SHREE SWAMINARAYAN PHYSIOTHERAPY COLLEGE, KALOL

PROPOSED SYLLABUS

1st Year B. Physiotherapy

Faculty of Physiotherapy

Degree of Bachelor of Physiotherapy

SWAMINARAYAN UNIVERSITY

AHMEDABAD – MEHSANA HIGHWAY, AT & PO – SAIJ,
TAL. – KALOL,
DIST. – GANDHINAGAR - 382725

Program Outcomes (POs)

1. Do independent physiotherapy assessment and treatment for patient/client.

2. Work in conjunction with a multidisciplinary team to diagnose and treat movement dysfunctions as per red and yellow flags.

3. Develop skills for physical & functional diagnosis, treatment planning, management, and administration of physiotherapy treatment for patient support.

4. Find employment opportunities in Hospitals/Nursing homes/Sports Teams/Fitness Centers /Community Rehabilitation centers/Health planning boards/Health promotions services/Special Schools/Education Institutes/Industrial Sectors in both private and public sectors as well as in independent physiotherapy clinics.

5. Shall be able to pursue further qualifications to attain a senior position in the professional field and to keep abreast with the recent advances and new technology.

6. Ability to communicate effectively and flexibly in a manner that is appropriate for the patients and other healthcare professionals.

7. Acquaint with the basics of research, and involved in the research process.

8. Apply ethical principles and commit to professional ethics and responsibilities and norms of the Physiotherapy practice as provided by national and state councils.

Program Educational Objectives (PEOs)

PEO 1: Professional Foundation and Application
Graduates will acquire and apply fundamental knowledge of basic medical sciences and physiotherapy principles to assess, diagnose, and manage functional disorders effectively across clinical, community, and institutional settings.

PEO 2: Clinical Decision-Making and Problem-Solving
Graduates will demonstrate clinical reasoning and problem-solving abilities to analyze patient conditions, evaluate treatment outcomes, and adapt physiotherapy interventions based on individual needs and current best practices.

PEO 3: Innovation, Research, and Lifelong Learning
Graduates will engage in evidence-based research, contribute to innovations in physiotherapy practice, and pursue higher education or specialization to remain updated with advancements in healthcare.

PEO 4: Social Responsibility and Ethical Practice
Graduates will uphold ethical values, communicate effectively, and contribute to society by participating in community health, national wellness initiatives, and collaborative interprofessional care, aligned with national and global health goals.

Program Specific Outcomes (PSOs)

PSO1: Clinical Assessment & Diagnostic Reasoning

Graduates will be able to perform comprehensive physiotherapy assessment across musculoskeletal, neurological, cardiopulmonary, pediatric, geriatric, and sports conditions and apply clinical reasoning to arrive at physiotherapy diagnoses.

PSO2: Evidence-Based Physiotherapy Practice

Graduates will integrate research evidence, clinical guidelines and professional expertise to plan and implement safe, effective and contemporary therapeutic interventions.

- **Course Credit Structure**

S. No	Year	Course Code	Course Name	L	T	P	Credit	ESE Max	Practical/ Viva Max	IA Max	CSE Max	Total Mark
Year-1												
1	1st	BPT0101	Human Anatomy	3.5	-	4.5	11.5	80	80	20	20	200
2	1st	BPT0102	Human Physiology	4	-	4	12	55	80	15	20	170
3	1st	BPT0102	Biochemistry	1	-	-	2	25	-	5	-	30
4	1st	BPT0103	Psychology	1	-	-	4	40	-	10	-	50
5	1st	BPT0103	Sociology	1	-	-	4	40	-	10	-	50
6	1st	BPT0104	Biomedical Physics	1	-	1	6	80	40	20	10	150
7	1st	BPT0105	Exercise Therapy 1 & Soft Tissue Mobilization	1.5	-	3	12	80	80	20	20	200
8	1st	BPT0106	English	0.5	-	0.5	1	-	-	-	-	-
9	1st	BPT0107	Professional Practice & Ethics- I	0.5	-	-	1	-	-	-	-	-
10	1st	BPT0108	Computer	0.5	-	0.5	1.5	-	-	-	-	-
11	1st	BPT0109	Environment Studies	0.5	-	-	2	-	-	-	-	-
12	1st	BPT01001	Observational Clinical Practice	-	-	3.5	3.5	-	-	-	-	-
			Total - 12				**60.5**	**400**	**280**	**100**	**70**	**850**

COURSE CONTENTS

FIRST YEAR B. PHYSIOTHERAPY

1. HUMAN ANATOMY

Prerequisite: Students should have a general understanding of biology, particularly the human body structure and cell- level basics from high school.

COURSE OBJECTIVE:

1. Understand the structural organization of the human body and its clinical relevance.
2. Identify and describe the gross anatomy of major systems and body regions.
3. Correlate embryological development with congenital anomalies.
4. Apply anatomical knowledge in physiotherapy practice and imaging interpretation.

- **Teaching Scheme:**

	L	T	P	Contact Hours	Credit	ESE Max	Practical/ Viva Max	IA Max	CSE Max	Total Mark
Teaching Scheme	3.5	0	4.5	8	11.5	80	80	20	20	200

SYLLABUS: -

UNIT. NO	Topic	Hours	Weightage
1	**General Introduction:** a) Definitions and subdivisions b) Plan of human body c) System of the body d) The unit of structure and function of the cell	**20**	**6%**
2	**Histology: (Not For University Examination)** a) Cell b) Tissues of the body c) Epithelium d) Connective tissue e) Cartilage f) Bone g) Lymphoid tissue	**05**	**2%**

3	**Embryology: (Not For University Examination)** a) Ovum, spermatozoa, fertilization and formation of germ layers and their derivations b) Development of skin, fascia, blood vessels and lymphatics Neural tube, brain vessels, spinal cord d) Development of brain and brainstem structures, development alanomalies (brief) e) Development of bones, axial and appendicular skeleton and muscles	**05**	**2%**
4	**Musculoskeletal anatomy:** (all topics to be taught in detail) **Osteology:** a) Anatomical positions of the body, axes, planes, common anatomical terminologies (grooves, tuberosity, trochanters etc.) b) Connective tissue classification c) Bones: - Composition and functions, classification of types according to morphology and development, growth and repair, structure of long bone, vertebral column, types of vertebrae, bones of extremities and body landmarks **Arthrology:** a) Definitions b) Classification of joints c) Construction of joints d) Motions of joints e) Structure of fibrous, cartilaginous joints f) Blood supply and nerve supply of joints g) Articulations – articular surfaces, types of joints, motions of upper and lower extremities, trunk, head **Myology:** a) Types of muscle tissue b) Muscles of upper extremity, lower extremity, trunk, eye, face etc. origin, insertion, nerve supply and action (in detail) **Myology of other systems:** a) Cardiovascular system b) Blood lymph, tissue fluid-characteristics, composition, and function c) The heart-main arteries, veins, capillaries d) Lymph circulation	**42**	**14%**
5	**Neuro-anatomy** a) Division and function of the nervous system b) Brain, spinal cord-their structures, division	**42**	**14%**

