**SYLLABUS FOR BACHELOR OF PHYSIOTHERAPY**

**BPT-1ST YEAR (4 YEAR PROGRAMME)**

**PAPERE-1**

**HUMAN ANATOMY**

**BPT (101)**

**GENERAL ANATOMY**

1.Introduction scope of anatomy cell as a structural and fundamental unit, Organization of tissue organs and system, Anatomical position of the body, Anatomical terms.

2.Skin and the appendages of the skin.

3.Muscles: Voluntary and Involuntary and cardiac muscles, short description of the structure of different muscles.

4.Muscles: Classification of voluntary muscles. Origin and Insertion, Tendon, Aponeurosis, Isometric and Isotonic contraction of muscles.

5.Bones: composition and functions, classification of bones according to morphology and development, various terms and markings on the bones.

6.Bones: Development of bones, parts of long bones and blood supply of bones, general remarks about bones of skull, thorax, vertebral column and bones of extremities indetail.

7.Joints: Definition, classification of joints structure and cartilaginous joints.

8.Joints: Structure of synovial joints, Movements of joints, blood supply of bones and joints and Bursae, close pack and loose pack position of the joints.

9.Nervous system: Nerve cell, Synapse and reflex.

10. Nervous system: organization of central nervous systems Spinal Nerves and nerve endings.

11. Cardiovascular system: Arteries Veins, Capillaries, and Collateral circulation.

12. Cardiovascular system: Blood as a connective tissue, Gross anatomy of Heart, large blood Vessels.

13. Respiratory system: General outline of respiratory passages, gross anatomy of Lung, Pleura.

14. Respiratory system: Broncho-pulmonary segments, Inter-costal muscles and Mechanism of respiration.

15. Digestive system: General idea or outline of gastro- intestinal tract and associated glands.

16. Excretory system structure and function of kidney, general outline of Ureters Urinary bladder and Urethra.

17. Reproduction system: general outline of male and female general organs.

18. Endocrines: Definition, Stricture in general.

19. Lymphatic system: Lympth circulartion, Lympth nodes and Lyphoid tissue.

(Neuranatomy) Emphosis)- Gross structure of

I,Sulci and Gyri and various areas of cerebral hemispheres,Thalamus, Hypothalamus, Basal Ganglia.

(I) Cerebellum.

(ii) Pons, Medeulla

(iii) Spinal Cord.

(iv) Ascending tracts.

(v) Descending tracts

(iv) Clinical application of Knowledge of the tracts.

(vii) Autonomic nervous system.

(viii) Nervous control of the urinary Vander and bladder dysfuction.

**Lecture-Demonstration**

1. Muscles of the whole body.
2. Demonstration of organs in thorax and abdomen.
3. Demonstration of viscera in head, face and neck.
4. Demonstration of all the glands in the body.
5. Identification of bony prominences on inspection and palpation in the body, especially of extremities.
6. Points to palpate nerves and arteries.
7. Identification of prominent muscles.
8. Extra-ocular muscles and salient points about the eye ball.
9. Demonstration on Brain.

**KINESIOLOGY**

1. Basic Concepts
2. Muscular system
3. Joints
4. Machinery Musculo skeletal system
5. Principles of Motion
6. Principles of force and work
7. Basic for the development of motor skill
8. Principles of stability
9. Postural principles

**REGIONAL ANATOMY**

1. **Superior Extremity:**

**Osteology:**Clavicle, Scapula, Humerus,Radius, Uina Carpals Metacarpals

**Soft parts:**Breast, Pectoral region, Front of arm, Back of arm, Cubital fossa, front of forearm, back of foream, nerves and vessels of forearm, paim, Dorrsum of Hand, Shoulder gridle, joints of hand.

1. **Inferior Extremity**

**Osteology:**Hip bone, Femur, Tibia, Fibula and Patella, Tarsals, Metatarsals.

**Soft parts:**Front of thigh- Femoral canal and femoral hernia, Adductor canal, medical compartment of thigh, glutel region, Back of thigh Popliteal fossa, Anterior compartment of leg, posterior compartment of leg, sol of foot, venous drainage of leg, hip joint, ankle joint, tarsal joints.

