

Core X

Physiology: Life Sustaining Systems

Programme Outcome:

- Knowledge of critical physiological processes.
- Understand anatomical attributes of Digestive, Respiratory, Renal and Cardiovascular system.
- Learn and develop an understanding of vital life-sustaining physiological processes.

Course Outcome:

- Appraise the significance of anatomical structures and physiological events.
- Apply information to understand the functioning of organisms.
- Demonstrate the ability to appreciate the occurrence of physiological actions.
- Understand interrelationships of life processes.
- Acquire practical skills in identifying different organs, and perform laboratory work based on theoretical applications

Learning Outcome:

- Acquire knowledge on digestion, respiration, renal and heart physiology.
- Understand the composition of blood grouping, functions and Blood clotting.

Unit 1: Physiology of Digestion

Structural organization and functions of gastrointestinal tract and associated glands; Mechanical and chemical digestion of food; Absorptions of carbohydrates, lipids, proteins, water, minerals and vitamins; Hormonal control of secretion of enzymes in Gastrointestinal tract.

Unit 2: Physiology of Respiration

Histology of trachea and lung; Mechanism of respiration, Pulmonary ventilation; Respiratory volumes and capacities; Transport of oxygen and carbon dioxide in blood; Respiratory pigments, Dissociation curves and the factors influencing it; Carbon monoxide poisoning; Control of respiration.

Unit 3: Renal Physiology

Structure of kidney and its functional unit, Mechanism of urine formation, Regulation of water balance, Regulation of acid-base balance, Homeostatic regulation of tubular reabsorption and secretion.

Unit 4: Blood and Physiology of Heart

Haemopoiesis, Components of blood and their functions; Structure and functions of haemoglobin, Blood clotting system, Blood groups: Rh factor, ABO and MN.

Structure of mammalian heart, Coronary circulation, Origin and conduction of cardiac impulses Cardiac cycle; Cardiac output and its regulation, Frank-Starling Law of the heart, nervous and chemical regulation of heart rate. Electrocardiogram, Blood pressure.

Practical:

1. Determination of ABO Blood group.
2. Enumeration of red blood cells and white blood cells using haemocytometer.
3. Preparation of blood smear for differential count.
4. Estimation of haemoglobin using Sahli's haemoglobinometer.
5. Preparation of haemin and haemochromogen crystals.
6. Recording of blood pressure using a sphygmomanometer.
7. Examination of sections of mammalian slides: oesophagus, stomach, duodenum, ileum, rectum liver, trachea, lung, kidney.

Text Books:

- ✓ Marieb E.N. and Hoehn K.N. (2009) Human Physiology. Pearson Education Publication, 9th edition
- ✓ Tortora, G.J. & Grabowski, S. (2006). Principles of Anatomy & Physiology. XI Edition John Wiley & sons.
- ✓ Guyton & Hall, (2016) Textbook of Medical Physiology. Elsevier, 12th edition.

Suggested Readings:

- ✓ Victor P. Eroschenko. (2008). diFiore's Atlas of Histology with Functional correlations. XII Edition. Lippincott W. & Wilkins.
- ✓ Vander A Sherman J. and Luciano D. (2014). Vander's Human Physiology: The Mechanism of Body Function. XIII Edition, McGraw Hills.
- ✓ Moyes C.D., Schulte PM (2016), Principles of physiology, 2nd edition, Pearson education, 3rd.
- ✓ Guyton, A.C. & Hall, J.E. (2006). Textbook of Medical Physiology. XI Edition. Herculat Asia PTE Ltd. W.B. Saunders Company.