	c) Nerve tissue-neuron, nerve fibre, synapse, end-organs etc d) Organization of Central Nervous System-spinal nerves and autonomic nervous system-mainly pertaining to cardiovascular, respiratory and urogenital system. e) Cranial nerves f) Peripheral nervous system-Peripheral nerves, sensory and organs,neuromuscular junction, spinal segments and areas g) Nerve supply to voluntary muscles and segmental distribution h) Central nervous system-Brain, cerebellum, Thalamus, Hypothalamus, Corpus striatum, Cerebral hemispheres – white and gray matter, lateral ventricles, blood supply of brain, meninges, pyramidal system, extrapyramidal systems, anatomic integration. i) Cerebro-spinal fluid j) Sensory end-organs and sensations k) Autonomic nervous system-sympathetic, parasympathetic		
6	**Respiratory System:** a) Thoracic cage b) Brief outline of air passages c) Brief gross anatomy of respiratory organs-lungs, pleura, bronchial tree, broncho- pulmonary segments d) Intercostals muscles in detail e) Mechanisms of respiration and muscles of respiration, Diaphragm	**15**	**5%**
7	**Cardiovascular System:** a) Heart (gross anatomy and functions) b) Arteries c) Veins d) Collateral Circulation	**15**	**5%**
8	**Digestive System:** a) Anatomy of digestive organs – Oesophagus, stomach, intestine, rectum etc. b) Digestive glands	**10**	**3%**
9	**Urinary System:** a) Anatomy of urinary organs, kidneys, ureters, urinary bladder urethra in males and females etc. b) Types of bladder especially in paraplegics	**10**	**3%**
10	**Reproductive System:** a) Brief outline of genital organs b) Outline of male and female reproductive system	**05**	**2%**
11	**Endocrine System:** a) Glands – classification, sites and section b) Enzymes	**05**	**2%**

	c) Hormones		
12	**Lymphatic System** – Brief outline	**05**	**2%**
13	**Special sensory organs and sensations:** a) Emphasis on skin, ear and eyes b) Less detail on smell and taste	**05**	**2%**
14	**Regional Anatomy:** **Upper Extremity:** a) Osteology: Clavicle, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals, Phalanges in articulated hand b) Soft parts: Breast, pectoral region, axilla, front of arm, cubital fossa, front of forearm, back of forearm, palm, dorsum of hand, muscles, fascia, nerves, blood vessels and lymphatic drainage of upper extremity c) Joints: shoulder girdle, shoulder joint, elbow joint, radio-ulnar joint, wrist joint and joints of hand d) Arches of hand, skin of the palm and dorsum of hand	**35**	**11%**
15	**Lower Extremity** a) Osteology: Hip bone, femur, tibia, fibula, patella, tarsals, metatarsals, phalanges. b) Soft parts: Gluteal region, front and back of thing {femoral triangle, femoral canal and inguinal canal}, medical side of the thigh {adductor canal}, lateral side of the thigh, popliteal fossa, anterior and posterior compartment of leg, sole of the foot, lymphatic drainage of lower limb, venous drainage of the lower limb, arterial supply of the lower limb, arches of the foot, skin of foot.	**45**	**15%**
16	**Trunk** **Osteology: Cervical, thoracic, lumbar, sacral and coccygealvertebra and ribs.** a) Soft tissue: Pre and Para vertebral muscles, anterior abdominal wall muscles, intervertebral disc. b) Joints: Hip joint, knee joint, ankle joint, joints of the foot.	**20**	**6%**
17	**Head and neck** a) Osteology: Mandible and bones of the skull. b) Soft parts: Muscles of the face and neck and their nerve and blood supply – Extraocular muscles, salient points about the eye ball and internal ear.	**20**	**6%**

Course Outcome

CO Number	Course Outcome Statement	Mapped Unit Numbers
CO1	Describe the general organization of the human body including cellular structure, tissues, embryological development, and anatomical terminology.	1, 2, 3
CO2	Explain the structural and functional anatomy of the musculoskeletal, cardiovascular, respiratory, digestive, urinary, reproductive, endocrine and lymphatic systems.	4, 6, 7, 8, 9, 10, 11, 12
CO3	Analyze the organization and functional integration of the central, peripheral and autonomic nervous systems including special sensory organs.	5, 13
CO4	Apply anatomical knowledge of upper limb, lower limb, trunk, head and neck in identifying structures, joints, muscles, vessels and nerves.	14
CO5	Evaluate the anatomical basis of growth, development, structural variations and their clinical relevance in physiotherapy practice.	3, 4, 5, 6–14

CO–PO Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	2	1	-	-	-	-	-
CO2	2	2	1	-	-	-	-	-
CO3	3	3	2	-	-	-	-	-
CO4	3	2	1	1	-	-	-	-
CO5	3	3	2	-	-	-	-	3
Total	13	12	7	1	0	0	0	3
No. of COs mapping with POs	5	5	5	1	0	0	0	1
Average	2.6	2.4	1.4	1.0	0	0	0	3.0
Rounded (Average)	3	2	1	1	0	0	0	3

Teaching & Learning Methodology:

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- Interactive lectures with diagrams/models
- Cadaveric demonstrations or 3D virtual anatomy
- Histology slide lab sessions
- Group discussions and quizzes
- Surface anatomy marking

Books Recommended:

1. **Gray's Anatomy for Students**
2. **Netter's Atlas of Human Anatomy**
3. **BD Chaurasia's Human Anatomy (All Volumes)**
4. **Cunningham's Manual of Practical Anatomy**
5. **Snell's Clinical Anatomy by Regions**
6. **Moore's Clinically Oriented Anatomy**
7. **Rohen's Color Atlas of Anatomy**

List of Open-Source Software/learning website:

1. https://www.physio-pedia.com/home/
2. https://anatomyzone.com/
3. https://www.kenhub.com/

Note: -

1. Dissection of upper and lower limbs & back.
2. Identification of anterolateral abdominal wall, posterior abdominal wall & thoracic cage.
3. Anatomical position & description of all bones.
4. Surface marking in cadaver and living body.
5. Radiological examination of upper limb, lower limb & other special X-rays.
6. In BRAIN: Identification of all parts and various sections at different levels.
7. In HISTOLOGY PRACTICAL: Identification of basic tissues of body.

HUMAN PHYSIOLOGY & BIOCHEMISTRY

Prerequisite: Understanding of biology, especially human systems, and basic chemistry

Course Objectives :

1. Explain normal human physiological functions and homeostatic mechanisms.
2. Understand biochemical processes and their relevance to organ function.
3. Correlate physiological and biochemical principles with clinical conditions.
4. Apply physiology and biochemistry knowledge in patient assessment and therapy planning.

