



## Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

### Shri Vaishnav Institute of Paramedical Sciences

#### SCHEME OF EXAMINATION: BACHELOR OF PHYSIOTHERAPY (B.P.Th.) 2024-25 Batch First Year B. P. Th. Examination

There shall be one paper setter external or internal for theory examination and two examiners, one internal (Chairman) and one external for practical examinations for subjects **Anatomy, Physiology, Fundamental of Physics, Biomechanics & Biomechanical Modalities and Fundamental of Medical Electronics & principles of Bioelectrical Modalities.**

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 examinations will be as under 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

#### For Sociology and Psychology-

The University examination shall be of 80 marks with Sections A- Psychology & B- Sociology. The university theory examination marks for Psychology shall be 40 and for sociology 40 marks respectively. There shall be two paper setters and two evaluators, one from Psychology and one from Sociology.

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Recognized teachers in psychology and sociology with five years of experience should be on the panel of examiners, 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 80 Max. Marks.

There will be two sections 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
01 Essay Type Questions (Answer to be given in 450-500 words)	14	14
		40

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**Scheme Of Examination: BPT**  
**Syllabus BPT I Year Session 2024-2025**

S.NO.	COURSE CODE	COURSE NAME	EXAMINATION SCHEME						TOTAL MARKS
			THEORY			PRACTICAL		VIVA	
			End University Exam	Mid Year Exam	Teachers Assessment	End University Exam	Mid Year Exam	End University Exam	
1	BPT101	Human Anatomy	100	20	0	40	20	20	200

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; \*Teacher Assessment shall be based on the following components: Quiz/Assignment/Project/Participation in Class, given that no component shall exceed more than 10 marks.

**Course Educational Objectives (CEOs): The students will**

**CEO 1:** Rationalize the basic knowledge of human anatomy.

**CEO 2:** Develop understanding about human system histology.

**CEO 3:** Gain knowledge about functioning systems in the body.

**CEO 4:** Application of knowledge of anatomy to learn evaluation and application of physical therapy.

**Course Outcomes (COs) upon successful completion of this course the student will:**

**COs 1:** Understand the structure and function of a variety of cells contained in the human body.

**COs 2:** Understand the structure and function of bones. → Know the major divisions of the human skeleton

**COs 3:** Relate the importance of hormones to the functioning of the human body. Describe the endocrine glands and the hormones they produce

**COs 4:** List the organs of the digestive tract by anatomical location.

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#### **Unit-1: 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 aspects.
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.

#### **Unit-2.**

##### **(A) 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

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#### **(B) Thorax:**

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

#### **Unit-3: - 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

#### **Unit-4: 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

#### **Unit-5: Endocrine system–Pituitary, Thyroid, parathyroid (Brief Description)**

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#### **Unit-6: 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

#### **Unit-7: 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)

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#### **Unit-8:**

##### **(A) Abdomen** (Brief descriptions only):

1. Boundaries, Muscles of abdominal wall
2. Division of Abdominal cavity
  - i Pouch of Douglas
  - ii. Morrisons pouch

##### **(B) Digestive system** (Liver & pancreas, Alimentary canal)

#### **Unit-9: Pelvis**

1. Pelvic floor, innervations.
2. Bony Pelvis

#### **Unit-10:**

1. **Urinogenital system** – Kidney, Ureter, bladder, urethra
2. **Reproductive system** – Male and Female

#### **Unit-11: Kinesiology**

1. Basic Concepts
2. Muscular system
3. Joints
4. Machinery Musculoskeletal system.
5. Principles of Motion.

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6. Principles of force and work.
7. Basics of the development of motor skills.
8. Principles of stability.
9. Postural principles

#### **Human anatomy Practical's:**

1. Learning of surface landmarks with special emphasis on bones, joints, muscles, and nerves.
2. The learning of anatomy is by demonstration only through dissected parts, slides, models, charts, etc.
3. Demonstration of dissected parts (upper extremity, lower extremity, thoracic & abdominal viscera, face and brain)
4. Demonstration of skeleton articulated and disarticulated.

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

#### **RECOMMENDED READING**

1. Chaurasia, B D Human Anatomy: Regional and CBS, New Delhi Latest 3V
2. Chaurasia, B D Human Osteology CBS, New Delhi Latest
3. Singh, Inderbir Textbook of Anatomy: With Color Atlas Jaypee, New Delhi Latest 3V
4. Singh, Inderbir Textbook of Neuroanatomy Jaypee, New Delhi Latest
5. Singh, Inderbir Textbook of Human Histology Jaypee, New Delhi Latest
6. Singh, Inderbir Textbook of Human Osteology Jaypee, New Delhi Latest

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7. Garg, Krishna Textbook 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 Livingstone, New York, Latest

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			End University Exam	Mid Year Exam	Teachers Assessment	End University Exam	Mid Year Exam	End University Exam	
1	BPT102	Human Physiology	100	20	0	40	20	20	200

**Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical.**

\*Teacher Assessment shall be based on the following components: Quiz/Assignment/Project/Participation in Class, given that no component shall exceed more than 10 marks.

