EXAM SCHEME AND SYLLABUS

(Applicable for the batches admitted from the
Academic Session 2023-24 onwards)

BACHELOR OF PHYSIOTHERAPY

(BPT, 4 ½ Years Degree Programme)

Faculty of Paramedical Science & Allied Health Science

Chirayu University

Bhopal, MP 462030, India

AIMS:

The aims of Bachelor of Physiotherapy (4 ½ year degree) program are typically focused on developing students' knowledge, skills, and professional competencies in the field of physiotherapy. The Physiotherapy graduates should acquire adequate knowledge, necessary skills and reasonable attitudes which are required for carrying out all activities, appropriate to general physiotherapy practice involving the prevention, diagnosis and treatment of anomalies and diseases of the human body. The graduate also should understand the concept of community physiotherapy education and be able to participate in the rural health care delivery programs existing in the country.

OBJECTIVES:

1. Foundational knowledge: Providing students with a solid understanding of the anatomical, physiological, and biomechanical principles related to human movement and function.
2. Clinical skills: Developing the practical skills required to assess and diagnose musculoskeletal, neurological, and cardiopulmonary conditions, as well as to design and implement evidence-based treatment plans.
3. Patient management: Equipping students with the ability to effectively manage and treat a wide range of patients, including those with acute and chronic conditions, sports injuries, and surgical procedures.
4. Professional ethics: Instilling ethical values and professionalism in students, emphasizing the importance of respecting patient autonomy, confidentiality, and conducting themselves ethically in the healthcare profession.
5. Critical thinking and research: Encouraging students to apply critical thinking skills in the assessment, evaluation, and selection of appropriate treatment options, as well as promoting research literacy to facilitate evidence-based practice.
6. Interprofessional collaboration: Cultivating the ability to work collaboratively and effectively with other healthcare professionals, such as physicians, nurses, occupational therapists, and speech-language pathologists, to provide holistic patient care.
7. Effective communication: Developing effective communication and interpersonal skills to establish rapport with patients, convey information clearly and empathetically, and educate individuals on injury prevention, rehabilitation, and self-management.
8. Professional development: Fostering a commitment to lifelong learning, professional growth, and engagement in continuing education to stay updated with advancements in the field and provide high-quality care.

   These aims collectively prepare graduates for a rewarding career as physiotherapists who can contribute to improving patients' health, well-being, and functional outcomes.

COURSE STRUCTURE:
The Bachelor of Physiotherapy (BPT) program is Four & Half year (4 ½ year) Degree Program.

DURATION OF THE PROGRAM:
1.BPT I YEAR
2.BPT II YEAR
3.BPT III YEAR
4.BPT IV YEAR

TEACHING DAYS: Each academic year shall consist of 160 teaching days.

INTERNSHIP: There shall be six months of Internship after the final examination for candidate declared to have passed the examination in all the subjects.

SCHEME OF EXAMINATION:
BACHELOR OF PHYSIOTHERAPY (B. P. T.)

2023- Batches Onwards

SCHEME OF EXAMINATION FOR FIRST YEAR B. P. T.

There shall be five subjects for the first year B.P.T. Examination. The subjects Qualification of the examination will be as follows.

Subject	**Internal Assessment**		**University Examination**			**Total**
	Theory	Practical	Theory	Viva	Practical	
Human Anatomy	20	20	100	20	40	200
Human Physiology	20	20	100	20	40	200
Fundamental of Physics, Biomechanics & Biomechanical Modalities	20	20	100	20	40	200
Fundamental of Medical Electronics & principles of Bioelectrical Modalities	20	20	100	20	40	200
Psychology & Sociology	20	--	80	--	--	100
Total Max. Marks						**900**

N.B.- Viva marks will be added in theory marks along with internal assessment theory; candidate have to get min. 50% marks in theory and viva collectively for passing the examination.

Passing Marks: - A candidate must obtain 50% in aggregate with a minimum of 50% in theory including viva and minimum 50% in practical.

BACHELOR OF PHYSIOTHERAPY (B.P.T.) FIRST YEAR

Paper-I: HUMAN ANATOMY

Subject	Internal Assessment		University Examination			Total
	Theory	Practical	Theory	Viva	Practical	
Human Anatomy	20	20	100	20	40	200

There shall be one paper setter external or internal for theory examination and two examiners, one internal (Chairman) and one external for practical examinations. The viva marks shall be added to University theory examination marks and 50% shall be the passing marks for both theory and practical university examination respectively.The pattern of University theory examination will be as under for 100 Max. Marks.

No. & Type of Question	Marks for each question	Total Max. Marks
10 Very Short Answer Questions (Answer to be given in 50-60 words)	02	20
5 Short Answer Questions (Answer to be given in 250-300 words)	10	50
2 Essay Type Questions (Answer to be given in 450-500 words)	15	30
		100

HUMAN ANATOMY

Total No. of Teaching Hours: - 200

Theory -140 Hrs. & Practical / Laboratory- 60 hrs

Course 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. Major emphasis of learning is towards Musculo-skeletal, cardio-respiratory and nervous system.

Course Contents:

A. General Anatomy:

1) Introduction to Anatomy, terms and terminology
2) Regions of Body, cavities and Systems outline.
3) Surface anatomy – Musculo-skeletal and cardiopulmonary
4) Cell Structure and function of cell organelles (Brief outline only).
5) Connective tissue & its modification, tendons, membranes, Special connective tissue.
6) Bone structure, blood supply, growth, ossification, and classification.
7) Muscle classification, structure and functional aspect.
8) Nerve – structure, classification, microscopy with examples.
9) Neurons, classification with examples. Simple reflex arc.
10) Parts of a typical spinal curve/Dermatome
11) Joints – classification, structures of joints, movements, range, limiting factors, stability, blood supply, nerve supply, dislocations and applied anatomy.
12) Circulatory system – major arteries and veins of the body, structure of blood vessels
13) Lymphoid system – circulation + function, lymphoid organs- and their structure & functions.

B. Upper extremity:

1) Bony architecture
2) Joints – structure, range of movement
3) Muscles – origin, insertion, actions, nerve supply
4) Major nerves – course, branches and implications of nerve injuries
5) Development of limb bones, muscles and anomalies
6) Radiographic identification of bone and joints

C. Lower Extremity:

1) Bony architecture
2) Joints – structure, range of movement
3) Muscles – origin, insertion, actions, nerve supply
4) Major nerves – course, branches and implications of nerve injuries
5) Development of limb bones, muscles and anomalies
6) Radiographic identification of bone and joints

D. Spine:

1) Back muscles - Superficial layer, Deep muscles of back, their origin, insertion, action and nerve supply.
2) Vertebral column – Structure & Development, Structure & Joints of vertebra
3) Radiographic identification of bone and joints

E. Thorax:

1) Thoracic cage
2) Pleural cavities & pleura
3) Lungs and respiratory tree
4) Heart and great vessels
5) Diaphragm

F. Head and neck:

1) Cranium
2) Facial Muscles
3) Structure of eyeball in brief and extra ocular muscles, visual pathway
4) Ear and auditory pathway
5) Triangles of Neck, boundaries and contents
6) Tongue – parts ,extrinsic and intrinsic muscles, motor and sensory nerves, gustatory pathway
7) Pharynx
8) Larynx

G. CNS:

1) Central nervous system – disposition, parts and functions
2) Cerebrum
3) Cerebellum
4) Midbrain & brain stem
5) Blood supply of brain & its applied anatomy
6) Spinal cord- anatomy, blood supply, nerve pathways
7) Pyramidal, extra pyramidal system
8) Thalamus, hypothalamus
9) Ventricles of brain, CSF circulation
10) Development of nervous system & defects (Brief Description)
11) Cranial nerves – special emphasis on V, VII, X, XI, XII (course, distribution and palsies)
12) Sympathetic nervous system, its parts and components (Brief Description)
13) Parasympathetic nervous system (Brief Description).
14) Embryology in brief of neuromuscular tissue

H. Endocrine - system – Pituitary, Thyroid, parathyroid (Brief Description)

I. Abdomen (Brief descriptions only):

a. Boundaries, Muscles of abdominal wall

b. Division of Abdominal cavity

i. Pouch of Douglus

ii. Morrisons pouch

J. Pelvis

1) Pelvic floor, innervations

2) Bony Pelvis

K. Digestive system (Liver & pancreas, Alimentary canal)

L. Urinary system – Kidney, Ureter, bladder, urethra

M. Genital system – Male and Female

PRACTICAL

Learning of surface landmarks with special emphasis on bones, joints, muscles, and nerves.

The learning of anatomy is by demonstration only through dissected parts, slides, models, charts, etc. Demonstration of dissected parts (upper extremity, lower extremity, thoracic& abdominal viscera, face and brain) Demonstration of skeleton articulated and disarticulated.

During the training more emphasis will be given on the study of bones, muscles, joints, nerve supply of the limbs.

PRACTICAL EXAMINATION

Students will be assessed by viva based examination upon learning in theory, demonstration of bones, and joints, muscles, nerves and major viscera.

BOOKS RECOMMENDED FOR READINGS:

1. Chaurasia, B D Human Anatomy: Regional and CBS, New Delhi Latest 3V
2. Chaurasia, B D Human Oesteology CBS, New Delhi Latest
3. Singh, Inderbir Text Book of Anatomy:With Color Atlas Jaypee, New Delhi Latest 3V
4. Singh, Inderbir Text Book of Neuroanatomy Jaypee, New Delhi Latest
5. Singh, Inderbir Text Book of Human Histology Jaypee, New Delhi Latest
6. Singh, Inderbir Text Book of Human Oesteology Jaypee, New Delhi Latest
7. Garg, Krishna Text Book Histology CBS, New Delhi Latest
8. Singh, Inderbir Multiple Choice Questions in Anatomy Jaypee, New Delhi Latest
9. Datta, A.K. Essentials of Human Anatomy: Neuroanatomy Current Book, Calcutta, Latest
10. Datta, A.K. Essentials of Human Anatomy: Thorax and Abdomen Current Book, Calcutta, Latest
11. Williams, Peter L Gray‘s Anatomy: Anatomical Basis of Churchill Livingston, New York, Latest
12. McMinn, M. H. Colour Atlas of Human Anatomy Mosby-Wolfe, London-Latest
13. Snell, Richard S Clinical Anatomy for Medical Students Little- Brown, Boston-Latest
14. Field, Derek Anatomy: Palpation and Surface Markings Butterworth, London-Latest

BACHELOR OF PHYSIOTHERAPY (B. P. T) FIRST YEAR

Paper-II: HUMAN PHYSIOLOGY

Subject	Internal Assessment		University Examination			Total
	Theory	Practical	Theory	Viva	Practical	
Human Physiology	20	20	100	20	40	200

There shall be one paper setter external or internal for theory examination and two examiners, one internal (Chairman) and one external for practical examinations. The viva marks shall be added to university theory examination marks and 50% shall be the passing marks for both theory and practical university examination respectively.The pattern of University theory examination will be as under for 100 Max. Marks.

No. & Type of Question	Marks for each question	Total Max. Marks
10 Very Short Answer Questions (Answer to be given in 50-60 words)	02	20
5 Short Answer Questions (Answer to be given in 250-300 words)	10	50
2 Essay Type Questions (Answer to be given in 450-500 words)	15	30
		100

HUMAN PHYSIOLOGY

Total No. of Teaching Hrs: - 200
Theory -140 Hrs. & Practical / Laboratory- 60 Hrs.

Course objectives:

1. To understand the Physiological functions of human body
2. To understand the application of physiological functions & physiology of exercise in relation to physical therapy
3. Major area of learning is cardio-respiratory, Musculo-skeletal and nervous system.

Note: Group discussions, seminars and tutorial will be on the topics covered in didactic lectures.

Course Contents:

1. GENERAL PHYSIOLOGY

1) Cell:- morphology, Structure and function of cell organelles
2) Structure of cell membrane, Transport across cell membrane
3) Functional morphology of the cell
4) Intercellular communication
5) Homeostasis

2. BLOOD

1. Composition, function and physical properties of blood
2. Plasma protein and their functions
3. Erythropoiesis, leucopoiesis and thrombopoiesis in brief
4. Hemoglobin and its functions
5. Structure and function of leukocytes
6. Immunity
7. Physiology of clothing mechanism and fibrinolysis
8. Blood group and physiological basis of transfusion medicine

3. MUSCLE

1. Structure-properties-classification-excitation/contraction coupling
2. Motor unit- Electromyography
3. Neuro-muscular transmission
4. Physiological basis of myopathies.

4. NERVE

1. Structure, classification & properties.
2. R.M.P.
3. Action potential
4. Propogation of nerve impulse.
5. Degeneration & regenaration
6. Reaction of degeneration [retrograde]

5. CARDIOVASCULAR SYSTEM

1) General introduction of cardiovascular systems.
2) Structure and properties of Cardiac muscle.
3) Dynamics of blood & lymph flow
4) Anatomical, biophysical consideration of arterial, arteriolar & capillary venous level, Lymphatic circulation.
5) Cardiac cycle and Heart sounds,Mechanical events of Cardiac cycle, Cardiac output, its regulation.
6) Origin and spread of cardiac excitation
7) Basic idea of Electrocardiogram and Interpretation of normal Electrocardiogram.
8) Cardiac output and cardiac failure.
9) Venous return,
10) Heart rate and its regulation.
11) Structure and organization of vascular tree.
12) Arterial blood pressure and pathophysiology of Hypertension.
13) Characteristic of Coronary circulation and pathophysiology of Coronary artery disease
14) Capillary circulation and physiological basis of Edema.
15) Local & systemic regulatory mechanisms of CVS, humeral & neural
16) Patho-physiology of Shock.
17) Cerebral, coronary, splanchnic, skin, Placental & Fetal circulation

6. RESPIRATORY SYSTEM

1) Functional anatomy of Respiratory System , Physiological anatomy of lungs, mechanics of respiration
2) Mechanics of breathing: Mechanism of inspiration and Expiration, intra-pleural and intra-alveolar pressures, Compliance, Surfactant, Air-way resistance and work of breathing
3) Pulmonary circulation, Respiratory membrane and Gas exchange in lungs
4) Composition of gases and Partial pressures.
5) Oxygen and Carbon-dioxide transport.
6) Other function of respiratory system
7) Lung Volumes, Capacities and Lung function tests.
8) Neural and Chemical control of breathing.
9) Regulation of respiratory activity, non-chemical influences on respiratory activity
10) Physio-clinical aspects of Dyspnoea, Apnoea, Asphyxia, Hypoxia, Cyanosis, Breath holding, high and Low atmospheric pressures.

7. CARDIO RESPIRATORY ADJUSTMENTS IN HEALTH & DISEASE

1) Exercise, high altitude, deep sea diving
2) Hypoxia, hypercapnia, hypocapnia, oxygen treatment
3) Asthma, emphysema, artificial respiration

8. RENAL SYSTEM

1) Functions of Kidney , Formation of Urine , Glomerular filtration rate, clearance, Tubular function
2) Water excretion, concentration of urine-regulation of Na, Cl, K excretion
3) Physiology of urinary bladder, Micturition- Neurogenic bladder.

9. DIGESTIVE SYSTEM.

1) Digestion & absorption of nutrients
2) Gastrointestinal secretions & their regulation
3) Functions of (a) Saliva, (b) Gastric juice, (c) Pancreatic juice (d) Succus entericus, (e) Bile.
4) Movements of G.I.T.
5) Functions of Liver & Exocrine Pancreas

10. NERVOUS SYSTEM (descriptive)

1) Organization of Nervous system.
2) Neuron and Neuralgia
3) Synapse: Properties and Synaptic transmission.
4) Reflex arc, its components, properties, type and neurological impairments.
5) General sensations and their properties.
6) Ascending tracts of the Spinal cord and effects of their lesions.
7) Pain and physiological Analgesia.
8) Motor neurons, Descending tracts and their applied aspects.
9) Regulation of Muscle Tone by Spinal and Supra-spinal mechanism.
10) Function of Brain -stem, Cerebellum, Basal Ganglia and Motor cortex.
11) Control of Voluntary movement
12) Regulation of posture and equilibrium, vestibular apparatus.
13) Broad functions of Thalamus, Hypothalamus, Major lobes of Cerebral cortex and Ascending Reticular
14) Activation System
15) Limbic System
16) Learning, memory, speech and conditional reflexes.
    a. Reflexes, monosynaptic, polysynaptic, withdrawal reflex
    b. Properties of reflexes
    c. Sense organ, receptors, electrical & chemical events in receptors
    d. Ionic basis of excitation
    e. Sensory pathways for touch, temperature, pain, proprioception, others
    f. Control of tone & posture: Integration at spinal, brain stem, cerebellar, basal ganglion levels, along with their functions & clinical aspects
    g. Autonomic nervous system & Hypothalamus
    i. Functioning of Autonomic Nervous System with special reference to micturition, defecation and labour ii. Higher neural regulation of ANS.

11. HIGHER FUNCTIONS OF NERVOUS SYSTEM
    a. Learning & memory, Neocortex,
    b. Limbic functions, sexual behaviour, fear & range, motivation
12. SPECIAL SENSES
    1. Functional anatomy of the Eye
    2. Optics of Vision
    3. Retinal Function
    4. Visual Pathways
    5. Mechanism of Hearing.
    6. Sensation of Taste and Smell.
13. ENDOCRINE
    1. Role of Hypothalamus as an endocrine gland.
    2. Functions and hypo & hyper secretion of hormones of
    a. Pituitary
    b. Thyroid
    c. Parathyroid. Adrenal
    e. Endocrine part of pancreas.
14. REPRODUCTIVE SYSTEM
    a) Male & female reproductive system
    b) Spermatogenesis, Functions of Testosterone.
    c) Ovarian and Menstrual Cycle and their hormonal control.
    d) Hormones of Ovary and their functions.
    e) Physiological basis of Fertilization, Implantation, Pregnancy, Parturition and Lactation.
    f) Contraception.
15. EXERCISE PHYSIOLOGY
    1. Effects of acute & chronic exercises
    2. Oxygen/CO2 transport – O2 debt.
    3. Effects of Exercises on muscle strength, power, endurance, B.M.R., R.Q.- hormonal & metabolic effects on respiratory & cardiac conditioning.
    4. Aging.
    5. Training, fatigue & recovery.
    6. Fitness- related to age, gender, & body type.
16. SKIN AND BODY TEMPERATURE REGULATION
    1. Functional anatomy of the Skin and its function
    2. Different mechanisms involved in body temperature regulation.
    3. Physiological basis of Pyrexia and Hypothermia

PRACTICAL

1. Examination of pulse, B.P., respiratory rate, & measure study the effect of posture & exercise. Recording of arterial blood pressure – effects of change in posture & exercise on A.B.P
2. Stethography
    a) Effect of deglutition.
    b) Effect of voluntary hyperventilation
    c) Effect of exercise.
3. Spirometery to measure various lung capacities & volumes, Respiratory rate, tidal volume, VC, timed VC, IRV, IC, ERV, EC on Spirometery (demonstration only)
    a) Spirometery : Lung volumes and capacities.
    b) Mosso‘s finger ergography and bicycle ergography
    c) Perimetry
4. Clinical examination of
    a) Respiratory system.
    b) Cardiovascular system.
    c) Central Nervous system.
    d) Special senses.
5. Estimate of Haemoglobin, T.R.B.C., T.W.B.C. count (demonstration only), Study of Graphs
    a. Blood indices, Blood grouping, Bleeding & Clotting time (demonstration only]
6. Skeletal muscles
    a) Simple muscle twitch
    b) Effect of increasing strength on SMT.
    c) Effect of increasing load on SMT.
    d) Effect of pre load & after load (Starling‘s law).
    e) Effect of temperature.
    f) Effect of two successive stimuli.
    g) Effect of fatigue.
    h) Effect of multiple stimuli & tetanus.
7. Cardiac muscles
    a) Simple myo-cardiogram.
    b) Effect of temperature on the myo-cardiogram.
    c) Effect of drugs.
    d) All or none law.
    e) Staircase phenomenon.
8. Physiology Fitness
    a) Breath holding
    b) mercury column test,
    c) Cardiac efficiency test – Harvard step test – Master step test

PRACTICAL EXAMINATION

Students will be assessed by viva based upon learning in theory.
Demonstration of measurements of pulse, BP

Suggested Readings:

1.Chatterji, C. C., Human Physiology Medical Allied ,
2 .Keele, Cyril A, Samson Wright's Applied Physiology, Oxford University Press
3. Bijlani, R L, UnderstandingMedical Physiology, Oxford University Press
4. Guyton, A.C. and Hall, J. E., Textbook of Medical Physiology, W.B.Saunders, Singapore

BACHELOR OF PHYSIOTHERAPY (BPT) FIRST YEAR

Paper-III: FUNDAMENTAL OF PHYSICS, BIOMECHANICS & EXERCISE THERAPY

Subject	**Internal Assessment**		**University Examination**			**Total**
	Theory	Practical	Theory	Viva	Practical	
Fundamental of Physics, Biomechanics & Biomechanical Modalities	20	20	100	20	40	200

There shall be one paper setter external or internal for theory examination and two examiners, one internal (Chairman) and one external for practical examinations. The viva marks shall be added to university theory examination marks and 50% shall be the passing marks for both theory and practical university examination respectively.

