, a concurrent force system, a parallel force system.
g) The relationship between torque, moment arm and rotator force component.
h) The methods of determining torque for the same given set of forces.
i) How anatomic pulleys may change action line, moment arm, arid torque passing through them.
j) In general terms, the point in the joint range of motion at which a muscle acting over the joint is bio mechanically most efficient.
k) How external forces can be manipulated to maximize torque.
l) Friction, its relationship to contacting surfaces and to the applied forces.

DETERMINETHEFOLLOWING:

1. The identity(name) of diagrammed forces on an object.
2. The new centre of gravity of an object when segments are rearranged, give the original centers of gravity.
3. The resultant vector in p linear force system, concurrent off system, and Parallel force system.

4. If a given object is in linear and rotational equilibrium.
5. The magnitude and direction of acceleration of an object not in equilibrium.
6. Which forces are joint distraction force and which are joint compression forces what are the equilibrium force for each.
7. The magnitude and direction of friction in a given problem.
8. The class of term in a given problem.

COMPARE THE FOLLOWING:

1. Mechanical advantage in second and third class level.
2. Work done by muscle in a second and third class level.
3. Stability of an object in two given situations in which location of the center of gravity and the base of support of the object.

DRAW THE FOLLOWING

1. The action line of muscle.
2. The rotary force component, the translatory force component and the moment arm for a given force on a lever.

A. JOINT STRUCTURE AND FUNCTION.

1. Describe the basic principles of joint design and a human joint.
2. Describe the tissue present in human joints: including dense fibrous tissue, bone, cartilage and connective tissue.
3. Classify joints – synarthrosis, Amphiarthrosis, Diarthrosis, classification of synovial joints.
4. Describe joint function, kinematics chains, range of motion.
5. Describe the general effects of injury and disease.

RECALL THE FOLLOWING.

1. The elementary principles of joint design.
2. The three main classifications of joints.
3. The five features common to all diarthodial joints.
4. Types of materials used in human joint construction.
5. Properties of connective tissue.

IDENTIFY THE FOLLOWING.

1. The axis of motion for any given motion at a specific joint (Knee, Hip, metacarpophalangeal).
2. The plane of motion for any given motion at a specific joint, shoulder, interphalangeal, wrist.
3. The degree of freedom at any given joint.
4. The distinguishing features of a diarthrodial joint.
5. The structure that contributes to joint stability.

COMPARE THE FOLLOWING.

1. A synarthrosis with a amphiarthrosis on the basis of methods, materials and function.
2. A synarthrosis with a diathrosis on the basis of methods, materials and function.
3. Closed kinematics chain with an open kinematics chain
4. Dense fibrous tissue with bone.
5. Hyaline cartilage with fibrocartilage.

B. MUSCLE STRUCTURE AND FUNCTION.

1. Describe mqbility and stability functions of muscles.

2. Describe elements of muscle structure Composition of a muscle fiber, the motor unit, types of muscle fibers, muscle fiber size, arrangement and number, Muscle tension, length- tendon relationship.
3. Describe types of muscle contraction, speed and angular velocity. Applied load, voluntary control, Torque & isokinetic exercise.
4. Summaries factors affecting muscle tension.
5. Classify muscles- spurt and shunt muscles, tonic and phasic Muscles.
6. Factors affecting muscle function: Type of joint and location of muscle attachment, number of joints, passive insufficiency, sensory receptors.

DESCRIBE THE FOLLOWING:

1. Ordering of the myofibrils in sarcomere.
2. An alpha motor neuron.
3. The connective tissue in a muscle.
4. How tension develops in muscle.
5. Isokinetic exercise.

DEFINE THE FOLLOWING

1. Active and passive insufficiency.
2. Active and passive tension.
3. Concentric, eccentric and isometric contractions.
4. Reserve action.
5. Agonists, antagonists and synergists.

RECALL THE FOLLOWING:

1. Factors affecting muscle tension.
2. Characteristics of different fiber types.
3. Characteristics of motor units.
4. Factor affecting angular velocity.

DIFFERENTIATE THE FOLLOWING:

1. A spurt from a shunt muscle.
2. A phase from a tonic muscle.
3. Agonists form an antagonist.
4. Active from passive insufficiency.
5. Concentric from eccentric contraction.

COMPARE THE FOLLOWING:

1.Tension development in eccentric versus concentric contractions.
2. The angular velocity of isometric versus concentric & isokinetic contractions.
3. Isokinetic exercise with concentric exercise.

C. THE VERTEBRAL COLUMN:

9. Articulations, Ligaments and muscles, typical vertebral intervertebral disc.
10. Describe factors affecting stability and mobility.
11. Regional structure and function of cervical, dorsal, lumber and sacral vertebrae.
12. Describe the muscle of the vertebral column- Flexors, Extensors, Rotators and Lateral flexors.

13. Describe the effects of injury and development deficits.

DESCRIBE THE FOLLOWING:

1.The curves of the vertebral column using appropriate terminology.

2. The articulations of the vertebral column.

3. The major ligaments of *toe* vertebral column.

4. The structural components of typical and atypical vertebrae.

5. The inter vertebral disc.

6. Regional characteristics of vertebral structure.

7. Motions of the vertebral column.

a. Lumbar - pelvic rhythm.

9. Rotation of the vertebrae in each region.

10. Movements of the ribs, during rotation.

IDENTIFY THEFQLLOWING:

1. Structure that provide stability for the column.

2. Muscles of the vertebral column and the specific functions of each.

3. Ligaments that limit specific motions (i.e. flexion, extension, lateral flexion, rotation).

4. Forces acting on the vertebral column during specific motions.

EXPLAIN THE FOLLOWING:

1. The relationship between the intervertebral and facet joints during motion of the vertebral column.
2. The role of the intervertebral disc in stability and mobility.
3. The effects of forces acting on the structural components during motion and at rest.

ANALYSE THE FOLLOWING:

1. The effect of disease process injury or other defects in the vertebrae.

2.The effects of an increased lumbo sacral angle on the pelvis and lumbar vertebral column.

D. THE SHOULDER COMPLEX:

1. Describe the structural components of the shoulder complex including the articulating surfaces, capsular attachments and ligaments and movements of the following joints:
    i) Sternoclavicular.
    ii) Acromioclavicular.
    iii) Scapulothoracic.
    iv) Gleno humeral.
2. Describe the function of shoulder complex including dynamic stability of the gleno humeral joint, gleno humeral Rhythm, scapulo thoracic and gleno humeral contributions.
3. Describe the muscles of elevation (Deltoid, Supraspinatus, Infraspinatus, Teres minor, Subscapularis, Upper Trapezius, lower Trapezius, Serratus anterior, and Middle Trapezius & Rhomboids).
4. Describe the muscles of depression, Lattisssimus dorsi Pectoralis, Teres Major, rhomboids,

DESCRIBETHE FOLLOWING:

1. The articular surfaces of the joints of the complex.

2. The function of the ligaments of each joint.
3. Accessory joint structures and the function of each.
4. Motions and ranges available at each joint and movement articular surfaces within the joint.
5. The normal mechanism of dynamic stability of the gleno humeral joint, utilizing principles of biomechanics.
6. The normal mechanism of gleno humeral stability in the dependent arm.
7. Scapulo humeral rhythm, including contributions of each joint.
8. The extent of dependent of independent function of each joint in scapulo humeral rhythm.
9. How restriction in the range of elevation of the arm may occur.
10. One muscular force couple at a given joint and its function.
11. The effect of given muscular deficit may have on shoulder complex function.

COMPARE THE FOLLOWING:

1. The advantages and disadvantages of coracoacromial arch.
2. The structural stability of the three joints, including the tendency toward degenerative changes and derangement.
3. Draw the action lines of muscles of the shoulder complex and the moment arm for each, and resolve each into components.

E. THE ELBOW COMPLEX.

1. Describe the structure of the humeroulnar and humeroradial joints including articulating surfaces, joints capsule, ligaments & Muscles.
2. Describe the function of the humeroulnar and humeroradial, all joints including the axis of motion, range of motion, muscle action.
3. Describe the structure of the superior and inferior radioulnar joints.
4. Describe the function of the superior and inferior radioulnar joints.
5. Describe the mobility and stability of the elbow complex its relationship to hand and wrist.
6. Describe the effects of injury and the resistance to longitudinal compression forces, to distraction forces & to medial lateral forces.

DESCRIBE THE FOLLOWING:

1. All the articulating surfaces associated with each of the following joints, humeroulnar, humeroradial, superior and inferior radioulnar.
2. the ligaments, associated with all the joints of the elbow complex.

IDENTIFY THE FOLLOWING:

1. Axes of motion for supination & pronation and flexion & extension.
2. The degrees of freedom associated with each of the joints of the elbow complex.
3. Factors limiting the range of motion in flexion and extension.
4. Factors that create the carrying angle.
5. Factors limiting motion in supination and pronation.

COMPARE THE FOLLOWING:

1. The translatory and rotary components of the brachio radial is and brachialis at all points in the range of motion.

2. The moment arms of the flexors at any point in the range of motion.
3. Muscle activity of the extensions in a closed kinematic chain with activity in an open the role of pronater teres with the role of pronator quadratus.
4. The role of biceps with that of brachialis.
5. The resistance to compressive forces.
6. The features of a classic tennis elbow with the features of cubital tunnel syndrome.
7. The role of and structure of the annular ligament with the role and structure of the articular disc.

F. THE WRIST AND HAND COMPLEX.

1. Describe the wrist complex including radiocarpal joint, metacarpal joint and the lingaments of the wrist complex.
2. Describe the function of the radiocarpal and midcarpal joints including the movements and muscles involved.
3. Describe the hand complex including: Structure of fingers (Carpometacarpal, Metacarpophalangeal and interphalangeal joints of fingers, ligaments, range of motion).
4. Describe the finger musculature including extrinsic & MCP, PIP and DIP joint function and intrinsic muscles.
5. Describe the structure of the Carpometacarpal, MCP and IP joints of thumb.
6. Describe the structure including the extrinsic & intrinsic thumb muscles.
7. Describe prehension, power, cylindrical, spherical & hook grips.
8. Describe precision handling, pad to pad, tip to tip and pad to side, prehension and functional position of wrist and hand.

DESCRIBE THE FOLLOWING:

1. The articular surfaces of the joints of the wrist and hand complexes.
2. The ligaments of the joints of the wrist and hand, including the function of each.
3. Accessory joint structures found in the wrist and hand complex, including the function of each.
4. Type of movements and types of motion of the radiocarpal joint, the midcarpal joint, and the total complex.
5. The sequence of joint activity occurring from full wrist flexion to extension including the role of the scaphoid, the sequence of joint activity in radial and ulnar deviation from neutral.
6. The role of wrist musculature in producing wrist motion.
7. Motions and ranges available to joints of the hand complex.
8. The gliding mechanism of the extrinsic finger flexors.
9. The structure of the extensor mechanism, including the muscles and ligaments that compose it.
10. How M.C.P. extension occurs, including the muscles that produce and control it.
11. How flexion and extension of the PIP joint occur, including the muscular and ligamentous forces that produce and control these motions.
12. How flexion and extension of DIP joints occur, including the muscular and ligamentous forces that produce and control these motions.

13. The role of the wrist in optimizing length - tension in. the extrinsic hand muscles.
14. The activity of reposition, including the muscles that perform it.
15. The functional position of the wrist and hand.

DIFFERENTIATEBETWEEN

1. The role *of* the interossei and lumbrical muscles at the MCP and IP joints.
2. The muscles used in cylindrical grip to those active in spherical grip, hook grip, and lateral, prehension.
3. The muscles that are active in pad to pad tip to tip and pad to side prehension.

COMPARE

1. The activity *of* muscles of the thumb (in opposition *of* the thumb to the index finger) with the activity *of* those active in opposition to the little finger.
2. The characteristics of power grip with those of precision handling.
3. The most easily disrupted form *of* precision handling that may be used some on without any active hand musculature: what are the prerequisites; *for* each.