2. HUMAN PHYSIOLOGY

- **Teaching Scheme:**

Teaching Scheme	L	T	P	Contact Hours	Credit	ESE Max	Practical/ Viva Max	IA Max	CSE Max	Total Mark
	4	0	4	8	12	55	80	15	20	170

SYLLABUS: -

Unit No.	Topic	Hours	Weightage
1	**General Physiology:** a) General Principles of Biophysics b) Body Fluid compartments.	**20**	**6%**
2	**Blood:** a) Composition of blood, Plasma, protein formation and their function. b) Structure, formation and functions of R.B.C c) Structure, formation and functions W.B.Cs. and Platelets. d) Coagulation and its effects on bleeding, clotting time. e) Blood groups and their significance, Rh. factor. f) Reticulo-Endothelial system, jaundice, structure and functions of spleen. g) Hemoglobin and E.S.R	**30**	**9%**

3	**Cardiovascular System:** a) Structure, properties of heart muscle and nerve supply of heart, Structure and function of arteries, arterioles, capillaries and veins b) Cardiac cycle and heart sounds. c) Cardiac output measurement & affecting factors d) Heart rate and its regulation, cardio vascular reflexes. e) Blood pressure, its regulations and physiological variations. f) Peripheral resistance, Factors controlling, Role in B.P. g) Hemorrhage. h) Changes in muscular exercise.	**30**	**9%**
4	**Respiratory System:** a) Mechanism of respiration, Intra-pleural and intra pulmonary pressure. b) Lung volumes and capacities. c) O2 and CO2 carriage and their exchange in tissues and lungs. d) Nervous chemical regulation of respiration - Respiratory Centres. Respiratory states - anoxia, asphyxia, Cyanosis, Acclimatization.	**30**	**9%**
5	**Digestive System:** a) General outline and salivary digestion b) Gastric secretion and its mechanism of secretion and functions. c) Digestion, absorption and metabolism of proteins. Structure, Secretions and Functions of Livers.	**10**	**3%**
6	**Nutrition:** a) Digestion, absorption and metabolism of carbohydrates. b) Digestion, absorption and metabolism of fats. c) Digestion, absorption and metabolism of proteins. d) Vitamins, sources, functions and resources. Balanced diet in different age groups and occupation.	**10**	**3%**
7	**Endocrines:** a) Anterior Pituitary. b) Posterior Pituitary and parathyroid. c) Thyroid. d) Adrenal Cortex e) Adrenal Medulla, thymus. Pancreas and Blood sugar regulation.	**10**	**3%**
8	**Reproductive System:** a) Sex determination and development, puberty, b) Male sex hormones and their functions, spermatogenesis. c) Female sex hormones and formation of urine, G.F.R. and Tubular functions. Pregnancy, functions of placenta and lactation	**10**	**3%**

9	**Excretory System:** a) Gross and minute structure of kidney and features of renal circulation. b) Mechanism of formation of urine, G.F.R. and Tubular function. c) Renal function tests. d) Physiology of micturition	**10**	**3%**
10	**Neuro Muscular Physiology:** **10.1 Muscle and Nerve:** a) Structure of neurones, membrane potential and generation of action potential. b) Nerve impulse conduction, saltatory conduction. c) Nerve muscular junction and drugs acting on it - Myasthenia. d) Degeneration and regeneration in peripheral nerves including Wallerian degeneration	**69**	**21%**
	10.2 Muscle: a) Type of muscles and their gross structure, stimulus, chronaxie, strength duration curve. b) Structure of Sarcomere - basis of muscle contraction, Starlings law, changes during muscle contraction. c) Electrical - Biphasic and monophasic action potentials. d) Chemical, Thermal and Physical changes, isometric and isotonic contraction. e) Motor units and its properties, clonus, tetanus, all or none law, beneficial effect. f) Nature of voluntary contraction, fatigue.		
11	**Nervous System:** a) Types and properties of receptors, types of sensations b) Structure of synapse, reflex arc and its properties, occlusion, summation, sub minimal fringe etc. c) Tracts of spinal cord. d) Descending tracts, Pyramidal and Extrapyramidal. e) Hemi section and complete section of spinal cord. Upper and lower motor neuron paralysis. f) Cerebral cortex, areas and functions - E.E.G. g) Structure - connections and function of cerebellum. h) Basal ganglia and thalamus, connections and functions. i) Reticular formation, tone, posture and equilibrium. j) Autonomic Nervous system.	**65**	**19%**

12	**Special Senses:** a) Broad features of eye, errors of refraction, lesions of visual pathways. b) Speech and its disorders. c) Ear and vestibular apparatus.	**4**	**1%**

3. BIO-CHEMISTRY

- **Teaching Scheme:**

Teaching Scheme	L	T	P	Contact Hours	Credit	ESE Max	Practical/ Viva Max	IA Max	CSE Max	Total Mark
	1	0	0	1	2	25	-	5	-	30

UNIT. No.	Topic	Hours	
13	**Cell Biology** a) Membrane structure and function. b) Function of intracellular organs in brief.	**03**	**1%**
14	**Carbohydrates** a) Chemistry, definition, classification with examples b) Function of mucopolysaccharide (in detail) c) Reducing properties of sugars of clinical and diagnosticimportance (e.g. Benedict's test, Barfoed's test, etc) d) Metabolism, digestion and absorption of carbohydrates, glycosis –aerobic and anaerobic, energetics and regulation. e) Kerbs's cycle, its energetics regulation and role of TCA cycle f) Glycogenesis, Glycogenolysis, their regulation and the role ofliver and muscle glycogen	**05**	**1%**
15	**Proteins** a) Chemistry, definition, classification of amino – acids, protein structure, effect of temperature on proteins, denaturation, coagulation, isoelectric pH and its importance. b) Metabolism, digestion and absorption, decarboxylation, deamination, transmethylation, transamination and their importance and detoxification of ammonia including urea cycle. c) Special products of amino acids, example: phenylalanine, glycine, methionine d) Neurotransmitters e) Plasma proteins including immunoglobulins f) Hemoglobin, Myoglobin, their functions, haemoglobinopathies, thalassemias	**04**	**1%**

	Structural proteins: Collagen, Elastin		

16	**Lipids** a) Chemistry, definition, classification and function Metabolism, digestion and absorption of lipids, beta oxidation of fatty acids and its energetics, regulation of fat metabolism in adipose tissue, ketone bodies formation and its utilization, cholesterol and importance of lipoproteins, lipoproteinemia with atherosclerosis – causes and prevention, fatty acid synthesis, fatty liver and obesity.	**04**	**1%**
17	**Nucleic Acids** DNA, RNA – definition, structure and function, types, genetic code, catabolism of purines – gout.	**03**	**1%**
18	**Enzymes** a) Definition, classification, factors b) Coenzymes. c) Inhibition and type of inhibitors d) Isoenzymes Clinical and therapeutic uses of enzymes	**03**	**1%**
19	**Vitamins** a) Definition, classification, functions Deficiency symptoms, RDA	**04**	**1%**
20	**Biological Oxidation** Oxidative phosphorylation, ETC	**02**	**1%**
21	**Minerals** a) Phosphate, calcium and iron (in details) b) Magnesium fluoride, Zinc, Copper, Selenium, Molybdenum c) RDA, iodine sources, absorption, transport, excretion, function and disorders Acid – base balance, water and electrolyte balance	**03**	**1%**
22	**Connective tissue** Biochemistry of connective tissue – Collagen, Glycoprotein, Proteoglycans	**03**	**1%**
23	**Nutrition and BMR, PEM, Balance diet.**	**04**	**1%**

Practical & Demonstrations:

	Title
	Nerve Muscle physiology
1	Gastrocnemius Muscle-Sciatic Nerve Prep.
2	Action Potential etc.
3	Effect of Temperature on S.M.C
4	Effect of Load on Skeletal Muscle Contraction
	Cardio-Vascular System
5	Graph
6	BP
7	Radial Pulse
8	Spirometry/Respiratory Efficiency Test
	Instruments
	Recording Body Temperature Hematology
9	Total red Cell Count
10	Total White Blood Count
11	Cells in Peripheral blood film
12	Differential WBC count
13	Absolute count, Arneth count
14	Blood grouping Bleeding time/Clotting Time, Blood, PCV, ESR
	Central Nervous System
15	Examination of sensory function
16	Examination of motor functions
17	Examination of reflexes
18	Cranial nerves I, III, IV, V, VI
19	Cranial nerve II
20	Cranial nerves VII, VIII, IX, X, XII