3. **Trunk:**

**Osteology:** Cervical, Thoracic and Lumbar Vertebra, Sacrum, Coccyx and Ribs.

**Soft tissue:** Inter-vertebral joints, costo-vartebral joints, Inter-vertebral Disc; Ligaments and Muscles.

Skull as a whole and mandible.

Demonstration of Dissected parts.

Parts of Limbs. Trunk, Brain, Thorax and Abdominal Contents.

**Books Recommended:**

* 1. An Introduction to fundamental of anatomy by David Sindair (Blackwell Publication0.
  2. Gray’s Anatomy
  3. Cunningham’s Manual of Practical anatomy
  4. Anatomy and physiology by Smout and Macdonald(Edward Arnold)
  5. Kinesiology by Katherine (Saunders Co).
  6. Clinical Kinesiology by Brunnstrome.
  7. Kinesiology and Applied Anatomy by Resch-Bruke(Lee & Febigar)
  8. Applied anatomy and Kinesiology by W. Bower & H. Stone(Lee & Febigar)
  9. Caties primary anatomy by Bestmaji J.

**PAPER-II**

**HUMAN PHYSIOLOGY**

**BPT (102)**

1. **GENERAL PHYSIOLOGY**
   1. Structure of cell and its functions
   2. Transport across cell membrane
   3. Body fluids- 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. **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]
4. **MUSCLE**
   1. Structure-properties-classification-excitation/contraction coupling
   2. Motor unit- Electromyography
   3. Neuro-muscular transmission
   4. Physiological basis of myopathies.
5. **NERVOUS SYSTEM**
   1. Organization of Nervous system.
   2. Neuron and Neurolgia
   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 Muscale Tone by Spinal and Supra-spinal mechanism.

10..Function of Brain -stem, Cerebellum, Basal Ganglia and Motor cortex.

* 1. Control of Voluntary movement
  2. Regulation of posture and equilibrium vestibular apparatus.
  3. Broad functions of Thalamus, Hypothalamus, Major lobes of Cerebral cortex and Ascending Reticular Activation System
  4. Limbic System
  5. Learning, memory, speech and conditional reflexes.

1. **SPECIAL SEMSES**
   1. Function anatomy of the Eye
   2. Optics of Vision
   3. Retinal Function
   4. Visual Pathways
   5. Mechanism of Heating.
   6. Sensation of Taste and Smell.

**7. AUTONOMIC NERVOUS SYSTEM**

* 1. Functioning of Autonomic Nervous System with soecial reference to micturition defecation and labour
  2. Higher neural regulation of ANS.

**8. SKINS 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.

**9. CARDIOVASCILAR SYATEM**

* + 1. General introduction of cardiovascular ystems.
    2. Structure and properties of Cardiac muscle.
    3. Cardiac cycle and Heart sounds.
    4. Interpretation of normal Electrocardiogram.
    5. Cadiac output and cardic failure.
    6. Venous retun,
    7. Heart rate and its regulation.
    8. Structure and organization of vascular tree.
    9. Arterial blood pressure and pathophysiology of Hypertension.
    10. Charactriteesaa of Cordnary ciraculation and pathophysiology of Coronary artry disese
    11. Capillary circulation and physiology basis of Edema.
    12. Pathophysiology of Shock.

**10. RESPIRATORY SYSTEM**

* 1. Functional anatomy of Respiratory System.
  2. Mechanics of breathing: Mechanism of inspiration and Expiration, intrapleural and intra-alveolar pressures, Conmpliance, Surfactant, Air-way resistance and work of breathing.
  3. Respiratory membrane and diffusion of gases.
  4. Composition of gases and Partial pressures.
  5. Oxygen and Carbon-dioxide transport.
  6. Lung Volume, Capacities and Lung function tests.
  7. Nervous and Chemical control of breathing.
  8. Physio-clinical aspects of Dyspnoea, Apnoea, Asphyxia, Hypoxia, Cyanosis, Breath holding, high and Low atmospheric pressures.

**11. DIGESTIVE SYSTEM.**

* 1. Functions of (a) Saliva, (b) Gastiric juice, (c) Pancreatic juice (d) Succus entericus, (e) Bile.
  2. Movements of G.I.T.
  3. Functions of Liver.

**12. RENAL SYSTEM**

* 1. Functions of Kidney
  2. Formation of Urine.
  3. Physiology of Micturition- Neurogenic bladder.