G. THE HIP COMPLEX.

1. Describe the general features *of* the hip joint including the articulating surfaces on the pelvis & the femur, angulations, angle *of* inclination, angle *of* torsion, Internal architecture *of* femur and pelvis, joint capsule, ligaments & muscles (Flexors, Extensors- one joint extensors, two extensors, Adductors, Medial Rotators and lateral Rotators).
2. Describe the function of hip- Rotation, between pelvis, lumber spine and hip, Pelvis motion, anterior posterior pelvic tilting, lumbar pelvic rhythm, lateral pelvic tilting, pelvic rotation.
3. Summarize the pelvic motions in the static erect posture.
4. Describe femoral motion.
5. Describe hip stability in erect bilateral stance, sagital plane equilibrium and unilateral stance.
6. Describe reduction *of* forces with weight shifting and using a cane and deviations *form* normal in muscular weakness & bony abnormalities.

DESCRIBE THE FOLLOWING.

1. The articulating surfaces *of* the pelvis and femur.
2. The structure and function *of* the trabecular systems of the pelvic and femur.
3. The structure and function o*f* ligaments of the hip joint.
4. The angle *of* inclination and the angle *of* torsion.
5. The planes and axes of the following pelvic motions and the accompanying motions at the lumber spine and hip joints, pelvic rotation and anterior, posterior and lateral tilting of the pelvis.
6. The muscle activity that produces tilting and rotation *of* the pelvis.
7. Motions *of* the femur on the pelvis including planes and axes of rotation.
8. The structure and function *of* all the muscles associated with the hip joints.
9. The forces that act on the head *of* femur.
10. The position of greatest stability at the hjp.

EXPLAIN THE FOLLOWING:

1. How sagittal and frontal plane equilibrium are maintained in erect bilateral stance.
2. How frontal plane equilibrium is achieved in unilateral stance.
3. How force acting on the femoral head may be reduced.
4. How the functions of the two joint muscles at the hip are affected by changes in the position of the knee and hip.
5. The functional and structural relationship- among the hip, knee pelvis and lumbar spine.

COMPARE THE FOLLOWING:

1. Forces acting on the femoral head in erect bilateral stance with the forces acting on the head in erect unilateral stance.
2. Coxa valga with coax vara on the basis of hip stability and mobility.
3. The motions that occur at the hip, pelvis and lumbar spine during forward trunk bending with the motion that occur during anterior and posterior tilting on the pelvis in the erect standing position.
4. Ante version with retroversion on the basis of hip stability and mobility.
5. The structure and function of the following muscles- Flexors and Extensors, abductors and abductors, lateral and medical fracture.

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G. **THE KNEE COMPLEX.**

1. Describe the structure of the tibiofemoral joint, articulating surfaces on femur and tibia, the menisci, joint capsule and bursa, ligaments and other supporting structures, anterior- posterior and ligaments and medio- lateral stability, muscle structure, knee flexors. & extensors, axes of knee complex: Mechanical axis, Anatomic axis and axis of motion.
2. Describe the function of the tibiofemoral joint: range of motion, flexion and extension, rotation, abduction and adduction, locking and unlocking. Function of menisci and muscle function.
3. Describe the structure of the patellofemoral joint.
4. Describe the function of the patellofemoral joint.
5. Describe the effects of injury and disease in the tibiofemoral and patellofemoral joints.

DESCRIBE THE FOLLOWING.

1. The articulating surfaces of tibiofemoral and patellofemoral joints.
2. The joint capsule.
3. The anatomic and mechanical axes of knee.
4. Motion of the femoral condyles during flexion and extension in a closed kinematics chain.
5. Motion of the tibia in flexion & extension in an open kinematics chain.

DRAW:

1. The Q angle when an illustration of the lower extremity.
2. Moment arm of the quadriceps at the following degree of knee flexion: 90 deg., 130 deg., 30

deg., 10 deg.

3. The action lines of vastus lateralis and the vastus medialis oblique.

LOCATE:

1. The origin and insertion of all the muscles at the knee.
2. The burses surrounding the knee.
3. The attachment of the ligaments of the medial compartments.

IDENTIFY:

1. Structures that contribute to the medial stability of the knee including dynamic and static stabilizers.
2. Structures that contributes, to the lateral stability of the knee including dynamic and static stabilizers.
3. Structures that contributes to the posterior stability of the knee including dynamic and static stabilizers.
4. Structures that contributes to the anterior stability of the knee including dynamic and static stabilizers.
5. Structures that contributes to the rotary stability of the knee.
6. The normal forces that are acting on the knee.

COMPARE:

1. The knee and the elbow joint on the basis of similarities/ dissimilarities in structure and function.
2. The lateral with the medical meniscus on the basis of structure and function.
3. The forces on the patellofemoral joint in full flexion with full extension.
4. The action of quadriceps in an open kinematics chain with that in a closed kinematics chain.
5. The effectiveness on the hamstrings as knee flexors in each of the following hip positions: hyperextension, ten degrees of *flexion* and full flexion (open kinematics chain).
6. The effectiveness of the rectus femoris as a knee extensor at sixty degree of knee flexion with its effectiveness at ten degrees of knee flexion.

EXPLAIN:

1. The function of the menisci.
2. How a tear of the medial collateral ligament may affect joint function.
3. The functions of the suprapatellar, gastrocnemus, infrapatellar and prepatellor bursae.
4. Why the semiflexed position of the knee is the least painful position.
5. Why the knee may be more susceptible to injury than the hip joint

H. TYPE ANKLE- FOOT COMPLEX.

Describe the structure, ligaments, axis and function of the following: ankle joint, tibiofibular joints,

subtalar joints, talocalcaneonavicular joints, transverse tarsal joint, tarsometatarsal joint, plantar arches, Metatarasophalangeal joints, interphalangeal joints.

Define the terminology unique to the ankle foot complex, including inversion-eversion, pronation-supination, dorsiflexion, plantar flexion and adduction and abduction.

DESCRIBE:

1. The compound articulations of the ankle subtalar, talocalcaneonavicular, transversetarsal and tarsometatarsal joints.
2. The role of the tibiofibular joints and supporting ligaments.
3. The degrees of freedom and range of motion available at the joint of the ankle and the foot.
4. The significant ligaments that support the ankle, subtalar and transverse tarsal joints.
5. The triplanar nature of ankle joint motion.
6. The articular movements that occur in the weight- bearing subtatar joint during inversion - eversion.
7. The relationship between tibial rotation and subtalar/ talocalcaneonavicular inversion-eversion.
8. The relationship between hind foot inversion-eversion and mobility stability of the transverse tarsal joint.
9. The function of the tarsometatarsal joints, including when motion at these joints is called upon.
10. Supination- pronation of the forefoot at the tarsometatarsal joints.
11. Distribution of weight within the foot.
12. The structure and function of the plantar arches including the primary supporting structure.
13. When muscles supplement arch support, including those muscles that specifically contribute.
14. The effects of toe extension on the plantar arches.
15. The general function of the extrinsic muscles of ankle & foot.
16. The general function of the intrinsic muscle of foot.

I. POSTURE.

1. Describe the effects of gravity and indicate the location of the gravity line in the sagital plane in optimal posture.
2. Analyze- posture with respect to the optimal alignment of joints in the antero- posterior and lateral views.

DESCRIBE:

1. The position of hip knee and ankle joints in optimal erect posture.
2. The position of body gravity line in optimal erect posture, using appropriate points of reference.
3. The effect of gravitational moments of body segments in optimal erect posture.
4. The gravitational moments acting around the vertebral column, pelvis, hip, knee and ankle in optimal erect posture.
5. Muscles, ligamentous structures that counterbalance gravitational moments in optimal erect posture.

6. The following postural deviations: pesplanus, halluxvalgus, pes cavus, idiopathic scoliosis, kyphosis and lordosis.
7. The effects of the above postural deviations on body structures i.e. ligaments, joints and muscles.

DETERMINE:

1. How changes in the location of the body' gravity line will effect gravitational moments acting around specified joints axes.
2. How changes in the alignment of body segments will affect. Either the magnitude or the deviation of the gravitational moments.
3. How changes in the alignment of body segments will affect supporting structures such as ligaments, joint capsules, muscles, joint surfaces.

J. GAIT

DEFINE:

1. The stance, swing and double support phases of gait.
2. The subdivisions of the stance and swing phases of gait.
3. The time and distance parameters of gait.

DESCRIBE:

1. Joint motion at the hip, knee and ankle *for* one extremity during a gait cycle.
2. The location of line of gravity in relation to the hip knee and ankle during the stance phases of gait.
3. The gravitational moments of force acting at hip, knee and ankle during the stance phase.

EXPLAIN:

1. Muscle activity at the hip, knee and ankle throughout the gait cycle, including why and when a particular muscle is active and type of contraction required.
2. The role each of the determinates of gaits.
3. The muscle activity that occurs in the upper extremity and trunk.

COMPARE:

1. Motion of upper extremities and trunk with motion of pelvis and lower extremities. .
2. The traditional gait terminology with the new terminology.
3. Normal gait with a gait in which there is a weakness of the hip extensors and abductions.
4. Normal gait with a gait in which there is unequal leg lengths.

REFERENCE BOOKS

1. Practice exercise therapy- Hollis- Blackwell Scientific Publication
2. Therapeutic Exercises- Basmajjan- Williams and Wilkins.
3. Therapeutic Exercises Foundations and Techniques -Kisner and Colby -F.A. davis.
4. Principle of exercise of therapy - Gardiner -C. B.S. Delhi

5. Hydrotherapy, principle and practice- Campion - Butterworth Heinmann.
6. Muscle testing and functions - Kendall- Williams & Wiikins.
7. Deniels and Worthingham's- Muscle testing- Hislop & Montgomery - W. B. Saunders.
8. Measuremeot of joint motion: I guide to Goniometry- Norkins & White- F.A. Davis.
9.Biomechanical principles: Frenkel
10.Biomechanics: Norkins

PAPER CODE- PT-13(a) & PT-13(b)

SOCIOLOGY & PSYCHOLOGY

THEORY- Model question paper— [80 MARKS]

Section-A

MCQ-Q-1]-based on -Single best answer [20 x 1] 20marks (20 Min.)

Section-B

S.A.Q.- Based on Sociology

Q-2]-Answer any 5 out of 6- [5 x 3] 15 marks

Q-3]-Answer any 3 out of 4 - [3 x 5] 15 marks

Section-C

S.A.Q.- Based on Psychology

Q-2]-Answer any 5 out of 6- [5 x 3] 15 marks

Q-3]-Answer any 3 out of 4 - [3 x 5] 15 marks

PAPER CODE- PT-13(a)

SOCIOLOGY

S.No.		Hours	Weekly	University Exam	Internal Assessment	Minimum Pass Marks	Max Marks	Time
1	Theory	96	3	40	10	25	50	1.5 hrs
	Total	96	3	40	10	25	50	

Objectives:

At the end of the course the candidate must Know-

1. Introduction- definition & Relevance with Physiotherapy.
2. Sociology & Health – Social factors affecting Health Status, Social Consciousness & Perception of Illness, Decision Making in taking Treatment.
3. Socialization – Definition, Influence, of Social Factors, on Personality, Socialization in the Hospital &Rehabilitation of the patients.
4. Social groups-Concepts, Influence of formal & informal groups of Health & Diseases.
5. Community Role of Rural & Urban communities in Public Health, Role of community in determining Beliefs, Practices & Home Remedies in Treatment.
6. Social problems of the Disabled-Consequences of the following social problems in relation to sickness disability, remedies to prevent these problems
   a] Population Explosion b] Poverty & Unemployment **.**
7. Social Security & Social Legislation in relation to the Disabled.
8. Role of Primary & Secondary Groups in the Hospital & Rehabilitation Setting.
9. Family-Influence on human personality, Individual Health, Family & Nutrition Effects of Sickness on Family Psychosomatic Diseases & Family.
10. Culture-Components Impact on Human Behaviour Cultural Meaning of Sickness Response to Sickness & Choice of Treatment.

11. Caste systems-Features of Modern Cast Systems & its Trends, Social change factors – Human Adaptation, Stress, Deviance, Health Programme, Role of Social Planning in the improvement of Health & in Rehabilitation.
12. Social Control – Definition, Role of norms, Folkways, Customs, Morals, Religion, Law & other means of social controls in the regulation of Human Behaviour, Social Deviance & Disease
13. Prostitution, Alcoholism, Beggary, Problems of Women in Employment, Role of a Social Worker.
14. Role of Culture as Social consciousness in moulding the Perception of Reality, Culture induced Symptoms & Diseases, Sub-Culture of Medical Workers.
15. Social problems of the Disabled-Consequences of the following social problems in relation to sickness disability, remedies to prevent these problems – Juvenile delinquency

I. Introduction:

Definition of sociology, sociology as a science of society, uses of the study of sociology, application of knowledge of sociology in physiotherapy and occupational therapy.