**Course Educational Objectives (CEOs): The students will:**

**CEO1:** Understand the basis of normal human physiology with special emphasis on the functioning of the cardiovascular, musculoskeletal and nervous systems.

**CEO2:** Demonstrate an understanding of elementary human physiology and Biochemistry.

**CEO3:** Understand how abnormal Physiology affects human function and dysfunction of the human body.

**Course Outcomes (COs): Students should be able to:**

**COs 1:** Understand the structure and function of a variety of cells contained in the human body.

**COs 2:** Understand the structure and function of bones. Know the major divisions of the human skeleton

**COs 3:** Relate the importance of hormones to the functioning of the human body. Describe the endocrine glands and the hormones they produce.

**COs 4:** List the organs of the digestive tract by anatomical location.

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#### **Unit-1: Cell & BLOOD**

1. Structure of cell membrane
2. Transport across cell membrane
3. Functional morphology of the cell
4. Intercellular communication
5. Homeostasis
6. W.B.C., R.B.C., Platelets formation & functions Plasma, Blood Groups
7. Hemostasis, Immunity

#### **Unit-2: 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.

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11. Structure and organization of vascular tree.
12. Arterial blood pressure and pathophysiology of Hypertension.
13. Characteristics 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. Pathophysiology of Shock.
17. Cerebral, coronary, splanchnic, skin, Placental & Fetal circulation.

#### **Unit-3: 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 functions of respiratory.
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 Dyspnea, Apnea, Asphyxia, Hypoxia, Cyanosis, Breath holding, high and Low atmospheric pressures.
11. Development of limb bones, muscles and anomalies.
12. Radiographic identification of bone and joints.

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#### **Unit 4: EXERCISE PHYSIOLOGY**

1. Effects of acute & chronic exercises.
2. Oxygen/CO<sub>2</sub> transport – O<sub>2</sub> debt.
3. Effects of Exercises 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.

#### **Unit 5: ENDOCRINE**

1. Role of Hypothalamus as an endocrine gland.
2. Functions and hypo & hyper secretion of hormones of
  - i Pituitary
  - ii Thyroid
  - iii Parathyroid
  - iv Adrenal
  - v Endocrine part of pancreas.

#### **Unit 6: 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

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#### **Unit 7: NERVE – MUSCLE, SYNAPTIC & JUNCTION TRANSMISSION**

1. Nerve -General Concept.
2. Nerve cell structure.
3. Genesis of resting membrane potential & Action potential.
4. Their ionic basis, All or None phenomenon.
5. Ionic basis of nerve conduction.
6. Classification & types of nerve fibre.
7. Mixed nerves & compound action potential.
8. Concept of nerve injury & Wallerian degeneration.
9. Muscle properties and functions.
10. Electric & Mechanical responses & their basis.
11. Concept of isometric & isotonic muscle contraction.
12. Electrical events in postsynaptic neurons.
13. Inhibition & facilitation at synapses.
14. Chemical transmission of synaptic activity.
15. Principal neurotransmitter system.
16. Neuromuscular junction, structure & events occurring during excitation.

#### **Unit-8 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 Brainstem, Cerebellum, Basal Ganglia and Motor cortex.

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- 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 Activation System.
- 14 Limbic System
- 15 Learning, memory, speech and conditional reflexes.
  - a) Reflexes, monosynaptic, polysynaptic, withdrawal reflexes.
  - 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
  - h) Functioning of Autonomic Nervous System with special reference to micturition, defecation and labour.
  - i) Higher neural regulation of ANS.

#### **Unit-9. 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

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#### **Unit-10. 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.

#### **Unit-11.: 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.

#### **Unit-12: REPRODUCTIVE SYSTEM**

1. Male & female reproductive system
2. Spermatogenesis, Functions of Testosterone.
3. Ovarian and Menstrual Cycle and their hormonal control.
4. Hormones of Ovary and their functions.
5. Physiological basis of Fertilization, Implantation, Pregnancy, Parturition and Lactation and Contraception.

