Tripura University

(A Central University)

Suryamaninagar

West Tripura

Syllabus for

Four Years Undergraduate Programme Subject:

Human Physiology

(As per NEP-2020)

6th Semester (Major)

Revised as on October, 2025

SEMESTER-VI
Paper-13 (Theory)
HP-601C
Total Mark = 100 (IA = 40 + ESE = 60) Credit = 04

Unit-I (Nervous System-I)

1. Structural organization of different parts of brain and spinal cord. Nerve roots.
2. Brain ventricle concept, CSF composition, formation, circulation and functions. Blood Brain Barrier, Lumber puncture, Cerebral circulation-course, factors affecting. cranial nerves-functions
3. Somato-sensory system: Ascending (sensory) tracts-carrying touch, pain, temperature sensation. Referred pain. Pain inhibiting system, opioids.
4. Motor system: Descending tracts (pyramidal and extra pyramidal systems), Upper motor and lower motor neurons and their lesions, Babinski sign.

Unit-II (Nervous System-II)

1. Functions of spinal cord with special reference to functional changes following hemi section and complete section at different levels of spinal cord. Brown sequard syndrome. Tabes Dorsalis.
2. Cerebellum: Histology, nuclei, connections and functions. Cerebellar diseases.
3. Basal ganglia: structure connections and functions, Parkinson's Disease.
4. Components and functions of Pons Medulla Reticular formation.

Unit-III (Nervous System-III)

1. Stretch reflex: muscle spindle-structure, connections, and function- special reference to muscle tone. Role of different parts of brain in muscle tone maintenance. Spasticity, Rigidity.
2. Maintenance of posture & equilibrium: vestibular apparatus, different postural reflexes-righting reflex. Romberg's sign.
3. Cerebral cortex: Histology, different lobes, areas and their functions.
4. Method of Localization of the functions of cerebral cortex.

Unit-IV (Nervous System-IV)

1. Thalamus: Nuclei, functions. Thalamic animal. Thalamic syndrome.
2. Hypothalamus: Nuclei, functions: Feeding & satiety, Thermoregulation etc.
3. Autonomic Nervous system (ANS): Classification, structural and functional organizations.
4. Neurotransmitter in ANS.

Paper-14A (Theory)

HP-602C- Special senses

Total Mark = 60 (IA = 24 + ESE = 36) Credit = 02

Unit-I (Special senses-I)

1. Vision: anatomy and general structure of eye ball,
2. Structure and function of layers of eye ball
3. Blood circulation of eye
4. Visual pathway, Photochemical changes of retina on exposure to light,
5. Light and dark adaptation,
6. Mechanism of development of glaucoma, diabetic retinopathy and cataract.
7. Theories of color vision, color blindness.

Unit-II (Special senses-II)

1. Audition: Structure and function of auditory apparatus, organ of Corti.
2. Auditory pathways & centers.
3. Mechanism of hearing. Perception of sound frequency and loudness. Deafness, audiometry, hearing tests.
4. Olfaction and gustation: Structure and functions of receptor organs, nerve pathways, centers.
5. Taste and smell adaptation, abnormalities of olfactory and taste sensation.

Paper-14B (Practical)

HP-602C

Total Mark = 40 (IA = 16 + ESE = 24) Credit = 02

CONTENTS:

1. Determination of heart rate and blood pressure at rest and after exercise.
2. Determination of PFI and graphical representation of recovery heart rate.
3. Determinations of VO2 max indirectly by Queens's college step test.
4. ECG demonstration.
5. Model electro cardiogram study in detail with abnormalities.
6. Optometric study – acquity chart, far and near vision.
7. Hearing test with tuning fork.

Paper-15 (Theory)
HP-603C
Total Mark = 100 (IA = 40 + ESE = 60) Credit = 04

Unit-I (Exercise & Sports Physiology -I)

1. Introduction to exercise & sports physiology- scope, Importance. Skeletal muscle types and their response to exercise. Types of exercise: isotonic, isometric etc.
2. Energy for exercise: source of energy in exercise, Nutrients used during exercise, energy stores.
3. Energy system for exercise and recovery--Aerobic and anaerobic energy system-anaerobic power, OBLA, Lactate threshold.
4. Aerobic energy system-Aerobic power-VO2 max; measurements, factors controlling. EPOC or O_2-debt -lactacid & alactacid. Fatigue causes.

Unit-II (Exercise & Sports Physiology-II)

1. Physiological responses in exercise: Effects of exercise on cardio-vascular & respiratory system.
2. Physiological responses to exercise in the heat and cold environment. Heat crams, heat stroke, frostbite.
3. Women in sports: Sex difference in physiological responses in exercise.
4. Pregnancy and menstruation in relation to exercise and Sports.

Unit-III (Exercise & Sports Physiology-III)

1. Exercise Training: Training principles; aerobic & anaerobic training, resistance training;
2. Effects of training on respiratory, cardio-vascular and muscular system. Concept of Overtraining, detraining. High altitude training.
3. Nutrition and ergogenic aids in sports: Role of nutrients in sports, pregame meal; carbohydrate loading, spacing of meals, glycogen loading, fluid replacement.
4. Ergogenic aids- effects of creatine, carnitine, erythropoietin, alkalinizers, anabolic steroids, amphetamines, caffeine etc. Concept of Doping in sports.

Unit-IV (Yoga)

1. Yoga and Human performance: Introduction to Yoga,
2. Traditional yogic practices- Asanas, Pranayamas, meditations.
3. Physiological applications of yoga
4. Experimental evidences exhibiting benefits of yoga.

Paper 16A (Theory)
HP-604C
Total Mark = 60 (IA = 24 + ESE = 36) Credit = 02

Unit-I (Work Physiology)

1. Work Physiology –definition and nature – isotonic, isometric and isokinetic, positive and negative work. Concept of physiological work, static and dynamic work. Power and work capacity relation.
2. Classification of Work-load – light, moderate and heavy work-depending on intensity and duration of work.
3. Different methods of assessment of energy cost for various physical work-- direct and indirect methods with their limitations.
4. Assessment of energy cost by using bicycle ergometer and treadmill.

Unit-II (Ergonomics and Occupational Health)

1. Ergonomics—definition, basic concept of ergonomics and its application. Work Study, time study and motion study-basic concept and application.
2. Concept of system design; Effect of Man, Machine and Environment in System Design; Failure of System – accident.
3. Static and Dynamic Anthropometry—concept and application in design and development. Application of Ergonomics for the development of safety
4. Occupational health—definition and basic concept, contribution of Bernardino Ramazzini.
5. Occupational hazards – Physical, chemical and biological hazards. Occupational diseases – silicosis, asbestosis and work-related musculoskeletal disorders.

Paper-16B (Practical)
HP- 604C
Total Mark = 40 (IA = 16 + ESE = 24) Credit = 02

CONTENTS:

1. Determination of body fat percentage by indirect method- using skinfold caliper.
2. Determination of somatotype (endomorphy, mesomorphy & ectomorphy) of the body
3. Determination/demonstration of muscular efficiency and fatigue by Mosso's ergograph
4. Determination grip strength by Grip dynamometer
5. Effect of exercise on respiratory pattern. Effect of hyperventilation on breath holding.
6. Measurement of wet bulb globe temperature (WBGT) indices.
7. Measurement of environmental temperature – dry bulb and wet bulb, relative humidity, air velocity. Determination of sound levels by sound level meter and noise index.