II Sociology & health:
Social factors affecting health status, social consciousness and perception of illness, social consciousness and meaning of illness, decision making in taking treatment. Institution of health of the people.

II. Socialization:
Meaning of socialization influences of social factor on personality socialization in hospitals, socialization in rehabilitation of patients.

III. Social Group:
Concept of social group, influence of formal and informal groups on health and sickness, the role of primary groups and secondary groups in the hospitals and rehabilitation setting.

IV. Family:
Influence of family on human personality, discussion of changes in the function of a family, influence of family on the individual's health family and nutrition, the effect of sickness on family, and psychosomatic disease.

V. Community:
Concept of community, role of rural and urban communities in public health, role of community in determining beliefs, practices and home remedies in treatment.

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

VII. Caste system: Feature of modern caste system and its trends.

VIII. Social change:
Meaning of social change, factors of social change, human adoption and social change, social change and stress, social change and deviance, social change and health programmers, the role of social planning in the improvement of health and in rehabilitation.

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

X. Social problems of the disabled:
Consequences of the following social problems in relation to sickness *and* disability remedies to prevent these problems:

a) Population explosion
b) Poverty and *unemployment* ~
c) Beggary
d) Juvenile delinquency
e) Prostitution
f) Alcoholism
g) Problems of women in employment.

XI Social Security: Social security and social legislation in relation to the disabled.
XII Social Worker: The role of medical social worker.

PAPER CODE- PT-13(b)

PSYCHOLOGY

S.No.		Hours	Weekly	University Exam	Internal Assessment	Minimum Pass Marks	Max Marks	Time
1	Theory	96	3	40	10	25	50	1.5 hrs
	Total	96	3	40	10	25	50	

Objectives:
At the end of the course the candidate will able to:

1. Be able to define the term Psychology& its importance in the Health delivery System & will gain knowledge of Psychological maturation during human Development & growth & alterations during aging process.
2. Be able to understand the importance of psychological status of the person in Health &disease, environmental &emotional influence on the mind & personality.
3. Acquire the Knowledge as to how to deal with the patients.
4. Socio economic and cultural differences.
5. Socioeconomic and cultural issues related to morbidity owing to the physical disability and handicaps.

A. GENERAL PSYCHOLOGY

1. Definition of psychology: Definition of psychology, in relation to following schools method and branches. Structuralism, functionalism, behaviorism, psychoanalysis, Gestalt Psychology. Intersection, observation,

inventory and experimental method. General, child, social, abnormal, industrial, clinical, counseling, educational.

2. Heredity and Environment: Twins relative importance of heredity an environment, their role in relation to physical characteristics, intelligence and personality, nature- nature controversy.

3. Development and growth behavior: Infancy, childhood, adolescence, adulthood, middle age, old age.

4. Intelligence: Definition, IQ, Mental age, list of various intelligence tests- WAIS, WISC, and Bhatia's performance test, Raven's Progressive Metrics test.

5. Motivation: Definition, motive, drive, incentive and reinforcement, basic information about primary needs: hunger thirst, sleep elimination activity, air avoidance of pain, attitude to sex. Psychological needs: Information, security, self esteem, competence, love and hope.

6. Emotions: Definition: differentiate from feelings, psychological changes of gland, heredity and emotion, nature and control anger, fear and anxiety.

7. Personality:

a. Definitions: List of components: physical characteristics character, abilities temperament, interest and attitudes.
b. Discuss briefly the role of heredity, nervous system, physical characteristics, abilities, family and culture of personality development.
c. Basic concept of Freud: Unconscious, conscious, id ego and superego, list and .define the oral, anal and phallic stages of personality department list and define the stages as proposed by Erickson, 4concept of learning as proposed by Dollard and Miller, drive cue, response and reinforcement.
d. Personality assessment: Interview, standardized, non-standardized, exhaustive, and stress interviews, Hst and define inventories BAI,CPI and MMPI,projective test. Rorschach, TATand sentence completion test.

8. Learning: Definition:

List the laws of learning as proposed by Thorndike, type of learning: Briefly describe, classical conditions, operant conditioning, insight observation and Traila and error type list the effective ways to learn: Massed Vs. spaced, whole vs. part, Recitation Vs reading serial Vs. International learning, role of language.

9. Thinking:

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

10. Frustration:

Definition, sources, solution, conflict, Approach, Avoidance avoidance and approach- avoidance solutions.

11.Sensation, Attention and perception.

a. List of senses: Vision, Hearing, Olfactory, Gustatory and cutaneous sensation, movement equilibrium and visceral sense. Define attention - and list factors that determine attention: nature of stimulus intensity, color, change, extensity, repetition, movement size, curiosity, primary motives.

b. Define perception and list the principles of perception: Figure ground, constantcy, similarity, proximity, closure continuity values and interests, past experience, context, needs moods, religion, sex and age, perceived susceptibility perceived seriousness, perceived benefits and socio economic status.
c. Define illusion and hallucination.
d. List visual, auditory, cutaneous, gustatory and olfactory hallucination.

12.Democratic'and Authoritarian Leadership:

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

13. Defense Mechanisms of the Ego:

Denial, rationalization, projection, reaction formation, identification, repression, emotional insulation, undoing, interjection, acting depersonalization.

B. HEALTH PSYCHOLOGY.

1. Psychological reactions of a patient:

Psychological reactions *of* a patient during admission and treatment anxiety, shock denial, suspicion, questioning, loneliness, regression, shame, guilt, rejection, fear withdrawal, depression, egocentricity, concern about small matters, narrowed interests, emotional over reactions, perpetual changes, confusion disorientation, hallucination, delusion, illusions anger, hostility, lose *of* hope.

2. Reaction to loss:

Reactions to loss, death and bereavement shock and disbelief, development *of* awareness, restitution, resolution, stages *of* acceptance as proposed by Kubler - Ross.

3. Stress:

Physiological and psychological relation to health and sickness: psychosomatic, professional stress burnout.

4. Communications:

a.Type verbal, non-verbal, element in communication, barriers to good communication, developing effective communication, specific communication techniques.

b.Counseling: Definition, Aim differentiates from guidance, principles in counseling and personality qualities *of* counselors.

5. Compliance:

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

6. Emotional Needs:

Emotional needs and psychological factors in relation to unconscious patients, handicapped patients, bed - ridden patients, chronic pain, spinal cord, injury, paralysis, cerebral palsy, burns, amputations, disfigurement, head injury, degenerative disorders, parkinsonism. Leprosy, incontinence and mental illness.

7. Geriatric psychology:

Specific psychological,reactions and needs *of* geriatric patients.

8. Pediatric psychology:

Specific psychological reactions and needs *of* pediatric patients.

9. Behavior Modifications:

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

10.Substance abuse:

Psychological aspects *of* substance abuse: smoking, alcoholism and drug addiction.

11. Personality styles:

Different personality styles *of* patients.

BOOKS RECOMMENDED:

1. Megee- sociology'-Drydon presscllinois.
2. Kupuswamy- Social Changes in India -Vikas, Delhi
3. Ahuja- Social problems-Bookhive, Delhi
4. Gihnsberg- Principles of sociology-sterling publications.
5. Parter & Alder- Psychology & sociology applied to medicine- W.B. Sunders.
6. Julian- Social Problem- Prentice hall.
7. IntroduCtion to psychology- Mums- I.D.P. Co.
8. Foundation *of* psychology- Weld- Publishing house, Bombay.
9. Introduction to social psychology- Akolkar- Oxford publishing house.
10. Psychology and sociology - Applied to Medicine - Porter & Alder - W. B.Saunders.
11. Behavioral Science for Medical - undergraduates -Manju Mehta – Jaypee Brothers
12. Elementary Psychology -Mohsin Moti Lal Banarsi Dass, Delhi.
13. Sachdeva, &Bhushan-An introduction to sociology – Allahabad; kitabmahal ltd.1974
14. Madan – Indian social problems, Vol - I - Madras – Allied publications 1973

PAPER CODE- PT-14

Computer Application

S.No.		Hours	Weekly	University Exam	Internal Assessment	Minimum Pass Marks	Max Marks	Time
1	Theory	32	1	80	20	50	100	3 hrs
	Total	32	1	80	20	50	100	

Objectives:

At the end of the course the candidate will able to:

1. Be able to know what the computer is and how it works.
2. Able to surf the web for the literature survey or data collection.
3. Able to work efficiently on the computer.

Course Description :

1. To study the various components of a personal computer.
2. To have working Knowledge *of* hardware and software.
3. To practice the operational skill *of* common computer application including MS office: word processing & spread sheet software.
4. To have a basic knowledge *of* utility *of* multi- media.
5. To learn skills *of* web surfing-For literature, research relevance to the field *of* medicine.

PAPER CODE- PT-15

SUPERVISED CLINICAL PRACTICE

S.No.		Hours	Weekly	University Exam	Internal Assessment	Minimum Pass Marks	Max Marks	Time
1	Theory	32	1	-	-	-	-	-
	Total	32	1	-	-	-	-	-

Objectives:

At the end of the course the candidate will able to:

1. Be able to know how to attend the patient.
2. Have knowledge for assessment of patient at the clinic.
3. Interpersonal skill with patients and colleagues.

(To practice clinical skills under the supervision of Senior clinical staff at the O.P.D. set up & to maintain a Register /Log book - in which the prescribed Case Histories & written assignments are to be documented & to obtain the signature from the respective section In-charge at the end of the assignment.)

BACHELOR OF PHYSIOTHERAPY -THIRD YEAR

S.No.	Code	Subject	Theory			Practical			Total
			Exam	I.A.	Total	Exam	I.A.	Total	Marks
1	PT-16	General Medicine	80	20	100	80	20	100	200
2	PT-17	General Surgery	80	20	100	80	20	100	200
3	PT-18	Orthopaedics	80	20	100	80	20	100	200
4	PT-19	Physiotherapy in Cardio Respiratory Conditions	80	20	100	80	20	100	200
5	PT-20	Physiotherapy in Orthopaedics	80	20	100	80	20	100	200
6	PT-21	Supervised Clinical Training	-	-	-	-	-	-	-
		Total Marks							1000

Passing Criteria –50 % of total marks each in theory & practical

Eligibility to appear for University exam –35 % in Internal Assessment.

Hours of Study

S.No.	Code	Subject	Theory	Practical	Hours of Study	Weekly
1	PT-16	General Medicine	128	64	192	6
2	PT-17	General Surgery	128	64	192	6
3	PT-18	Orthopaedics	128	64	192	6
4	PT-19	Physiotherapy in Cardio Respiratory Conditions	192	96	288	9
5	PT-20	Physiotherapy in Orthopaedics	192	96	288	9
6	PT-21	Supervised Clinical Training	-	192	192	6
		Total Hours			1344	42

BACHELOR OF PHYSIOTHERAPY IIIYEAR

PAPER CODE-PT16

GENERAL MEDICINE

TEACHING HOURS: 192

THEORY:* 128*MARKS

PRACTICAL: 64 MARKS

TIME:* 3 *HOURS

Note: For Paper setters / Examiners

- Paper setter is required to set eight questions from the entire syllabus.
- Question no. one will be compulsory which carries 15marks (long essay).
- Student will be required to attempt five more questions out of seven carrying thirteen marks each

COURSE OBJECTIVES:

The objective of this course is that after 200 hours of lectures, demonstrations, in addition to clinics the student will be able to demonstrate a general understanding of the diseases that therapists would encounter in their practice. They should have a brief idea of the etiology and pathology, what the patient's symptoms and the resultant functional disability. This would help the candidates to understand the limitation imposed by the diseases on any therapy that may be prescribed.

COURSE OUTLINE

1. Infection diseases:

Tuberculosis, Tetanus, Typhoid fever, bacillary dysentery, amoebiasis, HIV Infection, AIDS, Measles & Nosocomial infection.

