COURSE- BIOMECHANICS AND KINESIOLOGY

COURSE CODE – 06ABPTR17213 **CREDITS – 4**

UNIT I. BIOMECHANICS OF THE PERIPHERAL JOINTS OF UPPER LIMB

The shoulder complex: Structure and components of the shoulder complex and their integrated function.The elbow complex: Structure and function of the elbow joint humeroulnar and humeroradialarticulations, superior and inferior radioulnar joints; mobility and stability of the elbow complex; the effects of immobilization and injury.The wrist and hand complex: Structural components and functions of the wrist complex; structure of the hand complex. Prehension, functional position of the wrist and hand.

UNIT II. BIOMECHANICS OF THE PERIPHERAL JOINTS OF LOWER LIMB

The hip complex: structure and function of the hip joint; hip joint pathology- arthrosis, fracture, bony abnormalities of the femur:The knee complex: structure and function of the knee joint – tibiofemoral joint and patellofemoral joint; effects of injury and disease. The ankle and foot complex.: structure and function of the ankle joint, subtalar joint talocalcaneonavicular joint, transverse tarsal joint, tarsometatarsal joints, metatarsophalangeal joints, interphalangeal joints, structure and function of the plantar arches, muscles of the ankle and footDeviations from normal structure and function – Pes Planus and Pes Cavus.

UNIT III. BIOMECHANICS OF THE VERTEBRAL COLUMN

General structure and functionRegional structure and function – Cervical region, thoracic region, lumbar region, sacral region.Muscles of the vertebral column.General effects of injury and aging.

UNIT IV. ANALYSIS OF POSTURE AND GAIT

Static and dynamic posture, postural control, kinetics and kinematics of posture, idealposture, analysis of posture, effects of posture on age, pregnancy, occupation and recreation.General features of gait, gait initiation, kinematics and kinetics of gait, energy requirements, kinematics and kinetics of the trunk and upper extremities in relation to gait, stair case climbing and running, effects of age, gender, assistive devices, disease, muscle weakness, paralysis, asymmetries of the lower extremities, injuries and malalignments in gait

COURSE: HUMAN PHYSIOLOGY - II

CODE: 06ABPTR17212 **CREDITS: 4**

UNIT: I RENAL SYSTEM

Introduction: Physiological anatomy and Functions of kidneys... Nephrons – cortical and juxtamedullary Juxta-glomerular apparatus. Glomerular membrane. Renal blood flow and its regulation Mechanism of Urine Formation: Glomerular Filtration: GFR – normal value and factors affecting. Renal clearance. Inulin clearance. Creatinine clearance. Tubular Reabsorption: Reabsorption of Na+, glucose, HCO3-, urea and water. Renal tubular transport maximum. Glucose clearance: TmG. Renal threshold for glucose. Tubular Secretion: Secretion of H+ and K+. PAH clearance. Mechanism of concentrating and diluting the Urine: Counter-current mechanism. Regulation of water excretion. Diuresis. Diuretices Micturition: Mechanism of micturition. Cystometrogram, types of bladder.

Acid-Base balance. Artificial Kidney: Principle of hemodialysis. Skin and temperature regulation.

UNIT II – REPRODUCTIVE SYSTEM

Introduction: Physiological anatomy reproductive organs. Sex determination. Sex differentiation. Disorders. Male Reproductive System: Functions of testes. Pubertal changes in males. Spermatogenesis. Testosterone: action. Regulation of secretion. Semen. .Female Reproductive System: Functions of ovaries and uterus. Pubertal changes in females. Oogenesis. Hormones: estrogen and progesterone-action. Regulation of secretion. Menstrual Cycle: Ovarian and Uterine cycle. Hormonal basis. Menarche. Menopause.

Pregnancy: Pregnancy tests. Physiological changes during pregnancy Functions of placenta. Lactation. Contraception methods

UNIT III – ENDOCRINE SYSTEM

Introduction: Major endocrine glands. Hormone: classification, mechanism of action. Functions of hormones .Pituitary Gland: Anterior Pituitary and Posterior Pituitary hormones: Secretory cells, action on target cells, regulation of secretion of each hormone and their

Disorders,Pituitary-Hypothalamic Relationship. Thyroid Gland: Thyroid hormone, secretory cells, synthesis, storage, action and regulation of secretion. Disorders: Myxedema, Cretinism, Grave's disease. Parathyroid hormones: secretory cell, action, regulation of secretion. Disorders: Hypoparathyroidism. Hyperthyroidism, tetany. Calcium metabolism and its regulation. Adrenal Gland: Adrenal Cortex: Secretory cells, synthesis, And action, regulation of secretion of Aldosterone, Cortisol, and Androgens. Disorders: Addison's disease, Cushing's syndrome, Conn's syndrome, Adrenogenital syndrome.