**13. ENDOCRINE AND REPRODUCTIVE SYSTEM**

* 1. Role of Hypothalamus as an endocrine gland.
  2. Functions and hypo & hyper secretion of hormones of
     1. Pituitary
     2. Thyroid
     3. Parathyroid
     4. Adrenal
     5. Endocrine part of pancreas.
  3. Spermatogesis. Functions of Testosterone.
  4. Ovarian and Menstrual Cycle and their hormonal control.
  5. Hormones of Ovary and their functions.
  6. Physiological basis of Fertilization, Implantation, Pregnancy, Parturitution and Lactation.
  7. Contraception.

**14. EXERCISE PHYSIOLOGY**

* 1. Effects of acute & chronic exercises
  2. Oxygen/CO2 transport – O2 debt.
  3. Effects of Excises on muscle strength, power, endurance, B.M.R., R.Q.- hormonal & metabolic effects- respiratory & cardiac conditioning.
  4. AGING.
  5. Training, fatigue & recovery.
  6. Fitness- related to age, gender,& body type.

**Text Books**

* 1. Textbook of physiology- vol. & II – A.K. Jain.
  2. Medical physiology – R.L. Bijani.
  3. Concise medical physiology – S.Choudhari.

**Reference Books**

* 1. Textbook on medical physiology – Guyton & Hall.
  2. Review of medical physiology – Ganong.

**Practicals**

* 1. Haematology –[Demonstration only]
  2. Study of Graphs

a. Skeletal muscies-

* + 1. Simple muscle twitch
    2. Effect of increasing strength on SMT.
    3. Effect of increasing load on SMT.
    4. Effect of free load & after load (Starting’ aw).
    5. Effect of temperature.
    6. Effect of two successive stimuli.
    7. Effect of fatigue.
    8. Effect of multiple stimuli & tetanus

b. Cardiac muscles-

* + 1. Simple myocardiogram.
    2. Effect of temperature on the myocardiogram.
    3. Effect of drugs.
    4. All of none law.
    5. Staircase phenomenon.

3. Physiology Fitness

- Breath holding

- mercury column test,

- cardiac efficiency test – Harvard step tast – Master step

test

* 1. Recording of arterial blood pressure – effects of change in posture & exercise on A.B.P.
  2. Stethography
     1. Effect of deglutition.
     2. Effect of voluntary hyperventilation
     3. Effect of exercise.
  3. Spirometry

- Lung volumes and capacities.

* 1. Mosso’s finger ergography and bicycle ergography
  2. Perimetry
  3. Clinical examination of

Respiratory system.

Cardiovascular system.

Central Nervous system.

Special senses

**PAPER-III**

**BIOELECTRICAL MODALITIES**

**BPT (103)**

**Medical Electronics**

**1. A.C. Electricity**

**Sinusoidal wave from:**Frequency, Wavelength, Amplitude and phase of a sine wave, Average & RMS value of a sine wave.

**2. D.C. Electricity**

**Modern concept of electricity:**Fundamental of electric charges (Proton and electron), Bound and free electrons, conductors and insulators, current, Static electric charges, charging of an object, potential and capacitance, potential difference and EMF, Quantity of electricity, magnitude of current, Resistance of conductor and Ohm’s law, Resistances in series and parallel, Discharging charged object.

**Capacitor (condenser):**

Electric around a capacitor, charging and discharging a capacitor, type of capacitor with application of each physiotherapy Department.

**Rheostat:**Series and shunt rheostat with application of each in the physiotherapy department

**Effect of electric current:** Thermal effect, chemical effect (ionization) and magnetic effect, electric shock, causes and its prevention.

**3. Therapeutic Current**

Impulse: Definition, types, pulse duration and pulse Repetition time, Interrupted Galvanic Currents faradic current and surged faradic currents.

**4. Magnetism** Magnetic and non- magnetic materials, magnet and its poles, the basis of magnetism (Dipole theory), Magnetic lines of force and their properties.

**Electromagnetism:** Magnetic field around a current carrying conductor, electromagnetic induction, Lenz’s law strength of induced EMF, Inductor and inductance, type of inductor, reactance and impedance, Static transformer, mutual inductance.

Even ratio, step-up, step-down and earth free transformers.