The pattern of University theory examination will be as under for 100 Max. Marks.

No. & Type of Question	Marks for each question	Total Max. Marks
10 Very Short Answer Questions (Answer to be given in 50-60 words)	02	20
5 Short Answer Questions (Answer to be given in 250-300 words)	10	50
2 Essay Type Questions (Answer to be given in 450-500 words)	15	30
		100

FUNDAMENTALS OF PHYSICS, BIOMECHANICS & BIOMECHANICAL MODALITIES
Total No. of Teaching Hrs.- 160
Theory- 100 Hrs., Practical- 60 Hrs.

Course Objectives:

The objective of the course is that after 160 hours lectures. Demonstration, practicals and clinics, the Student will be able to describe the mechanics and their application in physiotherapy.

In addition, the student will be able to fulfil the 75% accuracy (as measured in written, viva and practical internal evaluation) the following objectives of the course.

Course Contents:

All topics are for a brief description only

1. Mechanics - Definition of mechanics and Biomechanics & Principles
2. Force - Definition, diagrammatic representation, classification of forces, concurrent, coplanar and co-linear forces, composition and resolution of forces, angle of pulls of muscle
3. Momentum - principles, and practical application
4. Friction
5. Gravity - Definition, line of gravity, Centre of gravity
6. Equilibrium - Supporting base, types, and equilibrium in static and dynamic state
7. Levers - Definition, function, classification and application of levers in physiotherapy & order of levers with example of lever in human body
8. Pulleys - system of pulleys, types and application their uses in physiotherapy.
9. Elasticity - Definition, stress, strain, HOOKE'S Law
10. Springs - properties of springs, springs in series and parallel, elastic materials in use
11. Aims and scope of various biomechanical modalities – shoulder wheel, shoulder ladder, shoulder pulleys, pronator-supinator instrument, static cycle, rowing machine, ankle exerciser, balancing board, springs, weights
12. Normal Posture - definition & description, static and dynamic, alignments of various joints, centre of gravity, planes & muscular moments, and Analysis of posture
13. Movements - Anatomical definition and description, Movements and exercise as therapeutic modality and their effects, Physiological reaction of exercise
14. Traction - Rationale, Technique, indications & contra-indications
15. Normal Gait - definition & description, alignments, centre of gravity during gait cycle, planes & muscle acting mechanisms, pattern, characteristics Normal gait cycle, time & distance parameters, & determinants of Gait
16. Starting positions - Description and muscle work, Importance of fundamental and derived types, Effects and uses of individual positions
17. Soft tissue manipulation - History, definition, types and their rationale, general effects, local effects of individual manipulation (physiological effects) and uses, contra-indications and techniques of application

PRACTICAL

Demonstration of Biomechanical principles

Study of structure, function and application of various Biomechanical modalities – shoulder wheel, shoulder ladder, shoulder pulleys, pronator-supinator instrument, static cycle, rowing machine, ankle exerciser, balancing board, springs, weights, etc. Study of structure, function and application of suspensions,

Demonstration and practice of

- Soft tissue manipulative techniques
- Normal gait and posture
- Starting and derived positions
- Spinal mechanical traction

(Demonstration of the following)

Mechanical principles applied in physiotherapy like force, Torque center of Gravity etc.

Demonstration of different types of lever in human body

Demonstration of different types of pulleys and springs used in physiotherapy.

Demonstration of axial and pendular.

PRACTICAL EXAMINATION

Students will be assessed by viva based upon learning in theory, demonstrations of various biomechanical modalities, suspensions, and manipulative techniques learned.

Suggested Readings:

1. Hollis, M. and Cook; P.F., Practical Exercise Therapy CBS, New Delhi , Latest Edition
2. Gardiner, Dena; Principles of Exercise Therapy CBS, New Delhi , Latest Edition
3. Lippert, Lynn; Clinical Kinesiology for Physical Therapy, Jaypee New Delhi , Latest Edition
4. Pagliarulo, M.A.; Introduction to Physical Therapy Mosby, London , Latest Edition
5. Jones, Human Movement Explained; Butterworth Heine , Latest Edition

BACHELOR OF PHYSIOTHERAPY (BPT) FIRST YEAR

Paper-IV: FUNDAMENTAL OF MEDICAL ELECTRONICS & PRINCIPLES OF BIOELECTRICAL MODALITIES

Subject	**Internal Assessment**		**University Examination**			**Total**
	Theory	Practical	Theory	Viva	Practical	
Fundamental of Medical Electronics & Principles of Bioelectrical Modalities	20	20	100	20	40	200

There shall be one paper setter external or internal for theory examination and two examiners, one internal (Chairman) and one external for practical examinations. The viva marks shall be added to university theory examination marks and 50% shall be the passing marks for both theory and practical university examination respectively. The pattern of University theory examination will be as under for 100 Max. Marks.

No. & Type of Question	**Marks for each question**	**Total Max. Marks**
10 Very Short Answer Questions (Answer to be given in 50-60 words)	02	20
5 Short Answer Questions (Answer to be given in 250-300 words)	10	50
2 Essay Type Questions (Answer to be given in 450-500 words)	15	30
		100

FUNDAMENTALS OF MEDICAL ELECTRONICS & PRINCIPLES OF BIOELECTRICAL MODALITIES

Total No. of teaching Hrs.- 160
Theory- 100 Hrs., Practical- 60 Hrs

Course Objectives:

The objective of this course is that after 160 hours of lectures, demonstrations, practical and clinics, the student will be able to describe the principles of generation, circuit diagram and testing of electrotherapy apparatus.

In addition, the student will be able to fulfil with 75% accuracy (as measured in written, oral and practical internal evaluation) the following objectives of the course.

Course Contents:

N.B.- All sections carry equal weightage. All topics are for a brief description only.

Section – A: **FUNDAMENTALS OF MEDICAL ELECTRONICS & MAGNETISM**

1. DC Currents -Modern concept of electricity: fundamental electric charges (proton and electron), bound and free electrons, free electrons and current, static electric charge, charging of an object, potential and capacitance, potential difference and EMF
2. A. C. currents: Sinusoidal wave from, frequency, wavelength, Amplitude and phase of a sine wave, Average & RMS value of a sine wave
3. Quantity of electricity, magnitude of current, conductors and insulators, resistance of conductor and Ohm‘s law, resistances in series and parallel
4. Capacitors: Electric field around a capacitor, charging and discharging of capacitor, types of capacitor with application of each in Physiotherapy department
5. Rheostat: series and shunt Rheostat with application of each in the Physiotherapy department
6. Effects of electric Current: Thermal effect, chemical effect (ionization) and magnetic effect. Electric shock, Earth shock, causes and its prevention
7. Magnetism: Magnetic - non-magnetic substances and their properties, properties of magnet, molecular theory, poles of magnet and its properties, magnetic lines of force and their properties, Electromagnetism, magnetic effects of electric current,

Electromagnetic induction, Lenz‘s law, Inductor and Inductance, types of inductor, reactance and impedance.

Section – B: Electronic Devices

1. Thermionic Valves: Thermionic emission, Diode and Triode valves and their characteristics, Construction and application of Cathode Ray Oscilloscope
2. Semiconductor Devices: Intrinsic and extrinsic semiconductors, advantages of diode and transistors devices.

Basing of Diode and their characteristics, Light Emitting Diodes, integrated circuits, Advantage of semiconductor devices over thermionic valve

3. Electronic Circuits: Rectifiers, Wheat stone bridge & smoothing circuits, Oscillators and its types.

4. A.C. AND D.C. meters: Functions and applications of Ammeter and volt meters, Ohmmeters,

5. Introduction to Therapeutic Energies – Thermal, Mechanical, Electrical, Electromagnetic and magnetic Definition, description, Electromagnetic spectrum, physiological effects, pathological effects and dangers

Section – C: Bioelectrical Modalities

1. Medical Instrumentation For Physical Therapy: Brief description of generation, circuit diagrams and testing

2. Low frequency currents, Direct currents

3. Medium frequency currents

4. Short wave Diathermy-continuous and pulsed

5. Microwave Diathermy

6. Ultrasound

7. Actino-therapy – Infrared- Types of generators , UVR-generators , types, dosimetery and LASER-Productions & instrumentation, classification and physiological effects.

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

PRACTICAL

Demonstration of Bioelectrical principles

Demonstration of electrotherapy instruments, principles of their functioning, usage, and safety implications for human beings

PRACTICAL EXAMINATION

Students will be assessed by viva based upon learning in theory and demonstration of various components of the equipments.

Suggested Readings:

1.Froster, A. and Palastanga, N.; Clayton‘s Electrotherapy: Theory and Practice AITBS, Delhi
2. Jhon, Low and Ann, Reed; Electrotherapy Explained: Principles Butterworth Heine, Oxford
3. Nelson, R.M. and Currier, D.P.; Clinical Electrotherapy Appleton and Lange
4 . Chemeron, M.H.; Physical Agents in Rehabilitation, W B Saunders, London
5. Michlovitz, S L; Thermal Agents in Rehabilitation, F A Davis, Philadelphia

BACHELOR OF PHYSIOTHERAPY (BPT) FIRST YEAR

Paper-V: PSYCHOLOGY & SOCIOLOGY

Subject	**Internal Assessment**		**University Examination**			**Total**
	Theory	Practical	Theory	Viva	Practical	
Psychology & Sociology	2	-	8	-	-	1

The University examination shall be of 80 marks with Section – A : Psychology and Section – B : Sociology the university theory examination marks for Psychology shall be 40 and for sociology 40 marks respectively. 50% shall be the minimum passing marks. Internal assessment will be of 10 marks in each subject. Total internal assessment will be 20 Marks.

The pattern of University theory examination will be as under for 80 Max. Marks.

There will be two section i.e. Section-A: Psychology and Section-B: Sociology of 40 Max. Marks each section and distribution of marks for questions will be as under

No. & Type of Question	**Marks for each question**	**Total Max. Marks**
05 Very Short Answer Questions (Answer to be given in 50-60 words)	02	10
02 Short Answer Questions (Answer to be given in 250-300 words)	8	16
01Essay Type Questions (Answer to be given in 450-500 words)	14	14
		40

PSYCHOLOGY & SOCIOLOGY

Total No. of Hrs :- 160 Hrs.

Course objectives:

This course will enable the student to understand specific psychological factors and effects in physical illness and this will help them to have a holistic approach in their dealings with patients during admission, treatment, rehabilitation and discharge.

Note: This course is to be taught by two teachers (Psychologist & Sociologist / Medical Sociologist). Each part carries equal weightage. External Question Paper for each part shall be set by two relevant subject paper setters. The examinees shall use different answer books for the two different parts. And, relevant subject teachers shall evaluate these.

SECTION: A- PSYCHOLOGY

Course Contents:-

1. What is psychology? Fields of application of psychology, influence of heredity and environment on the individual
2. Learning – Theories & Principles Learning
3. Memory, Forgetting, Theories of memory and forgetting, thinking & methods to improve memory
4. Thinking – Process, problem solving, decision making and creative thinking
5. Motivation - Theories and types of Motivation
6. Emotions - Theories of Emotions and stress
7. Attitudes – Theories, attitudes and behaviour, factors in attitude change
8. Intelligence - Theories of intelligence
9. Personality, Theories of personality, factors influencing personality
10. Development and growth of behaviour in infancy and childhood, adolescence, adulthood and old age
11. Behaviour - Normal and abnormal
12. Counselling - Definition, Aims and principles
13. Psychotherapy – Brief introduction to paradigms in psychopathology and therapy
14. Psychological need of children and geriatric patients
15. Communication – Effective and faulty
16. Emotional and Behavioural disorders of childhood and adolescence- (in brief)
    a) Disorders of under and over controlled behaviour
    b) Eating disorders
17. Mental deficiency
    a) Mental Retardation,
    b) Learning Disabilities
    c) Autistic Behaviour

18. Anxiety Disorders -
    a) Phobias, Panic Disorder,
    b) Generalized Anxiety disorder,
    c) Obsessive Compulsive Disorder,
    d) Post Traumatic Stress Disorder
19. Somatoform and Dissociate Disorders -
    a) Conversion Disorder,
    b) Somatisation Disorder,
    c) Dissociate Amnesia & Dissociate Fugue
20. Personality Disorder
21. Patho-physiological Disorders – stress and health
22. Severe psychological disorders – Mood disorders, psychosis

Suggested Readings:

1. Morgon, Clifford T; Introduction to Psychology Tata Mcg. Hill, Delhi
2. Farnald, L.D. Introduction to Psychology AITBS, Delhi
3. Korchin, Sheldon J.; Modern Clinical Psychology: Principals, CBS, New Delhi
4. McDavid, J.W. and Harari, H.; Social psychology: Individuals, Groups, Societies CBS, New Delhi
5. Davison, G.C. and Neale, J.M.; Abnormal Psychology Jhon Wiley, New York
6 . Mehta, Manju; Behavioral Sciences in Medical Practice, Jaypee, New Delhi

SECTION: B- SOCIOLOGY

Course Contents:-

A-Introduction

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

B-Social Factors in Health and Disease:

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

C-Socialization:

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

D. Social Groups:

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

E- Family:

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

F-Community:

1. Rural community – Meaning and features – Health hazards of rural population
2. Urban community – Meaning and features – Health hazards of urban population

G-Culture and Health:

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

H-Social change:

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

I-Social problems of disabled: Consequences of the following social problems in relation to sickness and Disability, remedies to prevent these problems

1. Population explosion.
2. Poverty and unemployment.
3. Beggary.
4. Juvenile delinquency.
5. Prostitution.
6. Alcoholism.
7. Problems of women in employment.

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

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

Suggested Readings:

1.Bhusan, Vidya and Sachdeva, D.R.; Introduction to Sociology Kitab Mahal, New Delhi
2.Turner, J. H.; Structure of Sociological Theory, Jaipur Publication
3. Anand Kumar Indian Society and Culture Vivek, New Delhi

B.P.T. SECOND YEAR

Second Year B.P.T. Scheme of Examination

S.No.	Subject	Internal Assessment		University Examination			Total
		Theory	Practical	Theory	Viva	Practical	
1	Pathology & Microbiology	20	--	80	--	--	100
2	Biochemistry & Pharmacology	20	--	80	--	--	100
3	Medicine including Paediatrics & Geriatrics	20	--	80	--	--	100
4	General Surgery, Obstetrics & Gynaecology	20	--	80	--	--	100
5	Exercise therapy including yoga	20	20	100	20	40	200
6	Electrotherapy	20	20	100	20	40	200
Total Max. Marks							**800**

N.B. - Viva marks will be added in theory marks along with internal assessment theory; candidate have to get min. 50% marks in theory and viva collectively for passing the examination.

BACHELOR OF PHYSIOTHERAPY (BPT): SECOND YEAR

Paper-I: PATHOLOGY & MICROBIOLOGY

Subject	**Internal Assessment**		**University Examination**			**Total**
	Theory	Practical	Theory	Viva	Practical	
Pathology & Microbiology	20	--	80	--	--	100

The University examination shall be of 80 marks with Section – A : Pathology and Section – B : Microbiology the university theory examination marks for Pathology shall be 40 and for Microbiology 40 marks respectively. 50% shall be the minimum passing marks. Internal assessment will be of 10 marks in each subject. Total internal assessment will be 20 Marks. The pattern of University theory examination will be as under for 80 Max. Marks. There will be two section i.e. Section-A: Pathology and Section-B: Microbiology of 40 Max. Marks each section and distribution of marks for questions will be as under

No. & Type of Question	**Marks for each question**	**Total Max. Marks**
05 Very Short Answer Questions (Answer to be given in 50-60 words)	02	10
02 Short Answer Questions (Answer to be given in 250-300 words)	8	16
01Essay Type Questions (Answer to be given in 450-500 words)	14	14
		40

PATHOLOGY & MICROBIOLOGY

Total No. of Hrs:-100

SECTION- A: PATHOLOGY

Theory: 52Hrs. Practical: 08 Hrs

Course objectives:

- Rationale for understanding of the subject for Physiotherapy students
- Brief concept of pathological basis of disease and infectious disease prevention

Course Contents:-

1. Aims and objectives of study of pathology
2. Concept of Diseases, Classification of Lesions.
2.Brief outline of cell injury, degeneration, necrosis and gangrene.
3. Brief concepts of inflammation and Repair, Degeneration, Necrosis and Gangrenes. Inflammation: Definition, vascular and cellular phenomenon, differences between transudate and exudates, granuloma.
4. Deficiency Diseases vitamin A, vitamin B, vitamin C, vitamin D.
5. Vascular disturbances: Oedema, Thrombosis, Embolism, Haemorrhage and Shock.
6. Blood Disorder: Anaemia, Leukaemia, Hemorrhagic disorders.
7. Neoplasia: Brief overview of Tumors, Definition, Classification, Etiology and spread of tumors, Benign versus Malignant tumors
8. In brief about:

A. Respiratory system diseases- Etio-pathogenesis, gross pathology of conditions - aging , Pneumonia, Bronchitis, Bronchiectasis, COPD, Asthma, Emphysema, Pulmonary Tuberculosis, Lung cancers, Restrictive Lung disease and Occupational Lung diseases

B. Cardiovascular system: – Etio-pathogenesis, gross pathology of conditions- aging, IHD, myocardial infarction, CCF, HT, Rheumatic heart disease, Congenital heart disease, Arteriosclerosis, Thrombo-angitis, Vasomotor-Raynaud‘s, venous thrombosis, Gangrene, Lymph edema.

C. Alimentary system
-Peptic ulcer, Carcinoma of stomach
- Ulcerative lesions of Intestine.

a. Liver – Hepatitis, Cirrhosis and Hepatoma.
b. Pancreas – Pancreatitis, Carcinoma of Pancreas, Diabetes.

9. Details about:

a. CNS and PNS: Etio-pathogenesis, gross pathology of conditions - Aging, Meningitis, Encephalitis, Parkinson‘s, Amyotrophic lateral sclerosis, Ataxias, Multiple Sclerosis, stroke, Neuropathies (Charcot Marie Tooth‘s Disease, Compression and entrapments, diabetic, G.B syndrome), Poliomyelitis and post-polio syndrome, Myasthenia Gravis, brief outline of C.N.S. Tumours and peripheral nerve lesions.

b. Musculoskeletal system (Bones and Joints): Etio-pathogenesis, gross pathology of conditions - Osteomalacia, Osteoporosis, Osteomyelitis, Osteoarthritis, rheumatoid arthritis, Gout, Spondyloarthropathy, Osteonecrosis bone tumours, Myofascial pain syndrome. Biological responses to trauma, bone and soft tissue immobilization

c. Muscle – Poliomyelitis, Myopathies, Volkmann's ischemic contracture. d. Skin – Scleroderma, Psoriasis, Autoimmune disorders.

10. In brief about
(a) Urinary system – Nephrotic syndrome, Nephritis, Glomerulonephiritis.
(b) Prostate –Prostatitis, BPH, Carcinoma of Prostate.
(c) Endocrine – Thyroid, Thyroiditis, Thyroid Tumours.
(d) Salivary gland – Salivary gland tumours.

Note:- No Questions should be asked from practical demonstration in theory paper.

Practical (8hrs.)
1. Normal total and differential WBC count, Hemoglobin, RBC.
2. Demonstration of slides:
    - Anaemia
    - Leukaemia
    - Acute inflammation – Appendix
    - Chronic inflammation – Non – specific.
    - Tuberculosis of lymph Node – specific inflammation.
    - Leprosy – Skin and Leprabacilli.
    - Squamous cell carcinoma – skin.
    - Osteogenic sarcoma – Bone tumor.
    - Osteoclastoma – Bone tumor.
    - Ewings – Bone tumour.
    - Multiple Myeloma – Bone tumor.

SECTION- B:
MICROBIOLOGY

Total no. of teaching Hrs. = 40

Course objectives:

- Rationale for understanding of the subject for Physiotherapy students
- Brief concept of microbiological basis of disease and infectious disease prevention

Course Contents:

I. General Microbiology

1. Introduction and historical background.
2. Classification of Microorganisms.
3. Morphology of bacteria.
4. Sterilization and disinfect ion.
5. Immunity – Antigens and Antibodies, General overview of antigen antibody reaction and practical applications.