2. Metabolic & deficiency disease

- Diabetes mellitus, Obesity, Vitamin deficiency disease.
- Diseases of respiratory system (Anatomy & Physiology aspects)
- Asthma, Bronchitis, Collapse, Bronchiectasis, pneumonia, lung abscess, Empyema.
- COPD (Chronic bronchitis & Emphysema).

3. CVS

- Applied, clinical Anatomy and physiological aspect.
- Hypertension, Congestive Heart Failure, rheumatic fever, infective endocarditis.
- Pericarditis, Valaular heart diseases (mitral stenosis, mitral regurgitation, aortic stenosis, aortic regurgitation).

- Congenial heart disease (Atrial Septal Defect, Ventricular Septal Defect, Patent Ductus Arteriosus, tetra logy of Failot), Eisenmenger syndrome.
- Ischemic heart diseases.
- Myocardial infarction.
- Deep vein thrombosis & pulmonary embolism.

4. Hematology:

- Anemia (Iron deficiency anemia, Megalobiastic anemia, Hemolytic anemia & Aplastic anemic).
- Thrombocytopenia (idiopathic thrombocytopenia, Purura).
- Leukemia (Acute Lymphoid Leukemia, Chronic Hyeloid Leukemia, Chronic Lymphoid Leukemia, Acute Hyeloid Leukemia).
- Hemophilia, lymphadenopathy & spenomegaly

5. Gastrointestinal System:

- Peptic Ulcer, Hematemesis, dyspepsia, diarrhea, mal-absorption syndrome, Diseases of liver.
- Jaundice, viral hepatitis, cirrhosis of liver, ascites.

6. Diseases of Kidney

- Post streptococcal glomerulonephritis, Nephritic syndrome, urinary tract infection.
- Urinary calculi, Chronic renal failure.

7. Endocrinology

- Hypothyroidism, Hyperthyroidism, Addison's diseases, Cushing’s syndrome, Gigantism.

8. Dermatology

- Structure and function of normal skin Primary and Secondary lesion Pediculosis.
- Fungal infection: Dermatophytosis, Pitysiasis vesicular, Candidacies.
- Bacterial infection of the skin: impetigo & boil.
- Viral infections: Herpes.
- Eczema, Dermatitis & allergies.
- Acne, Alopecia, Vitiligo, Ieukoderma.
- Psoriasis.
- Leprosy.
- Sexual Transmitted diseases & venereal Diseases- Syphilis, Gonorrhea, HIV.

9. PSYCHIATRY

Introduction: Definition: sign & symptoms, types of mental disorders psychosomatic complication

Disorders:

1. Psychosis, schizophrenia, delusional disorders, acute and transient psychotic disorders.
2. Affective disorders: depression, disorders, mania, bipolar affective disorders.
3. Anxiety disorders: Agoraphobia, panic disorder, Generalized anxiety disorders.
4. Dissociative disorders: somatoform disorders, OCD.
5. Organic conditions- dementia, delirium, traumatic.

Special therapies:

1. Psychotherapy – psychoanalysis, narco, synerhesis, hypnosis, psychodrama.
2. Group therapy.
3. Shock therapy.
4. Surgery in psychiatric conditions.

Reference Books:-

1. Davidson principle and practice of medicine.
2. Brain's clinical neurology.
3. Medicine & neurology by Golewala
4. Surgery by Nan

BACHELOR OF PHYSIOTHERAPY III year

PAPER CODE-PT17

GENERAL SURGERY.

TEACHING HOURS:192

THEORY:* 128 *marks

TIME:* 64 *hours

PRACTICAL:80 Marks

Note: For Paper setters/Examiners

- Paper setter is required to set eight questions from the entire syllabus.
- Question no. one will be compulsory which carries 15 marks (long essay).
- Student will be required to attempt five more questions out of seven carrying thirteen marks each

1. General principles of surgeries

2. Describe different events accompanying in general anesthesia, principles of procedures, blood transfusion, body response to surgeries, anesthesia and blood trans fusion, Different types of anesthesia, complication and their management.

3. Resuscitation & support

a. Shock: types, clinical features, pathogenesis & treatment.

b. Hemorrhage: types, clinical features & management.

c. Fluid & electrolyte balances.

d. Blood transfusion : Indications & management.

4. Wound sinuse & ulcer

a. Healing by 1st & 2^{nd} intention.

b. Factors influencing would healing.

c. Pathogenesis of healing.

d. Scars:

i) Hypertrophic scar.

ji) Keloid.

iii) Types of wound.

5. Venous Disorders

a. Varicose veins.

b. Deep vein thrombosis.

6. **Lymphatics** B **Lymph Nodes**

a. Lymphomas.

b. Filariasis.

c. Lymphangilis.

d. Lymphoedema.

e.cystic hygroma.

7. ARTERIAL DISORDERS

a. Acute & Chronic arterial obstruction with investigations & management - embolism and thrombi.

b. Amputations: types, Indications and decision Making, surgical procedures, Complications and their management.

c. Gangrene - types, etiology, pathogenesis and management.

8. CARDIO-THORACIC SURGERY

Type of incision, pre and post operative Assessment, management and complications of Cardiothoracic Surgery and their management.

1. CARDIAC SURGERY

General principles of cardiac surgery, Outline indications, Contra-indication, site of incision, pre and post operative management and complications of the following:

a. Valvotomy and Valve Replacement.
b. Open Heart Surgery/Cardiac By pass Surgery.
c. Surgery on *Pericardium.*
d. Operations in congenital disorders.
e. Heart transplantation.
f. Pacemaker.
g. Coronary Angioplasty.
h. Balloon Angioplasty and Vascular Surgery (Outline surgery of Artery and veins).

2 THORACIC SURGERIES

a. General principles of Thoracic surgery, Outline indication, Contraindication, site of incision, common surgical procedures, pre and post operative management, Post operative pulmonary complications & their management following:
    - Lobectomy.
    - Pneumonectomy.

- Segmentectomy.
- Pleuro pneumonectomy.
- Thoracoplasty.
- Decortication.
- Tracheostomy.

b. Outline clinical features and management of carcinoma of lung.

c. Outline clinical *features* and management of the following: Fracture of ribs, Flail chest, stove-in chest, Pneumothorax, Lung Contusion and Laceration and injury to Vessels, Haemothorax, and Pulmonary embolism
d. Describe in detail the following procedures: Endotracheal tubing, Tracheal suction, weaning the patient from ventilator, Extubation and Post-extubation care.
e. Describe the principles of Cardio-pulmonary Resuscitation, Cardiac massage, Artificial Respiration, Defibrillators and their uses.

9. ABDOMINAL SURGERY

Describe abdominal surgical incisions and their uses.

Outline indications, incisions, drains and complications and their management of various surgeries like:

Nephrectomy. Appendicectomy, Herniorraphy, Mastectomy, thyriodectomy, colostomy, Adrenalectomy, Cystectomy, Hysterectomy, Prostatectomy, Cholecystectomy, Ileostomy, Surgical procedures in various types of Hernias.

Clinical presentation, causes, Etiopathogenesis, management of the following:

Hernias, peptic ulcer, carcinoma of stomach, Acute & chronic pancreatitis, Cholelithiasis, Cholecystitis, Neoplasm of gallbladder & bile duct.

10. NEURO SURGERY

A. Outline indications , incisions, drains & complications and their Management about various surgeries of:

1. Surgeries of cranium, scalp &brain
2. Surgeries of vertebral column &spinal cord.
3. Surgeries of peripheral nerves.

B.Surgical interventions in hydrocephalus, Head injury, Benign & malignant tumors of brain and other congenital anomalies of brain.

11. BURNS & PLASTIC SURGERY

a. Classify burns by depth and surface area, calculation of burns, outline the causes, early & late complications and their management.
b. List the potential deformities due to burns, methods of prevention and precautions, Mentions cosmetics and functional treatment measures.
c. Outline the plastic surgery procedures and management in burns, including common deformities and prevention of burns contractures.
d. Skin grafting & other procedures.
e. Principles of cineplasty, tendon transplant, cosmetic surgeries, types of grafts & surgeries of hands.

12. Maxillo Fascial Injuries and Congenital Anomalies

Cleft Lip, palate, cancer, lip & cheek their clinical presentation investigations and surgical management

13. Mouth, Eye, Cheek & Tongue

Clinical presentation, investigations and surgical management of the following:

a. Salivary tumors - benign & malignant.
b. Carcinoma tongue
c. Salivary retension cysts.
d. Acute parotites.

14. THYROID GLAND

Definition, Patho-physiology, diagnosis & management of

i) Goiter.
ii) Thtrotoxicosis.
jii) Neoplasm.
iv) Thyroglosial cyst.

15. BREAST

Surgical anatomy, nipple discharge acute & chronic Infections Different incisions & management of tumour.

16. LIVER: clinical presentation, Etiopathogenesis and management of the following

a. Amoebic liver abscess
b. Hydrated cyst

c. Obstruction jaundice.

17. SPLEEN

Causes of splenomegaly, clinical presentation, examination findings & management.

18. Clinical presentation, investigations and Management of the following

Peritonitis, mesenteric cyst.

19. SMALL & LARGE INTESTINE.

Clinical presentation, investigations and Management of the following:

a. Intestinal amoebiasis, tuberculosis & carcinoma

b. Ulcerative colitis & cronicsds

c. Mechanical intestinal obst.

d. Paralytic ileus.

e.. Appendix

f. . All type of incisions & common, surgical procedures

20. RECTUM & ANAL CANAL

a. Anal fissure, fistula, hemorrhoids caranal canal rectal prolapsed

21. UROGENITAL SYSTEM

a. Renal calculi with complications.

b. Renal tuberculosis & renal tumors.

c. Hematuria, urinary obstruction.

d. stricture urethra and penis.

e. Passion testis & congenital anomalies.

f. Hydrocoel & varicocoel.

BOOK REFERENCE:-

1. Bailey & Love

2. Surgery by Nan

3. General surgery operations by R.M Kirk & R.C.N Williston.

BACHELOR OF PHYSIOTHERAPY III Year
PAPER CODE-PT18
ORTHOPEDICS

TEACHING HOURS: 192
THEORY: 128 MARKS
TIME:* 64 *HOURS
PRACTICAL: 80 MARKS

Note: For Paper setters / Examiners

- Paper setter is required to set eight questions from the entire syllabus.
- Question no. one will be compulsory which carries 15 marks (long essay).
- Student will be required to attempt five more questions out of seven carrying thirteen marks each

COURSE DESCRIPTION

Following the basic science the basic science course, this course introduces the student to the orthopedic conditions which commonly cause disability. Particular effort is made in this course to avoid burdening the student with any detail pertaining to diagnosis which will not contribute to their understanding of the limitation imposed by orthopaedic pathology on the functioning of the individual.

COURSE OBJECTIVES

The objective of this course is that after 200 hours of lectures, demonstrations, in addition to clinics the student will be able to demonstrate an understanding of orthopedics conditions causing disability and their management.

Section I

Traumatology

A. Bony Injuries

1.Fractures (General) & Dislocations, classifications, healing of fracture, factors affecting healing, early & late complications, general principles of management.

2.Specific: Types, Complications, Management of the following fractures.

a. Upper limb Fractures: Clavicle, Scapula, Humerus, Ulna, Radius, Carpals, phalanges, Crush injuries of Hand.

b. Lower limb Fractures: Pelvis, Femur, Patella, tibia, Fibula, tarsals, Metatarsals.

C. Spine: Cervical, Thoracic, Lumbar.

B. Soft Tissue Injuries

1.Tendon, bursa, sprain, strain, compartment syndromes, Capsules, Synovial membrane, Semilunar cartilage Injuries, Anterio Cruciate Ligament, Posterior Cruciate Ligament, Medial Collateral Ligament, lateral Cruciate ligament.

Section II

Inflammatory and Infective Conditions

A. Etiology, pathology, clinical features, operative and non operative management of Tuberculosis and pyogenic osteomylitis.
B. Etiology, pathology, clinical features, Investigations, operative and non operative management of Rheumatoid Arthritis, tuberculosis arthritis, pyogenic arthritis, ankylosing spondylitis, gouty arthritis, Neuropathic Joints, Hemophilic joints.
C. Poliomyelitis, etiology, Classification, pathology, clinical presentation, Post polio residual paralysis, non operative and operative management.
D. Synovitis, capsulitis.