Course Outcome Statement

CO Number	Course Outcome Statement	Mapped Unit Numbers
CO1	Describe the structural organization and physiological functions of blood, cardiovascular, respiratory, digestive, excretory and reproductive systems in maintaining homeostasis.	1,2,3,4,5,8,9
CO2	Explain the mechanisms of neuromuscular transmission, muscle contraction, nervous regulation, endocrine control and special senses in normal body functioning.	7,10,11,12
CO3	Analyze the biochemical structure, metabolism and regulatory pathways of carbohydrates, proteins, lipids and nucleic acids in relation to cellular function.	13,14,15,16,17
CO4	Evaluate the role of enzymes, vitamins, minerals, biological oxidation and acid-base balance in health and disease conditions.	18,19,20,21
CO5	Apply the principles of nutrition, connective tissue biochemistry and basal metabolic regulation in clinical and therapeutic contexts.	6,22,23

CO–PO Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	2	1	-	-	-	-	-
CO2	2	2	1	-	-	-	-	-
CO3	3	3	2	-	-	-	-	-
CO4	3	3	2	-	-	-	-	-
CO5	3	2	1	1	-	-	-	-
Total	13	12	7	1	0	0	0	0
No. of COs mapping with POs	5	5	5	1	0	0	0	0
Average	2.6	2.4	1.4	1.0	-	-	-	-
Rounded (Average)	3	2	1	1	-	-	-	-

Teaching & Learning Methodology:

- Concept-based lectures with system-wise teaching
- Practical experiments (BP, reflexes, haemoglobin, sugar tests)
- Audio-visual aids for physiology processes
- Flowcharts and diagrams for metabolism
- Group discussions and problem-solving

Books Recommended:

1. Guyton and Hall Textbook of Medical Physiology
2. Essentials of Medical Physiology by K. Sembulingam
3. Human Physiology: An Integrated Approach by Dee Unglaub Silverthorn
4. Lehninger Principles of Biochemistry by Nelson & Cox
5. Biochemistry by U. Satyanarayana

List of Open-Source Software/learning website:

1. https://www.classcentral.com/report/best-human-physiology-courses/

PSYCHOLOGY & SOCIOLOGY

Prerequisite: None specific; general awareness of human behavior and social systems is beneficial.

COURSE OBJECTIVE:

1. To understand the fundamental psychological theories and concepts related to human behaviour and mental processes.
2. To explore the social determinants of health and illness, including the impact of culture, society, and environment.
3. To develop skills in applying psychological and sociological principles to physiotherapy practice and patient care.
4. To enhance communication and empathy skills for effective patient interaction and support.

4. PSYCHOLOGY

- **Teaching Scheme:**

Teaching Scheme	L	T	P	Contact Hours	Credit	ESE Max	Practical/ Viva Max	IA Max	CSE Max	Total Mark
	2	0	0	2	4	40	-	10	-	50

SYLLABUS: -

UNIT. No.	Topic	Hours	Weightage
1	**Introduction:** Introduction of psychology, brief history, definitions, schools of psychology	**05**	**3%**
2	**Introduction: Biological foundations of behaviour**, hereditary, environment and logical basis for development, developmental psychology (child).	**05**	**3%**
3	**Learned and unlearned behaviour:** Simple learning and conditioning, social learning. Learning disability in children (counseling for exercise)	**05**	**3%**
4	**Memory:** Phases of memory, short term storage, memory and perception thinking etc. Forgetting testimony and recall of events, memory and ageing	**05**	**3%**
5	**Perception:** Sensory basis of perception, attention and perception, observer error	**05**	**3%**
6	**Motivation and Emotions:** Approaches to motivations, emotional development, influence of early experience. Family and social influences on motivation and behavior. Thematic Apperception Test developed by A M Mankad based on Maslow theory.	**05**	**3%**
7	**Thinking and Intelligence: Learning** and problem solving, development of conceptual thinking in children. Communication, language and thinking, Measurement of intelligence, influences on intelligence, extent and consequence of individual difference.	**05**	**3%**
8	**Tests:** Wechsler scales, Standford-Binet Intelligence scale, Bender, and Gestalt - other projective test, Anxiety scale.	**05**	**3%**

9	**Personality:** Nature of personality structure and dynamics, dimensional, psycho analytical and constitutional theories of personality, measurement of personality, culture and personality patterns.	**05**	**3%**
10	**Attitude:** Nature of attitudes and beliefs including prejudice,group Influences on attitudes, attitude change, doctor-patient expectations and attitudes, prejudice formation and reduction.	**05**	**3%**
11	**Interpersonal Behavior:** Experimental analysis on social interaction, studies of the interview situation, behavior in formal and informal groups, group norms and roles. Leadership in formal and informal groups, group moral, Behavior therapy, behavior modification techniques, token economy.	**05**	**3%**
12	**Social Psychology :** nature and scope of social psychology, social interaction, psychological groups and their classification, socialization of the individual, social control (social heredits) -moves, customs, fashion, propaganda and its techniques.	**05**	**3%**
13	**Stress:** stress and responses, disorders, coping with stressors, four maxims, meditational yoga.	**05**	**3%**
14	**Pain:** Physiological and psychological factors, types of pain, pain measurement.	**05**	**3%**
15	**Psychotherapy and counselling:** Goals, Psychodynamic therapy, Humanistic therapy Behavior therapy- Relaxation training	**06**	**4%**

5. SOCIOLOGY

- **Teaching Scheme:**

Teaching Scheme	L	T	P	Contact Hours	Credit	ESE Max	Practical/ Viva Max	IA Max	CSE Max	Total Mark
	2	0	0	2	4	40	-	10	-	50

UNIT. No.	Topic	Hours	Weightage
16	**Introduction:** Meaning - Definition and scope of sociology. Its relation with anthropology, psychology, social psychology and ethics. Methods of sociology - Case study, social survey, questionnaire interview and opinion poll methods. Importance of its study with special reference to health care professionals.	**07**	**5%**
17	**Social factors in Health and disease:** The meaning of social factors, the role of social factors in health and illness.	**07**	**5%**
18	**Socialization:** Meaning and nature of socialization Primary, secondary and anticipatory socialization Agencies of socialization.	**06**	**4%**
19	**Social Groups:** Concepts of social groups influence of formal and informal groups on health and sickness. The role of primary groups and secondary groups in the hospital and rehabilitation settings.	**06**	**4%**
20	**Family:** The family Meaning and definition Functions Types Changing family patterns Influence of family on the individuals health, family and nutrition, the effects of sickness on family and psychosomatic disease and their importance to physiotherapy.	**06**	**4%**
21	**Community:** Rural community - Meaning and features - Health hazards of ruralities. Urban community - Meaning and features -Health hazards of urbanities.	**08**	**5%**
22	**Culture and Health:** Concept of culture Culture and behaviour. Cultural meaning of sickness. Culture and health Disorders	**08**	**5%**