II. Systemic Microbiology

6. Gram Positive cocci – Staph, Strepto, Pneumnococci.
7. Gram-negative cocci –Goncocci and Meningococci.
8. Gram positive bacilli – Tubercule bacilli, Lepra bacilli, Clostridium tetani, Clostridium perfrigens.
9. Gram negative bacilli – Salmonella, Coloforms, pseudomonas, proteus etc.
10. Anaerobic non – sporing cocci and bacilli.
11. Virology – General introduction, brief description of polio virus, Rubella Hepatitis-B and AIDS (diagnosis, prevention and treatment).
12. Spirochetes- Syphilis (congenital and acquired).
13. Malaria
14. Mycology – Actinomycosis, Maduramycosis, Mucosal Candidiasis
15. Applied microbiology as relevant to diseases of bones, joints, Muscles, Skin, Infection and Bums.

III. Demonstration

16.Demonstration of collection of clinical specimen.
17.Demonstration of morphology and culture of organisms.
18.Demonstration of simple Gram‘s and Ziehl- Neelsen staining.
19.Sterilization and Disinfection techniques.
20.Demonstration of serological tests for syphilis, Hepatitis.

Suggested Readings:

1 Chakraborty, P. Textbook of Microbiology NCB, Calcutta 1999
2 Ananth Narayan, R. Text Book of Microbiology Orient Longman, Madras 1986
3 Chatterjee, K. D. Parasitology: Protozoology and helminthology Chatterjee, Calcutta 1965
4 Cotran, Ramzi S Pathologic Basis of Disease W. B. Saunders, Singapore 1999
5 Vinay Kumar Basic Pathology Harcourt 1997
6 Nagalotimath, S.J. Textbook of Pathology CBS, New Delhi 1998
7 Talib, V. H. Essential Parasitology Mehta, New Delhi 2001

BACHELOR OF PHYSIOTHERAPY (BPT):
SECOND YEAR

Paper-II: BIOCHEMISTRY & PHARMACOLOGY

Subject	**Internal Assessment**		**University Examination**			**Total**
	Theory	Practical	Theory	Viva	Practical	
Biochemistry & Pharmacology	20	--	80	--	--	100

The University examination shall be of 80 marks with Section – A : Biochemistry and Section – B : Pharmacology the university theory examination marks for Biochemistry shall be 40 and for Pharmacology 40 marks respectively. 50% shall be the minimum passing marks. Internal assessment will be of 10 marks in each subject. Total internal assessment will be 20 Marks. The pattern of University theory examination will be as under for 80 Max. Marks. There will be two section i.e. Section-A: Biochemistry and Section-B:Pharmacology of 40 Max. Marks each section and distribution of marks for questions will be as under

No. & Type of Question	**Marks for each question**	**Total Max. Marks**
5 Very Short Answer Questions (Answer to be given in 50-60 words)	02	10
2 Short Answer Questions (Answer to be given in 250-300 words)	8	16
1Essay Type Questions (Answer to be given in 450-500 words)	14	14
		40

BIOCHEMISTRY & PHARMACOLOGY

Total No. of Hrs.-100

SECTION: BIOCHEMISTRY

Total No. of Teaching Hrs. = 60 Hrs.

Course objectives:

To understand biochemical basis of life sciences. After 60 hours lecture and demonstration in Biochemistry this course shall provide the student with basic Biochemistry knowledge with special emphasis on clinical understanding of biochemistry processes. Students shall be able to relate these processes with underlying mechanism of physiotherapeutic.

Note: A brief description of metabolic pathways mentioned herein is indicated. Details and structures are to be avoided.

Course Contents:-

I. Basic Biophysics: Concept of Acid base, buffer, Henderson- Hasselbach equation, brief knowledge of biophysical process such as Osmosis. Viscosity, Surface tension, Dialysis with special emphasis on their biomedical implication. A brief study of Radio-isotopes and their clinical applications.

II. General Biochemistry with Biomedical functions

1. Nutrition: Basic principles of nutrition; Carbohydrates, Proteins and Lipid caloric requirement and balance diet.
2. Carbohydrates: Definition, classification with examples and general functions.

Metabolism - Glycolysis, T.C.A Glycogen metabolism, Blood Sugar regulation, Diabetes and diabetic keto-acidosis

3. Lipids: Definition, classifications and general functions. Essential fatty acids, cholesterol, Blood lipids. Brief review of lipoproteins. Metabolism-Oxidation of fatty acids, cholesterol synthesis, and fatty liver.
4. Proteins: Definition, classification, and Bio-medical Importance.
5. Study of hemoglobin and immunoglobulins with functions.
6. Plasma Proteins and functions. Metabolism: General reactions of amino acids. Formation and fate of ammonia - Urea cycle.
7. Nucleic Acids: Brief overview of the structure of RNA and DNA including Nucleosides and Nucleotides. Study of few biologically important nucleotides.
8. Tissue chemistry: Chemistry of connective tissue, bone and teeth. Composition function and chemical mediators of nerve structure of muscle tissue. General Biochemistry of muscle contraction and relaxation.
9. Enzymes: Definition, classification with examples. Factors affecting enzyme action. Brief study of enzyme inhibition. Clinical importance of enzymes.
10. Vitamins: Definition, classification and functions. Dietary source, Daily requirement and deficiency disorders.

III. Bioenergetics

Study of Plasma Membrane, Review of laws of thermodynamics as applicable to biological systems. Concept of free energy charge. High-energy compounds and Respiratory chain.

IV. General Metabolism

(Note: A brief outline of metabolic pathway herein is indicated. Details and Structure are to be avoided).

1. Carbohydrate metabolism: Glycolysis, TCA,Glycogen metabolism, blood sugar regulation, Diabetes and Diabeti Ketoacidosis.
2. Lipids Metabolism: Beta-oxidation of Fatty acids, Fatty acid synthesis, cholesterol synthesis, Ketosis and Fatty liver.
3. Protein Metabolism: General reaction of Amino acids, Formation and fate of Ammonia, Urea cycle.
4. Purine and Pyrimidine: Only catabolism of Purine to be stressed in detail with special emphasis on Gout. General breakdown of Pyrimidine and associated disorders.

V. Water and Electrolyte Balance

General outline of fluid compartments of the body with their water and electrolyte content and balance, Dehydration.

Book References

1. Textbook of Biochemistry by West and Todd.
2. Textbook of Medical Biochemistry by Chatterjee and Shinde
3. Principles of Biochemistry by A. Lehninger.
4. Textbook of Biochemistry by A.C. Deb
5. Ahuja, Lakshmi CBS Quick Review in Biochemistry CBS, New Delhi
6. Chatterji, M N Text Book of Medical Biochemistry Jaypee, Bangalore
7. Deb, A.C. Fundamentals of Biochemistry CBA,Calcutta
8. Lehninger, A.L. Principles of Biochemistry CBS,Delhi

SECTION: B – PHARMACOLOGY

Total No. of Teaching Hrs. = 40 Hrs.

Course Objective

The objective of the course in Pharmacology is that after 40 hours of lectures and demonstration, the students shall be able to understand and correlate the biochemical process involved with drugs in human body and their clinical importance especially in physiotherapeutic, in addition, the students shall be able to fulfill with 75% accuracy (as measured by written, oral, practical and internal evaluation) the following objectives of the courses.

a) To understand pharmaco-kinetics, pharmaco-dynamics.

b) Usage of common drugs with (indications, contraindications, side effects).

c) To understand the drug actions that may affect the physical therapy treatment. d) Course is not prescription oriented.

Course Contents:-

I. General Pharmacology (Brief description only)

1. Definition of drug, Pharmacokinetics and Pharmacodynamics.
1. Broad categories of adverse drug reactions.
2. Alcohols
3. Analgesics and Antipyretics, anti-inflammatory drugs.
4. Sedatives.
5. Stimulants.
6. Drugs acting on muscles- Muscle relaxants, Muscle stimulants.
7. Anti-parkinsonism agents
8. Drugs modifying B.P.
9. Hypolipidemia.
11. Anticoagulants.
12. Thyroxin and Anit thyroid drugs.
13. Anti-diabetics.
14. Glucocorticoids.
15. Calcium, Phosphorus, Calcitonin and Parathormone.
16. Narrow spectrum antibiotics.
17. Broad-spectrum antibiotics.
18. Anti-cancer drugs.
19. Drugs acting on respiratory systems: Respiratory stimulants and respiratorydepressants, Bronchodilators, Expectorants. Anti-Asthmatics, Anti-tussive.
20. Vitamins
21. Ovarian hormones, Anabolic steroids, Estrogen, Progesterone, Androgen.
22. Locally acting drugs: Anodies ,Local anesthetic drugs, Counter-irritants Rubefacient, Soothing agent, Anti-microbial.

Books Suggested :-

1. Pharmacology by Satoskar
2. Clinical Pharmacology by Lawrence.
3. Textbook of Pharmacology by B.N. Ghose.
4. Tripathi, K.D.Essential of Medical Pharmacology New Delhi

BACHELOR OF PHYSIOTHERAPY (BPT) SECOND YEAR

Paper-III: MEDICINE INCLUDING PAEDIATRICS & GERIATRICS

Subject	**Internal Assessment**		**University Examination**			**Total**
	Theory	Practical	Theory	Viva	Practical	
Medicine including Pediatrics & Geriatrics	20	--	80	--	--	100

There shall be one paper setter external or internal for theory examination, 50% shall be the minimum passing marks.Internal assessment will be of 20 marks. The pattern of University theory examination will be as under for 80 Max. Marks.

No. & Type of Question	**Marks for each question**	**Total Max. Marks**
5 Very Short Answer Questions (Answer to be given in 50-60	02	10
4 Short Answer Questions (Answer to be given in 250-300	10	40
2 Essay Type Questions (Answer to be given in 450-500 words)	15	30
		80

MEDICINE INCLUDING PAEDIATRICS & GERIATRICS

Total No. of Hrs.- 130
Theory: - 100 Hrs. & Practical - 30 Hrs.

Description

This course follows the basic course on Anatomy, Physiology, Psychology, Sociology, Pathology and Microbiology and provides knowledge about relevant aspects of General Medicine with emphasis on physiotherapeutic.

Course Objective

The objective of this course is that students at the end of course shall have a broad understanding about common medical diseases, which they would be handing as a physiotherapist. They should have a brief idea about Etiology, pathology, Type and Degree of Disability the patient will have as a result of the disease, so that he/she as a physiotherapist with physician should help the patient to achieve cure and/or ameliorate his/her illness and sufferings. To understand a Paediatrics patient and its special needs in relation to physical therapy

Course Contents:-

A. Infections

Outline briefly the Etiology, symptoms and brief management of the following disease.
Bacterial – Tetanus, Typhoid.
Viral – Herpes simplex, Herpes Zoster, Measles, Hepatitis –
B. and HIV. Protozal – Filariasis, Malaria, Amoebiasis**.**

B. Diseases of blood.

Define and describe clinical aspects of Nutritional Anaemias.
Brief description of Bleeding Disorder with emphasis to Haemophilia.
Lymphadenopathy and splenomegaly.
Leukaemia – acute and chronic.

C. Diseases of Liver

Jaundice
Viral Hepatitis. Cirrhosis of Liver

D. GIT Diseases (Brief description)

1. Peptic Ulcer
2. Diarrhea and Dysentery.

E. Renal Diseases

1. Brief description of acute and chronic renal Failure.
2. Urinary Tract Infection.
3. Acute Nephritis, Nephrotic Syndrome.

F. Nutritional and Metabolic Disease.

1. Balanced normal diet.
2. Protein Calorie Malnutrition
3. Avitaminosis of both water and fat-soluble vitamins.
4. Diabetes mellitus – Definition, Classification and complications, brief description of management of diabetes mellitus.
5. Obesity – Etiology and management.
6. Hyper and Hypo-thyroidsm.
7. Calcium Homeostasis.
8. Gigantism and Acromegaly.

G. Diseases of Bones, Joints and Connective tissue

1. Brief introduction to understanding of Auto immune diseases.
2. Rheumatic fever and Rheumatoid arthritis – Aetio pathogenesis, Clinical features, complications, diagnosis and briefly outline the management.
3. Brief description of Systemic Lupus Erthematosus.
4. Polyarteritis Nodosa, Dermatomyositis, Scleroderma.

Osteoarthritis – Aetiopathogenesis, clinical feature, diagnosis, complication and management.

H. Genetics and Diseases

1. Common inherited disorders.
2. Prevention of genetic disorders**.**

I. Miscellaneous

1. Allergy
2. Drug reactions.

J. Dermatology

1. Common skin infections.
2. Psoriasis
3. Leprosy- aetio pthogenesis, clinical features and treatment.
4. Venereal diseases – Syphilis, HIV etc., brief description and prevention (lecture demonstration only).

K. Radiology

(Both in normal and Pathological conditions).

Radiology of Bone and joints. Radiology of chest including Heart.

I. Geriatrics

physiology of ageing, manifestations of diseases in old people and general principles of management. Common Geriatric Disorders and their management, Implications of aging in physical therapy. Lung disease, Pleurisy & Pulmonary embolism

PAEDIATRICS

Total No. of Hrs.- 20

1. Normal Growth and development of child – motor, mental, language and social from birth to 12 years including physical ,social, adaptive development.
2. Pathological presentations of growth and development disorders
3. Common infectious diseases in children: Brief description of following infectious diseases along with outline of management: Tetanus, diphtheria, Mycobacterial, measles, chicken pox, gastroenteritis, HIV, and Malaria
4. Immunization programmes – WHO schedule, different vaccinations, rationale; special consideration to various disease eradication programmes like Pulse-Polio
5. Child and nutrition - Nutritional requirements, malnutrition syndrome, Vitamins (A, B, C, D & K) and Minerals (iron, calcium phosphorus, iodine) deficiencies in children and management in brief
6. Clinical presentation, management & prevention of the following: - Cerebral palsy, Poliomyelitis, Muscular dystrophy
7. Childhood rheumatism-types, clinical presentation, & management in brief
8. Acute CNS infections: clinical presentation, complications and management of bacterial and tubercular infections in brief
9. Clinical presentation, management & prevention of the following respiratory conditions: URI, LRI, bronchiolitis, asthma, TB (in brief)
10. Clinical presentation, management & prevention of the following cardiac conditions: Rheumatic heart disease, SABE, Congenital heart disease - ASD, VSD, PDA (in brief)

Practical:-

Students shall be posted for one month in general Medicine ward. They shall do clinical checking and ward work to acquaint themselves to General Medicine and pediatrics.

Book References:-

1. Davidson Principles and Practice of Medicine (Churchill Livingstone)
2. Chemberlin, E.N.and Ogilvie, C.Symptoms and signs in Clinical Medicine Jhon Wright
3 Swash, Michael Hutchison‘s Clinical Methods W B Saunders, London
4 Ghai, O. P. Essential Pediatrics Interprint, New Delhi
5 Haslett, C.Davidson‘s Principal and Practice of Medicine Churchill Livingstone,London
6 Golwalla, Aspi F. Medicine For Student NBD, Mumbai
7 Behrman, R.Nelson‘s Text Book of Pediatrics W B Saunders, London
8 Kasper, D.L Harrison ‗s Principles of Internal Medicine Mc-Graw Hill, New York

BACHELOR OF PHYSIOTHERAPY (BPT) SECOND YEAR

Paper-IV: GENERAL SURGERY, OBSTETRICS & GYNECOLOGY

Subject	**Internal Assessment**		**University Examination**			**Total**
	Theory	Practical	Theory	Viva	Practical	
General Surgery, Obstetrics & Gynecology	20	--	80	--	--	100

The University examination shall be of 80 marks with Section – A : General Surgery and Section – B : Obstetrics & Gynecology, the university theory examination marks for General Surgery shall be 40 and for Obstetrics & Gynecology 40 marks respectively. There shall be two paper setters and two evaluators, external or internal for theory examination. Section- A, which will be set by General Surgery examiner (40 marks) and Section-B, by Obstetrics & Gynecology (40 marks) examiner. 50% shall be the minimum passing marks. Internal assessment will be of 10 marks in each subject. Total internal assessment will be 20 Marks. The pattern of University theory examination will be as under for 80 Max. Marks. There will be two section i.e. Section-A: General Surgery and Section-B: Obstetrics & Gynecology of 40 Max. Marks each section and distribution of marks for questions will be as under

No. & Type of Question	**Marks for each question**	**Total Max. Marks**
05 Very Short Answer Questions (Answer to be given in 50-60 words)	02	10
02 Short Answer Questions (Answer to be given in 250-300 words)	8	16
01Essay Type Questions (Answer to be given in 450-500 words)	14	14
		40

GENERAL SURGERY, OBSTETRICS & GYNECOLOGY
Total No. of teaching Hrs.- 150 +40= 190 Hrs
Total theory-110 Hrs. +40 Hrs, Practical Hrs.- 40

Course Description

This course follows the basic course on Anatomy, Physiology, Psychology, Sociology, Pathology and Microbiology and provides knowledge about relevant aspects of general surgery, Plastic surgery, Paediatrics, E.N.T. Ophthalmology, Obstetrics and Gynaecology and Radiology with emphasis on physiotherapeutic.

Course Objectives

The objective of this course is that students at the end of course shall have a broad understanding about common surgical diseases, which they would be handing as a physiotherapist. They should have a brief idea about etiology, pathology and type and degree of disability the patient will have as a result of the disease, so that he/she as a Physiotherapist with surgeon should help the patient to achieve cure and/or ameliorate his/her illness and sufferings

SECTION:A- GENERAL SURGERY
(INCLUDING E.N.T AND OPHTHALMOLOGY)

Theory: 110 Hrs. **Practical: 40 Hrs.**

General Surgery

Course Contents:-

1.**Introduction:** Description of events frequently accompanying general Anaesthesia, Blood transfusion and physiological response of the body.
2.Wounds, scars, ulcers, boils, carbuncles etc.
3.Principles of pre- and post –operative physical examination, investigations, postoperative complications and their management.
4. Abdominal surgery: Incisions, complications and management of following:
Nephrectomy, Appendicectomy, Herniorrhaphy, Mastectomy, Thyroidectomy, Colostomy, Adrenalectomy, Cystectomy, Hysterectomy, Prostatectomy, Cholecystectomy, llleostomy, Incisional hernia and its prevention.
5.Burns: Causes, Classification, Medical management and precautions in the acute stage, complications of burns and their management.
6. Plastic Surgery:
a. Principles of plastic surgery, post – operative management and complications.
b. Cineplasty.
c. Principles of cosmetic surgery.
d. Skin grafting.
e. Surgery of Hand with emphasis on management of traumatic & leprosy hand.
f. Burns and plastic surgery management.
7. Ophthalmology: Etiology, symptomatology and treatment of visual defects emphasis on Errors of Refraction, Squint, Conjunctivitis, Trachoma, Corneal ulcers, lritis, Cataract, Retinitis, Detachment of retina
8. E.N.T.:- Aetiology, sysptomatology and treatment of sinusitis, Rhinitis, Acute and Chronic Otitis, Otosclerosis, Mastoidectomy and loss of hearing

Book References

1. Surgery by Nan.
2. Surgery by Baily & Love –
3. Short Practice of Surgery by Rain & Ritelife.
4. Russell, R.C.G.Short practice In Surgery Arnold, London
5. Gupta, R. L. Text Book of Surgery Jaypee, New Delhi

SECTION: B- OBSTETRICS AND GYNECOLOGY

Total teaching Hrs.- 40 Hrs.

Course objectives:

To understand common gynaecological conditions and procedures (in brief)
To understand implications of gynaecological conditions and procedures on physical therapy

Course Contents:

1. Brief Anatomy and physiology of female reproductive system .
2. Basic principles of clinical examination, investigation, diagnosis, prognosis of female reproductive system disorders .
3. Menstruation and its disorders.
4. Physiological changes during pregnancy.
5. Antenatal care and diagnosis of pregnancy including high-risk pregnancy.
6. Labour, stage of labour, normal and abnormal labour, Delivery and management of neonate.
7. Puerperium & postnatal care, social obstetrics- maternal & perinatal mortality.
8. Pelvic pain and its management : Musculo-skeletal problems in an obstetric patient, management
9. Importance Gynecological condition, a short review of PID, Tumors, malignancies, infertility, Endometriosis, Ectopic pregnancy, Vesicular mole.
10. Prenatal and post-natal care
11. Prolapse Uterus, causes of incontinence of urine, type and management.
12. Pelvic inflammatory diseases
13. Abortion and birth control.
14. Surgical consideration in obstetrics and gynecology.

Practical

Students shall be posted for one month in General Surgery, plastic and burns, obstetrics and Gynecology & Radiology units. They will do clinical checking and ward work to acquaint themselves to General Surgical and Obs. & Gyn. conditions.