Sect III

Deformities:

Etiology, epidimology, Clinical Presentation, investigations, management of the following: Torticolis, Cervical rib, CTEV, CDH, Pes Cavus, Pes Planus, spina Bifida, Klippel feil Syndrome, Goucher's diseases, scoliosis, increased thoracic Kyphosis, Increased lumbar lordosis, coxa vara, Genu varum, Genu valgum, genu recurvatum, hallux valgus, hammer toe.

Sect IV

Degenerative & Metabolic disorders:

A. Etiology, Pathology, Clinical features, Investigations, management of Osteoartherosis of major joints, spondylosis, spondylolisthesis PIVD.

B. Etiology, Pathology, Clinical features, Investigations, management of rickets, osteomalacia, osteoporosis.

Sect V

Bone tumours & Amputations

a) Benign & Malignant, Classification, Pathology, Clinical Features, Management including chemotherapy and Radiotherapy.
b) Level of amputation of lower Limb and upper limb, causes of amputation.

Sect VI

Corrective procedures

Osteotomy, Arthoplasty (Hip, Knee, Ankle, shoulder & elbow), Bone Grafting, arthodesis, tendon transfers, Soft tissue release,

Sect VI

Miscellaneous conditions

De- Querveins Diseases, Duputerynes Contracture, Myositis Ossificans, Carpal Tunnel syndrome, Chondromalacia Patella, Perthes's Diseases, Avascular necrosis of femoral head, Internal derangement of Knee, Osteochondrosis.

Books Recommended:

1. Orthopedics & Traumatology - Natrajan
2. Out line of Fracture by Adams
3. Outline of Orthopedics- By Adams
4. Orthopedics Physical Assessment- magee
5. Textbook of Orthopedics _ Kalava
6. Physiotherapy in Orthopedics - Alkinsons

BACHELOR OF PHYSIOTHERAPY-III YEAR

PAPER CODE-PT19

Physiotherapy in Cardio-Respiratory Conditions

TEACHING HOURS: 288

THEORY: 192 MARKS

TIME: 3 HRS.

PRACTICAL:96 MARKS

Note: For Paper setters / Examiners

- Paper setter is required to set eight questions from the entire syllabus.
- Question no. one will be compulsory which carries 15 marks (long essay).
- Student will be required to attempt five more questions out of Seven carrying thirteen marks each

COURSE DESCRIPTION

This course serves to integrate the knowledge gained by the students in Clinical Cardiorespiratory conditions with the skills gained in exercise therapy, electrotherapy and massage, thus enabling them to apply these in clinical situations of dysfunction due to cardiorespiratory pathology.

COURSE OBJECTIVES

The objective of this course is that after 200 hours of lectures, demonstrations, practical and clinics the student will be able to identify cardio respiratory dysfunction, set treatment goals and apply their skills in exercise therapy, electrotherapy and massage in clinical situation to restore cardiorespiratory function.

Section-I

Respiratory

- Review of mechanism of normal respiration (rate, rhythm, use of accessory muscles).
- Chest examination, including auscultation, percussion, knowledge of various investigative procedures (invasive & non invasive) use in the diagnosis of various respiratory disorders.
- Chest deformities (Barrel chest, pigeon chest)
- Measurement: Chest expansion at different Levels.
- Techniques of physical treatment: Breathing exercise, Chest mobilization exercises Postural drainage, Huffing, Coughing, Percussion, Vibration & Chest Shaking.
- Review of the Pathological and principles of management by physiotherapy to the following conditions:

1. COPD, Asthma, Lung abscess, Bronchietasis.
2. Pleurisy and Empyema, Pneumonia.
3. Bacterial Disease.
4. Rheumatic fever, Carcinoma of respiratory tract.
5. Paralysis of diaphragm & Vocal cords.
6. Chest wall deformities.
7. Principles of Intensive Care Physiotherapy, Aerosol Therapy, Humidification.

Section-II

Cardiovascular

1). Review of anatomy and physiology of the cardiovascular system.
2). Knowledge of various investigative procedures, Physical assesment (invasive & non invasive) used in the diagnosis of 'various cardio vascular disorders.
3). Review of pathological changes, Clinical presentation, Principle of management by Physiotherapy of the following conditions:

- Hypertension.
- Hypotension.
- Aneurysm.
- Congestive Cardiac failure.
- Peripheral Vascular Disordes:
    a. Atherosclerosis.
    b. Arteriosclerosis.
    c. Thrombosis.
    d. Embolism.
    e. Burger's diseases.
    f. Thrombophlebitis.
    g. Phlebitis.
- Gangrene.
- Lymphedema.

Section-III

Thoracic Surgery.

Review of pathological changes and principle of pre and post operative management by physiotherapy of the following conditions:

1). Lobectomy, Pneumonectomy, Thoracotomy, Thoracoplasty, Endoscopy & Eye Hole surgeries.
2). Corrective surgeries of congenital heart defects, Angioplasties, Blood vessel grafting, Open heart surgeries & Heart transplant.

Book Recommended:

1.Cash Textbook of general medical and surgical conditions for physiotherapists- Donnie Jaypee Brothers.
2. Essential of Cariopulmonary physical therapy- Hillegass & Sadowsky- W.B.Saunders.
3.Cash textbook of Chest, Heart and Vascular Disorders for physiotherapists- Downie- J.P. Brothers.
4. The-Brompton Guide to chest physical therapy
5. Cardiopulmonary Physical Therapy- Irwin and Tecknin, Mosby.
6. Cardiovascular/Respiratory physiotherapy- Smith & Ball- Mosby
7. ACSM Guidelines for exercise testing and prescription- ACSM- Williams and Wilkins.
8.Chest physiotherapy in intensive care unit- Mackenzie et al - Williams and Wilkins.

Note: For Paper setters / Examiners

- Paper setter is required to set eight questions from the entire syllabus.
- Question no. one will be compulsory which carries 15 marks (long essay).
- Student will be required to attempt five more questions out of seven carrying thirteen marks each

COURSE OBJECTIVES

The objective of this course is that after 300 hours of lectures, demonstrations, practicals and clinics the student will be able to identify disability due to musculoskeletal dysfunction, set treatment goals and apply their skills in exercise therapy, electrotherapy and massage in clinical situation to restore musculoskeletal function.

COURSE DESCRIPTION

This course serves to integrate the knowledge gained by the students in Clinical Orthopaedics, with the skills gained in exercise therapy, electrotherapy and massage, thus enabling them to apply these in clinical situations of dysfunction due to musculokeletal pathology.

Theory

1. **Traumatology:** Brief review of the following condition and various management aims, physiotherapeutic intervention, means and technique of physiotherapy should be taught including Kalternborn, Maitland, Mulligan, Mckenzie etc.

   A. Bony Tissue

   1. Fracture and dislocations: Classification and type of displacement, method of immobilization, healing of fractures and factors affecting union, non union, delayed Union etc., common sites of fractures and their general physiotherapeutic management.
   2. Specific fractures and their physiotherapeutic management.
      a) Upper limb: Clavicle, humerus, ulna, radius, crush injuries of hand.
      b) Lower Limb: fracture neck of femur, shaft of femur, patella, tibia fibula, pott's fracture, fracture of tarsal and metatarsals.
      c) Spine: fracture and dislocations of cervical, thoracic and lumbar vertebrae with and without neurological deficits.

   B. Soft tissue injuries:

   - Synovitis.
   - Capsulitis.
   - Tendonitis and other tendon injuries around wrist, elbow, knee, shoulder, ankle.
   - Bursitis, volkman's ischemic contracture.
   - Tear of semilunar cartilage, menisectomy.
   - Injury to cruciate ligaments of knee.

- Internal derangement of knee.
- And other overuse injuries important for a Physiotherapist.

2. **Surgical procedures:**

a. Pre and post operative physiotherapy management of common corrective procedure like arthroplasty, arthrodesis, osteotomy, patellectomy, tendon transplants, soft tissue release, grafting, including post polio residual paralysis and leprosy deformities corrections.

b. Amputation: Level of amputation of upper limb and lower limb, stump care, stump bandaging, Pre and post operative physiotherapy management, pre and post prosthetic management including check out of prosthesis, training etc.

3. Deformities: Etiology, pathology, clinical presentation, diagnostic criterion general, orthotic, and Physiotherapy Management of the following: Congenital torticollis, Cervical rib, CTEV, Pes cavus , Pes planus and other common congenital deformities, Scoliosis, Increased and decreased Kyphosis, increased & decreased Lordosis, Coxa vara, Genu valgum, Genu varum and recurvatum.

4. Degenerative and infective conditions: Etiology, pathology, clinical presentation, diagnostic criterion, general, orthotic, and Physiotherapy Management of the following:
osteoarthritis of major joints, Spondylosis, Spondylitis, Spondylolisthesis, PIVD, Periarthritis of shoulder, Tuberculosis of spine, bone and major joints, and other miscellaneous orthopaedic conditions treated by Physiotherapy.

5. Arthritis and Allied conditions (in details): Etiology, pathology, clinical presentation, diagnostic criterion general, orthotic, and Physiotherapy Management of the following:

a Osteo- Arthritis-generalized, Degenerative and traumatic.

b. Rheumatoid Arthritis, Still's disease, infective Arthritis.

c. Spondylitis, ankylosing spondylitis.

d. Non articular Rheumatism, Fibrositis, trigger point, fibromyalgia.

e. Perthes disease

f. Ganglion,

g. Duputuren’s contracture

6. Etiopathogenesis and physiotherapy and general management of the Edema-Traumatic, Obstructive, position dependent and Paralytic,

7. Deficiency disease- Rickets, Osteomalacia, Osteoporosis and other deficiency disorders related to Physiotherapy their clinical presentation, etiopathogenesis, management strategies including physiotherapy interventions.

Practical

Various physiotherapy modalities and treatment techniques for the above mentioned conditions to be demonstrated and practiced by the students in clinical setup.

Books Recommended:

1.Cash textbook orthopedics and Rheumatology for physiotherapists - Downie -Jaypee brothers.

2. Tidy's physiotherapy- Tomson et. al Butterworth Heinmann

3. Essentials of orthopedics and applied physiotherapy - Joshi and Kotwal- B.L. Churchill Livingstone.

4 Tetraplegia & Paraplegia- Bromley- W.B. Saunders.

5 Orthopedics physiotherapy- Donatelli & Wooden- WB. Saunders.

6 Rheumatological Physiotherapy- David - Mosby

7 Orthopaedic Physiotherapy- Tids well - Mosby

8 Physiotherapy for amputee- Engstrom & Van de van - Churchill Livingsstone

9. Sports Injuris: Diagnosis and management: Norris Butterworth Heinmann.

BACHELOR OF PHYSIOTHERAPY III YEAR
Paper Code-P21

Supervised Clinical Training

TEACHING HOURS: 192

PRACTICAL: 192 Hours

Clinical assignments should include Observation, Clinical History taking & technical assistance to the senior clinical staff on Duty. All the subjects covered General Medicine, General Surgery, Orthopaedics, Physiotherapy in Cardio-Respiratory Conditions, Physiotherapy in Orthopaedics sections at the O.P.D set up.

[The student should maintain a Journal/File in which documentation of minimum 15 case histories to be included.]

BACHELOR OF PHYSIOTHERAPY -FINAL YEAR

S.No.	Code	Subject	Theory			Practical			Total
			Exam	I.A.	Total	Exam	I.A.	Total	Marks
1	PT-22	Neurology	80	20	100	80	20	100	200
	PT-23(a)	Paediatrics	40	10	50	-	-	-	50
2	PT-23(b)	Geriatrics	40	10	50	-	-	-	50
	PT-24(a)	Gynae & Obstetrics	40	10	50	-	-	-	50
	PT-24(b)	ENT	20	5	25	-	-	-	25
3	PT-24(c)	Ophthalmology	20	5	25	-	-	-	25
4	PT-25	Physiotherapy in Neurology	80	20	100	80	20	100	200
5	PT-26	Physiotherapy in General Medical and Surgical Conditions	80	20	100	80	20	100	200
6	PT-27	Rationale of Rehabilitation	80	20	100	80	20	100	200
7	PT-28	Physiotherapy Ethics and Law	40	10	50	-	-	-	50
8	PT-29	Research Methodology and Biostatistics	80	20	100	-	-	-	100
9	PT-30	Supervised Clinical Training	-	-	-	-	-	-	-
		Total Marks							1150

Passing Criteria –50 % of total marks each in theory & practical

Eligibility to appear for University exam –35 % in Internal Assessment.