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#### **Human physiology Practical's:**

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 – Heart and Breath sound
  - Effect of deglutition.
  - Effect of voluntary hyperventilation
  - Effect of exercise.
3. Spirometry to measure various lung capacities & volumes, Respiratory rate, tidal volume, VC, timed VC, IRV, IC, ERV, EC on Spirometry (demonstration only)
  - Spirometry: Lung volumes and capacities.
  - Mosso's finger ergography and bicycle ergography
  - Perimetry
  - Clinical examination of
    1. Respiratory system.
    2. Cardiovascular system.
  - 3. Estimate of Haemoglobin, T.R.B.C., T.W.B.C. count (demonstration only) ,Study of Graphs
  - 4. Blood indices, Blood grouping, Bleeding & Clotting time (demonstration only]
  - 5. Cardiac muscles.
    - Simple myocardiogram.
    - Effect of temperature on the myo-cardiogram.
    - Effect of drugs.
    - All or none law.
    - Staircase phenomenon.
    - Physiology Fitness
    - Breath holding
    - mercury column test,
    - Cardiac efficiency test – Harvard step test – Master step test

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#### **PRACTICAL EXAMINATION**

Students will be assessed by viva based upon learning in theory.

Demonstration of measurements of pulse, Blood Pressure.

#### **RECOMMENDED READING**

1. Chatterji, C. C., Human Physiology Medical Allied.
2. Keele, Cyril A, Samson Wright's Applied Physiology, Oxford University Press.
3. Bijlani, R L, Understanding Medical Physiology, Oxford University Press.
4. Guyton, A.C. and Hall, J. E., Textbook of Medical Physiology, W.B. Saunders, Singapore.
5. K sembulingam, Prema sembulingam Essentials of physiology  
Publisher: Jaypee Brothers Medical Publisher

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**Scheme Of Examination: BPT**  
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			THEORY			PRACTICAL		VIVA	
			End University Exam	Mid Year Exam	Teachers Assessment	End University Exam	Mid Year Exam	End University Exam	
1	BPT103	Fundamental of Physics, Biomechanics & Biomechanical Modalities	100	20	0	40	20	20	200

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical.

\*Teacher Assessment shall be based on the following components: Quiz/Assignment/Project/Participation in Class, given that no component shall exceed more than 10 marks.

**Course Educational Objectives (CEOs): The students will:**

**CEO1:** understand the basic principles of Physics, Biomechanics & exercise therapy, basic principles and application of soft tissue manipulation

**CEO2** Apply the principles of mechanics to the human body and be able to articulate the same.

**CEO3** Apply mechanical principles to identify difficulty and faulty movements in a healthy individual.

**CEO4** Apply biomechanical evaluation to common activities –static & dynamic.

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**Course Outcomes (COs): Students should be able to:**

**COs 1:** Understand the structure, types, and functions of joints of the human body

**COs 2:** Understand the structure, properties, biomechanical behavior and functions of biological tissues, peripheral nerve, and skeletal muscle.

**COs 3:** Understand the structure, kinematics, and kinetics of joints of vertebral column, chest wall and temporomandibular joint.

#### **Unit-1:**

**A. Mechanics** - Definition of mechanics and Biomechanics

**B. Force** - Definition, diagrammatic representation, classification of forces, concurrent, coplanar and co-linear forces, composition and resolution of forces, angle of pull of muscle

#### **Unit-2:**

**A. Momentum** - principles, and practical application.

**B. Friction**

#### **Unit-3:**

**A. Gravity** - Definition, line of gravity, Centre of gravity

**B. Equilibrium** - Supporting base, types, and equilibrium in static and dynamic state

#### **Unit-4:**

**A. Levers** - Definition, function, classification and application of levers in physiotherapy & order of levers with example of lever in human body

**B. Pulleys** - system of pulleys, types and application

#### **Unit-5:**

**A. Elasticity** - Definition, stress, strain, HOOKE 'S Law

**B. Springs** - properties of springs, springs in series and parallel, elastic materials in use.

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#### Unit-6: Springs

Properties of springs, springs in series and parallel, elastic materials in use **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

#### Unit-7: Normal Posture –

Definition & description, static and dynamic, alignments of various joints, center of gravity, planes & muscular moments, and Analysis of posture.

#### Unit-8: Movements –

Anatomical definition and description, Movements and exercise as therapeutic modality and their effects, Physiological reaction of exercise.