Suggested Readings:-

1. Gynaecology and Obstetrics in the Health care of a Woman by Seymoul L. Romney, Mary Jane Gray, J. A. Merrill.
2. Shaw‘s Textbook of Gynecology.
3. Jeffcoat‘s Principles of Gynecology.
4. General Surgical Operations by R.M. Kirk and R.C.N. Williamson.
5. Howkins, John Shaw‘s Textbook of Gynecology Orient-Longman, Bangalore
6. Datta, D.C. Textbook of Obstetrics NCBA, Calcutta
7. Mudaliar, A.L. Clinical Obstetrics Orient-Long main, Bangalore
8. Percival, Robert Manual of Obstetrics ELBS, London

BACHELOR OF PHYSIOTHERAPY (BPT):
SECOND YEAR
Paper-V: EXERCISE THERAPY INCLUDING YOGA

Subject	**Internal**		**University Examination**			**Total**
	Theo	Practic	Theo	Vi	Practical	
Exercise therapy including	2	20	1	2	40	200

There shall be one paper setter external or internal for theory examination and two examiners, one internal (Chairman) and one external for practical examinations. The viva marks shall be added to university theory examination marks and 50% shall be the passing marks for both theory and practical university examination respectively.The pattern of University theory examination will be as under for 100 Max. Marks.

No. & Type of Question	**Marks for each question**	**Total Max. Marks**
10 Very Short Answer Questions (Answer to be given in 50-60 words)	0	2
5 Short Answer Questions (Answer to be given in 250-300 words)	1	5
2 Essay Type Questions (Answer to be given in 450-500 words)	1	3
		10

EXERCISE THERAPY INCLUDING YOGA

Total No. of Teaching Hrs. – 200

Theory :- 120 Hrs.& Practical:- 80

Course Description

In these courses, the student shall learn principles, techniques and effects of exercise as a therapeutic modality in the restoration of physical function.

Courses Objective

To understand the principles of exercise therapy and its application as a treatment modality. The objectives of this course is that after 200 hours of lectures, demonstrations, practical and clinical, the students shall be able to list the indications and

contraindications of various types of exercise and demonstrate the different techniques and describe their effects. In addition, the students shall be able to fulfill with 75% accuracy (as measured by written, oral and practical internal evaluation) the

following objective of the course.

Course Contents:-

1. Introduction to Exercise Therapy.
2. Exercise and physiology of body.
3. Psychogenic and Pharmacological aspects of exercise.
4. Classification of movements in details :

- ***Active voluntary movements*** : Free, assisted and resisted
- Indication, contraindications, advantages and techniques of various types of active exercises
- Clinical methods of strengthening of various muscle groups.

-Involuntary movements

- ***Passive movements:*** Definition, types- Relaxed, forced and stretching type.
- Indications, contraindications, advantages and Techniques of various passive movements.

5. Voluntary Movements :- Free exercises, assisted exercises, Resisted exercise .

A. Free exercises – Classification technique effects of free exercise on various systems

B. Resisted exercises – technique and types of resistance, SET system (heavy resisted exercise, Oxford method, Delorme method, McQueen‘s method)

6. Relaxed passive movement- Definition, Classification of relaxed passive movements, Technique, effects and uses of relaxed passive movements.

7. Muscle strength – Anatomy and Physiology of muscle tissue, Causes of muscle weakness/paralysis, Prevention of muscle weakness/paralysis. Type of muscle work and contractions, Torque of muscle work, Muscle assessment M.R.C. grading, Principles of muscle strengthening/re-education, early re-education of a paralyzed muscle etc. , Strengthening technique, Endurance training, Therapeutic Gymnasium.

8. Manual Muscle Testing: Concept, introduction, significance and limitations. Grade systems, Techniques of Muscle testing. Emphasis on skills to grade upper, lower limb, neck and trunk muscles including trick movements.

9. Joint movement-Classification of joint movements, Causes for restrictions of joint movement, prevention of restriction of

joint range of motion. principles of mobilization of joint, increasing its range of motion, technique of mobilization of stiff joint. Accessory movements- glides, traction and approximation, Mobilization of peripheral, spinal joints, techniques and grading in detail.

10. Manipulation therapy: Introduction, Principles of therapy, Indications and Contraindication (no clinical application of these techniques).

11. Goniometry:- Measurement of various joints range in normal and disease condition. Different techniques of goniometry. Limb length measurements.

12. Passive stretching- Aims, Principles, Indications, Techniques & contra indications.

13. Relaxation: Description of fatigue and spasm & factors. General causes, signs and symptoms of fatigue. Principle to obtain relaxation in various positions, effects and uses, Techniques of Relaxation- local and General with indication.

14. Neuromuscular coordination and P.N.F: Basic theory of proprioceptive –neuromuscular facilitation techniques, Functional Re-education Exercises.

15. Re-education of muscles:

- Concept, technique, spatial and temporal summation.
- Various reduction techniques and facilitating methods.
- Progressive strengthening of various muscle groups in Grade-I-Grade IV.
- Muscle strengthening technique – PNF - Principles of PNF, indications, contra indications, techniques, limb patterns

16. Co-ordination: Balance – Static and Dynamic, Definition of co-ordinated movements, incordinated movements , Factors for coordinated movements, causes of incordination, Discoordination: LMNL & UMNL, cerebellar lesion, loss of kinesthetic sense (Tabesdorsalis, leprosy, syringomyelia). Principles of re-education of coordinated movements, techniques of coordinated exercises, Reeducation of balance and coordination: PNF and Frenkel‘s exercises

17. Suspension Therapy: Principles of suspension, Type of suspension, Therapeutic effects and uses of suspension therapy, their application either to mobilize a joint or to increase muscle power.

18. Hydrostatics and Hydrodynamics: History, Properties of water, Specific gravity, Hydrostatic pressure, Archimedes principle, Buoyancy-law of floatation, Effect of buoyancy on movements performed in water, Equilibrium of a floating body,

Bernoulli‘s theorem, Physiological effects of exercise in water

19. Hydrotherapy: Indication, contraindication, benefits, dangers and precautions

- Hydrotherapy regimes of exercises, Hydrotherapy exercise for all age groups
- Types of pools and baths

20. Soft tissue manipulations Techniques of application, Kneading and picking up, rolling (back) Clapping, Tapping, Friction.

21. Isometric exercise and Isotonic exercise.
22. Exercises of the shoulder and hip and evaluation.
23. Exercise of hand, foot and evaluation.
24. Exercise of the knee and elbow and evaluation.
25. Spinal exercises including neck exercises.
26. Gait analysis, Pathological gaits, Gait training.
27. Walking aids and crutch walking:- Description of crutch - components, classification
- Good crutch, measurements, Crutch use- Preparation, Training, counselling.
- Crutch gaits- types, & significance. Crutch complications- Palsy, dependency etc.
28. Types of paraplegic gaits.
29. Oedema: Types and treatment.
30. Group Therapy: Indication, contraindication, types.
31. Yogasanas and Pranayama:
    - Physiology and therapeutic principles of yoga, Yogasanas and their scientific studies
    - Concept of total yoga discipline, Yogasana for physical culture, relaxation and medication.
    - Psycho-physiological aspects yoga procedures , Psychological aspects of yoga, Psycho-social aspects of yoga , Yogasanas for physical fitness, relaxation, flexibility and meditation .
    - Therapeutic application of yoga- Application of Yogasana in flexibility, cardio-respiratory rehabilitation, Neuro motor learning. Yoga a holistic approach

EXERCISE THERAPY INCLUDING YOGA: PRACTICAL

Demonstration and learning of active & passive movements of Limbs and spine

Demonstration and practice of Manual Muscle testing, Goniometry

Demonstration and practice of muscle stretching techniques

Demonstration and practice of muscle strengthening techniques

Demonstration and practice of muscle re-education techniques

Demonstration and practice of coordination exercises (Frankel's)

Demonstration and practice of relaxation techniques

Demonstration and practice of all types of soft tissue manipulation, mobilization of peripheral joints, various types of manipulations

demonstrated and practiced to Upper limbs, Lower Limbs, Neck and Face appropriately

Demonstration of normal and pathological gaits and crutch walking.

Demonstration and practice of suspension techniques

Demonstration and Practice of Functional Re-education Technique.

Demonstration and Practice of various Yogasana & Pranayama.

PRACTICAL EXAMINATION

Students will be assessed by viva & practical demonstrations based upon learning in theory & practical classes.

Suggested Books for Readings:

1 Hollis, M. and Cook, P.F. Practical Exercise Therapy Blackwell, Oxford
2 Gardiner, Dena M. Principles of Exercise Therapy CBS, New Delhi
3 Lippert, Lynn Clinical Kinesiology for Physical Therapy Jaypee, New Delhi
4 Paliarulo, M. A. Introduction to Physical Therapy Mosby, London
5 Jones and Barker, Human Movement Explained Butter worth- Heine
6 Thomson, Ann Tidy's Physiotherapy Varghese, Mumbai
7 Hislop, H.J. and Montgomery, J.Daniels and Worthingham's uscle Testing: Techniques of Manual Examination W.B.Saunders, Philadelphia
8 Norkin Measurement of Joint Motion
9 Kisner, C. and Kolby, L.A. Therapeutic Exercise Foundation and Technique Jaypee, New Delhi
10 Holey, E. and Cook, E.Therapeutic Massage Harcourt, Singapore
11 Bates, Andrea and Hanson, Norm Aquatic Exercise Therapy W.B.Saunders, Philedelphia
12 Kendal, F.P. Muscles Testing and Function Lippincott, New York
13 Campion, M. R. Hydrotherapy: principles and Practice Butterworth, Oxford
14 Perry, Jan F Kinesiology Workbook F A Davis, Philadelphia
15 Adler, S.S. PNF in Practice Springer, New York
16. Aids to P.T. by J.M. Lee.
17.Therapeutic Exercise by Basmajian.
18. Aliimco all Volumes.
19. Science and medicine of exercise and sports by Warren R. Johnson.
20.Basic Athletic training by Cramer.
21.Anatomy and physiology of yogic practice by M.M. Gone.
22. The yogi philosophy of physical well being by Yogi Tamacharaka.
23. Yoga stretching and relaxation for sports men by Capt. M. Rajan.

BACHELOR OF PHYSIOTHERAPY (BPT): SECOND YEAR

Paper-VI:

ELECTROTHERAPY

Subject	**Internal Assessment**		**University Examination**			**Total**
	Theory	Practical	Theory	Viva	Practical	
Electrotherapy	20	20	100	20	40	200

There shall be one paper setter external or internal for theory examination and two examiners, one internal (Chairman) and one external for practical examinations. The viva marks shall be added to university theory examination marks and 50% shall be the passing marks for both theory and practical university examination respectively. The pattern of University theory examination will be as under for 100 Max. Marks.

No. & Type of Question	Marks for each question	Total Max.
10 Very Short Answer Questions (Answer to be given in 50-60 words)	02	20
5 Short Answer Questions (Answer to be given in 250-300 words)	10	50
2 Essay Type Questions (Answer to be given in 450-500 words)	15	30
		100

ELECTROTHERAPY

Total No. of teaching Hrs. – 200
Theory: - 120 hrs. & Practical: - 80 hrs.

Course Description -

In this course the student shall learn the principles, techniques and effects of electrotherapy as a therapeutic modality in the restoration of physical function.

Course Objective -

The objective of this course is that after 200 hours of lectures, demonstration, practical and clinics, the students shall be able to list the indications and contraindications of various types of electrotherapy, modalities and demonstrate the different techniques and describe their effect. In addition, the students shall be able to fulfill with 75% accuracy (as measured by written, oral and practical internal evaluation) the following objective of the course-

a) To list indications and contraindications of various Modalities.
b) To understand different techniques of applications, their justification and effects.
c) Demonstration of individual techniques of applications of various modalities.

Course Contents:-

A. LOW FREQUENCY CURRENTS:

I. **Nerve Muscle Physiology** - Resting potential, Action potential, propagation of action potential, in myelinated and un-myelinated nerve fibre, Motor unit, and Synapse and Synaptic transmission of Impulse. Effect of negative and positive
electrodes on nerve and accommodation of the nerve.

II. Faradic Current - Definition, Characteristic of original Faradic current, modified faradic plane faradic current interrupted faradic current and surged faradic current, parameters, indication, effect on denervated muscles, innervated muscles, technique of application, group muscles stimulation, individual muscle stimulation, faradic bath, faradic under
pressure, pelvic floor muscle re-education, therapeutic effect of faradic current, contraindication and dangers.

III.Galvanic Current – Classification of Galvanic current

- Plain galvanic current
- Interrupted galvanic current

- Plain Galvanic Current :- Parameters of plain Galvanic current, principle of Iontophorosis technique of Iontophorosis(Bath method, bath and pad method, pad method) Common drugs used in Iontophorosis with its polarity, therapeutic effect, contraindication and dangers of plain galvanic current
- Interrupted Galvanic current (Interrupted direct current I.D.C.) - Definition of IDC, parameters, wave form, duration and amplitude of the pulse effect of strength and duration on muscles and nerves technique of stimulation of individual

muscles and group muscles, therapeutic effect, contraindication and dangers and precaution of IDC.

III. Electro-Diagnosis -

- S.D. Curve
- Chronaxae and Rheobase
- Nerve Conduction
- EMG
- Nerve Conduction Velocity Measurement (outline only).

IV. TENS:- Definition, parameters and wave form, pain gate theory of pain modulation, techniques of application, therapeutic effect and contraindication.

B. MEDIUM FREQUENCY CURRENTS:

Definitions, effects, indications, techniques of application, contraindications

Interferential therapy:

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

C. HIGH FREQUENCY CURRENT

I. Short Wave Diathermy:- Introduction, Principle of application (Capacitor field methods and conductive field methods) preparation of patient, Therapeutic effects, contraindication and dangers of SWD.Methods of application-capacitor and induction electrode, precautions and Potential harmful effects of treatment, Dosimetry.

II. Pulsed S.W.D.:-Definition, Characteristic, Principles of Treatment, Therapeutic e ffects, Indications, Technique of application, Contraindications and dangers.

III. Microwave Diathermy:- Definition, characteristic of wave, properties of microwave, technique of application, Therapeutic effects, contraindication, and dangers, , precautions and potential harmful effects, Dosimetry.

D. ACTINOTHERAPY :

I. Infra-Red:- Introduction, Classification, penetration depth, Techniques of application, Dangers and Contraindicatios

II. Ultraviolet Radiation :- Introduction, classification of ultraviolet rays, penetration depth, effect of ultraviolet, Physiological and therapeutic effects- photosensitization, test dose calculation, technique of application, (contact methods non contact methods) Physiological and Therapeutic effect, Indications and contraindications , Potential harmful effects and dangers, Methods of application, Sensitizes, Filters, Dosage, wavelength, penetration, tolerance,Treatment / Application condition wise. Comparison between UVR & IR Therapy.

III. LASER:-(Infrared and red light laser, helium/neon laser and semi conductor laser)Definition, principle of application, (contact methods non contact methods) technique of application, Therapeutic effect and potential harmful effects , dose calculation, indications, contraindications and dangers.

E.ULTRASONIC THERAPY:- Introduction and Characteristics of the wave parameters, coupling media, Therapeutic effects, Indications, Contraindication and Dangers, Testing of Apparatus, and Techniques of application and dose. Physiological and therapeutic effects & potential harmful effects and precautions, Dosimetry

F.THERMAL THERAPY MODALITIES:

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

I. Paraffin wax bath therapy - Introduction, Preparation of wax, preparation of patient, Method of application, Therapeutic Effects, Indications and Contraindications.

II. Hydro collator packs (Heating pad, and Moist heat): - Introduction, methods of application, indication,
contra indication.

III. Whirlpool and moist heat Heating pads

IV. Hot air chambers, fluidotherapy .

V. Cryotherapy :- Introduction, Physical Principles, Physiological and Therapeutic effects, Techniques of Application, Indications, precautions and Potential harmful effects of treatment, Contraindications and dangers, Dosimetry.

G. BIO FEEDBACK :

Introduction, principles of Bio feedback, therapeutic effects of Bio Feedback, Indication and Contraindications, Techniques of Treatment.

H. ADVANCED ELECTROTHERAPY:

- Computerization of electrotherapy modalities
- Programming of parameter of treatment .
- Appropriate Selection and combination of parameters in therapy .
- Combined therapy-Microwave with traction, Ultrasonic therapy with stimulation,IFT or TENS-Principles, uses, indications etc.

ELECTROTHERAPY PRACTICAL

Practical:- No. of Hrs. (80)

Testing of above apparatus
Techniques of application of above treatment modalities (Demonstration & Practice)
Demonstration of Electrical Modalities functioning & Usage
Demonstration and practice of various motor point stimulations.
Demonstration and practice of therapeutic application of different low frequency currents.
Demonstration and practice of Electro diagnosis (demonstration and Practice of following electro diagnostic Measures) F.G. Test, SD curves plotting, Chronaxae and Rheobase, Reaction of degeneration.
Demonstration and practice of therapeutic application of the following modalities:
Short-wave diathermy, Ultrasound, Infra red, Wax bath, Hydro collator, Electric muscle stimulator, Interferential currents, TENS, Ultraviolet, Microwave, Lasers, and Electrical Traction. Note: All the demonstrations are done on normal persons.

PRACTICAL EXAMINATION
Students will be assessed by viva & practical demonstrations based upon learning in Theory and Practical.

Suggested Readings Books:

1 Froster, A. and Palastanga, N. Clayton‘s Electrotherapy: Theory and Practice AITBS, Delhi
2 Jhon, Low and Ann, Reed Electrotherapy Explained: Principles Butterworth Heine, Oxford
3 Nelson, R.M. and Currier, D.P. Clinical Electrotherapy Appleton and Lange
4 Chemeron, M.H. Physical Agents in Rehabilitation W B Saunders, London
5 Michlovitz, S L Thermal Agents in Rehabilitation F A Davis, Philadelphia
6.B.K.Nanda, Electrotherapy , Jaypee Publication, New Delhi
7. Jagmohan Singh- Electrotherapy , Jaypee Publication, New Delhi

B.P.T. THIRD YEAR

SCHEME OF EXAMINATION FOR THIRD YEAR B.P.T.

There shall be six subjects for the Third Year B.P.T. Examination. The subjects Qualification of the examination will be as follows.

S.No.	Subject	Internal Assessment		University Examination			Total
		Theory	Practical	Theory	Viva	Practical	
1	Neurology including Psychiatry & Neurosurgery	20	--	80	--	--	100
2	Orthopaedics	20	--	80	--	--	100
3	Applied Biomechanics & Kinesiology	20	--	80	--	--	100
4	Physiotherapeutic in Neurology & Neurosurgery	20	20	100	20	40	200
5	Physiotherapeutic in Orthopaedic Conditions	20	20	100	20	40	200
6	Physical Evaluation, Diagnosis & Prescription	20	20	100	20	40	200
Total Max. Marks							**900**

N.B.- Viva marks will be added in theory marks along with internal assessment theory; candidate have to get min. 50% marks in theory and viva collectively for passing the examination.

BACHELOR OF PHYSIOTHERAPY (BPT)- THIRD YEAR

Paper –I: NEUROLOGY INCLUDING PSYCHIATRY& NEUROSURGERY

Subject	**Internal Assessment**		**University Examination**			**Total**
	Theory	Practical	Theory	Viva	Practical	
Neurology including Psychiatry & Neurosurgery	20	--	80	--	--	100

The University examination shall be of 80 marks with Section – A : Neurology including Psychiatry and Section – B : Neurosurgery the university theory examination marks for Neurology including Psychiatry shall be 40 and for Neurosurgery 40 marks respectively. There shall be two paper setters and two evaluators, 50% shall be the minimum passing marks. Internal assessment will be of 10 marks in each subject. Total internal assessment will be 20 Marks.

The pattern of University theory examination will be as under for 80 Max. Marks. There will be two section i.e. Section-A: Neurology including Psychiatry and Section-B: Neurosurgery of 40 Max. Marks each section and distribution of marks for questions will be as under:-

No. & Type of Question	**Marks for each question**	**Total Max.**
05 Very Short Answer Questions (Answer to be given in 50-60 words)	02	10
02 Short Answer Questions (Answer to be given in 250-300 words)	8	16
01Essay Type Questions (Answer to be given in 450-500 words)	14	14
		40

NEUROLOGY INCLUDING PSYCHIATRY& NEUROSURGERY
Total No. of teaching Hrs. -120

Course Description

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

Course Objectives:

1. To understand clinical manifestations of Neurological and Psychological disorders
2. The rationale and implications of psychological disorders on disability
3. To understand the management of neural & psychological disorders
4. In addition, the students shall be able to fulfill with 75% accuracy (as measured by written, oral and practical internal evaluation) the following objectives of the course.