Hours of Study

S.No.	Code	Subject	Theory	Practical	Hours of Study	Weekly
			128	64	192	6
1	PT-22	Neurology	64	-	64	2
2	PT-23(a)	Paediatrics	64	-	64	2
	PT-23(b)	Geriatrics	64	-	64	2
3	PT-24(a)	Gynae & Obs	32	-	32	1
	PT-24(b)	ENT	32	-	32	1
	PT-24(c)	Ophthalmology	128	64	192	6
4	PT-25	Physiotherapy in Neurology	128	64	192	6
5	PT-26	Physiotherapy in General Medical and Surgical Conditions	96	64	160	5
6	PT-27	Rationale of Rehabilitation	64	-	64	2
7	PT-28	Physiotherapy Ethics and Law	96	-	96	3
8	PT-29	Research Methodology and Biostatistics	-	192	192	6
9	PT-30	Supervised Clinical Training			1344	42

BACHELOROF PHYSIOTHERAPY-IV Year

PAPERCODE-PT22

NEUROLOGY

TEACHING HOURS: 192

THEORY:* 80 *MARKS

PRACTICAL:80 MARKS

TIME:* 3 *HOURS

Note: For Paper setters / Examiners

- Paper setter is required to set eight questions from the entire syllabus.
- Question no. one will be compulsory which carries 15 marks (long essay).
- Student will be required to attempt five more questions out of seven carrying thirteen mark's each

COURSE DESCRIPTION

Following the basic science and clinical science course, this course introduces the student to the neurological conditions which commonly cause disability. Particular effort is made in this course to avoid burdening the student with any detail pertaining to diagnosis which will not contribute to their understanding of the limitations imposed by neurological pathology on the functioning of the individual.

COURSE OBJECTIVE

The objective of this course is that after 120 hours of lectures & demonstrations. In adding to clinics, the students will be able to demonstrate an understanding of neurological conditions causing disability and their management in addition, the student will be able to fulfill with 75% accuracy (as measured by written, oral& practical, internal evaluation) the following objectives of the course.

COURSE OUTLINE

1 .NEUROANATOMY.

Review the basic anatomy of the brain and spinal cord including: Blood supply of the brain and spinal cord, anatomy of the visual pathway, connections of the cerebellum, and extra pyramidal system, relationship of the spinal nerves to the spinal cord segments, long tracts of the spinal cord, the brachial and lumbar plexuses, and cranial nerves.

2. NEUROPHYSIOLOGY

Review in brief the Neurophysiologic basic of disorder of tone posture, bladder control, muscle contraction, movement control and pain.

3. CLINICAL FEATURE & MANAGEMENT.

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

1.Congenital childhood disorders.

a. Cerebral palsy.

b. Hydrocephalus.

c. Spina Bifida.

2. Cerebrovascular accident.

a. General classification: thrombotic, embolic, hemorrhagic & inflammatory strokes.

b. Gross localization and sequelae.

c. Detailed rehabilitative program.

3. Traumatic disorders

Trauma-broad localization, first aid and management of sequelae of head injury and spinal cord injury.

4. Diseases of the spinal cord

- Craniocerebral junction anomalies.
- Syringomyelia.
- Cervical and lumber disc lesions.
- Spinal Tumors (Intramedullary & Extra medullary)
- Spinal archnoiditis.

5. Demyelinating diseases (central and peripheral)

- Guillian- Barre syndrome.
- Acute disseminated encephalomyelitis.
- Transverse myelitis.
- Multiple sclerosis.

6. Degenerative disorders.

- Parkinson's disease.
- Dementia.

7. Infectious disorders of Nervous system

a. Pyogenic Meningitis sequel.

b. Tuberculous infection of central nervous system.

c. Poliomyelitis.

8. Diseases of the muscle: classification, signs, symptoms, progression and management.

a. Muscular Dystrophy: definition, classification, course and management.

b. Myasthenia Gravis: Definition, course and management.

c. Myopathy: definition, classification, course and management.

9. Peripheral nerve disorders.

a. Peripheral nerve injuries: localization and management.

b. Entrapment neuropathies.

c. Peripheral neuropathies.

10. Miscellaneous.

a. Epilepsy: Definition, classification and management.

b. Intracranial tumors: Broad classification, signs and symptoms.

c. Motor neuron disease.

d. Dystonia.

4. ASSESSMENT

Clinical assessment of neurological function to be taught through bedside or demonstration clinics spread out over at least 5 sessions.

1. Basic history taking to determine whether the brain, spinal cord of peripheral nerve is involved.
2. Assessment of higher mental function such as orientation, memory, attention, speech and language.
3. Assessment of cranial nerves.
4. Assessment of motor power.
5. Assessment of sensory function: touch, pain and position.
6. Assessment of tone: spasticity, rigidity and hypotonia.
7. Assessment of cerebellar function.
8. Assessment of higher cortical function: apraxia, etc.
9. Assessment of gait abnormalities.

Books Recommended:

1. Adams & Victor, Principals of Neurology by maurica Victor & Allan H. Rupper.
2. Neurology & Neurosurgery Illustrated By Kenneth W. Lindsay & Ian Bone
3. Brains Diseases of Nervous system edited By Michael Dowaghy
4. Blue Book of Practical neurology- Movement Disorder By CD Marsden & S. Fahn.

BACHELOR OF PHYSIOTHERAPY-IV YEAR
PAPER CODE-PT23 (PART-I)
PAEDIATRICS

TEACHING HOURS: 64
THEORY: 40 MARKS
TIME: 1.30 HOURS

Note: For Paper setters / Examiners

- Paper setter is required to set 4 questions from the entire syllabus.
- Question No. one will be compulsory which carries 14 marks (long essay).
- Student will be required to attempt two more questions out of three carrying thirteen mark's each

PEDIATRIC TOPICS:-

1. Introduction to pediatrics.
2. Growth and development: laws of growth, factors affecting growth & development, developmental delay.
3. Developmental mile stone: Motor, adaptive, social milestones.
4. Congenital deformities, Cleft lip cleft palate, choandatresia imperforate clinical presentation, diagnosis and management.
5. Etiology, sign, symptoms and treatment I of the following:
   - Clubfoot .
   - Flatfoot.
   - Knock knees.
   - Bowlegs.
7. Spina-bifida & meningocele Diagnosis, treatment and complication.
8. Scoliosis diagnosis & Management
9. Congenital dysplasia Hip : clinical presentation, diagnosis & management.
10. Obstetric palsies: Etiology, management, follow up & prevention
11. Cerebral palsy, etiology, clinical presentation, classifications, management.
12. Osteogenesis imperfect: Pathogenesis type and treatment.
13. Rickets: Etiology clinical picture and treatment.
14. Scurvy Etiology clinical picture and treatment.
15. Anemia Etiology type and management.
16. PEM Type classification and nutritional therapy.
17. Muscular dystrophy Presentation and management.

18. Genetic Disorders: Diagnosis and treatment.
19. Down's syndrome Clinical profile and management.
20. Epilepsy: Types and treatment.
21. Disability, Handicap Definition & implication.
22. Worm infestation Types and treatment.
23. Tuberculosis Primary complex diagnosis & treatment.
24. Bronchial asthma: Etiology & treatment including AC secure asthma.
25. Congenital Heart Disease: types, clinical presentation, diagnosis and treatment.
26. Rheumatic fever Diagnosis criteria, complication & treatment.
28. Diarrhea: Etiology, treatment, ORD & fluidotherapy.
29. Pneumonia: Causes sign symptom &treatment.
30. Nephritic Syndrome: definition pathogenesis & treatment.

Books Recommended:

1. Nelson text book of pediatrics-Behraman & varghan.

BACHELOR OF PHYSIOTHERAPY-IV Year

PAPER CODE-23 (PART-II)

GERIATRICS

TEACHING HOURS: 64

THEORY:* 40 *MARKS

TIME: 1.30 HOURS

Note: For Paper setters / Examiners

- Paper setter is required to set 4 questions from the entire syllabus.
- Question no .one will be compulsory which carries 14 marks (long essay).
- Student will be required to attempt two more questions out of three carrying thirteen marks each.

Course Objective:

After the end of the course the physiotherapist should be able to:

- Collect history from a geriatric patient.
- Clinically assess a geriatric patient.
- Know the common problems in elderly.
- Know the multiple diseases occurring in one elderly patient.
- Know the problems associated with multiple drug therapy in elderly.

Detailed Syllabus:

1. The ageing process- Loss of sense, effect on skeletal system, altered homeostasis and how these may affect pathological processes.
2. How to make life active in old age - Healthy life style & modifying risk factors which may cause other health problems: like treating hypertension, hyper cholestremia to prevent stroke & MI.
3. Causes of frequent falls, common fractures associated with fall, risk factors, and management of fractures
4. Aetiopathogenesis Urine & fecal incontinence in old age and management.
5. Aetiopathogenesis, clinical presentations investigations and management of stroke in old age.
6. Palliative care, prevention, cause & management of bed sores in old age.
7. Aetiology, pathology, clinical presentation and management of the following in old age
    - Delirium & dementia.

- Depression.
- Parkinsonism.
- COPD.
- IHD.& CCF.
- Rheumatoid arthritis, Osteoarthritis, Osteoporosis.
- Diabetes mellitus.

8. Examination and Investigations in older person
    - Mini mental state examination.
    - Geriatric depression scale.
    - Barstool ADL.

Books Recommended:

1. Current Geriatrics Diagnosis& treatment- C. Seth Landefeld.

BACHELOR OF PHYSIOTHERAPY IV Year
PAPER CODE- PT24
OBS & GYNE, ENT, OPTHALMOLOGY

TEACHING HOURS: 128
M. *MARKS:* 80 *MARKS*
TIME:* 3 *HOURS

Note: For Paper setters I Examiners
The paper has following three sections: -

Sr. No.	Section	Topics	Max. Marks	Time	Teaching Hours
1	*Section -I*	*OBS & GYNAE*	40 Marks	11/2 Hrs.	64
2	*Section-II*	ENT	20 Marks	1/2 Hrs.	32
3	*Section-III*	Opthamology	20 Marks	1/2 Hrs.	32

1. Paper setter must draft down fifteen questions *from* all the three section of these sections of subject.
2. Each section must have five questions carrying five marks each.
3. The students are required to attempt any *four* questions *from* each section.

Section –I
OBS &Gynecology

1. Anatomy of Female reproductive system:
   i) External genital.
   ii) Ovaries fallopian tubes, uterus & vagina.
   iii) Blood and nerve supply to genital organs.
2. Physiology of Pregnancy:
   i) Menstruation.
   ii) Pregnancy and fetal development.
   iii) Physiological changes in various maternal system and organs.
   iv) Endocrine system in pregnancy.
3. Complication of pregnancy:
   i) Abortion, Ectopic.
   ii) APH & PPH.
   iii) PIH.
   iv) Abnormal Presentation.
4. Antenatal and postnatal cases:
   i) Normal Pregnancy- Symptoms signs, investigation, immunization, nutrition and supplements.
   ii) Normal Delivery
   iii) Normal Puerperium role of Physiotherapy in Pregnancy, delivery, puerperium
5. Common Gynecological Problems and role of physiotherapy
   i) Disorders of menstruation, menorrhagia, DUB, menopause, menarche.

ii) Pelvic inflammatory disease.
iii) Fibroid uterus.
iv) Stress incontinent.

6. Common Obstetrics and Gynecological operation
   i) Caesarean
   ii) Hysterectomy
   iii) D & C
   iv) MTP
   v) Tubectomy
   vi) D & E

Section-II
ENT

1. Clinical Presentation, pathology, complications, and treatment of the following conditions:

a. Rhinitis
i) Acute rhinitis
ii) Chronic non-specific & specific rhinitis
iii) Atrophic rhinitis
iv) Vasomotor rhinitis

b. Sinusitis
i) Acute rhino sinusitis & Chronic sinusitis

c. Otitis Media
i) Acute otitis media
ii) Chronic otitis media

4. Otoscleosis: Incidence, Clinical features & Medical and Surgical Rx.

5. Mastardectomy: Types of hearing loss, methods to detect hearing loss. Presbyacusis, hearing aids, hearing loss in children.