**Traction** - Rationale, Technique, indications & contra-indications

**Unit-9: 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

**Starting positions** - Description and muscle work, Importance of fundamental and derived types, Effects and uses of individual positions

**Unit-10: 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.

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#### **Fundamental of physics, Biomechanics & Biomechanical modalities Practical's:**

1. Demonstration of Biomechanical principles.
2. Study of structure, function and application of various Biomechanical modalities – shoulder wheel, shoulder ladder, shoulder pulleys.
3. Pronator-supinator instrument, static cycle, rowing machine, ankle exerciser, balancing board, springs, weights, etc.
4. Study of structure, function and application of suspensions,
5. Demonstration and practice of - soft tissue manipulative technique
6. Shall be conducted for various joint movements and analysis of the same.
7. Demonstrations may also be given as to how to analyze posture and gait. The demonstrations may be done on models or skeletons.
8. Measurement of Joint ROM using goniometer
9. Identification of walking aids.
10. The student shall be taught and demonstrated to analysis for activities of daily living – ADL – (like sitting to standing, throwing, lifting etc.) The student should be able to explain and demonstrate the movements occurring at the joints, the muscles involved, the movements or muscle action produced, and mention the axis and planes through which the movements occur.

#### **PRACTICAL EXAMINATION**

1. Students will be assessed by viva based upon learning in theory, demonstrations of various biomechanical modalities, suspensions, and manipulative techniques learned.
2. The student shall be taught and demonstrated to analysis for activities of daily living ADL (like sitting to standing, throwing, lifting etc.)
3. The student should be able to explain and demonstrate the movements occurring at the joints, the muscles involved, the movements or muscle action produced, and mention the axis and planes through which the movements occur.

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#### **RECOMMENDED READING**

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
6. Carolyn Kisner, Lynn Allen Colby, Therapeutic Exercise: Foundations and Techniques. Davis, 2007
7. Basant Kumar Nanda, Electrotherapy Simplified, Jaypee Brothers Medical Publishers (P) Ltd.

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**Scheme Of Examination: BPT**  
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			THEORY			PRACTICAL		VIVA	
			End University Exam	Mid Year Exam	Teachers Assessment	End University Exam	Mid Year Exam	End University Exam	
1	BPT104	Fundamental of Medical Electronics & Principles of Bioelectrical Modalities	100	20	0	40	20	20	200

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical.

**\*Teacher Assessment** shall be based on the following components: Quiz/Assignment/Project/Participation in Class, given that no component shall exceed more than 10 marks.

**Course Educational Objectives (CEOs): The students will:**

**CEO1.** Know the principles, technique and effects of electrotherapy as a therapeutic modality in the restoration of physical function in condition like nerve injuries.

**CEO2.** List the indications and contra-indications of various types of electrotherapies, demonstrate different techniques and describe their effects.

**CEO3.** Aware of the construction, Biophysical principles and effects, dangers, safety measures, judicial use, appropriate methods of application, contraindications of the various low frequency equipment.

**CEO4.** Practice evidence-based physiotherapy

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#### Course Outcomes (COs): Students should be able to:

**COs 1:** Understand the indications and contra-indications of various types of electrotherapy, demonstrate different techniques and describe their effects.

**COs 2:** Aware of the construction, Biophysical principles and effects, dangers, safety measures, judicial use, appropriate methods of application, contraindications of the various low frequency equipment.

#### Unit-1:

**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 form, frequency, wavelength, Amplitude and phase of a sine wave, Average & RMS value of a sine wave

#### Unit-2:

**1. Electricity:** Quantity of electricity, magnitude of current, conductors and insulators, resistance of conductor and Ohm's law, resistances in series and parallel

**2. Capacitors:** Electric field around a capacitor, charging and discharging of capacitors, types of capacitors with application of each in Physiotherapy department

**3. Rheostat:** series and shunt Rheostat with application of each in the Physiotherapy department

#### Unit-3:

**1. Effects of electric Current:** Thermal effect, chemical effect (ionization) and magnetic effect. Electric shock, Earth shock, causes and its prevention

**2. 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 inductors, reactance and impedance.

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#### Unit-4:

**Thermionic Valves:** Thermionic emission, Diode and Triode valves and their characteristics, Construction and application of Cathode Ray Oscilloscope.

#### Unit-5:

**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.

#### Unit-6:

- 1. Electronic Circuits:** Rectifiers, Wheat stone bridge & smoothing circuits, Oscillators and its types.
- 2. A.C. AND D.C. meters:** Functions and applications of Ammeter and volt meters, Ohmmeters,

#### Unit-7:

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

#### Unit-8:

Medical Instrumentation for Physical Therapy: Brief description of generation, circuit diagrams and testing low frequency currents, Direct currents

#### Unit-9:

- Medium frequency currents
- Short wave Diathermy-continuous and pulsed
- Microwave Diathermy
- Ultrasound

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#### **Unit-10:**

Actinotherapy, Infrared- Types of generators, UVR-generators, types, dosimetry and LASER  
Production & instrumentation, classification and physiological effects.