23	**Social Change:** a) Meaning of social changes. b) Factors of social change. c) Human adaptation and social change. d) Social change and stress. e) Social change and deviance. f) Social change and health program. g) The role of social planning in the improvement of health and in rehabilitation.	**06**	**4%**
24	**Social Problems of Disabled:** Consequences of the following social problems in relation to sickness and disability remedies to prevent these problems. a) Population explosion. b) Poverty and unemployment. c) Beggary. d) Juvenile delinquency. e) Prostitution. f) Alcoholism. g) Problems of women in employement.	**10**	**8%**
25	**Social Security:** Social security and social legislation in relation to disabled.	**06**	**4%**
26	**Social Worker:** Meaning of social work. The role of a medical social worker	**06**	**4%**

Course Outcomes:

CO Number	Course Outcome Statement	Mapped Unit Numbers
CO1	Explain the fundamental psychological concepts including learning, memory, perception, motivation, intelligence, personality, stress and pain in relation to patient behavior.	1–15
CO2	Apply psychological principles and counseling techniques to enhance patient communication, coping, behavior modification and therapeutic interaction in physiotherapy practice.	3,6,10,11,13,14,15
CO3	Describe the basic concepts of sociology, socialization, social groups and family structure in relation to health and rehabilitation.	16–20

CO4	Analyze the influence of community, culture and social change on health behavior, illness patterns and healthcare delivery systems.	21,22,23
CO5	Evaluate social problems, social security measures and the role of social workers in disability rehabilitation and healthcare support systems.	24,25,26

CO–PO Mapping:

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	2	1	-	-	-	-	-
CO2	3	2	1	1	-	1	-	1
CO3	2	2	1	-	-	-	-	-
CO4	3	3	2	-	-	-	-	-
CO5	3	3	2	1	-	-	-	1
Total	13	12	7	2	0	1	0	2
No. of Cos mapping with Pos	5	5	5	2	0	1	0	2
Average	2.6	2.4	1.4	1.0	0	1.0	0	1.0
Rounded (Average)	3	2	1	1	0	1	0	1

Teaching & Learning Methodology:

- Theory lectures using case-based examples
- Role-plays to understand behavior and communication
- Group discussions and peer learning
- Reflection journals for sociological issues

Books Recommended:

1. Mangal SK. "Introduction to Psychology". New Delhi: Sterling Publishers. 25,26
2. Morgan CT, King RA. "Introduction to Psychology". New Delhi: Tata McGraw-Hill Education. 3. Mishra BK. "Psychology: The Study of Human Behaviour". New Delhi: PHI Learning.
4. Skinner CE. "Essentials of Educational Psychology". New Delhi: Surjeet Publications.
5. Page JD. "Abnormal Psychology". New Delhi: Surjeet Publications.
6. Bid D. "Sociology for Physiotherapists". New Delhi: Jaypee Publications.
7. Indrani TK. "Textbooks of Sociology for Graduate Nurses and Physiotherapy Students". New Delhi: JP Brothers.
8. Neeraja KP. "Textbook of Sociology for Physiotherapy Students". New Delhi: Jaypee

Publications.
9. Sachdeva A, Bhushan S. "An Introduction to Sociology". New Delhi: Kitab Mahal Publications.

List of Open-Source Software/learning website:

1. **https://www.physio-pedia.com/home/**
2. **https://www.sociologyguide.com/basic-concepts/**

6. EXERCISE THERAPY I & SOFT TISSUE MOBILIZATION

Prerequisite: Introductory knowledge of human anatomy and biomechanics.

COURSE OBJECTIVE:

1. Explain principles and effects of therapeutic exercise and movement techniques.
2. Demonstrate correct use of exercise equipment and therapeutic positions.
3. Perform soft tissue mobilization techniques safely and effectively.
4. Apply exercise therapy and massage for pain relief, muscle relaxation, and functional restoration

- **Teaching Scheme:**

Teaching Scheme	L	T	P	Contact Hours	Credit	ESE Max	Practical/ Viva Max	IA Max	CSE Max	Total Mark
	4	0	4	8	12	80	80	20	20	200

EXERCISE THERAPY - I

SYLLABUS: -

Unit . No.	Topic	Hours	Weightage
1	Introduction to exercise therapy.	05	2%
2	Physiological effects and uses of exercise.	05	2%
3	Definition of strength, power & work, endurance, muscle actions. Physiology of muscle performance: structure of skeletal muscle, chemical & mechanical events during contraction &relaxation, muscle fiber type, motor unit, force gradation. Causes of decreased muscle performance Physiologic adaptation to training: Strength & Power, Endurance.	05	2%
4	Use of apparatus in exercise therapy.	02	1%
5	Fundamental starting positions and its muscle work a) Derived positions and its muscle work b) Effects and uses of starting and derived positions c) Pelvic tilt	15	5%
6	Joint movement Terminology Normal Range	30	9%

	c) Axes and planes of movement d) Levers, e) Measurement of joint movements (goniometry) f) Principles of Goniometry g) Types of goniometer including Universal, bubble and gravity goniometer. h) Methods of measuring joint range of each joint		
7	a) Causes of restriction of range of movement - Distinguish between skin, muscles, b) Capsular contractures.	05	2%
8	**Movement**		
	8.1 Classification of movements	02	1%
	8.2 Active movements a) Definition, b) Types c) Tec hniques Effects and uses. .	15	5%
	8.3 Passive movements a) Causes of immobility, b) Classification of Passive movements, c) Specific definitions related to passive movements, d) Principles of giving passive movements e) types f) Techniques of applications of relaxed passive movements g) Uses h) Comparison of active and passive movements i) Techniques of mobilization for stiff joints	20	6%
9	**Group work - Criteria of selection of patients, advantages and disadvantages of group class exercises.**	05	2%
10	a) Home exercises b) Trick movements.	03	1%
11	**Suspension therapy** a) Definitions of suspension b) Point of suspension, c) Types of suspension, d) Pulleys and use of pulleys in suspension therapy, e) Application of suspension therapy either to increase the joint range or to increase muscle power.	15	5%

12	**12.1 Breathing** Mechanism of breathing (normal) Muscles of respiration Changes in thoracic cage during process of respiration	**07**	**2%**
	12.2 Breathing Exercises Diaphragmatic and segmental breathing Principles and techniques Therapeutic effects Exercises for bronchial hygiene, coughing and huffing, home program Pursed lip breathing Glossopharyngeal Breathing - significance.	**15**	**5%**
13	**Posture**: Definition, types Factors influencing posture Posture training Physiological deviations	**10**	**3%**
14	**Normal gait cycle – Phases of gait**	**07**	**2%**
15	**15.1 Walking with walking aids - Crutch walking / Walking with walker, rollator etc.** Types of crutch walking, Group of muscles responsible during crutch walking Use of parallel bars in pre-crutch walking stage Balance exercises as pre-gait training Phase of walking in terms of walking with walking aids f) Gait training Progression in crutch walking Crutch - walking on even surface, slopes, climbing up the stair case	**20**	**6%**
	15.2 Measurement of crutches and other walking aids like canes, walkers, tripods other types of crutches,.	**10**	**3**
16	Measurement of limb length Methods of measurements.	**05**	**2**
17	**Free, Active and Active assisted Exercises** a) Classification Techniques Effects and Uses Indications and Precautions Application for all the joints techniques of mobilization for stiff joints	**05**	**2**