Course Contents:

SECTION – A: NEUROLOGY
(Total Hrs.- 40)

1. Nervous system: Disorders of Neurological functions in the light of Anatomy and Physiology (Brief description only) –

A. Basic Neurophysiology, functional anatomy, tracts, pyramidal and extrapyramidal/cerebellar systems of brain and spinal cord/nerves , Major Nerve Tracts, Motor System, Sensory System, Autonomic System, Communication & CSF.

B. Reflexes:- Physiology of reflexes, genesis of spasticity, rigidity, postural reflex

C. Bladder and Bowel Control:- Innervations, anatomy, physiology, pathology

2. Clinical assessment of a neurological patient: Principles of clinical examination and diagnosis, higher mental function, assessment of brain and spinal cord function, Differential diagnosis and Prognosis of Neurological disorders, history taking/overview from perspective of clinical examination.

3. Investigation : Principles, methods, views, type of following investigative procedure- Skull XRay, CT, MRI, Evoked potential, lumber puncture, CSF examination, EMG, NCV.

4. General manifestations of nervous system disease & management

5. Brief Description of Headache, migraine, raised intra-cranial pressure

6. Cranial Nerves and special senses with major emphasis on V, VII, X, XI, & XII

7. Inflammatory conditions (brief description) – meningitis (bacterial, tubercular), viral encephalitis, Poliomyelitis, syphilis, rabies

8. Disorders of cerebral circulation –

A. Stroke:- Etiopathology, clinical features pertaining to artery involved , types, management

B. Hypertensive encephalopathy

9. Demyelinating diseases (brief description) - acute disseminated encephalomyelitis, multiple sclerosis

10. Movement disorders/ Extra pyramidal syndromes - Parkinson‘s disease, Chorea, Athetosis, Dystonia, Hemiballismus, Spasmodic Torticollis, Tremors and Writer‘s Cramps, Cerebellar Ataxia, Friedreich's Ataxia

11. Convulsive disorders (brief description) - epilepsy (GM, PM, Psychomotor), tetany

12. Developmental and degenerative syndromes – cerebral palsy, kernicterus, hereditary ataxias, motor neuron disease, peroneal muscular atrophy

13. Disorders of Spinal cord and Cauda Equina- spinal cord injury, paraplegia, quadriplegia, spina-bifida, transverse myelitis, Non-compressive myelopathies , Neurogenic bladder and bowel.

14. Metabolic and intoxication disorders (brief description) - Alcoholism, Drug addiction, heavy metals poisoning (lead, mercury, copper), Organo-phosphorous poisoning, electric shock, tetanus, botulism

15. Peripheral nerve disorders – traumatic/ compression or entrapment neuropathy, polyneuritis, AIDP, CIDP, GB syndrome,diabetic polyneuropathy and spinal radiculopathies. Special emphasis on brachial and lumbo-sacral plexuses and major nerves –radial, ulnar, median, femoral, and sciatic nerve.

16. Muscle disorders – Dystrophies (classification clinical features. Beckers muscular dystrophy, duchennes muscular dystrophy), Progressive muscular dystrophy, polymyositis, myasthenia gravis, floppy infant syndrome, overview of other muscle disorders like channelopathies, cramps.

17. Autonomic nervous system (brief description)– clinical features of autonomic disorders, autonomic dysreflexia, autonomic nervous system and pain.

18. **Pediatric neurology :** Neural development, etiology, pathophysiology, classification, climical sign and symptoms, investigations,differential diagnosis, medical management, surgical management and complications of following disorders-

Cerebral palsy, hydrocephalus, Arnold Chiari malformation, basilar impression, Klippel-feil syndrome, achondroplacia,cererbral malformations, Autism, Dandy walker syndrome and Down syndrome.

19. Motor Neuron disease: Etiology, pathophysiology, classification, climical sign and symptoms, investigations, differential diagnosis, medical management and complications of following disorders. Amyotrophic Lateral Sclerosis, Spinal muscular atrophy, Bulbar palsy, neuromyotonia .

20. Multiple Sclerosis: Etiology, pathophysiology, classification, climical sign and symptoms, investigations,differential diagnosis, medical management, and complications.

21. Dementia

Practical

Students shall be posted for 10 hrs. in Neurology units. They shall do clinical checking and ward work to acquaint themselves to neurological and medical conditions

PSYCHIATRY

(Total no. Hrs.- 20)

Brief outline only:-

A) Principles of psychiatric examination

B) Modalities of psychiatric treatment

C) Psychiatric illness and physical therapy link

D) Brief description of Etio-pathogenesis, manifestations, and management of psychiatric illnesses - Anxiety neurosis, Depression, Obsessive compulsive neurosis, Psychosis, Maniacdepressive psychosis, Drug induced psychosis, Post-traumatic stress disorder, Psychosomatic reactions: Stress and Health; theories of Stress – Illness Link, Organic brain syndrome, Dementia, Drug dependence and alcoholism, Somatoform and Dissociate Disorders – conversion reactions, Somatization, Dissociate Amnesia, and Dissociate Fugue, Multiple Personality & Depersonalization disorder

E) Child psychiatry: Brief descriptions of manifestations, and management of childhood disorders - attention deficit syndrome, and behavioural disorders

F) Geriatric Psychiatry

G) Mental deficiency- (descriptive): Mental retardation, Learning disabilities, Autistic behaviour

Suggested Reading Books:

1 Bannister, R. Brain and Bannister Clinical Neurology Oxford university press, oxford 2002
2 Chamberlain, E.N.Symptoms and Signs in Clinical Medicine John Wright, Bristol 1974
3 Friedman, H.H. Problem-Oriented Medical Diagnosis Little Browne, Boston 1979 3V
4 Swash, Michael Hutchison‘s Clinical Method W B Saunders, London 2000
5 Rees, Lingford New Short Text Book Of psychiatry Arnold, New Delhi 1988
6 Walton, John Brain‘s Disease of the Nervous System Oxford university press, Delhi 1998
7 Haerer, A.F. Neurological Examination Lippincott, Philedelphia 1999
8 Ahuja, Neeraj Short Text Book Of psychiatry Jaypee, New Delhi 1999
9 Haslett, C.Davidson‘s Principal and Practice of Medicine Churchill Living stone, London 1999
10 Kasper, D.L Harrison Principles of Internal Medicine Mc-Graw Hill, New York 2005 2V

SECTION:B-

NEUROSURGERY

Total No. of Teaching Hrs. 40

A) Neurophysiology: Reviews in brief the neurophysiologic basis of tone and Disorders of tone and Posture, Bladder control, Muscle conduction, Movement and Pain.

B) Clinical Features and Management: Briefly outline the clinical features and management of the following neurological disorders.

1. Congenital and Childhood disorders
   a) Hydrocephalus. b) Spinal Bifida.
2. Trauma - Broad localization, first aid and management .
3. Head Injury: : Etiology, pathophysiology, classification, clinical sign and symptoms, investigations, medical management, Surgical management and complications.
4. Intra-cranial disorders – clinical features, complications & management of brain abscess, space occupying lesion, hydrocephalus, vascular malformation
5. Brain tumours and Spinal tumours: classification, clinical sign and symptoms, investigations, differential diagnosis, medical and surgical management.
5. Intracranial tumours: Broad Classification, Signs and Symptoms.
5. Vertebral column injuries – classification, clinical features, complications & management.
6. Spinal Cord injury and Diseases of the Spinal Cord:
   a) Craniovertebral junction anomalies.
   b) Syringomyelia.
   c) Cervical and lumbar disc disease d) Tumours.
   e) Spinal arachnoiditis.
4. Peripheral Nerve Disorders:
   a) Peripheral nerve injuries: Localization and Management b) Entrapment Neuropathies.
5. Pre-operative assessment, Indications and Contraindications for Neurosurgery.
6. Introduction and brief description of indication and complications of following neurosurgeries: Craniotomies, cranioplasty, stereotactic surgery, deep brain stimulation, burr hole, shunting, laminectomy, hemilamectomy, rhizotomy,microvascular decompression surgery, Endareterectomy, embolization, pituitary surgery, ablative surgery- Thalamotomy and pallidotomy, Neuralo implantation.
7. Infections of brain and Spinal Cord: patho-physiology, classification, clinical sign and symptoms, investigations, differential diagnosis, medical management, surgical management and complications.
8. Management of Pain, Electrical Stimulation of Brain and Spinal cord.

Practical

Clinical assessment of neurological function to be taught through bedside or demonstration in clinics, of the following:

- Basic history taking to determine whether the brain, spinal cord or peripheral nerve is involved.
- Assessment of higher mental function such as Orientation, Memory, Attention, Speech and Language.
  1. Assessment of Cranial nerves.
  2. Assessment of Motor system.
  3. Assessment of Sensory function, Touch, Pain and Position.
  4. Assessment of Tone-Spasticity, Rigidity and Hypotonia.
  5. Assessment of Cerebral function.
  6. Assessment of Higher cortical function - Apraxia.
  7. Assessment of Gait Abnormalities.

Students shall be posted for 10 hrs. in Neurosurgery units. They shall do clinical checking and ward work to acquaint themselves to neurological and surgical conditions.

BACHELOR OF PHYSIOTHERAPY (BPT) THIRD YEAR

Paper-II : ORTHOPAEDICS

Subject	Internal Assessment		University Examination			Total
	Theory	Practical	Theory	Viva	Practical	
Orthopaedics	20	--	80	--	--	100

There shall be one paper setter external or internal for theory examination. 50% shall be the minimum passing marks. Internal assessment will be of 20 marks. The pattern of University theory examination will be as under for 80 Max. Marks.

No. & Type of Question	Marks for each question	Total Max. Marks
05 Very Short Answer Questions (Answer to be given in 50-60 words)	02	10
04 Short Answer Questions (Answer to be given in 250-300 words)	10	40
02 Essay Type Questions (Answer to be given in 450-500 words)	15	30
		80

ORTHOPAEDICS

Total No. of Teaching Hrs.- 130
Theory: - 100 Hrs. & Practical:- 30 Hrs.

Course Description

This specially marks the students to understand the common traumatic and orthopaedic conditions, which commonly cause disability. The syllabus is made keeping in mind to avoid details of diagnosis and pathology.

Objective of Course

1. To understand an orthopaedic patient, common orthopaedic conditions and procedures
2. To understand applications of physical therapy in various orthopaedic conditions
3. To understand the implications of various orthopaedic conditions, and procedures on physical therapy
4. At the end of syllabus and instructional course and demonstrations, the student shall be able to understand orthopaedic conditions causing disability and manage them by physiotherapy point of view.
5. In addition, the students shall be able to fulfill with 75% accuracy (as measured by written, oral and practical internal evaluation) the following objective of the course

Course Contents:

1. Introduction to Orthopaedics: Terminology, types of common aetiology, clinical examination, Common investigation, Outline of management – Operative & Non-Operative.
2. Fractures and Dislocations: Briefly mention Types of fracture and dislocations, symptoms and signs of above injuries and their Principles of management and Complications, Fracture healing (Normal & pathological) Calcium-phosphorus metabolism
- normal and pathological states

3.Prevention and treatment of common complications: Fracture disease, Volkmann's ischemic contracture, Sudeck's osteo dystrophy, Myositis ossificans, Ligament injuries, Shoulder- hand syndrome etc.

4. Spinal column: fractures, management and complications of Spinal injuries spinal deformities like Scoliosis, Kyphosis, and Lordosis etc.
5. Injuries of upper limb and lower limb, enumerate major fracture and joint injuries, brief description of principle of management and complications.
6. Congenital anomalies and other deformities:

Brief descriptions of following congenital conditions along with the outline of treatment: Congenital Hip Dysplasia, Congenital Talipes Equinovarus / Calcaniovalgus, Arthrogryposis, Multiplex Congenita, Congenital Torticolis, Scoliosis, Acromelia, phocomelia, Amelia, Spina Bifida: all types, clinical presentation, sequel & management

7. Development diseases of skeleton: (Brief description only)Osteogenesis imperfecta, heterotopic ossification, Osteochondritis, Perthes' disease.
8. Neuromuscular diseases: Volkmann's Ischemic contracture, obstetrical paralysis, and peroneal muscular atrophy, Poliomyelitis : common deformities due to PPRP and their orthopaedic aspects and management.

9. Spinal deformities: clinical features, diagnosis & Conservative management of Scoliosis, Kyphosis, and traumatic deformities

10. Bone and Joint infections: Etiology, clinical feature, management and complications of Septic arthritis, Bacterial infections, Osteomyelitis, Tuberculosis and leprosy, Pott‘s paraplegia.

11. Neuro-vascular Diseases (Brief Description): orthopaedic aspects and treatment of – Nerve injuries (major nerves), Plexus injuries

12. Arthritis & Rheumatic Diseases: Outline of Pathology , Clinical features, evaluation & conservative management of various categories of arthritis :- Rheumatoid arthritis, Juvenile Ch. Arthritis, Reiter‘s disease, Polymyalgia rheumatica, Gout, osteoarthritis, and Ankylosing spodylitis, Neuropathic- joints, haemophilic arthropathy, Avascular necrosis .

13. Sprain and Strains: Common sites of sprains and muscle strains, their clinical manifestations and treatment.

14. Bony & Soft tissue injuries: Injury & repair, Clinical presentation, evaluation & general principles of rehabilitation management (Brief Description)

15. Upper Limbs: Clinical presentation, evaluation & conservative management of rotator cuff injuries, adhesive capsulitis, bursitis, biceps tendonitis, shoulder dislocation, Frozen shoulder and other painful conditions of shoulder , snapping & winged scapula, tennis and golfer elbow, olecranon bursitis , soft tissue injuries, sprains and strains, Arthritic conditions, tenosynovitis, Carpal tunnel syndrome, deformities Dupnytren‘s contracture, VIC, reflex sympathetic dystrophy, common fractures and dislocations.

16. Lower Limb: Clinical presentation, evaluation and conservative management of Arthritic conditions, soft tissue injuries, sprains and strains, achillis tendonitis, bursitis, Painful heel conditions, Tendinitis , plantar fascitis, deformities, reflex sympathetic dystrophy, neuropathic Joints, common fractures and dislocations.

17. Spine: clinical presentation, evaluation and conservative management of – Low backache, disc prolapse, cord compression, spondylosis, Ankylosing spondylosis, Spondylyolisthesis and Spinal Fractures

18. Inflammatory and degenerative conditions: Causes, clinical features, complications, deformities, radiological features, management – conservative and surgical management for the following conditions: Osteoarthritis, rheumatoid arthritis, Ankylosing Spondylitis, Gouty arthritis, Psoriatic arthritis, hemophilic arthritis, Charcot‘s joints.

19. Amputations - Justification, outline of surgical approaches, incisions, procedures, Classification, indications, contraindications, complications , pre-operative, operative and postoperative management.

20. Principles of operative Managements: Orthopaedic surgeries, Indications, classification, types, principle of management of the following surgeries: Arthrodesis, Arthroplasty(partial and total replacement), Osteotomy, external fixators, Spinal stabilization surgeries, Tendon operations, Arthroscopy, total joint replacements, limb re-attachments.

21 . Bone and Joint Tumors: Classification, clinical features and management of Osteoma, Osteosarcoma, Osteoclastoma, Ewings tumor, Multiple myeloma and Secondaries.

Practical

Students do clinical checking, ward work, hospital posting for a period of one month to acquaint themselves with traumatology and orthopedic conditions.

Suggested Readings:

1. Outline of fracture by Adams.
2. Outline of Orthopedics by Adams.
3. Orthopedics and Traumatology by Natarajan.
4. Aplay‘s Orthopedics.
5. Joshi, J. and Kotwal, P. Essential of Orthopedics and Applied Physiotherapy Elsevier, New Delhi
6. Terke, Samual L.Orthopedics: principles and their application Lippencott, New York
7. Magee, David J. Orthopedic and Physical Assessment Saunders, Philadelphia
8. Maheshwari, J Essential Orthopedics
9. Solomon, Louis Apley‘s Systems of Orthopedics and Fracture Arnold, London
10. McRae, R. and Esser, Max Practical Fracture Treatment Churchill Living stone, London

BACHELOR OF PHYSIOTHERAPY (BPT) THIRD YEAR
Paper-III : APPLIED BIO-MECHANICS & KINESIOLOGY

Subject	Internal Assessment		University Examination			Total
	Theory	Practical	Theory	Viva	Practical	
Applied Biomechanics & Kinesiology	20	--	80	--	--	100

There shall be one paper setter external or internal for theory examination 50% shall be the minimum passing marks. Internal assessment will be of 20 marks. The pattern of University theory examination will be as under for 80 Max. Marks.

No. & Type of Question	Marks for each question	Total Max. Marks
05 Very Short Answer Questions (Answer to be given in 50-60 words)	0	10
04 Short Answer Questions (Answer to be given in 250-300 words)	1	40
02 Essay Type Questions (Answer to be given in 450-500 words)	1	30
		80

APPLIED BIO-MECHANICS & KINESIOLOGY

Total No. of teaching Hrs. - 100

COURSE DESCRIPTION:

The 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 rehabilitation and dysfunction, kinesiological analysis and bioengineering appliances, manufacture and uses.

COURSE OBJECTIVE:

1. To understand the musculoskeletal surgical anatomy normal and pathological deviations

2. After 100 hours of lectures, demonstrations, and practicals, the student shall be able to demonstrate an understanding of the principles of biomechanics, kinesiology and their applications in health, disease and bioengineering.

3. In addition the student shall be able to fulfill with 75% accuracy (as measured in written and oral evaluation) the following objectives of the course.

Course Contents:

1. Introduction: Definition and Aim of Biomechanics, Scope and Importance of Biomechanics in Physiotherapy and Bioengineering
2. Kinematics and Kinetics: Definition, Descriptors of motion, Types of motion, and Axes and planes. Definition of force, Statics and Dynamics, Inertia, Classification of forces, Composition and Resolution of forces: Linear, Concurrent and Parallel force system, Muscle force, Friction force, Torque, Anatomic Pulley and its role in movement
3. Gravity: Definition, Center of Gravity and Center of Mass, Location of Center of Mass, Line of Gravity, Stability and Equilibrium, Linear and Angular Equilibrium
4. Biomechanics of Bone, collagenous tissue and muscle: Structure, function and Mechanics in health and in disease, injury, immobilization, exercise and overuse
5. Biomechanics of Spine: Structure, Function and Mechanics in health and in disease
6. Biomechanics of Upper Extremity: Structure, Function and Mechanics in health and in disease
7. Biomechanics of Lower Extremity: Structure, Function and Mechanics in health and in disease
8. Biomechanics of Locomotion and Gait Deviations, Origin of human movements and significance, Forms of human movements, their characteristics and factors affecting them
9. Biomechanics of Activities of Daily Living, Work Analysis
10. Posture: Definition, Biomechanics of Good Posture, Biomechanics of postural deviations, effect of age, disease, occupation and pregnancy on good posture

A. Joint structure and function

1. Types of joints
2. Joint functions

B. Kinesiology:

1. Origin of human movement and its significances

2. Analysis of movement – kinetics and kinematics
3. Body links and motion parts
4. Principles of Kinesiology
    a. Basic Concepts
    b. Muscular system
    c. Joints
    d. Machinery Musculoskeletal system
    e. Principles of Motion
    f. Principles of force and wor
    g. Basics of the development of motor skills
    h. Principles of stability
    i. Postural principles

C. General effects of injury and disease on joint functioning

- Brief surgical anatomy (structural components, and alignment)
- Joint range of motion, axis and plane of motion
- Joint movements, mobility and stability, restrictions and limitations, end feels
- Abnormal deviations in joints in disease and injury of the following joint complexes:

Shoulder joint complex, Elbow joint complex, Wrist and hand complex, Hip joint complex Knee joint complex, Ankle-foot complex, Vertebral column, Weight distribution (lower limb joints)

D. Abnormal Posture:

1. Definition and description.
2. Analysis of postures (anterior, lateral and posterior), alignment of joints in different postural deviations.
3. Abnormal postures – biomechanical analysis and effects.
4. Principles of Postural correction

E. Pathological Gait:

1. Phases of gait – biomechanical analysis.
2. Time and distance parameters – biomechanical significance.
3. Joint motion – chains of movement
4. Effects of pain, deformity, weakness in pathological gaits
5. Management of pathological gaits.

