



Tripura University

(A Central University)

Suryamaninagar

West Tripura

Syllabus for
Four Years Undergraduate Programme Subject:
Human Physiology
(As per NEP-2020)

2nd Semester (Major)

Revised as on October, 2025

SEMESTER-II
HP-201C
Paper-3 (Theory)
Total Mark = 100 (IA = 40 + ESE = 60) Credit = 04

Unit-I (Cardiovascular System-I)

1. Anatomy of the heart. Properties of cardiac muscle. Origin and propagation of cardiac impulse. Heart Block.
2. Cardiac cycle-Pressure and volume changes. Heart sounds. Murmurs.
3. Cardiac output-Measurement by application of Fick's principle & factors affecting. Starling's law of heart.
4. Electrocardiography- Principles of Electrocardiography, Normal electrocardiogram, different waves, intervals and segments; different electrocardiographic lead systems. Cardiac Arrhythmias. The pulse- Arterial and venous. Hemodynamic of blood flow.

Unit-II (Cardiovascular System-II)

1. Innervation of the heart and blood vessels, cardiac and vasomotor reflexes.
2. Coronary Circulation. Coronary artery disease- Atherosclerosis.
3. Blood vessels-types, structure. Hemodynamics: velocity of blood flow, nature of blood flow, Flow-Pressure- Resistance relationship.
4. Blood pressure-regulation with special reference to sino-aortic mechanism. Its controlling factors.
5. Immediate and delayed effects of hemorrhage.

Unit-III (Respiratory System-I)

1. Anatomy and histology of the lung and airways.
2. Mechanics of breathing: Role of respiratory muscles, Compliance of lungs and chest wall, pressure-volume relationships, alveolar surface tension and surfactant. Spirometry: Lung volumes and capacities. Dead space.
3. Pulmonary Circulation.
4. Ventilation-perfusion ratio, Transport of gases (O₂ and CO₂) in body: Partial pressure and composition of normal atmospheric gases in inspired, expired, alveolar air and blood.

Unit-IV (Respiratory System-II)

1. Oxygen dissociation curve of hemoglobin – factors affecting. Carbon dioxide dissociation curve.
2. Regulation of respiration -- neural and chemical, respiratory centers, chemoreceptors, baroreceptors, pulmonary receptors.
3. Disorders of Breathing: Hypoxia: Types & effects. Asphyxia, Cyanosis, Periodic breathing, Apnoea, Asthma, Emphysema.
4. High altitude pulmonary oedema (HAPO). Oxygen therapy. Decompression sickness, caisson's disease.

Paper- 4A (Theory)

HP-202C

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

Unit-I (Physiology of Blood and body fluids-I)

1. Bone marrow: Formed elements of blood—origin, formation, functions and fate.
2. Plasma proteins: Origin and functions.
3. Erythropoiesis-factors effecting and leucopoiesis.
4. Hemoglobin-Structure, types. Anemia.

Unit-II (Physiology of Blood and body fluids-II)

1. Blood volume-factors effecting.
2. Hemostasis- Factors, mechanism, anticoagulants, procoagulants. Disorders of hemostasis -Hemophilia.
3. Blood group-ABO, Rh system and other minor blood group systems. Blood transfusion and its hazards.
4. Lymph and tissue fluids-Formation, circulation, functions and fate.
5. Lymphatic organs- Histological structures and functions of lymph gland and spleen. Splenomegaly-causes and effects.

Paper-4B (Practical)

HP-202C

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

CONTENTS:

1. Hematological experiments: Preparation and staining of blood film with Leishman's stain. Identification of blood cells. Total count of W.B.C and R.B.C. Differential count of W.B.C. Hemoglobin estimation by Sahli's hemoglobinometer. Preparation of hemin crystals.
2. Cardiovascular Physiology Experiments: Determination of Blood pressure in different body posture. Determination of pulse rate.
3. Interpretation of Kymographic recording of the movements of perfused heart of toad and the effects of Excess Calcium, acetylcholine and adrenaline on the contraction of heart.
4. Respiratory Human Experiments: Pneumographic recording / demonstration of effects of hyperventilation, breath-holding and talking. Interpretation of lung function tests using Spirometry (Digital) and analysis of the results.
5. Determination of Peak Expiratory Flow Rate
6. **Laboratory Records:** Student must get the laboratory note books duly signed by the respective teacher during practical classes.
7. **Viva voce:** Questions based on theory and practical syllabus of 3rd semester.