Precautions against Earth shock variable and auto transfer.

**5. Thermionic valves**

Thermionic emission, Diode valves and triode valves and their characteristics and constants.

**6. Semi-conductor devices**

Intrinsic and extrinsic semi-conductors, advantage of semi-conductors devices over

Thermionic valves, semi-conductor diode and transistor.

Biasing of Diode and Diode characteristics.

Light emitting Diodes, Integrated circuits.

**7.Electronic circuits**

Rectifiers and smoothing circuits.

Sinusoidal and Non-sinusoidal Oscillators.

Pulse generator circuits, short wave diathermy and ultrasound apparatus.

**8. A.C. and D.C. Meters**

Functions and applications of D.C. current meter, D.C. Voltage meter, series and shunt Ohmmeters, Wheat stone bridge and multi-meter, construction and application of cathode ray oscilloscope.

(Emphasis should be given to theoretical part without mathematical derivations; however, final formula must be written).

**ELECTRO-THERAPEUTIC MODALITIES**

Introduction to generation, Circuit diagram, testing of apparatus, Indications and Contraindications of.

* 1. Low frequency currents
  2. D.C. currents
  3. Medium frequency currents
  4. S.W.D. and Pulsed S.W.D.
  5. M.W.D.
  6. Ultra-Sonics
  7. Infrared
  8. U.V.R.
  9. Laser

(**Note:**Emphasis is given only to generation, circuit diagram and testing of above apparatus).

**Practical (Demonstration only)**

Diode and triode valves, transistor, ammeter, voltmeter, Galvanometer, Rheostat, Resistance box, Transformer.

Demonstration of possible electrotherapy unit circuits like stimulator, SWD and testing of apparatus etc.

**Book References**

* 1. Basic radio by M. Tepper Vol. I’ II’ III’ and V.
  2. Fundamentals of physics by verghese, parvathy Sebastian and anatomy (VAS Publication).
  3. Modern College Physics by Harvey E. White (CBS Publication).
  4. Electronic Principles by A.P. Malvino (Tata McGraw-Hill Publication).
  5. Handbook of electronics by Gupta and Kumar (Pragati Prakashan).
  6. Technique of Electrotherapy and its physical and physiological basis by Stafford L. Osborne and Harold J. Holmquest.
  7. Clayton’s Electrotherapy by Angel Forster and Nigel Palestanga.
  8. Therapeutic Electricity by Sydney Litch
  9. Medical Electronics Book.

**PAPER-IV**

**BIOMECHANICAL MODALITIES**

**BPT (104)**

**MECHANICS**

**1.** Mechanics and Mechanical Principles.

Definition of Mechanics, force, Diagrammatic representation of forces, Measurement of forces, classification of forces, Coplanar and parallel forces, Composition and Resolution of forces.

Momentum, Action and Reaction, Friction, Rotation about a Pivot.

Angle of Pull of Muscle.

Assistance and Resistance of Movements.

Moment of a force and practical application.

**Gravity**

Definition, Line of gravity, Center of Gravity.

Equilibrium.

Supporting base, Stability of equilibrium.

**Energy Work and Power**

Energy (Potential and Kinetic), work and Power.

**Levers**

Lever, Action of the lever, Position of the fulcrum, Orders of Levers, Tools and Other Mechanical devices Pulley block.

**Elasticity**

Definition, Stress, Strain, Hook’s law, springs, Properties of Springs, springs in series and parallel.

**2. Hydrostatics and Hydrodynamics**

Archimede’s principle

Properties of water, liquids, pressure.

Buoyancy, Laws of Floatation.

Apparent loss in weight, factors determining up-thrust, effect of buoyancy on movement performed in water.

Movement of force, further effects of apparent loss in weight.

Equilibrium of floating body, movement of water, Inertia, Movement of Objects in water.

Bernoulli’s theorem and its application in Atomiser or syrayer.

(Only qualitative explanation of the above).