Suggested Readings:

1. Norkin, C.C. and Levangie P.K. Joint Structure and Function: Comprehensive Ara Jaypee, New Delhi 1998
2 Magee, David J. Orthopaedic and Physical Assessment Saunders, Philadelphia 2002
3 Donatelli, R.A. Biomechanics of the Foot and Ankle Davis, Philadelphia 1996
4 Mow, Van C. and Hayes, W.C. Basic Orthopedic Biomechanics Lippincott, New York 1997
5 Norkin, C.C. and White, J. Measurement of Joint Motion Jaypee, New Delhi 1995
6 Kapandgi, I.A. Physiology of Joints Churchill- Livingstone 1998 3V
7 Tritschler, Katbleen Practical Measurement and Assessment Lippincott, New York 2000
8 Leveau, Biomechanics of Human Motion

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Paper-IV: PHYSIOTHERAPEUTIC IN NEUROLOGY & NEUROSURGERY

Subject	Internal Assessment		University Examination			Total
	Theory	Practical	Theory	Viva	Practical	
Physiotherapeutic in Neurology & Neurosurgery	20	20	100	20	40	200

There shall be one paper setter external or internal for theory examination and two examiners, one internal (Chairman) and one external for practical examinations. The viva marks shall be added to university theory examination marks and 50% shall be the passing marks for both theory and practical university examination respectively.

The pattern of University theory examination will be as under for 100 Max. Marks.

No. & Type of Question	Marks for each question	Total Max. Marks
10 Very Short Answer Questions (Answer to be given in 50-60 words)	02	20
5 Short Answer Questions (Answer to be given in 250-300 words)	10	50
2 Essay Type Questions (Answer to be given in 450-500 words)	15	30
		100

PHYSIOTHERAPEUTIC IN NEUROLOGY & NEUROSURGERY

Total No. of Teaching Hrs. – 200 Hrs
Theory: - 110 Hrs. & Practical: - 90 hrs.

Course Description

This course serves to integrate the knowledge gained by the student in normal neurology with the skills gained in exercise therapy and Electrotherapy enabling them to apply these in clinical situations of dysfunction due to pathology in the nervous system.

Course Objective

1. To identify various neurological dysfunction, Disability due to neurological dysfunction clinically

2. To set treatment goals and apply therapeutic skills in different neurological conditions to restore neurological function.

3. In addition, the student shall be able to fulfill with 75% accuracy (as assured by written oral and practical internal evaluation) the following objectives of the course.

Course Contents:

1. Review of Neuroanatomy and Physiology.

2. Symptomatology of Neurological disorders, Role of investigations in differential diagnosis, diagnosis and clinical examination of C.N.S. functions including cranial nuclei,

3. Principles of examination of higher function and applicability in training.

4. Physiotherapy evaluation of a neurological patient, electro diagnostic procedures, interpretations and prognosis in different neurological conditions.

5. Developmental disorders of C N S.

6. Early detection of brain damaged child, Risk babies, Neuropediatric examination.

6. Developmental programmes and Delayed milestones.

7. Neuro-developmental screening test.

8. Minimum Brain Damage.

9. Sensory, Motor, Functional Psycho-social behaviours of a child.

10. Developmental physiotherapy programs (Neurodevelopmental approaches) , reeducation and retraining techniques in neurological conditions, approaches like: Bobath‘s, Rood‘s, PNF, Vojta techniques, biofeedback, Brunnstorm, Motor Relearning programming .

11. Primitive patterns and abnormal motor behaviour due to brain damage, its control and training with reference to gait and hand function.

12. Assessment and principles of therapeutic management of following neurological conditions: Stroke, meningitis, encephalitis, basal ganglion diseases , Parkinson‘s disease, Cerebral palsy, Ataxia, Cerebellar Ataxia, Friedreich‘s Ataxia , Brain tumors

13 . Traumatic brain injury: Types and Mechanisms of head injury, Clinical features, potential complications, Physiotherapy principles of immediate and postoperative therapeutic management

14. Assessment and Treatment techniques of:- Motor Neuron Disease ,Disseminated sclerosis, Transverse myelitis, Spinal tumors, Poliomyelitis, Syringomyelia, spina bifida, Subacute combined degeneration of spinal cord.

15. Spinal cord injury: review of anatomy and physiology, Physiotherapy Assessment of Spinal cord injury, Principles of

Physiotherapy at various stages of Spinal cord injury, Rehabilitation goals and ADL training.

16 . Assessment and treatment of neuropathies.

17. Peripheral nerve injuries, surgical resection & repair: Classification & types, Functional assessment, investigation, diagnosis & prognosis, Physiotherapeutic management

18. Assessment and treatment of Myopathies including neuromuscular junction disorders.

19. Neurosurgery: Post surgical Physical therapy in neurosurgical procedures – craniotomy, shunts, SOL resection, surgical treatment of spasticity, cervical cord decompression

Note:- Practical Physiotherapy technique applicable for neurological rehabilitation for the for the above conditions

Suggested Readings:

1. Cash‘s Textbook of Neurology for Physiotherapist by John Cash.
2. Key issue in Neurological Physiotherapy by Ada/Canning.
3. Elements of Paediatric Physiotherapy by Eckersy.
4. Tidy‘s Physiotherapy.
5. Hislop, H.J. and Montgomery, J. Daniels and Worthingham‘s Muscle Testing: Techniques of Manual Examination W.B.Saunders, Philadelphia 2002
6. Bobath, Berta Adult Hemiplegia: Evaluation and treatment Butterworth, Oxford 1990
7. Shepherd, R.B. Physiotherapy in Paediatrics Butterworth- Heinemann, Oxford 1995
8. Downie, P.A. Cash‘s Textbook of Neurology for Physiotherapy Jaypee, New Deli 1993
9. Swaner, K.A. and LaVigne, J.M. Brunnstom‘s Movement Therapy in Hemi Lippincott, New York 1992
10. Burns, Y.R. and Macdonald J. Physiotherapy and the Growing Child Harcourt, Singapore 1998
11. Bromley, Ida Tetraplegia and Paraplegia Churchill-Livingston, London 1998
12. Voss, Dorothy Proprioceptive Neuromuscular Facilitation Lippincott, New York 1989
13. Adler, S.S. PNF in Practice Springer, New York 2003
14. Carr, J.H. and Shepherd, R.B. Stroke Rehabilitation Butterworth- Heinemann, Singapore 2003
15. Carr, J.H. and Shepherd, R.B Neurological Rehabilitation Butterworth, Oxford 1998
16. Kottke, F.J. and Lehman J.F. Handbook of Physical, Medicine and Rehabilitation W B Saunders, London 1990
17. Umphred, Dracy A,Neurological Rehabilitation Mosby, London 2001

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Paper-V: PHYSIOTHERAPEUTIC IN ORTHOPAEDIC CONDITIONS

Subject	Internal Assessment		University Examination			Total
	Theory	Practical	Theory	Viva	Practical	
Physiotherapeutic in Orthopaedic Conditions	20	20	100	20	40	200

There shall be one paper setter external or internal for theory examination and two examiners, one internal (Chairman) and one external for practical examinations. The viva marks shall be added to university theory examination marks and 50% shall be the passing marks for both theory and practical university examination respectively. The pattern of University theory examination will be as under for 100 Max. Marks.

No. & Type of Question	Marks for each Question	Total Max. Marks
10 Very Short Answer Questions (Answer to be given in 50-60 words)	02	20
5 Short Answer Questions (Answer to be given in 250-300 words)	10	50
2 Essay Type Questions (Answer to be given in 450-500 words)	15	30
		100

PHYSIOTHERAPEUTIC IN ORTHOPAEDIC CONDITIONS

Total No. of teaching Hrs. – 200
Theory: - 120 Hrs. & Practical: - 80hrs

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 Physical evaluation, thus enabling them to apply these in clinical situations of dysfunction due to musculoskeletal pathology.

Course Objective

1. To identify various Musculo skeletal dysfunction clinically
2. To set goals and apply therapeutic skills in different orthopaedic conditions to restore musculoskeletal function.
3. In addition, the student shall be able to fulfill with 75% accuracy (as measured by written, oral and practical internal evaluation), the following objectives of the course.

Course Contents:

1. **Traumatology and Orthopaedics: -** Classification of fractures, causes and types, Signs and symptoms, Complications, Healing and factors affecting, Principles of fracture management. Principles of Physiotherapy management, management of complication. Dislocation - Common sites, signs and symptoms.
2. Principles of Physiotherapy evaluation and Management of an orthopaedic patient.
3. General principles of physiotherapy in fracture management including complications at different stages, Post fracture - assessment and PT management.
4. **Specific fractures and their complete physiotherapy assessment and management.**

a) Upper Limb: Scapula, Clavicle, Humerus, Ulna and Radius, Colle‘s fracture and Crush injuries of Hand,

b) Lower Limb: Fracture of Pelvis, Neck of Femur, Shaft of Femur, Patella, Tibia and Fibula, Pott‘s Fracture, Fractures of Tarsal and Metatarsal bones

c) Management of Fracture of Spine with or without neurological deficit.

5. **Soft Tissue injuries:** Assessment and therapeutic management of Sprains, strains, ligament and cartilage tear (Tear of semilunar cartilage and cruciate ligament of knee)/rupture, Synovitis, Capsulitis, Volkmans ischamic contracture. Rotator cuff tendinitis, Ankle sprains, Tennis elbow, Golfer‘s Elbow, Retrocalcaneal bursitis.

6 . **Assessment, treatment and management of Degenerative and infective Conditions:-** Osteoarthritis of major joints. Spondylosis, spondyiitis, spondylolisthesis, Spondylolisthesis, Prolapsed intervertebral disc , Lumbar cord decompression, periarthritis, Rotatory cuff lesion of shoulder, Tuberculosis of spine, Bone and Major joints, perthes disease, Avascular bony necrosis at hip joint , Rheumatoid arthritis, Ankylosing spondylitis,

7 . **Deformities**

a. Congential: Torticolllis and Cervical rib, thoracic outlet syndrome , C.T.E.V., Pescavus and Pes Planus and Other common deformities.

b. Acquired: Scoliosis, Kyphosis, Lordosis, Coxa vara, Genu Valgum, Genu varum and Genu recurvatum.

8. General principles of physiotherapy assessment and management in dislocations including complications with special consideration in shoulder dislocation, Hip dislocation.

9 . **Orthopaedics Surgery:** General principles of assessment, physiotherapy management in surgical conditions like –Osteotomy, Joint Replacements, ORIF, Arthroplasty, Arthodesis, Illizarov's technique , Tendon transfers, soft tissue releases & soft tissue repair , Tendon transplant, Grafting, Arthroscopy, spinal Stabilization, reattachment of limbs, operation in C.P. and Polio.

10 . Amputations: Levels of Amputation of upper and lower extremity, pre & postoperative evaluation & principles of management, stump bandaging, Pre and Post Prosthesis fitting assessment and management (check-out of Prosthesis Training) Complications of Amputations and their management.

11. Manipulation therapy - General assessment, indications, contra indications, Principles and Techniques of Therapy and Factors considered in therapy. Brief introduction to schools of manual therapy (Maitland, Kaltenborne, Cyriax, Mulligan, Mackenzie)

Practical

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

Suggested Readings:

1. Cash‘s textbook of Orthopedics and Rheumatology.
2. Physiotherapy in Rheumatology.
3. Physiotherapy in disorders of brain.
4. Clinical Orthopedics for Physical Therapy - by Campbell
5. Tidy‘s Physiotherapy.
6. Clinical Orthopedics for Physical Therapy - by Richardson‘s & Sadowsky.
7. Smith, Laura K Brunnstrom‘s Clinical Kinesiology Jaypee, New Delhi
8. Buckley, John Exercise on Prescription Butterworth-Heinemann, Boston
9. Downie, Patricia A. Cash‘s Textbook of Orthopedics and Rheumatology Jaypee, New Delhi
10. Donatelli, R. A. and Wooden, M.J. Orthopedic Physical Therapy Churchill- Livingstone, New York
11. Tidswell, Marian Orthopedic Physiotherapy Mosby, London
12. Jones and Barker, Human Movement Explained Butter worth- Heine
13. Jacobs, Karen Ergonomics For Therapist Butter worth- Heine, Boston
14. Maitland, G.D. Maitland‘s Vertebral Manipulation Butter worth- Heine, Oxford
15. Nachemson, A.L. and Jonsson,, E. Neck and Back pain: Scientific Evidence Lippincott, New York
16. Donatelli, R.A. Physical Therapy of Shoulder Churchill, New York
17. Walker, J.M. and Helewa, A. Physical Therapy in Arthritis W B Saunders, London
18. Engstrom,B. and Van de Ven C. Therapy for Amputees Churchill, London
19. Calliet, Rene Knee Pain and Disability Jaypee, New Delhi
20. Calliet, Rene Shoulder Pain Jaypee, New Delhi
21. Calliet, Rene Low Back pain syndrome Jaypee, New Delhi
22. Calliet, Rene Neck and arm pain Jaypee, New Delhi
23. Calliet, Rene Foot and Ankle Pain Jaypee, New Delhi
24. Calliet, Rene Soft tissue Pain and disability Jaypee, New Delh

BACHELOR OF PHYSIOTHERAPY (BPT) THIRD YEAR
Paper-VI : PHYSICAL EVALUATION, DIAGNOSIS & PRESCRIPTION

Subject	Internal Assessment		University Examination			Total
	Theory	Practical	Theory	Viva	Practical	
Physical Evaluation, Diagnosis & Prescription	20	20	100	20	40	200

There shall be one paper setter external or internal for theory examination and two examiners, one internal (Chairman) and one external for practical examinations. The viva marks shall be added to university theory examination marks and 50% shall be the passing marks for both theory and practical university examination respectively. The pattern of University theory examination will be as under for 100 Max. Marks.

No. & Type of Question	Marks for each question	Total Max. Marks
10 Very Short Answer Questions (Answer to be given in 50-60 words)	02	20
5 Short Answer Questions (Answer to be given in 250-300 words)	10	50
2 Essay Type Questions (Answer to be given in 450-500 words)	15	30
		100

PHYSICAL EVALUATION, DIAGNOSIS & PRESCRIPTION
Total No. of teaching Hrs. – 160 Hrs

Course Description

This course serves to integrate the knowledge gained by the students in both basic and Clinical Medical science subjects and physiotherapy subjects, thus enabling them to apply these in evaluation of functions and measurements in general and in clinical situations of dysfunctions of systems in order to reach a state of diagnosing the physical problems presented by the patients.The student shall also learn principles, techniques and effects of exercise as a therapeutic modality in the restoration of physical function.

Courses Objective

1. Student shall be able to acquire the concept of evaluation of functions and measurements in general and in disorders of different systems.
2. Able to diagnose and measure the physical problems presented by the patients.
3. In addition, the student shall be able to fulfill with 75% accuracy (as Measured by written, oral, Practical and Internal Evaluation)

Course Contents:-

A. General principles of Human development & maturation

1. Aspects: physical, motor, sensory, cognitive, emotional, cultural, social
2. Factors influencing human development & growth: Biological, environmental, inherited.
3. Principles of maturation - in general and anatomical directional pattern cephalo – caudal, proximo – distal centero –lateral, mass to specific pattern, gross to fine motor development
4. Reflex maturation tests
5. Development in specific fields: Oromotor development, sensory development, neurodevelopment of hand function

B. Electro-diagnosis

1.Bioelectricity-Physiology of generation & propagation of action potential, volume conduction

2.Therapeutic current-as a tool for electrodiagnosis

3.Physiological principles, use of alternating & direct currents in electro-diagnosis such as sensory & Pain threshold, Pain tolerance,-Short & long pulse test, S.D. curves, Chronaxie & Rheobase, accommodation ratio

4.Surface and Needle Electromyography, Nerve conduction velocity Test (Motor and Sensory),Reflex Study, late responses ‗H' and ‗F' Waves, Cerebral Evoked Potential, Analysis in Normal and Pathological conditions.

5.E.M.G. instrumentation, basic components, panel diagram, types of electrodes

6.Principles of Electro- myography, motor unit –Normal characteristics-activity at rest, recruitment/frequency pattern at minimal activity, Interference pattern

C. Assessment of Neurological dysfunctions :-

1.Higher functions, cranial nerves, sensations & sensory organization, body image, Muscle tone, Voluntary movement and voluntary control tests (isolated and skilled), Abnormal movements -Clonus, Tremor, Chorea, Athetosis , Reflexes: superficial & deep, Primitive Reflexes, muscle strength, Myotomes and Dermatomes, Upper motor and lower motor neuron lesions , Nerve entrapments, Test for disorder of programme (i.e. cerebellum basal ganglia lesions) and co- ordination tests , balance, posture, gait, Neural control of bladder

2. Perceptual motor dysfunction,

3. Investigative Methods in Modern Medicine like EEG, MRI, CT Scan

4. Scales: FRT, Berg‘s Balance, modified Ashworth, Glasgow Coma, TUG, FIM

5. Functional Diagnosis using International Classification of Function, Disability & Health (I.C.F)

6. Interpretation of electro diagnostic findings, routine biochemical investigations

D. Assessment of Musculoskeletal Dysfunction

1.Postures and postural disorder , Tightness, deformity, ROM joint mobility, muscle strength and endurance , muscle girth, pelvic inclination, limb length , segmental Measurement of body part (femur, tibia etc.), trick movement, special tests, Angle of scoliotic curve , Gait analysis in pathological conditions and measurement of gait parameters .

2.Functional diagnosis using ICF

3.Interpretation of X-ray of extremities & spine, routine bio-chemical investigations,CT scan, MRI

E. Assessment of cardiopulmonary dysfunction

1. Posture (recumbent, erect orthopnoeic)

2. Vital parameters, Breathing pattern and breath hold (rate, rhythm, use of accessory muscle) Chest deformity, Cough, Sputum, Tactile and vocal fremitus, Mobility of thoracic spine and rib cage, Percussion, chest expansion measurements

, breath holding test, breath sounds, rate of perceived exertion (RPE), peak flow rate, Measurement of lungs volumes and lung capacities, blood gas level.

3. Heart rate, blood pressure, heart sounds, pulse rate (volume and pressure)

4. Exercise Tolerance: six minutes walk test, theoretical bases of Bruce‘s protocol, step test

5. Ankle Brachial Index, tests for peripheral arterial & venous circulation

6. Cardiac Efficiency Tests: ECHO, Ultra-sonography, Clinical Monitoring, Stress ECG , Treadmill and Ergometry.

7. Functional diagnosis using ICF

8 . Interpretation of X-ray chest, routine bio-chemical investigations, ABG, PFT, ECG (normal values)

F. Assessment of pelvic floor muscle strength and function:- Digital evaluation of Vagina, Perineometer, Pad Test

G . Assessment of pain

1. Intensity & quality
2. Objective assessment & documentation: VAS, Numerical Rating Scale. Other scales

H. Assessment of Hand

1. Sensations, mobility of joints, strength
2. Special tests
3. Hand function: Precision & power grips

I . Assessment of Obesity

1. Classification
2. Assessment – BMI, Waist circumference, Waist – Hip ratio

J. Functional Evaluation:

1.Mobility in bed- Transfer, Ambulation.
2.Personal care – Eating, Dressing, Washing, Bathing
3.House hold Jobs
4.Work and Recreation

K. Disability Evaluation: - Gait and Gait parameters, percentage of disability, temporary or permanent

L. Introduction to Quality of Life Questionnaire

M. Principles of prescription writing and prescription writing of Therapeutic Modalities. K. Biophysical Measurements & Ergonomics

N. Work Physiology and Exercise prescription: Ergonomics considerations for Exercise, Work Physiology Considerations, Exercise Analysis and planning (orthopedic, sport, neurological, cardiothoracic conditions related to physiotherapy).

PRACTICALS

Skills to be practiced in following condition

1. Pediatric conditions
2. Neurology conditions
3. Cardio respiratory conditions
4. Orthopedics conditions
5. Sports conditions
6. Electro diagnosis and biophysical diagnosis

Case presentation with Physical & Functional diagnosis in medical – surgical conditions

RECOMMENDED TEXT BOOKS:-

1. Pediatric developmental therapy - Sophie Levitt
2. Orthopedics physical examination by Magee
3. Physical Rehabilitation Assessment and Treatment - O'Sullivan Schmitz
4. Electrotherapy explained - Low & Reed
5. Clayton's electrotherapy (6th and 9th Ed.)
6. Clinical Electro Therapy - Nelson-Currier
7. Clinical Electromyography - Mishra
8. Cash's textbook of chest, heart, vascular disorder for physiotherapist
9. Physiotherapy for respiratory and cardiac problems - Webber and Pryor
10. Cash's textbook of General Medicine and surgical conditions for physiotherapists
11. Clinical Electromyography - Kimura
12. Orthopaedic Physical therapy - Donnatelli
13. Exercise & Heart - Wenger
14. Exercise Physiology - Mc' Ardle
15. Orthopedic examination - Hoppenfield
16. Cardio-respiratory physiotherapy - Elizabeth Dean
17. Text Book of Physical Diagnosis — by Mark M. Swartz.
18. Rehabilitation medicine — by Joel A. Delisa.
19. Differential Diagnosis in Physical Therapy — Goodman and Snyder.
20. Manual of Exercise Testing — CRDET
21. Clinical Electromyography — by Basmajian.
22. Rehabilitation Medicine – Rusk
23. Tidy's Physiotherapy
24. Cash's Text Book for Physiotherapist (all volumes).
25. Physical Rehabilitation Assessment and Treatment by Susan O' Sullivan

B.P.T. FOURTH YEAR

SCHEME OF EXAMINATION FOR FOURTH YEAR B.P.T

There shall be six subjects for the Fourth Year B.P.T. Examination out of which for five subjects university examination will be arrange by the university and for one subject –PT Ethics, Management & Administration ** NUES‖ institute will provide Internal Assessment –practical marks to university during submission of internal assessment marks ,in this subject there will be no university examination. The subjects Qualification of the examination will be as follows.