18	**Resisted Exercises** a) Techniques b) Types of resistance c) How to measure resistance d) SET system (Heavy resisted exercises) e) Oxford method f) Delorme method g) Macqueen's method. h) DAPRE	**20**	**6**
19	**Application of resistance to develop endurance and power** a) Progression of exercises b) Angle of pull c) Types of muscle work d) Exercises - free resisted, assisted - use of gadget apparatus.	**10**	**3**
20	a) Maintenance of record and documentation volume, range of motion, resistance, limb length b) Anthropometric Measurements: Muscle girth – biceps, triceps, forearm, quadriceps, calf	**03**	**1**
21	**Mat Exercises** a) Principles b) Equilibrium / balancing exercises c) Transfer activities d) Indications and contraindications	**08**	**2**
22	**Soft tissue Mobilization**: Introduction-brief history, definition, classification. Physiological effects and therapeutic uses, contra - indications. Preparation of patient, basic points to be considered before and during massage procedure. Technique, effects and uses of each manipulation and contraindications. Specific effects of certain manipulations. Massage for arm, leg, neck and upper back face. Massage for edema, scar, tendinitis, fibrosis (tight fascia)	**75**	**22 %**

Course Outcome:

CO Number	Course Outcome Statement	Mapped Unit Numbers
CO1	Explain the mechanical principles, physiological effects and therapeutic applications of exercise therapy in restoration of physical function.	1,2,3
CO2	Apply the principles of joint movements, goniometry, active and passive movements, suspension therapy and gait training in clinical practice.	6,7,8,11,14,15,17
CO3	Analyze the effects of resisted exercises, endurance training, posture correction and breathing exercises on muscle performance and functional capacity.	12,13,18,19
CO4	Demonstrate the use of therapeutic gymnasium apparatus, mat exercises, group exercises and measurement techniques in exercise therapy.	4,5,9,10,16,20,21
CO5	Evaluate the principles, techniques, indications and contraindications of soft tissue mobilization and massage in rehabilitation settings.	22

CO–PO Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	2	1	-	-	-	-	-
CO2	3	3	2	1	-	-	-	-
CO3	3	3	2	-	-	-	-	-
CO4	3	2	1	1	-	1	-	-
CO5	3	3	2	1	-	-	-	1
Total	14	13	8	3	0	1	0	1
No. of COs mapping with POs	5	5	5	3	0	1	0	1
Average	2.8	2.6	1.6	1.0	-	1.0	-	1.0
Rounded (Average)	3	3	2	1	-	1	-	1

Teaching & Learning Methodology:

- Demonstration of therapeutic exercises
- Supervised hands-on lab/practical sessions
- Use of therapeutic equipment and models
- Peer practice, gait/posture analysis
- Case-based teaching

Books Recommended:

1. **Principles of Exercise Therapy – M. Dena Gardiner**
2. **Soft Tissue Release: A Practical Handbook for Physical Therapists – Mary Sanderson**
3. **Soft Tissue and Trigger Point Release – Jane Johnson**
4. **Spinal Manual Therapy: An Introduction to Soft Tissue Mobilization – Robert A. Makofsky**
5. **Trail Guide to the Body – Andrew Biel**

List of Open-Source Software/learning website:

1. https://www.physio-pedia.com/home/

7. BIOMEDICAL PHYSICS

Prerequisite: Basic physics and mathematics understanding

COURSE OBJECTIVE:

1. Explain fundamental physical principles relevant to physiotherapy.
2. Understand the working of therapeutic and diagnostic physiotherapy equipment.
3. Apply physical principles to ensure safe and effective physiotherapy procedures.

- **Teaching Scheme:**

Teaching Scheme	L	T	P	Contact Hours	Credit	**ESE Max**	**Practical/ Viva Max**	**IA Max**	**CSE Max**	**Total Mark**
	2.5	0	1	3.5	6	80	40	20	10	150

7.1 General Physics (Mechanics):

SYLLABUS:

Unit No.	**Topic**	**Hours**	**Weightage (%)**
1	Basic Concepts Centre of Gravity (COG) Line of Gravity (LOG) Planes and axis of motion (mechanical and anatomical	05	4%
2	Principles of stability Base of Support (BOS) Height COG and LOG Mass of body The impact of forces Friction Segmentation Visual factors Psychological and Physiological factors	05	4%

3	**Force, Motion and Work** a) Definition, unit, resolution of forces. b) Magnitude of force c) Centripetal and Centrifugal force. d) Point of application of force e) Direction of force and Resistance f) Arm of lever g) Perpendicular distance h) Composite effect of two or more forces i) Methods of determining the components of force and work, j) Principles of motion: k) Causes of motion, l) Motions experienced by the body, m) Newton's laws of motion. n) Types of motion, direction and quantity of motion, o) Speed, p) Velocity, q) Work, r) Energy and Power s) Movements of body as a whole and of segments of body in air, water and on surface	10	8%
4	a) Force of gravity b) Centre of gravity c) Line of gravity and base	02	1%
5	**Friction** a) Force of friction b) Static and dynamic friction c) Limit of friction d) Friction a necessity and evil.	04	3%
6	**Musculoskeletal mechanics** a) Anatomical levers b) Angle of pull c) Mechanical advantage d) Wheel and axle e) Pulley f) Fixed and movable pulley g) Pendulums h) Elasticity i) Spring - properties of spring and application	08	6%

7	**Fluid mechanics** a) Viscosity- definition b) Coefficient of viscosity c) Streamline and turbulent flow d) Effect of temperature and pressure on viscosity e) Principle of Archimedes f) Laws of floatation g) Hydrostatic pressure h) Buoyancy i) Surface tension j) Excess pressure in spherical liquefied drop k) Physical property of water	08	6%
8	**Heat** a) Heat transfer b) Properties of thermal radiation c) Specific heat d) Thermal capacity e) Energy conversion f) I^{st} and II^{nd} law of thermodynamics g) Physical effects of heat – expansion, evaporation, thermionic emission etc. h) Concept of heat and temperature, measurement of heat thermometry i) Thermometer. j) Method of measuring body temperature. k) Human body temperature. l) Biophysics of superficial heat and cold	04	3%
9	**Sound** a) Origin of sound b) Characteristics of sound waves c) Velocity of sound in air and water d) Effect of temperature, pressure, density of medium, humidity, wind on sound waves. e) Frequencies of sound waves f) Infrasonic, Normal hearing band and Ultrasonics g) Reflection, Refraction and Attenuation of Sound waves h) Acoustic Impedance i) Interference of sound waves j) Resonance, Echo, Doppler effect k) Fresnel and Fraunhofer zones in Ultrasonics	04	3%

10	**Fundamentals of Low frequency currents** a. Production of electricity, mains supply, b. A.C. currents & Faradic type current c. D.C. currents – Types d. Fundamentals of electrical charges e. Static electricity f. Physics of direct currents g. Ohm's law h. Conductors i. Capacitors j. Rheostats k. Potentiometers l. Ammeters m. Oscilloscopes n. Types of electrodes o. Skin resistance p. Electrodes - Types & significance q. Gels	**10**	**7%**
11	**Fundamentals of High frequency currents** a. Magnetism b. E.M.F. Conduction c. Lenz's Law d. Transformers and its types. e. Thermionic valves. f. Semi–conductors: types, transistors g. Electronic circuits– oscillators, pulse generators	**05**	**4%**
12	**Electromagnetic spectrum** a. Electromagnetism and its production b. Physical properties of electromagnetic radiations c. Electromagnetic spectrum d. Laws of transmission- reflection, refraction, absorption, attenuation e. Grothus' law f. Cosine law g. Inverse square law h. Practical application of all Laws i. Uses of Electromagnetic waves j. Environmental currents and fields – risk factors on prolonged exposure to electromagnetic field	**08**	**6%**