Adrenal Medulla: Secretory cells, action, regulation of secretion of adrenaline and noradrenaline. Disorders: Phoechromocytom Endocrine Pancreas: Secretory cells, action, regulation of secretion of insulin and glucagon. Glucose metabolism and its regulation. Disorder: Diabetes mellitus.Calcitriol, Thymus and Pineal gland. And Local Hormones.

UNIT IV- NERVOUS SYSTEM

Introduction: Organization of CNS – central and peripheral nervous system. Functions of nervous system. Synapse: Functional anatomy, classification, Synaptic transmission. Properties. Sensory Mechanism: Sensory receptors: function, classification and properties. Sensory pathway: The ascending tracts – Posterior column tracts, lateral spinothalamic tract and the anterior spinothalamic tract – their origin, course, termination and functions. The trigeminal pathway. Sensory cortex. Somatic sensations: crude touch, fine touch, tactile localization, tactile discrimination, stereo gnosis, vibration sense, kinesthetic sensations. Pain sensation: mechanism of pain. Cutaneous pain –slow and fast pain, hyperalgesia. Deep pain. Visceral pain – referred pain. Gate control theory of pain. Tabesdorsalis, sensory ataxia. Motor Mechanism: Motor Cortex. Motor pathway: The descending tracts – pyramidal tracts, extrapyramidal tracts – origin, course, termination and functions. Upper motor neuron and lower motor neuron. Paralysis, monoplegia, paraplegia, hemiplegia and quadriplegia. Reflex Action: components, classification and Properties. Monosynaptic and polysynaptic reflexes, superficial reflexes, deep reflexes.Stretch reflex– structure of muscle spindle, pathway, higher control and functions. Inverse stretch reflex. Muscle tone – definition, and properties hypotonia, atonia and hypertonia. UMNL and LMNL

Spinal cord Lesions: Complete transection and Hemisection of the spinal cord.Cerebellum: Functions. Cerebellar ataxia.Posture and Equilibrium: Postural reflexes – spinal, medullary, midbrain and cerebral reflexes. Gait and its Types.Thalamus and Hypothalamus: Nuclei. Functions. Thalamic syndrome.

Reticular Formation and Limbic System: Components and Functions.Basal Ganglia: Structures included and functions. Parkinson's disease.Cerebral Cortex: Lobes. Brodmann's areas and their functions. Higher functions of cerebral cortex – learning, memory and speech. EEG: Waves and features. Sleep: REM and NREM sleep.CSF: Formation, composition, circulation and functions. Lumbar puncture and its significance. Blood brain barrier. Hydrocephalus. ANS: Features and actions of parasympathetic and sympathetic nervous system, cranial nerves structure, course, action of cranial nerves .

UNIT V: SPECIAL SENSES

Vision: Introduction: Functional anatomy of eye ball. Functions of cornea, iris, pupil, aqueous humor – glaucoma, lens – cataract, vitreous humor, rods and cones. Photopic vision. Scotopic vision. Visual Pathway and the effects of lesions, Refractive Errors: myopia, hypermetropia, presbyopia and astigmatism. Visual Reflexes: Accommodation, Pupillary and Light. Visual acuity and Visual field. Light adaptation. Dark adaptation. Color vision – color blindness. Nyctalopia.Audition: Physiological anatomy of the ear. Functions of external ear, middle ear and inner ear. Structure of Cochlea and organ of corti. Auditory pathway. Types of Deafness. Tests for hearing.Taste: Taste buds. Primary tastes. Gustatory pathway. Smell: Olfactory membrane. Olfactory pathway. Vestibular Apparatus: Crista ampullaris and macula. Functions. Disorders.

UNIT VI - PHYSIOLOGY OF EXRECISE

Effects of acute and chronic exercise on . O2 transport Muscle strength/power/endurance B.M.R. /R.Q.Hormonal and metabolic effectCardiovascular system Respiratory system. Body fluids and electrolyte Effect of gravity / altitude /acceleration / pressure on physical parametersPhysiology of Age

UNIT VII – APPLIED PHYSIOLOGY

More detailed study of the physiology and practical applications of the following selected topics with emphasis on aspects, which should help in understanding the nature and treatment of

common clinical situations of interest in Physiotherapy.Muscles And Nervous System Functions Peripheral nervous system, neuromuscular transmission, Types of nerve fibers. Action potential, Strength-duration curve, ECG, EMG, VEP,Degeneration and regeneration of nerve, Reactions of denervations. Synaptic transmission, Stretch reflex- Mechanism and factors affecting it.Posture, Balance and Equilibrium/Coordination of voluntary movement. Voluntary motor action, clonus, Rigidity, incoordination. Special senses- Vision, taste, hearing, vestibular, Olfaction Sympathetic and Parasympathetic regulation, Thermoregulation. Metabolic Functions - Diabetes Mellitus, Physiological basis of Peptic Ulcer, Jaundice, GIT disorders and Dietary fiber, Thyroid functions, Vitamins deficiency. .(L,A,Ap)Endocrine functions - TSH,T3, T4 and Testosteron, Growth harmone, vitamin D3.