S.No.	Subject	Internal Assessment		University Examination			Total
		Theory	Practical	Theory	Viva	Practical	
1	Community PT, Rehabilitation & Disability prevention	20	--	80	--	--	100
2	Research Methodology & Biostatistics	20	--	80	--	--	100
3	Cardiothoracic diseases and surgeries	20	--	80	--	--	100
4	Physiotherapeutic in General & Cardiothoracic Conditions	20	20	100	20	40	200
5	Sports Physiotherapy	20	20	100	20	40	200
6	PT Ethics, Management & Administration ** NUES	--	100	--	--	--	100
7	Project Work**NUES	---	100	--	--	--	100
Total Max. Marks							**900**

N.B.- Viva marks will be added in theory marks along with internal assessment theory; candidate have to get min. 50% marks in theory and viva collectively for passing the examination.

** NUES= Non-university Examination Subject

BACHELOR OF PHYSIOTHERAPY (BPT)- FOURTH YEAR

Paper –I: COMMUNITY PT, REHABILITATION & DISABILITY PREVENTION

Subject	**Internal Assessment**		**University Examination**			**Total**
	Theory	Practical	Theory	Viva	Practical	
Community PT, Rehabilitation & Disability Prevention	20	--	80	--	--	100

The University examination shall be of 80 marks with Section – A : Community PT and Section – B : Rehabilitation & Disability prevention the university theory examination marks for Community PT shall be 40 marks and for Rehabilitation & Disability prevention 40 marks respectively. There shall be two paper setters and two evaluators, 50% shall be the minimum passing marks. Internal assessment will be of 10 marks in each subject. Total internal assessment will be 20 Marks. The pattern of University theory examination will be as under for 80 Max. Marks. There will be two section i.e. Section-A: Community PT and Section-B: Rehabilitation & Disability of 40 Max. Marks each section and distribution of marksfor questions will be as under:-

No. & Type of Question	**Marks for each**	**Total Max. Marks**
05 Very Short Answer Questions (Answer to be given in 50-60 words)	02	10
02 Short Answer Questions (Answer to be given in 250-300 words)	8	16
01Essay Type Questions (Answer to be given in 450-500 words)	14	14
		40

COMMUNITY PT, REHABILITATION & DISABILITY PREVENTION

Total No. of teaching Hrs. -160

Total theory hrs.- 60+60+40

Course Description

This course provides knowledge about health care delivery programmes in Rural and urban areas and role of Physiotherapy in both Rural & Urban set ups with special emphasis to various community awareness programmes and preventive aspects of health disorders causing disability. Enables the student to understand the effects of the environment and the community dynamics on the health of the individual with special emphasis on disability limitation specific protection and rehabilitation.

Course Objective

The objective of this course is that after 60 hours of lectures, demonstrations, practical, clinics and filed visits, the student will be the students will be able to understand the various community awareness programmes and health disorders causing disability and the role of physiotherapy in community awareness and prevention of health disorders causing disability. In addition, the student will be able to fulfill with 75% accuracy (as measured by written, oral and practical evaluation), the following objectives of the course.

Course Contents:-

Community PT & Community Medicine

1. General Concepts of health and diseases with reference to natural history of disease with pre-pathologenic and pathogenic phase. The role of soclo-economic and cultural environment in health and disease. Epidemiology and scope. Role of Epidemiological investigation in public health,
2. Public Health Administration — Overall view of the health administration setup at Central State and Local self-government levels. Role of Non-Government Organisations in public health care delivery system.
3. The National Health Programmes — Highlighting the role of social, economic and cultural factors in the implementation of the National Programmes, Primary Health Care, objectives and implementation.
4. Health Problems of vulnerable groups — Pregnant and Lactating women Infants and Pre-school children, Occupational groups (see below) and Geriatrics.
5. Occupational Health: Definition, scope, occupational diseases, prevention of occupational diseases and hazards. Role of E S I in occupational health of industrjal workers.
6. Social security and other measures for the protection of occupational hazards, accidents and diseases. Details of Factory Act, Environmental safety and Compensation acts, ESI Acts.
7. Family Welfare Programme — Objectives of National Family Welfare Programme and Family Planning Methods. A general idea of advantages and disadvantages of methods Reproductive Child Health Services, Concept, of plan d pregnancies, population dynamics.
8. Mental Health — Community aspects of Mental Health: Role of Physiotherapists. Therapist in Mental Health Problems such as Cerebral Palsy, Mental retardation etc.
9. Communicable diseases — Diseases transmission concepts, an overall view of communicable diseases (Malaria, Filaria, Tuberculosis, Leprosy, Poliomyelitis, and Viral Encephalitis etc.) classified according to principal mode of transmission, Role of Insects and other Vectors in disease transmission. Control and prevention of communicable diseases, universal immunizatEon programme, Programmes such as ARI, Diarrhoea and Polio Control Programmes.
10. International Health Agencies and National NGOs.
11. Non-communicable diseases, Blindness, Accidents, Cancer, IHD, Hypertension, Stroke (CVA).
12. Vital and health statistics — Basic concepts, Morbidity and Mortality rates, Period, Age and Cause of specific death rates and role of these rates as indicators of health and diseases.

REHABILITATION:-

1. Introduction of Rehabilitation & History

2. Epidemiology of disability (Impairment, disability, phases of disability process, etc.).

3. Principles of Rehabilitation & concept of team approach with rolls of each individual participant.

4. Organization of Rehabilitation unit.

5. Disability prevention evaluation & principles of Rehabilitation Management.

6. Role of Physiotherapy in Rehabilitation (Preventive, treatment & restoration)

7. Brief outline of Communication disorder & its implications on Rehabilitation process.

8. Brief outline of psychosocial & vocational aspects of Rehabilitation.

9. Introduction to Occupational therapy.

10. Activities of daily living, functional assessment & training for functional independence.

11. Brief outline of basic community medicine with special reference to community based Rehabilitation, infrastructure and role of CBR

12. Assessment of disability in rural & urban setups. Health care delivery system & preventive measures with specific reference to disabling conditions. Community education program.

13. Application of Physiotherapy skills at community level with special reference to the need at rural level.

14. Role of voluntary Organizations in CBR: Charitable Organizations, Voluntary health agencies – National level and International NGO‘s, Multilateral and Bilateral agencies. International Health Organizations: WHO, UNICEF, UNDP, UNFPA, FAO, ILO, World bank, USAID, SIDA, DANIDA, Rockfeller, Ford foundation, CARE, RED CROSS.
15. National District Level Rehabilitation Program: Primary rehabilitation unit, Regional training center, District rehabilitation center, Primary Health center, Village rehabilitation worker, Anganwadi worker.

16. Role of Physiotherapy in CBR: Screening for disabilities, Prescribing exercise program, Prescribing and devising low cost locally available assistive aids, Modifications physical and architectural barriers for disabled, Disability prevention, Strategies to improve ADL, Rehabilitation program for various neuro-musculoskeletal and cardiothoracic disabilities.

DISABILITY PREVENTION; ORTHOTICS AND PROSTHOTICS
1. Introduction to surgical anatomy and various pathological deviations with respect to brace fitting.
2. Rationale of prescribing Prosthetic and Orthotic devices.
3. Types of Prosthetic and Orthotic devices: Spinal, Lower limb, and Upper limb.
4. Checkout, usage advice, precautions, and follow-up.
5. Walking aids and wheel chairs: prescription, usage advice, and follow-up.

Book Reference

1. Textbook of Preventive and Social Medicine by Dr J E Park.
2. Rehabilitation medicine -- by Joel A. Delisa.
3. Text book of physical diagnosis --- by Mark .M Swartz
4. Physical Rehabilitation ---- by Susan B O'Sullivan , Thomas J Schmitz , George Fluke
5. Essentials of Physical Medicine and Rehabilitation: Musculoskeletal Disorders, Pain, and Rehabilitation –by Walter R.Frontera MD PhD (Author), Julie K. Silver MD (Author), Thomas D. Rizzo Jr. MD (Author)
6. Delisa's Physical Medicine and Rehabilitation: Principles and Practice – by Walter R. Frontera
7. Parks Text Book Of Preventive & Social Medicine -by K. Park
8. Textbook of Community Medicine –by Bhalwar (Author)

FIELD VISITS

1. Demonstration of methods of using orthotics & prosthetics devices.
2. Methods of organization of community based rehabilitation centers.
3. Visit of different rehabilitation centers and preparing a report of the visit & viva-voce of the aforesaid report
4. Visit to different physiotherapy colleges.
5. Visit to different National and Regional Rehabilitation Centre,
6. Visit to different Health Institutions.

BACHELOR OF PHYSIOTHERAPY (BPT) - FOURTH YEAR

Paper –II: RESEARCH METHODOLOGY & BIOSTATISTICS

Subject	**Internal Assessment**		**University Examination**			**Total**
	Theory	Practical	Theory	Viva	Practical	
Research Methodology & Biostatistics	20	--	80	--	--	100

The University examination shall be of 80 marks with Section – A : Research Methodology and Section – B : Biostatistics the university theory examination marks for Research Methodology shall be 40 marks and for Biostatistics 40 marks respectively. There shall be two paper setters and two evaluators, 50% shall be the minimum passing marks. Internal assessment will be of 10 marks in each subject. Total internal assessment will be 20 Marks. The pattern of University theory examination will be as under for 80 Max. Marks. There will be two section i.e. Section-A: Research Methodology and Section-B: Biostatistics of 40 Max. Marks each section and distribution of marks for questions will be as under:-

No. & Type of Question	**Marks for each Question**	**Total Max. Marks**
05 Very Short Answer Questions (Answer to be given in 50-60 words)	02	10
02 Short Answer Questions (Answer to be given in 250-300 words)	8	16
01Essay Type Questions (Answer to be given in 450-500 words)	14	14
		40

RESEARCH METHODOLOGY & BIOSTATISTICS
Total No. of teaching Hrs. -100

Course Description

The course "Research Methodology & Biostatistics" is designed to provide students with a solid foundation in research methods and statistical analysis, particularly in the context of biomedical and health-related research. Through a combination of lectures, practical exercises, and assignments, students will gain the knowledge and skills necessary to design, conduct, and analyze research studies in the field of biostatistics.

Course Objectives

Students will develop an understanding of the research process, including formulating research questions, designing research studies, selecting appropriate research methods, and conducting literature reviews.

Students will develop a foundational understanding of statistical concepts and methods, including data types, measures of central tendency, measures of dispersion, hypothesis testing, and inferential statistics. They will learn how to analyze research data using appropriate statistical techniques.

Course Contents :-

1)RESEARCH METHODOLOGY AND BIOSTATISTICS RESEARCH METHODOLOGY

1. Introduction to Research methodology: Meaning of research, objectives of research, Motivation in research, Types of research & research approaches, Research methods vs. methodology, Criteria for good research. \
2. Research problem: Statement of research problem, Statement of purpose and objectives of research problem, Necessity of defining the problem
3. Research design: Meaning of research design, Need for research design, Features for good design, Different research designs, Basic principles of research design.
4. Measurement & scaling techniques: Measurement in research Measurement scales, sources of error in measurement, Technique of developing measurement tools, Meaning of scaling, its classification, important scaling techniques.
5. Methods of data collection: collection of primary data, collection data through questionnaires & schedules, Difference between questionnaires & schedules.
6. Computer technology: Introduction to Computers, computer application in research computers & researcher.

BIOSTATISTICS

1. Introduction: Meaning, definition, characteristics of statistics. Importance of the study of statistics, Branches of statistics, Statistics and health science , Parameters and Estimates, Variables and their types, Measurement scales.
2. Tabulation of Data: Basic principles of graphical representation, Types of diagrams – histograms, frequency polygons, smooth frequency polygon, cumulative frequency curve, Normal probability curve.
3. Measures of Central Tendency: Need for measures of central Tendency, Definition and calculation of Mean – ungrouped and grouped, interpretation and calculation of Median-ungrouped and grouped, Meaning and calculation of Mode, Geometric mean & Hormonic mean, Guidelines for the use of various measures of central tendency.

4. Measures of Dispersion : Range, mean deviation, standard deviation & variance.
5. Probability and Standard Distributions: Meaning of probability of standard distribution, the binominal distribution, the normal distribution, Divergence from normality– skewness, kurtosis.
6. Correlation & regression : Significance, correlation coefficient, linear regression & regression equation.
7. Testing of Hypotheses , Level of significance, Degrees of freedom.
8. Chi-square test, test of Goodness of fit & student t-test.
9. Analysis of variance & covariance: Analysis of variance (ANOVA), what is ANOVA? Basic principle of ANOVA, ANOVA technique, Analysis of Co variance (ANACOVA)
10. Sampling: Definition, Types- simple, random, stratified, cluster and double sampling. Need for sampling - Criteria for good samples, Application of sampling in community, Procedures of sampling and sampling designs errors.

Book References

1. Bailey, N.T.J. -Statistical methods in Biology. The English universities press, London
2. Bajpai, S.R.- Methods of Social Survey and Research, Kitab Ghar, Kanpur.
3. Colton - Statistics in medicine, Little Brown Company, Boston
4. Gupta, S.P -Statistical methods. Sultan Chand and Sons Publishers , New Delhi.
5. Goulden C.H.- Methods of Statistical Analysis. Asia Publishing House , New Delhi.
6. Mohsin S.M.- Research Methods in Behavioral Sciences: Orient Publications. New Delhi.
7. Mahajan - Methods in Biostatistics, Jay Pee Brothers.Medical Publishers (P) Ltd. N. Delhi.
8. Hicks- Research for Physiotherapists, Churchill Livingstone, London.
9. Meenakshi. - First Course in Methodology of Research. Kalia Prakashan, Patiala.
10. Kumar , R.- Research Methodology. Pearson Education , Australia.
11. Snedecor,G.W -Statistical Methods, Allied Pacific Pvt. Ltd., London
12. Singh, I.- Elementary Statistics for Medical Workers. Jaypee Brothers Medical Publishers (P) Ltd. New Delhi.

BACHELOR OF PHYSIOTHERAPY (BPT)- FOURTH YEAR

Paper –III: CARDIOTHORACIC DISEASES AND SURGERIES

Subject	**Internal Assessment**		**University Examination**			**Total**
	Theory	Practical	Theory	Viva	Practical	
Cardiothoracic diseases and surgeries	20	--	80	--	--	100

The University examination shall be of 80 marks with Section – A: Cardiothoracic diseases and Section – B : Cardiothoracic surgeries, the university theory examination marks for Cardiothoracic diseases shall be 40 and for Cardiothoracic surgeries 40 marks respectively. There shall be two paper setters and two evaluators, 50% shall be the minimum passing marks. Internal assessment will be of 10 marks in each subject. Total internal assessment will be 20 Marks. The pattern of University theory examination will be as

Under for 80 Max. Marks. There will be two section i.e. Section-A: Cardiothoracic diseases and Section-B: Cardiothoracicsurgeries of 40 Max. Marks each section and distribution of marks for questions will be as under:-

No. & Type of Question	**Marks for each question**	**Total Max. Marks**
05 Very Short Answer Questions (Answer to be given in 50-60 words)	02	10
02 Short Answer Questions (Answer to be given in 250-300 words)	8	16
01Essay Type Questions (Answer to be given in 450-500 words)	14	14
		40

CARDIOTHORACIC DISEASES AND SURGERIES
Total No. of teaching Hrs. -100

Course Description

Following the basic science and clinical science courses, this course introduces the student to cardio-thoracic 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 Cardio-thoracic pathology on the functioning of the individual.

Course Objective

the student will be able to demonstrate an understanding of Cardio-thoracic conditions causing disability and their management.In addition, the student will be able to fulfill with 75% of accuracy (as Measured by written, oral and practical internal evaluation), the following objectives of the course.

Course Contents

CARDIO - THORACIC DISEASES AND SURGERY CARDIO - THORACIC DISEASES
Theory

1) Brief idea of Anatomy and Physiology of Cardio- respiratory systems.

2)Outline Aetiopathogenesis of Cardio-respiratory disorders, Investigations, Diagnostic, Differential diagnosis and principles of management.

3) Cardio - Vascular System

i) Cardiac failure - Definition, Causes, Symptoms and Signs and Brief management of Cardiac failure.

ii) Rheumatic Fever - Definition, Brief description of Aetiology, Clinical features, Complication and Treatment.

iii) Congenital Heart Diseases: Classification and brief outline of diseases like ASD, VSD, PDA, Fallots's Tetrology with complication.

iv) Ischemic Heart Disease - Aetiopathogenesis, Classification. Symptoms, Diagnosis and Medical and Surgical treatment.

v)Hypertension - Definition, Classification, Symptomatology, Complications and Treatment,

vi) Infective Endocarditic - Brief aetiopathogenesis, clinical features, Diagnosis and Treatment.

vii) Brief description of Deep Vein Thrombosis and Pulmonary embolism.

viii) Vascular Disease: Atherosclerosis, Burgers disease, Phlebitis etc. Respiratory System

4) Respiratory diseases including diseases of chest wall

1)Chronic Bronchitis and Emphysema, Definition.Clinical features, and investigation, complication and treatment.

2)Bronchial asthma - Definition, Aetiopathogenesis, clinical features, Diagnosis and Treatment.

3)Pneumonia - Definition, Classification, clinical features, Complications and Treatment.

4) Tuberculosis - Aetiopathogenesis, clinical test of pulmonary tuberculosis, Diagnosis Complication & Treatment.

5) Lung abscess and Bronchiectesis - Definition, clinical features, Diagnosis and Treatment.

6) Chest wall deformities- Describe various deformities of chest wall, its effect and Pulmonary diseases associated with it.

7) Occupational Lung Diseases - Clinical features, Diagnosis and Treatment.

8) Respiratory failure - Classification, Causes and Treatment.

Cardiothoracic surgery

Theory

(1) Introduction-types of incision, pre and post operative assessment, management and com0plicationa of cardio thoracic surgery and their management.

(2) Cardiac Surgery-Outline indication, contra indication, site of incision, pre and post Operative management and complications of the following:

I. Valvotomy and Valve Replacement.
II. Open heart surgery/ cardiac by pass surgery
III. Surgery of pericardium
IV. Heart transplantation
V. Pacemaker
VI. Coronary angioplasty
VII. Balloon angioplasty and vascular surgery
(Outline surgery and artery and veins)

(3) Thoracic Surgery

i.Outline clinical features and management of the following; fracture of ribs, Flail chest, stovein chest, Pneumothorax, Haemothorax, Lung contusion and Lacerration and injury to vessels and brounchus.

ii.Outline indications, contradiction, site of incision, pre and post operative management and complication of following- Lobectomy, Pneumonectomy, segentectomy, pleuro-pneumonectomy, Thoracoplasty, decortion, Tracheostomy.

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

iv.Describe in detail the following procedure: management of endotracheal tubes, tracheal Suction,Weaning the patient from ventilator, Extubation and Post-extubation care.

v.Describe the principles of cardio-pulmonary Resusciation, cardiac Massage, Artificial respiration, defribrillators and their use.