#### **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 equipment.

#### **RECOMMENDED READING**

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

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			End University Exam	Mid Year Exam	Teachers Assessment	End University Exam	Mid Year Exam	End University Exam	
1	BPT105	Psychology & Sociology	80	20	0	0	0	0	100

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical.

**\*Teacher Assessment** shall be based on the following components: Quiz/Assignment/Project/Participation in Class, given that no component shall exceed more than 10 marks.

**Course Educational Objectives (CEOs): The students will:**

**CEO1.** Recognize and help with the psychological factors involved in disability, pain, disfigurement, unconscious patients, chronic illness, death, bereavement and medical- surgical patients/conditions.

**CEO2.** Understand the elementary principles of behavior for applying in the therapeutic environment.

**CEO3.** Perform psychosocial assessment of patients in various developmental stages.

**CEO4.** Understand Ego defense mechanisms and learn counseling techniques to help those in need demonstrate an understanding of the role of socio-cultural factors as determinants of health and behavior in health and sickness.

**CEO5.** Relate to therapeutic situations in the practice of physiotherapy.

**CEO6.** Understand the role of family and community in the development of behaviors.

**CEO7.** Develop a holistic outlook toward the structure of society and community resources.

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#### **Course Outcomes (COs): Students should be able to:**

**COs 1:** Demonstrate an understanding of the role of socio-cultural factors as determinants of health and behavior in health and sickness

**COs 2:** Relate to therapeutic situations in the practice of physiotherapy.

**COs 3:** Understand the role of family and community in the development of behaviors.

**COs 4:** Develop a holistic outlook toward the structure of society and community resources

**COs 5:** Identify the subtle influence of culture in the development of human personality, the role of beliefs and values as determinants of individual and group behaviors.

**COs 6:** Recognize and help with the psychological factors involved in disability, pain, disfigurement, unconscious patients, chronic illness, death, bereavement and medical surgical patients/conditions.

**COs 7:** Understand the concept of stress and its relationship to health, sickness and one's profession.

**COs 8:** Find reasons for non-compliance among patients and improving compliance behavior.

#### **A. PSYCHOLOGY**

##### **Unit-1:**

1. What is psychology. Fields of application of psychology, influence of heredity and environment on the individual.
2. Learning – theories & principles of 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.

##### **Unit-2:**

1. Attitudes – theories, attitudes and behavior, factors in attitude change
2. Intelligence - theories of intelligence.
3. Personality, theories of personality, factors influencing personality.
4. Development and growth of behavior in infancy and childhood, adolescence, adulthood and old age

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#### **Unit-3:**

1. Behavior - normal and abnormal
2. Counseling - Definition, Aims and principles
3. Psychotherapy – brief introduction to paradigms in psychopathology and therapy
4. Psychological need of children and geriatric patients
5. Communication – effective and faulty
6. Emotional and behavioral disorders of childhood and adolescence- (in brief)
  - a) Disorders of under and over controlled behavior
  - b) Eating disorders.

#### **Unit-4: Mental deficiency**

1. Mental retardation.
2. Learning disabilities.
3. Autistic behavior

#### **Unit-5: Anxiety Disorders –**

1. Phobias, panic disorder,
2. Generalized Anxiety disorder,
3. Obsessive Compulsive Disorder,
4. Post traumatic stress disorder

#### **Unit-6:**

##### **Somatoform and Dissociate Disorders –**

1. Conversion Disorder,
2. Somatization Disorder,
3. Dissociate Amnesia & Dissociate Fugue
4. Personality Disorder
5. Patho-physiological Disorders – stress and health
6. Severe psychological disorders – Mood disorders, psychosis

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#### **B. SOCIOLOGY**

##### **Unit-1:**

##### **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, and 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. Agencies of Socialization.

##### **Unit-2:**

##### **A. Social Groups:**

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

##### **B. 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.

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#### **Unit-3:**

##### **A-Community:**

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

##### **B-Culture and Health:**

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

#### **Unit-4:**

##### **C-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.

#### **Unit-5:**

##### **A-Social problems of disabled:**

1. Consequences of the following social problems in relation to sickness and Disability, remedies to prevent these problems.
2. Population explosion.
3. Poverty and unemployment.
4. Beggary.
5. Juvenile delinquency.

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6. Prostitution.
7. Alcoholism.
8. Problems of women in employment.

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

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

### RECOMMENDED READING

#### PSYCHOLOGY

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

#### SOCIOLOGY

1. Bhushan, 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.

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