Tripura University

(A Central University)

Suryamaninagar

West Tripura

Syllabus for

Four Years Undergraduate Programme Subject:

Human Physiology

(As per NEP-2020)

7th Semester (Major)

Revised as on October, 2025

Paper-17 (Theory)
HP-701C
Total Mark = 100 (IA = 40 + ESE = 60) Credit = 04

Unit-I (Metabolic Biochemistry-I)

1. Glycolysis, Gluconeogenesis,
2. Pentose phosphate pathway
3. Glycogenesis and glycogenolysis
4. TCA cycle, Energetics of glycolysis and TCA cycle
5. Cori cycle

Unit-II (Metabolic Biochemistry-II)

1. β-oxidation of fatty acids and Ketone body metabolism.
2. Biosynthesis of fatty acids,
3. Cholesterol synthesis and functions
4. Lipoproteins- VLDL, LDL, HDL.

Unit-III (Metabolic Biochemistry-III)

1. Amino acids - Amino acid pool, Amination, Deamination, Transamination and Decarboxylation. energy producing role of amino acids.
2. Catabolism of amino acids, Urea cycle.
3. Integration of major metabolic pathways of energy metabolism.
4. Inborn error of metabolism. Glycogen storage disease, phenylketonuria, albinism.
5. Catabolism of purine and pyrimidines. Disorders of purine and pyrimidine metabolism.

Unit-IV (Metabolic Biochemistry-IV)

1. Gibbs free energy, free energy changes and redox potentials, High energy compounds.
2. Electron transport chain, components and reactions of the electron transport chain.
3. Oxidative phosphorylation-mechanism-different hypothesis: chemo-osmotic hypothesis.
4. Structural and functional aspects of F0, F1ATPase, Inhibitors of oxidative phosphorylation; uncouplers.

Paper 18A (Theory)
HP-702C
Total Mark = 60 (IA = 24 + ESE = 36) Credit = 02

Unit-I (Nutrition & Dietetics-I)

1. Nutritional importance and dietary requirements of carbohydrate, proteins and fat. RDA- Carbohydrates, protein, fats and other nutrients. Complete and incomplete proteins, biological value of proteins, essential amino acids and fatty acids.
2. Nutritional requirements and formulation of balanced diet for adolescents and college students, workers with sedentary, moderate and heavy physical activity, pregnant and lactating woman.
3. BMR – definition and determination, factors affecting BMR and its significance.
4. Biological value of protein, RQ, SDA and RDA.

Unit-II (Nutrition & Dietetics-II)

1. Chemical nature and structure of Vitamins, Vitamins- sources, daily requirements, deficiency symptoms and functions, hyper vitaminosis and hypo vitaminosis
2. Marasmus, kwashiorkor
3. Minerals and trace elements– iron, zinc, magnesium, calcium and iodine: physiological functions, source, requirements, deficiency symptoms
4. Calorific value of foods; SDA of foods, RQ. their definition and physiological importance.
5. Food groups, basis and formulation of balanced diet for Growing child. Adult man and Women. Pregnant and Lactating mother, Elderly people.
6. Dietary Fiber; Recommended intake of fiber. Glycemic Index (GI); Factors affecting GI of foods; GI in chronic diseases. Pro-biotics- concept and benefits.

Paper-18B (Practical)
HP- 402C
Total Mark = 40 (IA = 16 + ESE = 24) Credit = 02CONTENTS:

1. Glucose estimation by enzymatic.
2. Glucose estimation by titrimetric method.
3. Anthropometric Nutritional assessment.
4. Estimation of cholesterol.
5. Study of diet chart as per age group and gender.
6. Study of diet chart for pregnant and lactating mother.
7. Study of diet chart in metabolic disease.

Paper-19 (Theory)
HP-703C
Total Mark = 100 (IA = 40 + ESE = 60) Credit = 04

Unit-I (Embryology and Developmental Biology-I)

1. Introduction to Developmental Biology, Details of Mitotic and Meiotic cell division.
2. Stem Cells: basic concept, potentials, mechanisms of cell differentiation, and morphogenesis.
3. Ultrastructure of egg and sperm, Spermatogenesis and Oogenesis and its regulation.
4. Embryonic stem cells and their signal pathways.
5. Genetic control of different genes related to development.

Unit-II (Embryology and Developmental Biology-II)

1. Early embryonic development: fertilization, cleavage, gastrulation and axis formation.
2. Formation of germ layers: Derivatives of germ layers.
3. Implantation, Placentation and Extra embryonic Membranes.
4. Placental disorders.
5. Foetal Circulation.
6. Development of limb.
7. Molecular basis of sex determination, aging and senescence.
8. Developmental disorders.

Unit-III (Stress Physiology-I)

1. ROS generation in the body-mechanism
2. Role of superoxide dismutase catalase. Glutathione in oxidative stress physiology.
3. High altitude physiology: Barometric & partial pressure of oxygen at high altitude, changes in the body in high altitude
4. Motion sickness, acclimatization to high altitude.

Unit-IV (Stress Physiology-II)

1. Aviation Physiology - Accelerative and gravitational force
2. Effect of positive and negative G force on body.
3. Space physiology - Effects of weightlessness on Cardiovascular system, musculoskeletal system, blood, immune system
4. Space motion sickness.

Paper 20A (Theory)
HP-704C
Total Mark = 60 (IA = 24 + ESE = 36) Credit = 02

Unit-I (Neurochemistry)

1. Concept of neuro-transmitter,
2. Classification- Inotropic, metabotropic, fast, slow.
3. Structure, subtype and functions of different neurotransmitter receptors (Acetyl choline, catecholamines, glutamate, GABA etc.) and
4. Mechanism of action of neurotransmitters, co-transmitters.

Unit-II (Behavioral Physiology, Higher brain functions & Chronobiology)

1. Emotion & Behavior: Limbic system, neural circuitry of limbic system-Papez circuit. Functions of Limbic system-emotions, motivation, Behavior- fear & rage, Reward & punishment. Sham rage, Khuer-Bucy syndrome. Specific functions of other parts of limbic system: Hippocampus, Amygdala. Amininergic system in mood, depression, manic depressive psychosis-schizophrenia.
2. Higher functions of brain: –learning, memory, classification of memory, molecular basis of memory- consolidation of memory. Amnesia, Dementia, Alzheimer's disease.
3. Functions of neocortex. Prefrontal cortex. Wernicke's area and Broca's area. Physiology of language and speech, Aphasis. Idea about Cognition.
4. States of Brain activity: EEG, different waves, physiological basis. Sleep, classification. Mechanism of sleep. Changes in the EEG at different stages of wakefulness and sleep. Sleep Disorder. Epilepsy.
5. Circadian rhythm and different physiological processes.

Paper-20B (Practical)
HP- 704C
Total Mark = 40 (IA = 16 + ESE = 24) Credit = 02

CONTENTS:

1. Chart / model study -different embryological phases.
2. Placenta model study – normal and abnormal.
3. Determination of Km value of enzyme.
4. Effect of temperature on enzyme action.
5. Effect of pH on enzyme action.
6. Chart study of different EEG waves.
7. Recording of self / subject heart rate at different time intervals (24h scale) and preparation of curve.