Book References

1.Cardiothoracic Surgery: Recent Advances and Techniques- by Daniel Willson

2 .Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine - By Douglas P. Zipes , Peter Libby

3.Textbook of Interventional Cardiology Hardcover – by Eric J. Topol MD and Paul S. Teirstein MD

4.Textbook of Pulmonary and Critical Care Medicine (vol 1&vol 2)by SK Jindal

5.Principles of Respiratory Medicine - by Farokh Erach, Zarir Farokh Udwadia, Anirudh Kohli Udwadia

6.Davidson's Principles and Practice of Medicine, International Edition

7. Murray & Nadel's Textbook of Respiratory Medicine – by by Robert J. Mason MD

8.Bailey & Love's Short Practice of Surgery text book

9. Oxford Textbook of Fundamentals of Surgery- by William E. G Thomas, Malcolm W. R. Reed, Michael G. Wya

10. Surgery by Nan.

11. Short Practice of Surgery by Rain & Ritelife.

12. Russell, R.C.G.Short practice In Surgery Arnold, London

13. Gupta, R. L. Text Book of Surgery Jaypee, New Delhi

BACHELOR OF PHYSIOTHERAPY (BPT)- FOURTH YEAR
Paper –IV: PHYSIOTHERAPEUTIC IN GENERAL & CARDIOTHORACIC CONDITIONS

Subject	Internal Assessment		University Examination			Total
	Theory	Practical	Theory	Viva	Practical	
Physiotherapeutic in General & Cardiothoracic	20	20	100	20	40	200

There shall be one paper setter external or internal for theory examination and two examiners, one internal (Chairman) and one external for practical examinations. The viva marks shall be added to university theory examination marks and 50% shall be the passing marks for both theory and practical university examination respectively.The pattern of University theory examination will be as under for 100 Max. Marks.

No. & Type of Question	Marks for each Question	Total Max. Marks
10 Very Short Answer Questions (Answer to be given in 50-60 words)	02	20
5 Short Answer Questions (Answer to be given in 250-300 words)	10	50
2 Essay Type Questions (Answer to be given in 450-500 words)	15	30
		100

PHYSIOTHERAPEUTIC IN GENERAL & CARDIOTHORACIC CONDITIONS

Total No. of teaching Hrs. -100

Course Objectives

1. Student shall be able to acquire the concept of common cardiovascular Conditions, including diagnostic tests and therapeutic approaches
2. Able to diagnose and measure the physical problems presented by the patients.
3. In addition, the student shall be able to fulfill with 75% accuracy (as Measured by written, oral, Practical and Internal Evaluation)

Course Contents

1) PHYSIOTHERAPY IN CARDIO-RESPIRATORY & GENERAL CONDITIONS

THEORY

1. Anatomical and Physiological differences between the Adult and Pediatric lung.

2. Bedside assessment of the patient-Adult & Pediatric.

3. Investigations and tests – Exercise tolerance Testing – Cardiac & Pulmonary, Radiography, PFT, ABG, ECG, Hematological and Biochemical Tests

4. Physiotherapy techniques to increase lung volume – controlled mobilization, positioning, breathing exercises, Neurophysiological Facilitation of Respiration, Mechanical aids - Incentive Spirometry, CPAP,IPPB

5. Physiotherapy techniques to decrease the work of breathing – Measures to optimize the balance between energy supply and demand, positioning, Breathing re-education – Breathing control techniques, mechanical aids – IPPB, CPAP, BiPAP

6. Physiotherapy techniques to clear secretions – Hydration, Humidification & Nebulisation, Mobilization and Breathing exercises, Postural Drainage, Manual techniques – Percussion, Vibration and Shaking, Rib Springing, ACBT, Autogenic Drainage, Mechanical Aids – PEP, Flutter, IPPB, Facilitation of Cough and Huff, Nasopharyngeal Suctioning

7. Drug therapy – Drugs to prevent and treat inflammation, Drugs to treat Bronchospasm, Drugs to treat Breathlessness, Drugs to help sputum clearance, Drugs to inhibit coughing, Drugs to improve ventilation, Drugs to reduce pulmonary hypertension, Drug delivery doses, Inhaled Nebulizers.

8. Management of wound ulcers- Care of ulcers and wounds - Care of surgical scars U.V.R and other electro therapeutics for healing of wounds, prevention of Hyper granulated Scars Keoloids, Electrotherapeutics measures for relief of pain during mobilization of scars tissues

9. Physiotherapy in dermatology -Documentation of assessment, treatment and follow up skin conditions. U.V.R therapy in various skin conditions; Vitiligo; Hair loss; Pigmentation; Infected wounds ulcers. Faradic foot bath for Hyperhydrosis. Care of anesthetic hand and foot; Evaluation, planning and management of leprosy- prescription, fitting and training with prosthetic and orthotic devices.

10. Neonatal and Pediatric Physiotherapy – Chest physiotherapy for children, The neonatal unit, Modifications of chest physiotherapy for specific neonatal disorders, Emergencies in the neonatal unit.

11. Physiotherapy in Obstructive lung conditions

12. Physiotherapy in Restrictive lung conditions.

13. Management of breathlessness.

14. Pulmonary Rehabilitation.

15. Physiotherapy following Lung surgeries.

16. Respiratory failure – Oxygen Therapy and Mechanical Ventilation. Introduction to ICU : ICU monitoring –Apparatus, Airways and Tubes used in the ICU -Physiotherapy in the ICU – Common conditions in the ICU – Tetanus, Head Injury, Lung Disease, Pulmonary Oedema, Multiple Organ Failure, Neuromuscular Disease, Smoke Inhalation, Poisoning, Aspiration, Near Drowning, ARDS, Shock; Dealing with an Emergency Situation in the ICU.

17. Burns management - Role of physiotherapy in the management of burns, post grafted cases- Mobilization and Musculo- skeletal restorative exercises following burns.

18. Physiotherapy management following cardiac surgeries.

19. Cardiac Rehabilitation.

20. Physiotherapy management following Peripheral Vascular Disease (PVD).

21. Abdominal Surgeries - Management of Pulmonary Restorative Dysfunction following surgical procedures on Abdomen and Thorax

22. Management of Amputations following Diabetes, PVD - Prosthesis in amputations of lower limbs following ulcers and gangrenes

23. Physiotherapy intervention in the management of Medical, Surgical and Radiation Oncology Cases

24. Home program and education of family members in patient care.

25. Physiotherapy in Obstetrics – Antenatal Care, Antenatal Education, Postnatal Care. Electrotherapy and Exercise Therapy measures for the re-education of Ano-Urethral sphincter.

26. Treatment, Response to exercise and Implications of Physiotherapy in the following disease conditions: Hypertension, Diabetes, Renal Failure and Obesity.

27. Geriatrics: Problems in old age, role of physiotherapy in elderly

PRACTICAL

Practical demonstration of basic principles of physiotherapy assessment, functional assessment and application of physiotherapy in cardio – respiratory, OBG, Skin, and other medical conditions. 2. Student must maintain a logbook. The duly completed logbook should be submitted during practical examination.

Book References:

(Subject: Physiotherapeutic in General & Cardiothoracic Conditions)

1. Cash‘s text book of general medicine and surgical conditions for physiotherapist
2. Cash‘s text book of chest ,heart and vascular disorder for physiotherapist.
3. The brompton guide to chest physiotherapist – D.U GASKED (completed)
4. Physiotherapy of paediatrics – shepherd .
5. Elements of paediatric physiotherapy by pamel .M .eckersly
6. Essential of cardiac – pulmonary physical therapy by Hillegas
7. Cardiac pulmonary symptoms in physical therapy practice Cohens‘ and Michael
8. Chest physiotherapy in Intensive care Unit by Mackenzie.
9. Physiotherapy in Respiratory care, Latest Edn, By Alexander Hough, Nelson Thornes
10. Cardiovascular pulmonary essentials : applying the preferred physical therapist practice patterns. 2007, Marllyn Moffat,Slack
11. Fundamentals of Lung and Heart Sounds with CD Rom, Willkins Robert L , Hodgkin John E Lopez Brad: Mosby

BACHELOR OF PHYSIOTHERAPY (BPT)- FOURTH YEAR

Paper –V: SPORTS PHYSIOTHERAPY

Subject	**Internal Assessment**		**University Examination**			**Total**
	Theory	Practical	Theory	Viva	Practical	
Sports Physiotherapy	20	20	100	20	40	200

There shall be one paper setter external or internal for theory examination and two examiners, one internal (Chairman) and one external for practical examinations. The viva marks shall be added to university theory examination marks and 50% shall be the passing marks for both theory and practical university examination respectively. The pattern of University theory examination will be as under for 100 Max. Marks.

No. & Type of Question	**Marks for each question**	**Total Max. Marks**
10 Very Short Answer Questions (Answer to be given in 50-60 words)	02	20
5 Short Answer Questions (Answer to be given in 250-300 words)	10	50
2 Essay Type Questions (Answer to be given in 450-500 words)	15	30
		100

SPORTS PHYSIOTHERAPY
Total No. of teaching Hrs. -100

Course Objectives

1. Student shall be able to acquire knowledge and skill in physiotherapy assessment and management of sports injuries and conditions
2. Able to diagnose and measure the physical problems presented by the patients.
3. In addition, the student shall be able to fulfil with 75% accuracy (as Measured by written, oral,

Course Contents

1) PHYSIOTHERAPY IN SPORTS

THEORY

1.Pre-exercise evaluation

2. Diet and nutrition Measurement of fitness components and sports skills - Measurement of muscular strength, Measurement of muscular endurance, Measurement of flexibility, Determination exercise endurance,

3. Physiological effects of exercise on body systems - Muscular system, Endocrine system, Cardio-respiratory system, Nervous system

4. Sports injuries - Spine – PIVD, Kissing spine, cervical whiplash injuries, facet joint syndrome, SI joint dysfunction, Hip – muscle strain, piriformis syndrome, ITB syndrome, osteitis pubis, Knee – menisci, cruciate, collateral, osteochondritis, chondromalacia patellae, biceps femoris tendonitis, swimmers knee, patello-femoral pain syndrome, Leg & ankle – shin splint, achillis tendonitis & rupture, TA bursitis, ankle sprain, plantar fascitis, turf toe syndrome, Head & face – maxillofacial injuries, helmet compression syndrome.

5. Sports injuries Shoulder – instability, rotator cuff injury, biceps tendonitis and rupture, pectoralis major rupture, scapular dyskinesis and acromio-clavicular joint injuries, Elbow – tennis elbow, golfer‘s elbow, Wrist and hand – carpal tunnel syndrome, gamekeeper‘s thumb.

6. Principles of injury prevention.

7. Principles of training & Rehabilitation in sports injuries.

8.Sports in Special age groups: Female athletic triad, Younger athlete- Musculoskeletal problems, management, children with chronic illness and nutrition. Older athlete- Physiological changes with aging, benefits, risks of exercise in elderly, exercise prescription guidelines for elderly.

PRACTICAL

1. Practical demonstration of basic principles of physiotherapy assessment, functional assessment and application of sports physiotherapy
2. Student must maintain a logbook. The duly completed logbook should be submitted during practical examination.

Book References:

(SUBJECTS - PHYSIOTHERAPY IN SPORTS)

1. Morris B. Mellion: Office Sports Medicine, Hanley & Belfus.
2. Richard B. Birrer: Sports Medicine for the primary care Physician, CRC Press.
3. Torg, Welsh & Shephard: Current Therapy in Sports Medicine III - Mosby.
4. Zulunga et al: Sports Physiotherapy, W.B. Saunders.
5. Brukner and Khan: Clinical Sports Medicine, McGraw Hill.
6. Reed: Sports Injuries – Assessment and Rehabilitation, W.B. Saunders.
7. Gould: Orthopaedic Sports Physical Therapy, Mosby.
8. C. Norris: Sports Injuries – Diagnosis and Management for Physiotherapists,Heinmann.
9. D. Kulund: The Injured Athlete, Lippincott.
10. Nicholas Hershman: Vol. I The Upper Extremity in Sports Medicine. Vol. II The Lower Extremity and Spine in Sports
Medicine. Vol. III The Lower Extremity and Spine in Sports Medicine. Mosby.
11. Lee & Dress: Orthopaedic Sports Medicine - W.B Saunders.
12. K. Park: Preventive and Social Medicine - Banarsi Dass Bhanot - Jabalpur.
13. Fu and Stone: Sports Injuries: Mechanism, Prevention and Treatment, Williams and Wilkins.
14. Scuderi, McCann, Bruno: Sports Medicine – Principles of Primary Care, Mosby.
15. Lars Peterson and Per Renstron: Sports Injuries – Their prevention and treatment, Dunitz.
16.clinical sports medicine 3rd edition (english, paperback, peter brukner, karim khan
17.text book of orthopedic physical assessment by magee, david
18.Modern principles of athletic training by corl .e.klafs and physiotherapist
19..sports injuries :diagnosis and management for physiotherapist
20. The children,s sports injuries by david kennedy.
21. Dynamics of clinical rehabilitative exercise by order
22. Basic athletic training by cramer

BACHELOR OF PHYSIOTHERAPY (BPT)-
FOURTH YEAR **Paper –VI : PT Ethics, management &Administration ** NUES**
Total No. of teaching Hrs. -100

Subject	Internal Assessment		University Examination			Total
	Theory	Practical	Theory	Viva	Practical	
PT Ethics, Management & Administration ** NUES	--	100	--	--	--	100

Objectives:

This course is aimed to unable the candidate in acquire the knowledge of ethical code of professional practice ,its moral and legal aspect rule of IAP,WHO,& WCPT

Contents:
PT Ethics

1. History of physiotherapy,
2. Ethical principles in health care,
3. Ethical principles related to physiotherapy, scope of practice, enforcing standards in health profession-promoting quality care,
4. Professional ethics in research, education and patient care delivery
5. Informed consent issues,
6. Medical ethics and economics in clinical decision-making.
7. Rules of professional conduct: physiotherapy as a profession relationship with patients relationship with health care institutions relationship with colleagues and peers relationship with medical and other professional Concepts of morally ethics, and legally rules of professional conduct and their medico legal and moral implication. the need of council act for physiotherapy constitution and functions of the Indian association of physiotherapist Functioning of the world federations of physical therapy(wcpt) & its various branches. Rule of WHO & WCPT
8. Confidentiality and responsibility, malpractice and negligence, provision of services and, advertising, legal aspects: consumer protection act, legal responsibility of physiotherapist for their action in professional context and understanding liability and obligations in case of medico-legal action
9. Major ethical principles applied to.clinical practice in health care
10. Rules of professional conduct and scope of practice
11. Personal & professional standards & accreditation
12. Laws and legal concepts – protection from malpractice claims , consumer protection act
13. Liability & documentation

Management &Administration

1. Planning health care services
2. Promoting & building a new hospital
3. Technology advances and high quality patient care
4. Hospital facilities, staff & services
5. Equipment planning and financial planning
6. Hospital organization, operational plan and functional plan
7. Design development, planning and purchase
8. Organization and management of hospital
9. Planning and administrative services
10. Hospital information system
11. Human resources management
12. Financial management
13. Nursing service administration
14. Public relations & marketing
15. Medical & ancillary services
16. Planning & designing supportive services and hospital services
17. Safety & security of the institution
18. Disaster management & preparedness plan
19. Management studies related in local health care organization management and structure .planning delivery with quality assurance and finding of service delivery
20. Information technology in professional practical.
21. Time management and carrier development in physiotherapy.
22. Administration principles based on the goals and function for large hospital setups, domociliary service ,private clinics and academic setups .
23. Faculty planning – academic and clinical setups
24. Methods of maintaining records and documentation.
25. Budget planning for physiotherapy services in various setups.
26. Performance analysis physical structure reporting system (man power, status, function) quantity and quality of service turnover cost benefits and revenue contribution.
27. Public relation and marketing reaching media marketing of physiotherapy practice and strengthening of brand identity with consumer and other health care professionals

Book References

1. Managerial and supervisory principles for physical therapists by-hardcover, nosse larry j.
2. hospital administration and management: a comprehensive guide by gupta joydeep das
3. Textbook of medical administration and leadership by: loh, erwin, long, paul w., spurgeon, peter.
4. Essentials of community physiotherapy & ethicsby prof. (dr.) Rajendra rajput .
5. Physical therapy ethics book by donald l. Gabard and mike martin
6. ethical decision-making in therapy practice book by julius sim

BACHELOR OF PHYSIOTHERAPY (BPT)- FOURTH YEAR
Paper –VII : PT Project
Work**NUES

S.No.	Subject	Internal Assessment		University Examination			Total
		Theory	Practical	Theory	Viva	Practical	
7	Project Work**NUES	---	100	--	--	--	100

Seminar-25 marks

(5x5) Case

Presentation -25 (5x5)

Dissertation Work- 50

marks

20 marks –presentation

20 marks dissertation work

10-marks viva

BACHELOR OF PHYSIOTHERAPY (BPT) FOURTH YEAR

PROJECT
WORK*

Course objective:

The student will be doing specific case studies allotted by their teacher/guide. Subject is for Case Presentations and evaluations. Minimum 5- 10 cases are to be documented for discussion.

EXAMINATION

*There will be no university examination. Students will be assessed on the basis of Viva on his/her project work and the awards so secured by them will be sent to University

B.P.T. INTERNSHIP
GUIDELINES

- Candidates seeking entry to the internship period must have passed all examinations in all subjects (i.e. He/She must have secured total credits of the Programme).
- Duration: 6 months inclusive of posting in rural setup/CBR/similar setup.
- During the internship candidate shall have to work full time average 7 hours per day (each working day) for 6 Calendar months (total Credit hours – 1260).
- Each candidate is allowed maximum of 6 holidays during entire Internship Programme and in case of any exigencies during which the candidate remains absent for a period more than 6 days, he/she will have to work for the extra days during which the candidate has remained absent.
- Assessment: The interns/candidate shall maintain the record of work, which will be verified and certified by the Head of the Department under whom he/she works. Apart from scrutiny of the record of work, the Head of the Department shall undertake assessment and evaluation of training in attendance, discipline, knowledge, skills and attitude for the duration of training. The assessment report of the candidate shall be sent to the Parent institution.
- Based on the record of work and date of evaluation the Director/Principal shall issue Certificate of Satisfactory Completion of training following which the University shall award the Bachelor of Physiotherapy Degree or declare the candidate eligible for the same.
- In the event of unsatisfactory report, the said intern shall have to repeat the internship for the period to be decided by the Head of the Institution concerned.
- Intern will abide by all the rules & regulations of Institution/Hospital where they are posted.
- Intern shall be responsible for proper use of equipments of the Institute/Hospital where they are posted. He/She shall be liable to pay for damages caused to the equipments resulting from improper use by him/her.
- Internship duration can be extended by the Principal / Director on the grounds:

i. Remaining absent in excess of the permitted 6 days leave period, which is due: An intern will compensate by working extra for each day leave taken.

ii. Unsatisfactory performance during the period: If there are unsatisfactory reports in terms of performance of the intern, submitted by the Department In-charge, the said intern shall have to repeat the internship for a period at least two months further.

iii. Case of indiscipline at any level: A Discipline and Action Committee will be formed in the college / Institution convened by Internship coordinator/HOD PT & headed by Director/Principal. In case of any lack of discipline, breach of trust or indulgence in any criminal activity on the part of the interns when reported by the concerned departments of Hospitals/Institutions where the interns have been posted, the defaulting Intern shall be called back immediately and subjected to disciplinary proceedings by the Disciplinary Action Committee.

iv. Punishments:

a. Suspension of Internship for a period of 3-4 weeks for the reasons to be recorded. Following this disciplinary suspension, internship can be resumed only after submission of an appropriate undertaking/guarantee/surety. Period of suspension shall be considered as Break in Internship. Disciplinary Action Committee shall decide the period of suspension and resumption of Internship for a specified period.

b. Rustication & Termination: In case of a serious complaint of indiscipline or breach of trust against intern or any criminal activity done by intern according to the law of the country, he/she may be rusticated along with termination of Internship. Hon'ble Court of Law can resume the Internship in this case only on the abrogation of criminal charges against him.

- Institution shall have to satisfy themselves that satisfactory infrastructure facilities of Physiotherapy exist in the Institute / Hospital where the internship training has to be undertaken. Following parameters / guidelines have been suggested:

  a. It is mandatory for the Institution conducting BPT Programme to have its own Physiotherapy clinic fully furnished with all the necessary equipments as per the curriculum of the Programme.

  b. The Institutes & the Hospitals should have the Physiotherapy section with all the necessary infrastructure facilities.

  c. Senior Physiotherapist with sufficient clinical experience should manage the physiotherapy departments in the Institutes/Hospitals.

  d. Institute Director / principal can at his discretion grant NOC to the students to do the Internship at the place of his choice provided, the concerned Hospital fully satisfies the above criteria. For the purpose of granting NOC the candidate shall have to submit to the Institution the status of Physiotherapy Services available at the place where he intend to do his Internship.

EVALUATION OF STUDENTS UNDER PRACTICAL/INTERNSHIP

S. No.	Description	Satisfactory/ Unsatisfactory
1	Attendance	
2	Discipline and general behavior in the Department	
3	Approach to patients	
4	Inquisitiveness regarding the subject	
5	Knowledge about evaluation of conditions	
6	Knowledge about various therapeutic modalities	
7	Knowledge about actual application of therapeutic skills	