6. Andrology: Pure tone audiometry, impedance audiometry, types of speech, speech defects, speech therapy.

Book reference:-

1. Modern trend of ophthalmology-Arnold Sorsby.
2. ENT of general Practitioners.

Section-III
Opthalmology

EYE EXAMINATION

Eye-Anatomy and Physiology

a) Common inflammations and other infections of the eyediagnosis and managment.
b) Ptosis, defects of the external rectus,managment.
c) Cataract, diagnosis and managment.
d) Refractions-Myopia, hyper Metropia, diagnosis and management.
e) Pleoptic Exercisesand indications.
f) Physiological defects of vision and managment.
g) Cornea ulcers, managment.

Books Recommended:

1. A.K. Khurana-Ophthalmology.

BACHELOR OF PHYSIOTHERAPY IV Year
PAPER CODE-PT25
PHYSIOTHERAPY IN NEUROLOGY

TEACHING HOURS: 192
THEORY:* 80 *MARKS
TIME:* 3 *HOURS
PRACTICAL: 80 MARKS

Note: For Paper setters / Examiners

- Paper setter is required to set eight questions from the entire syllabus.
- Question No. one will be compulsory which carries 15 marks (long essay).
- Student will be required to attempt five more questions out of seven carrying thirteen marks each

COURSE DESCRIPTION

This course serves to integrate the knowledge gained by the students in Clinical Neurology, with the skills gained in exercise therapy, electrotherapy and massage, thus enabling them to apply these in clinical situations of dysfunction due to pathology in the nervous system.

COURSE OBJECTIVES

The objective of this course in that after 300 hours of lectures & demonstrations, practical and clinics, the student will be able to identify disability due to neurological dysfunction, set treatment goals and apply their skill in exercise therapy, electrotherapy and massage in clinical situation to restore neurological function. In addition, the student will be able to fulfill with 75% accuracy (as measured by written, oral & practical internal evaluations) the following objectives of the course.

SECTION-I

COURSE OUTLINE

A. Review of Clinical Neuroanatomy & Neurophysiology:

Review, the structure and function of a) neuron b) synapse c) supporting tissue, Review the organization and function of a) cerebral hemispheres b) cerebellum c) spinal cord d) peripheral nerves e) pyramidal system f) extra pyramidal system. Review the factors influencing alpha motor neuron activity. Review the neurological basis of muscle tone and movement and demonstrate the following: a) hypertonia b) spasticity and rigidity c) ataxia d) athetosis e) chorea

B. **Principles of Assessment**

Review a) skill in history taking b) assessment of higher functions, cortical sensations, cranial nerves, dorsal column sensation and pain & temperature sensations c) assessment of motor function: grading of muscle power, assessment of range of movement, balance and coordination d) assessment of superficial and deep reflexes e) assessment of reflex maturation in terms of stimulus, position negative/positive reaction and their significance f) assessment of gait- both normal and abnormal (spastic, ataxic and paralytic patterns) Emphasis should be placed on teaching accurate assessment techniques and various recording methods e.g. color coding on body charts, graphs etc.

C. **Principles of Treatment**

Review the treatment principles as follows:-

a. Sensory re -education: hypersensitivity, hyposensitivity and anesthesia.

b. Treatment of altered tone: hyper tonicity and hypo tonicity.
c. Motor re-education: Strengthening exercise, coordination exercise, joint mobilization exercise, use of equilibrium and labyrinthine systems, use of PNF patterns, controlled sensory stimulation to bias the spindle cells e.g. Vibration, tactile, ice etc. use of stretch to elicit movement (facilitation), light joint compression (inhibition) use of rifle, activity to improve motor function, phylogenic sequence of motor behavior.
d. Treatment to improve function: Free exercise, gait training with and without aids, activities of daily living, mat exercise, exercise for recreation.
e. Review the use of ambulatory aids in neurological conditions: In spastic upper motor neuron lesions, In lower motor lesions, in dorsal column dysfunction and cerebral dysfunction.
f. Review the use of splints and braces in spastic upper motor neuron and in flaccid lower motor neuron lesions, in both upper and lower limbs.
g. Review the management of chronic pain in neurological conditions with respect to the type of pain, treatment modalities available, selection criteria for each modality and possible complications.

D. Cerebral Palsy

Define cerebral palsy and describe the topographical classification, monoplegia, diplegia, paraplegia, hemiplegia & tetraplegia.

Describe types of cerebral palsy. Assess reflex activity at different levels: Cortical, mid brain, brain stem, spinal. Assess developmental milestones from birth to five years, Assess functional ability: Prone to supine (rolling) Coming to sitting, quadruped, crawling, kneeling, kneel-stand, stand with support and walking. Examine for contractures as follows: hip flexion, adduction, internal rotation: Knee flexion: ankle plantar flexion, inversion, eversion. Flexion contracture of elbow, wrist & fingers and spinal deformities.
Treatment - Describe and demonstrate the treatment motor dysfunction: Passive movement, stretching of soft tissue tightness, use of ice to reduce spasticity, positioning the child to prevent soft tissue contractures, to inhibit abnormal reflexes and to facilitate volitional movement. Describe and demonstrate techniques of carrying of different type of CP children, encouraging bimanual activities in different starting positions like prone sitting and standing and activities across the midline. Describe appropriate home programmes for positioning the child, handling them and assisting improvement of function. Introduction to treatment techniques: Bobath, Rood.

E. **Peripheral Nerve Lesions**

Identify type of peripheral nerve lesions. Assess the motor 'system: Specific muscles. Range of motion, active and passive ranges, muscle girth. Assess sensory system: touch, pain, temperature, par aesthesia, nerve reverberation. Assess autonomic function: sweating, skin condition, soft tissue atrophy. Treatment: describe muscle reeducation techniques: electrical stimulation (selection of current): active, assisted, resisted movements: Passive and self assistive stretching and massage. Describe sensory reeducation and pain relief by various modalities; describe the common splints used peripheral nerve lesions. Static, dynamic and functional. Isolating muscle contraction, specific muscle strengthening.
Post- Operative management: Pressure bandaging reeducation after transfer. Describe a home programme.

F**. Neuro Muscular Diseases**

1. Amyotrophic Lateral sclerosis: introduction, etiopathology, clinical sign & symptoms, impairments, disabilities,evaluation Procedure, physiotherapy management.

2. Demyelinating inflammatory polyradiculoneuropathies: Introduction, etiopathology, clinical sign & symptoms, impairments, disabilities, evaluation procedure & physiotherapy management.
3. Muscular Dystrophy: Describe stages of the disease: ambulatory, wheelchair and bed stages. Describe significance of exercise resisted, active and free. Identify and assess common contractures and deformities. Assess range of motion and muscle power. Assess functional ability.
   Demonstrate treatment program for strengthening weak muscles:
   Active movements and hydrotherapy. Increase range of motion by suspension therapy, powder board, passive stretching positioning etc.
   Demonstrate gait training with appropriate orthoses, Describe management of chest complication: breathing exercises chest percussion, drainage of secretions and assisted coughing.

G. Basal Ganglion disorders:

Introduction to the function of basal Ganglion, relation with posture and movement.

i. Parkinsonism: Review the natural history, course and prognosis of the disease. Identify and assess problems in posture sitting, kneeling and standing balance, voluntary and automatic movements rigidity. Tremor and gait. Assess also hearing, speech and finger dexterity. Describe disability grading according to Yulu. Demonstrate treatment: postural awareness and relaxation training. Gait training techniques: associated reactions, heel-toe gait, overcoming obstacles, start and stop on command, turning and walking backwards, forwards and sideward. Describe an appropriate home exercise programme.
ii. Huntingtons Diseases: etiopathology, sign& symptoms, stages, examination procedure, physiotherapist treatment goals and treatment techniques.
iii. Wilsons Diseases: etiopathology, sign& symptoms, stages, examination procedure, physiotherapist treatment goals and treatment techniques.
iv. Tardive Dyskinesia : etiopathology, sign& symptoms, stages, examination procedure, physiotherapist treatment goals and treatment techniques.
v. Dystonias : etiopathology, sign& symptoms, stages, examination procedure, physiotherapist treatment goals and treatment techniques.

H. **Spinal Cord Lesions:**

Describe types of spinal cord lesions. Describe sign of tract and root
Interruptions, Describe positioning of the patient in acute spinal cord injury, Describe assessment of the motor system: tone, power of specific muscle range of motion and limbs girth. Describe assessment of sensory system and reflexes.

Describe assessment of functional ability and balance reactions in appropriate cases. Describe assessment of respiratory function. Muscles of respiration, coughing ability and vital capacity. Describe how the level of lesion is ascertained.

Treatment: Describe the stages of immobilization & stage when weight bearing is allowed, Describe spinal orthosis. Demonstrate motor reeducation programmes and programme for respiratory care in high level paraplegics and quadriplegics. Demonstrate progressive ambulation, mat exercises, various strengthening programmes, methods of decreasing spasticity and improving sitting balance. Demonstrate paraplegic gaits and reeducation in functional activities: transfer and protective falling. Describe common ambulatory aids used in paraplegics and common plints used .in tetraplegics. Describe the use of Hydrotherapy in paraplegics. Describe the concept of team approach in rehabilitation of these patients.

I. **Hemiplegia:**

Define hemiplegia and identify the following: Sensory disturbance, alterations in tone, loss of selective movement, loss of balance reactions and communications problems.
Treatment: Describe the unilateral and bilateral approaches to treatment. Describe positioning in the supine position, on the affected and on the unaffected sides. Demonstrate activities in the recumbent position arm mobilization. Trunk elongation-scapular movement, arm elevation, activities for a recovering arm: activities for the lower limb. i.e. hip and knee flexion over the side of the bed, knee extension with dorsi flexion, hip control, and isolated knee extension

Mat activities: demonstrate rolling on to affected and unaffected sides, sitting and kneeling. Describe the technique of making a patient sit passively and active assisted in sitting: Demonstrate Transfer Technique. Describe activities in sitting: equal weight transference on buttocks, shuffling on buttocks, weight transfer through arms balance reaction on trunk & head.

Demonstrate activities in the standing position : standing from plinth, from chair (assisted and independent), weight bearing an affected leg, knee, control in stand weight transfers forward, backward and side wards, Gait training and stair climbing. Describe tilt board activities in the lying and sitting positions. Describe additional methods of stimulation using verbal cues, ice, pressure & tapping. Describe management of shoulder pain and shoulder hand syndrome. Identify and describe hemiplegics gait, identify synergy, Components and abnormal reflex activities. Demonstrate reeducation of gait, motor relearning techniques functional approach and use of orthosis.

J. **CEREBELLAR LESIONS:**

Identify and assess abnormal tone, decomposition of movement. Rapid alternate movements, Pleurothotonus, proprioception, dysmetria, posture and gait. Treatment: Demonstrate exercises for in coordination- Frenkel's and weighted exercises. Demonstrate techniques for reeducation of balance and equilibrium reactions by visual compensation. Describe use of appropriate aids far ambulation depending in the severity of affection - walker, elbow crutches, quadruped, walking sticks, etc.

K. **POLIOMYELITIS & Post Polio syndrome:**

Define poliomyelitis and review the stages in the disease -acute, recovery and residual paralysis. Describe treatment in the acute stage: heat chest care, positioning. Describe the assessment of a patient in the recovery stage: active and passive range of motion, soft tissue tightness, muscle power & spinal deformities. Demonstrate treatment in the recovery stage: muscle strengthening- progress resistive exercises. Describe the role of suspension and hydrotherapy. Describe the treatment of soft tissue tightness by passive stretching, auto-stretching, pre-operative assessment of contractures: hip flexion, TA contracture, knee flexion and foot deformities. Review orthotic aids commonly used the management of polio. Describe tendon transfer operations commonly performed. Describe functional retraining for self care, gait training and posture correction.

L. Multiple Sclerosis: etiopathology, sign& symptoms, stages, examination procedure, physiotherapy treatment goals and treatment techniques.

M. Balance & Vestibular Disorders: basic physiology and balance control, common vestibular disorder, assessment, therapeutic goals and treatment techniques.