13	**Production, Physical principles, Panel diagram, testing of apparatus** a) S.W.D. b) Ultra-sound c) U.V.R. d) I.F.T. and Beat frequency currents e) I.R. f) LASER (no panel diagram).	**20**	**15%**
14	**Light** a) Emission and absorption spectra b) Electromagnetic spectrum c) Laws of transmission, reflection, refraction, absorption. d) Internal reflection and fibre optics e) Interference of light. f) LASER and its application	**08**	**6%**
15	**Therapeutic continuous / interrupted direct currents & their various wave forms, A.C. current**	**05**	**4%**
16	**Bio-physics of superficial heat & cold (Only basic principles)** a) Home remedies, b) Paraffin wax bath c) Whirl pool d) Contrast bath e) Hydro-collator hot packs / cold packs f) Cryotherapy	**25**	**19%**
17	a) Electric Shock b) Earth Shock	**02**	**1%**

Course Outcome:

CO Number	Course Outcome Statement	Mapped Unit Numbers
CO1	Explain the principles of mechanics including force, motion, work, stability, levers, friction and fluid mechanics in relation to human movement and physiotherapy practice.	1–7
CO2	Analyze the physical principles of heat, sound and light and their therapeutic applications in physiotherapy modalities.	8,9,12,14,16
CO3	Describe the fundamentals of low and high frequency currents, electromagnetic spectrum and laws governing transmission and absorption in electrotherapy.	10,11,12,15
CO4	Apply the principles of electricity and electronics in understanding the production, testing and safe use of electrotherapy equipment.	13,16,17
CO5	Evaluate the structure and function of basic electrical and electronic components including capacitors, transformers, valves and transistors in physiotherapy instruments.	10,11

CO–PO Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	2	1	-	-	-	-	-
CO2	3	3	2	-	-	-	-	-
CO3	2	2	1	-	-	-	-	-
CO4	3	2	1	1	-	-	-	1
CO5	3	3	2	-	-	-	-	-
Total	13	12	7	1	0	0	0	1
No. of COs mapping with POs	5	5	5	1	0	0	0	1
Average	2.6	2.4	1.4	1.0	0	0	0	1.0
Rounded (Average)	3	2	1	1	0	0	0	1

Teaching & Learning Methodology:

- Conceptual lectures on physical principles
- Practical demonstrations using physiotherapy equipment
- Use of analogies and simulations
- Diagrams and interactive discussions

Books Recommended:

1. **Basic Biophysics for Physiotherapy – Dr. P. Choudhary**
2. **Textbook of Biophysics – R. N. Roy**
3. **Biophysics – V. B. Bhatia**
4. **Essentials of Biophysics – P. Narayanan**
5. **Physics for Biology and Medicine – Paul Davidovits**

List of Open-Source Software/learning website:

1. https://www.physio-pedia.com/home/

8. PROFESSIONAL PRACTICE & ETHICS
(Not for University Exam)

Prerequisite: None specific; interest in healthcare practice and conduct.

COURSE OUTCOMES:

1. Understand ethical principles, professional values, and legal aspects of physiotherapy.
2. Demonstrate professional behavior, bedside manners, and effective communication skills.
3. Recognize the importance of professional dress code, conduct, and responsibilities.

- **Teaching Scheme:**

Teaching Scheme	L	T	P	Contact Hours	Credit	ESE Max	Practical/ Viva Max	IA Max	CSE Max	Total Mark
	0.5	0	0	0.5	1	-	-	-	-	-

SYLLABUS:-

Sr, No.	Topic	Hours
1	Introduction to the history of physiotherapy	**03**
2	Orientation to the curriculum, clinical areas and geographical location	**05**
3	Concept of morality & ethics	**06**
4	Concept of professionalism and professional dress code	**05**

Course Outcomes:

CO Number	Course Outcome Statement	Mapped Unit Numbers
CO1	Describe the history and development of physiotherapy profession and its role in healthcare delivery.	1
CO2	Explain the concepts of morality, ethics and professional responsibilities in physiotherapy practice.	3
CO3	Apply principles of professional behavior, dress code and institutional orientation in academic and clinical settings.	2,4
CO4	Analyze the importance of effective communication and bedside manners in interactions with patients and healthcare team members.	2,3
CO5	Evaluate ethical dilemmas and professional conduct scenarios in accordance with standards of physiotherapy practice.	3,4

CO–PO Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	-	-	-	1	-	-	-	1
CO2	-	-	-	1	-	-	-	3
CO3	-	-	-	1	-	1	-	2
CO4	-	-	-	1	-	1	-	2
CO5	-	-	-	1	-	-	-	3
Total	0	0	0	5	0	2	0	11
No. of COs mapping with POs	0	0	0	5	0	2	0	5
Average	-	-	-	1.0	-	1.0	-	2.2
Rounded (Average)	-	-	-	1	-	1	-	2

Teaching & Learning Methodology:

- Lectures with real-world clinical examples
- Discussion of case laws and ethical dilemmas
- Role-play and debates on professionalism

9. COMPUTER APPLICATIONS
(Not for University Exam)

Prerequisite: Basic familiarity with operating a computer is helpful.

COURSE OBJECTIVES:

1. Understand fundamental concepts of computers and their applications in healthcare.
2. Utilize software tools for documentation, research, and clinical data processing.
3. Apply computer knowledge to physiotherapy-related technologies and research tools.

- **Teaching Scheme:**

Teaching Scheme	L	T	P	Contact Hours	Credit	ESE Max	Practical/ Viva Max	IA Max	CSE Max	Total Mark
	0.5	0	0.5	1	1.5	-	-	-	-	-

Sr. No.	Topic	Hours
1	**Introduction to data processing:** a) Features of computers. What are Hardware and Software? b) Advantages of using computers. Role and uses of computers. What is data processing? c) Application areas of computers and common activities in data processing. Types of data processing, characteristics of application.	**10**
2	**Hardware concepts:** a) Architecture of computers – characteristics of discs, tapes, terminals, printers, network. b) Types of storage devices. c) Concept of damage. Application of networking concept of PC system care, floppy care, data care etc.	**10**
3	**Concept of software** a) Classification of software: System software. Application of software, Operating System, Computer System, computer virus, precautions against viruses, dealing with viruses, computers in medical electronics.	**08**
4	**Basic anatomy of Computers:** a) Principles of programming: Computer application – principles in scientific research, work processing, medicine, libraries, museum, education, information system. b) Data processing Computers in Physical Therapy – Principles of EMG, Exercise testing equipment, Laser.	10

Course Outcomes:

CO Number	Course Outcome Statement	Mapped Unit Numbers
CO1	Describe the fundamental concepts of computers including data processing, hardware, software and storage devices.	1,2,3
CO2	Explain the architecture and functioning of computer systems, operating systems and networking concepts relevant to healthcare settings.	2,3
CO3	Apply basic principles of programming and data processing in academic, research and clinical documentation activities.	4
CO4	Analyze the role of computers and medical electronics in physiotherapy applications such as EMG, exercise testing and laser systems.	3,4
CO5	Evaluate safe practices related to computer usage including virus prevention, data care and system maintenance in professional environments.	2,3

CO–PO Mapping:

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	2	1	-	-	-	-	-
CO2	2	2	1	-	-	-	-	-
CO3	3	2	1	1	-	-	-	-
CO4	3	3	2	-	-	-	-	-
CO5	3	3	2	1	-	-	-	1
Total	13	12	7	2	0	0	0	1
No. of COs mapping with POs	5	5	5	2	0	0	0	1
Average	2.6	2.4	1.4	1.0	-	-	-	1.0
Rounded (Average)	3	2	1	1	-	-	-	1

Teaching & Learning Methodology:

- Hands-on lab sessions
- Instructor-led step-by-step software training
- Assignments involving document/report creation
- Presentations using MS PowerPoint or equivalent

10. ENGLISH
(Not for University Exam)

Prerequisite: High school level English grammar and vocabulary.