COURSE: SOCIOLOGY

CODE: 06ABPTR17114 **CREDIT: 4**

UNIT I INTRODUCTION

Meaning- Definition and scope of sociology. Its relation to Anthropology, Psychology, Social Psychology. Methods of Sociological investigations- Case study, social survey, questionnaire, Interview and opinion poll methods. Importance of its study with special reference to Health Care

UNIT II: SOCIAL FACTORS IN HEALTH AND DISEASE.

Meaning and role of social factors in health and illness.

UNIT III: SOCIALIZATION

Meaning and nature of socialization. Primary, Secondary and Anticipatory socialization. Agencies of socialization.

UNIT IV SOCIAL GROUP

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.

UNIT V FAMILY

The family, meaning and definitions, Functions of types of family. Changing family patterns. Influence of family on the individuals health, family and nutrition, the effects of sickness in the family and psychosomatic disease and their importance .

VI:COMMUNITY:

Rural community: Meaning and features –Health hazards of ruralities, health hazards to tribal community. Urban community: Meaning and features- Health hazards of urbanities.

UNIT VII -CULTURE AND HEALTH

Concept of Health andCulture.Culture and Health .Culture and Health Disorders .

UNIT VIII:SOCIAL CHANGE:

Meaning of social changes, Factors of social changes.Human adaptation and social change and stress. Social change and deviance. Social change and health programe The role of social planning in the improvement of health and rehabilitation.

UNIT IX - SOCIAL PROBLEMS OF DIFFERENTLY ABLED

Consequences of the following social problems in relation to sickness and disability, remedies to prevent these problems. Population explosion . Poverty and unemployment BeggaryJuvenile delinquency.Prostitution.Alchoholism.Problems of women in employment .Geriatric problems and Problems of underprivileged. .

UNIT X: SOCIAL SECURITY

Social security and social legislation in relation to the disabled

UNIT XI: SOCIAL WORKER

The role of a Medical Social Worker. Meaning of Social Work

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SCOURSE: HUMAN ANATOMY – II

CODE: 06ABPTR17211 **CREDITS: 4**

\UNIT: I LOWER EXTREMITY

Osteology: Hip bone, femur, tibia, fibula, patella, tarsals, metatarsals and phalanges.

Soft parts: Gluteal region, front and back of the thigh (Femoral triangle, femoral canal and inguinal canal), medial 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 foot, skin of foot.Joints: Hip Joint, Knee joint, Ankle joint, joints of the foot.

UNIT II: TRUNK AND PELVIS

Osteology Cervical, thoracic, lumbar, sacral and coccygeal vertebrae and ribs.Soft tissue: Pre and Para vertebral muscles, intercostal muscles, anterior abdominal wall muscles, Inter-vertebral disc. Pelvic girdle and muscles of the pelvic floor.

UNIT III: HEAD AND NECK

Osteology: Mandible and bones of the skullSoft parts: Muscles of the face and neck and their nerve and blood supplytriangles of the neckGross anatomy of eyeball, extra ocular muscles, nose, ears and tongue.

UNIT IV- NEURO ANATOMY

Organization of Central Nervous system - Spinal nerves and Autonomic nervous system mainly pertaining to cardiovascular, respiratory and Urogenital systemCranial nerves, Peripheral nervous system and Peripheral nerve, neuromuscular junction. Sensory end organs and Central Nervous System. Spinal segments and areas, Brain Stem and Cerebellum.Inferior colliculi, Superior Colliculi,Thalamus, Hypothalamus,CorpusstriatumCerebral hemisphere, Lateral ventricles,Blood supply to brain.Basal Ganglia, The pyramidal system Pons, medulla, extra pyramidal systems.Anatomical integration.

UNIT:V ENDOCRINE GLANDS

Position, shape, size, function, blood supply and nerve supply of the following glands: Hypothalamus and pituitary gland, thyroid glands, parathyroid glands, Adrenal glands, pancreatic islets, ovaries and testes, pineal glands, thymus.

UNIT:VI EMBRYOLOGY

Ovum, Spermatozoa, fertilization and formation of the Germ layers and their derivations.(K,)
Development of skin, Fascia, blood vessels, lymphatics.Development of bones, axial and appendicular skeleton and muscles.Neural tube, brain vessels and spinal cord.
Development of brain and brain stem structures.