Section II
Neuro surgery

Review of pathological changes and principle of pre and post operative management by physiotherapy of the following conditions.

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

Practical

Various Physiotherapy modalities and treatment techniques for above Mentioned conditions should be demonstrated and practiced by the students.

Books Recommended:

1. Cash's textbook of neurology for, physiotherapists - Dowani - J.P. Brothers.
2. Adult Hemiplegia - Evaluation & treatment - Bobath – Oxford ButterworthHeinman
3. Neurological Rehabilitation - Carr&Shepherd - ButterworthHeinman
4.Tetraplegia and paraplegia - A guide for physiotherapist- Bromley-Churchill Livingstone.
5.Neurological physiotherapy - A Problem solving approach – Susan Edwards- Churchill Linvigstone.
6. Neurological Rehabilitation - Umpherd - Mosby.
7. Geriatric physical therapy- Gucciona- Mosby.
8. Motor assessment of Developing Infat - Piper & Darrah - W.B. Saunders.
9. Pediatric physical therapy- Teckling Lippincott.
10.Treatment of cerebral Palsy and motor Delay - Levitts- Blackwell Scientific Publications, London.
11.Aging the Health care Challenge - Levis- F.A. Davis.
12. Physiotherapy in Pediatrics - Shepherd - Butterworth Heinman.

BACHELOR OF PHYSIOTHERAPY - IV YEAR

Papercode-PT26

Physiotherapy in General Medical & Surgical Conditions

TEACHING HOURS: 192
THEORY:* 80 *MARKS
TIME:* 3 *HOURS
PRACTICAL: 80 MARKS

Note: For Paper setters / Examiners

- Paper setter is required to set eight questions from the entire syllabus.
- Question No. one will be compulsory which carries 15 marks (long essay).
- Student will be required to attempt five more questions out of seven carrying thirteen marks each

Section-I

General, Gynecology and Obstetrics and ENT.

Review of pathological changes and principle of pre and post operative management by physiotherapy of the following conditions:

1) Common abdominal surgeries. Including GIT, liver, spleen, Kidney, bladder etc.
2) Common operation of reproductive system, including surgical intervention for child delivery. Ante natal & post natal, physiotherapy.
3) Common operations of the ear, nose, throat & Jaw as related to physiotherapy.
4) Common organ transplant surgeries - heart, liver, bone marrow etc.

Section-II

Wounds, Burns & Plastic Surgery.

Review of pathological changes and principle of pre and post operative management by physiotherapy of the following conditions:

1) Wounds, ulcers, pressure sores:
2) Burns & their complications.
3) Common reconstructive surgical proceedings of the management of wounds, ulcers, burns & consequent contractures & deformities.

Section-III

Pediatrics.

A. Review the examination & assessment of a pediatric patient.

B.Review of pathological change and principle of management by Physiotherapy of the following conditions:

1) Common congenital and acquired muscle skeletal disorders.

2) Common congenital and acquired neurological disorders (CNS & PNS)

3) Common heredity disorders.

4) Common nutritional, metabolic & vitamin deficiency disorders

5) Cerebral palsy, myopathy and muscular dystrophies.

Section-IV

Geriatrics

A. Review of the examination &assessment of a geriatric patient.

B. Review of pathological changes and principle of management by Physiotherapy of the following conditions:

1) Musculoskeletal disorders.

2) Cardiopulmonary disorders

3) Neurological disorders (CNS &PNS)

4) Injuries &accidents specific to the aged.

Section-V

Sports Physiotherapy

Principle of sports physiotherapy - causes of sports injury, prevention of sports injuries, management of acute sports injury, common occurred injuries., Role of physiotherapist in sports principle and advanced rehabilitation of the injured athlete.

Section-VI

Skin & Psychiatric disorders

Review of the Pathological and principles of management by physiotherapy to the following conditions,

1. Common conditions of Skin-Acne, Psoriasis, Alopecia, Leucoderma, leprosy, Sexually transmitted diseases.
2. Psychiatric Disorders- Psychosis, Psychoneurosis, Senile dementia.

Practical

Various Physiotherapy modalities and treatment techniques for above Mentioned conditions should be demonstrated and practiced by the students.

BACHELOR OF PHYSIOTHERAPY-IV YEAR

PAPERCODE-PT27

RATIONALE OF REHABILITATION

TEACHING HOURS: 160

THEORY: 80 MARKS

TIME:* 3 *HOURS

Note: **For Paper setters I Examiners**

- Paper setter is required to set eight questions from the entire syllabus.
- Question No. one will be compulsory which carries 15 marks (long essay).
- Student will be required to attempt five more questions out of seven carrying thirteen mark's each

COURSE DESCRIPTION

Following the basic sciences and clinical science course, this course will enable the students to understand their role in the management of disability within the rehabilitation team.

COURSE OBJECTIVES

The objective of this course is that after 120 hours of lectures, demonstrations in addition to clinics, the student will be able to demonstrate an understanding of:

A. The concept of team approach in rehabilitation will be discussed and implemented, through practical demonstration, with contributions from all members of the team.
B. Observation and identification of diagnostic features in physical conditions will be practiced through clinical demonstration.
C. Medical and surgical aspects of disabling conditions will be explained in relation to rehabilitation.
D. Identification of residual potentials in patients with partial or total disability (temporary or permanent).
E. Formulation of appropriate goals (long & short term) in treatment & rehabilitation will be discussed.

Section I

(Disability & Rehabilitation)

1. Introduction to Disability & Rehabilitation.
2. Definition concerned in the phases of disability process.
3. Definition concerned with causes of impairment, functional limitation & disability.
4. Disability prevention and Rehabilitation Principles of physical Medicine, different Rehabilitation teams, their members and their role.
5. Community based Rehabilitation, Rural rehabilitation incorporated with Primary Health Centers.
6. Present rehabilitation services.
7. Reservation and Legislation for rehabilitation services for the disabled.
8. Principles of prescription writing and referral services.

Section II

(Bioengineering)

1. Definition and principles of bioengineering. Designing and construction of upper lower extremity orthosis and spinal orthosis. Upper extremity and lower extremity prosthesis
2. Prescription, fitting, and checking.
3. Prescription of foot wear modifications and their importance
4. Wheel chair: various parts, prescription, modification, wheel chair activities & training.
5. Design and construction of adoptive devices.

Section III

(Physical Medicine)

Principles of physical Medicine, calculation of percentage of physical Disability, Physical evaluation, principles of management and rehabilitation.

Section IV

(Communication rehabilitation)

1. Principle of Management of Communication: Impairment.
2. Speech production
3. Communication disorders secondary to brain damage.
4. Evaluating Language
5. Aphasia and its treatment.
6. Dysarthria and its treatment.
7. Non- aphasic Language disorders.

Section V

(Social Rehabilitation)

1. Principles in management of social problems.
2. Social needs of the patient.
3. Rehabilitation center environment.
4. The social worker as a member of the rehabilitation team.
5. Contribution on social work.

Section VI

(Vocational Rehabilitation)

1. Principle in Management of Vocational problems
2. Vocational Evaluation.
3. Vocational Goals for the disabled.
4. Community Resources.

Section VII

(Administration)

1. Description of various rehabilitation Institutions, centers and attached to Hospitals or other wise in India and abroad.
2. Space locations, climatic and environmental conditions, Preparation of scheme for set up of rehabilitation units in a hospital or outside hospital with a given number of patients and specific condition
3. Basic principles of Administration and organization philosophy & approach
4. Organizational of structure of the rehabilitation units of the handicapped including : Finances, Budgets and income and expenditure statement.

Section VIII

(Organization)

1. Principle or relationship between personnel of rehabilitation unit and other department.
2. Principles of relationship between the institution and the guardians of the handicapped or patient.
3. Principle of relationship between head of the unit with various government and semi-government, trusts and juniors.
4. Relationship between a staff and his supervisors equals and juniors.
5. Personnel Management: recruitment, ACR, implementation of policies, use of resources. Accounts register, fees register, other office registers like cash book, stock, various forms and parents correspondence, leave registers, (including leave Account, miscellaneous like, financial records, grant applications etc.)
6. Principle of maintaining department secrecy,
7. Definition of policy and how best it Is to be carried out:.
8. Introduction to job analysis of importance.
9. Methods of teaching to handicapped and other workers in rehabilitation Unit.
10. Principles of teaching and guiding student's juniors and senior in O.T. and PT training schools and centers.

Books Recommended:

1. Rehabilitation -Evans.
2. Directory for disabled people.
3. Improvement residential life for disabled people- truly.
4. Physical medicine & rehabilitation- Okawata.
5. Community diagnosis & Health action- Bennerth.
6. Hand book of Physical medicine & rehabilitation.- Husk.

BACHELOR OF PHYSIOTHERAPY-IV YEAR

PAPER CODE-PT28

PHYSIOTHERAPY ETHICS & LAW.

TEACHING HOURS:64
THEORY MAXIMUM MARKS: 40
EXAMINATION TIME:* 3 *HOURS

Note: For Paper setters I Examiners

- Paper setter is required to set eight questions from the entire syllabus.
- Question No. one will be compulsory which carries 15 marks (long essay).
- Student will be required to attempt five more questions out of seven carrying thirteen marks each

1. History of physiotherapy.
2. Philosophy and Philosophical statements.
3. Major Ethical principles applied to moral issue in health care.
4. Rules of professional conduct.
5. Scope of practice.
6. Relationships with patients.
7. Relationships with medical collogues.
8. Relationships between professional with carrier.
9. Relationships with in the profession.
10. Confidentiality and responsibility.
11. Pervision of services and advertising.
12. -Sale of goods.
13. Personnel and professional standard.
14. Professional standard.
15. Professional and government licensing, Accreditation and Education standards.
16. Laws and legal concepts.
    - Law.
    - Legal concepts.
    - Protection from Malpractice claims.
    - Consumer protection Act.
    - Liability and Documentation.

Books Recommended:

1. British Journal of Physiotherapy 1994 Issues
2. Medical Ethies- By. CM. Francis.

BACHELOR OF PHYSIOTHERAPY III YEAR

Paper Code- PT29

RESEARCH METHODOLOGY AND BIOSTATISTICS

TEACHING HOURS: 96

THEORY:* 80 *MARKS

TIME:* 3 *HRS.

Note: For Paper setters / Examiners

- Paper setter is required to set eight questions from the entire syllabus.
- Question no. one will be compulsory which carries 15 marks (long essay).
- Student will be required to attempt five more questions out of seven carrying thirteen marks each.

COURSE DESCRIPTION

Section-I

a. Introduction & importance of research in Clinical practice, scientific approach, characteristics, purpose and limitations of research.
b. Ethical issues in research, elements of informed constant.
c. Research question including literature review.
d. Research design, statics and basic concepts.
e. Structure of a research proposal.
f. Questionnaires, surveys and sampling
g. Measurement, principles of measurement, reliability and validity.
h. Reading published research for critical analysis.
i. Techniques of Descriptive research.
j. Writing the research for publication.
j. Basic concepts for stage presentation of research.

Section-II

a. Biostatistics:
b. Descriptive stastics.
c. Comparison of means, T-tests.
d. Analysis of variance.
e. Multiple comparisons.
f. Non-parametric statistics.
g. Correlations.

Books Recommended:

1. Methods in Biostatistics- Mahajan- J.P.
2. Statistics in Medicine-Colton-Little Brown, Boston.
3. Research for Physiotherapist Project Design and Analysis-Hicks - Churchill Livingstone.
4. Biostatistics: The manual for Statistical methods for in health and nutition-KV. Rao. J.P.
5. Research methods in behavioural Sciences- Mohsin- Orient Publication.

BACHELOR OF PHYSIOTHERAPY III YEAR
Paper Code-P30

Supervised Clinical Training

TEACHING HOURS: 192

PRACTICAL: 192 Hours

Clinical assignments should include Observation, Clinical History taking & technical assistance to the senior clinical staff on Duty. All the subjects covered Neurology, Paediatrics, Geriatrics, Gynae & Obs, ENT, Opthalmology, Physiotherapy in Neurology, Physiotherapy in General Medical and Surgical Conditions & Rationale of Rehabilitation sections at the O.P.D set up.

[The student should maintain a Journal/File in which documentation of minimum 15 case histories to be included.]