COURSE OBJECTIVES:

1. Improve English language skills for academic and clinical communication.
2. Develop effective reading, writing, and verbal communication for professional use.
3. Apply English proficiency in patient interaction and professional documentation.

- **Teaching Scheme:**

Teaching Scheme	L	T	P	Contact Hours	Credit	ESE Max	Practical/ Viva Max	IA Max	CSE Max	Total Mark
	0.5	0	0	0.5	1	-	-	-	-	-

SYLLABUS: -

Sr. No.	Topic	Hours
1	**Introduction:** a) Study techniques b) Organization of effective note taking and logical processes of analysis and synthesis. c) Use of the dictionary d) Enlargement of vocabulary e) Effective diction	**03**
2	**Applied Grammar:** a) Correct usage b) The structure of sentences c) The structure of paragraphs d) Enlargement of vocabulary	**03**
3	**Written composition:** a) Precise writing and summarizing b) Writing of Bibliography c) Enlargement of vocabulary	**03**
4	**Reading and Comprehension:** Review of selected materials and express oneself in one's words	**03**

	and enlargement of vocabulary.	
5	**The study of various forms of composition:** Paragraph, essay, letter, summary, practice in writing	**03**
6	**Verbal Communication:** Discussions and summarization, debates, oral reports, use in teaching.	**04**

Course Outcome:

CO Number	Course Outcome Statement	Mapped Unit Numbers
CO1	Describe the fundamental components of English language including grammar, vocabulary building and sentence structure.	1,2
CO2	Explain techniques of effective reading, comprehension and note-taking for academic learning.	1,4
CO3	Apply principles of precise writing, summarizing and structured composition in academic and professional contexts.	3,5
CO4	Analyze written texts and express ideas logically through organized paragraphs and essays.	2,4,5
CO5	Evaluate verbal communication skills including discussions, debates, oral reports and presentations for professional use.	6

CO-PO Mapping:

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-
CO3	-	-	-	1	-	1	-	-
CO4	-	-	-	1	-	1	-	-
CO5	-	-	-	1	-	1	-	1
Total	0	0	0	3	0	3	0	1
No. of COs mapping with POs	0	0	0	3	0	3	0	1
Average	-	-	-	1.0	-	1.0	-	1.0
Rounded (Average)	-	-	-	1	-	1	-	1

Teaching & Learning Methodology:

- Reading and comprehension exercises
- Speaking practice and mock interviews
- Written assignments, formal letter/report writing
- Audio-visual aids and communication games

11.ENVIRONMENTAL SCIENCES
(Not for University Exam)

Prerequisite: General awareness of environmental concerns

COURSE OBJECTIVES:

1. Understand basic concepts of environment and ecology.
2. Recognize environmental issues affecting health and rehabilitation.
3. Apply environmental awareness in sustainable physiotherapy practice.

- **Teaching Scheme:**

Teaching Scheme	L	T	P	Contact Hours	Credit	ESE Max	Practical/ Viva Max	IA Max	CSE Max	Total Mark
	1	0	0	1	2	-	-	-	-	-

SYLLABUS:-

Sr. No.	Topic	Hours
1	**Multidisciplinary nature of environmental studies** a) Definition, scope and importance b) Need for public awareness	**03**
2	**Natural Resources:** **Renewable and non-renewable resources:** Natural resources and associated problems. a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people. b) Water resources: Use and over-utilization of surface and ground water, Floods, drought, conflicts over water, dams-benefits and problems. c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of	**05**

	modern agriculture, fertilizer-pesticide problems, water Logging, salinity, case studies. e) Energy resources: Growing energy needs, renewable and nonrenewable energy sources, use of alternate energy sources. Case studies.	
3	**Ecosystems** a) Concept of an ecosystem. b) Structure and function of an ecosystem. c) Producers, consumers and decomposers. d) Energy flow in the ecosystem. e) Ecological succession. f) Food chains, food webs and ecological pyramids. g) Introduction, types, characteristic features, structure and function of the Following ecosystem :- ● Forest ecosystem ● Grassland ecosystem ● Desert ecosystem Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)	**05**
4	Biodiversity and its conservation a) Introduction –Definition: genetic, species and ecosystem diversity. b) Biogeographical classification of India c) Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic d) and option values e) Biodiversity at global, National and local levels. f) India as a mega - diversity nation g) Hot-sports of biodiversity. h) Threats to biodiversity: habitat loss, poaching of wildlife, man- wildlife conflicts i) Endangered and endemic species of India Conservation of biodiversity: In situ and Ex-situ conservation of biodiversity	**05**
5	**Environmental Pollution** a) Definition, Cause, effects and control measures of: - b) Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, nuclear hazards c) Solid waste Management: Causes, effects and control measures of urban and Industrial wastes. d) Role of an individual in prevention of pollution. e) Pollution case studies. Disaster management: floods, earthquake, cyclone and landslides	**05**

	g) Environment Protection Act. h) Air (Prevention and Control of Pollution) Act. i) Water (Prevention and control of Pollution) Act j) Wildlife Protection Act k) Forest Conservation Act l) Issues involved in enforcement of environmental legislation. m) Public awareness.	**05**
6	**Human Population and the Environment** a) Population growth, variation among nations. b) Population explosion – Family Welfare Program. c) Environment and human health. d) Human Rights. e) Value Education. f) HIV/AIDS. g) Women and Child Welfare. h) Role of Information Technology in Environment and human health. i) Case Studies.	**05**
7	**Field work** a) Visit to a local area to document environmental assets river/ forest/grassland/hill/mountain b) Visit to a local polluted site-Urban/Rural/Industrial/Agricultural c) Study of common plants, insects, birds. Study of simple ecosystems-pond, river, hill slopes, etc	**05**

Course Outcome:

CO Number	Course Outcome Statement	Mapped Unit Numbers
CO1	Describe the scope, importance and multidisciplinary nature of environmental studies and public awareness.	1
CO2	Explain the classification, utilization and associated problems of renewable and non-renewable natural resources.	2
CO3	Analyze environmental impacts of exploitation of forest, water, mineral, food and energy resources.	2
CO4	Apply principles of sustainable development in addressing environmental issues and resource management.	1,2
CO5	Summarize environmental problems and possible solutions for ecological balance and sustainable growth.	1,2

CO–PO Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-
CO3	-	2	1	-	-	-	-	-
CO4	3	2	1	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-
Total	3	4	2	0	0	0	0	0
No. of COs mapping with POs	1	2	2	0	0	0	0	0
Average	3.0	2.0	1.0	0	0	0	0	0
Rounded (Average)	3	2	1	0	0	0	0	0

Teaching & Learning Methodology:

- Thematic lectures on sustainability and health
- Field assignments, eco-surveys
- Group projects on waste/recycling/health link
- Poster-making and awareness presentation