**EXERCISE THERAPEUTIC MODALITIES**

1. Introduction

2. Aim and scope of biomechanical modalities, examples of different type of modalities.

3. Mechanics and Mechanical principles

* + 1. Mechanical Principles applied in physiotherapy like force, momentum, torque etc.
    2. Mechanics of position, gravity, line of gravity and center of gravity in human body, base equilibrium, fixation and stabilization.
    3. Mechanics of movement – axes and planes, the plane of movement and gravity
    4. **Lever:**definition, order of lever, examples in human body, levers at home and its work, levers in physiotherapy.
    5. **Pulleys:**Different type of pulleys and their uses in physiotherapy.
    6. **Elasticity:**Elastic materials used in physiotherapy like springs (in detail), Rubber elastic and Sorbo rubbers.
    7. Hydrostatic and hydrodyamic principles used in Hydrotherapy.

**Praticals**

(Demonstration of the following)

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

2. Demonstration of different types of lever in human body

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

4. Demonstration of axial and pendular.

5.Demonstration of Archimedes’s principle of floatation and Bernoulli’s Therrem’s application in Hydrotherapy.

**Book Reference**

1.Principles of exercise therapy by Dena Gardner.

2.Practical exercise therapy by Margaret hollies.

3.Krusen’s textbook of physical medicine and rehabilitation by krusen kortke.

4.Muscle testing by Daniel.

5. Clayton’s electrotherapy.

6.Elements properties of matter by D.S. Mathur.

**PAPER-V**

**PSYCHOLOGY AND SOCIOLOGY**

**BPT (105)**

**SOCIOLOGY**

**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 professional.

**B. Social Factors in health and disease**

1. The meaning of social factors,

2. The role of social factors in health and illness.

**C. Socialization**

**1** Meaning and natural of socialization.

2 Primary secondary and anticipatory socialization.

3 Agencies of socialization.

**D. Social Groups**

Concepts of social group, influence of formal and informal group on health and sickness. The role of primary group and secondary group in hospital and rehabilitaion setting.

**E. Family**

1. The family,

2. Meaning and definition,

3. Functions,

4. Types,

5.Changing family,

6. Influence of family on the individual’s health, family and nutrition, 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 ruralites, 2.Urban community – meaning and features, health hazards of Urbanites.

**G. Culture and Health**

1. Concepts of culture,

2. Cultures and Behaviuor,

3. Cultural meaning of sickness,

4. Culture and Health disorders.

**H. Social change**

* + - * 1. Meaning of social change,
        2. Factors of social change,
        3. Human Adaptation and social change,
        4. Social change and stress,
        5. Social change and deviance,
        6. Social change and health programme,
        7. The role of 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.

Population Explosion,

Poverty and Unemployment,

Beggary,

Juvenile Delinquency,

Prostitution,

Alcoholism,

Praoblems of Women in employment.

J. **Social Security**

Social Security and Social Legislation to the disabled.

**K. Social Worker**

1. Meaning of social Work,

2.The role of a medical social worker.

**PSYCHOLOGY**

**GENERAL PSYCHOLOGY: THEORY.**

* 1. What is psychology! Field of application and methods of study of psychology.
  2. The respective influences of heredity and environment on the individual.
  3. Development and growth of behaviour in infancy and childhood.
  4. Motivation: Achievement, affiliation and aggression Maslow’s theory**.**
  5. Emotions and emotional development.
  6. Learning theories, methods of learning (Pavlov, Thorndike, hull- Toleman).
  7. Learning and maturation – special reference to conditioning positive and negative reinforcement interest and in learning.
  8. Sensation, perception.
  9. Social psychology, influence of individual or groups on behavior of others leadership and group psychology.

10.Memory, thinking and causes of forgetting.

**CLINICAL PSYCHOLOGY: THEORY**

* 1. **Introduction:** Field of application and short history of clinical psychology.
  2. **Concept of mind:**Conscious and unconscious mind (psychological approach).
  3. **Intelligence**and intelligence testing, kinds of mental deficiency.
  4. **Personality:**Concept, influencing factors and tests.
  5. **Major psychological disorders:** Psychoneurosis
     1. Anxiety
     2. Phobia
     3. Obsessive-compulsive reaction.
  6. **Major psychological disorders:**Psychosis
     1. Schizophrenia
     2. Depression
  7. Psychosomatic disorders, personality disorders
  8. Frustration and conflict.
  9. **Stress:**Coping mental mechanism with special reference to normal and abnormal conditions.
  10. Counseling: Process, approaches.

a. Directive

* + - 1. Non-directives
      2. Counseling skills.

**Book References**

Clinical Psychology by Koleman.