DISCIPLINE SPECIFIC CORE COURSE– 9:
Human Physiology- Life Sustaining Systems
Zoo-DSC-9

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Human Physiology- Life Sustaining Systems **Zoo-DSC-9**	**04**	**02**	**Nil**	**02**	Passed 12th Class	**NIL**

Learning Objectives

The learning objectives of this course are as follows:

- The course will provide a thorough understanding of the normal body function and helps to determine the cause of disease.
- It will enable the development of new and more effective treatments and guidelines for maintaining good health.
- It will equip the students with an ability to pursue career in medical and healthcare sector, pharmaceuticals and other related areas.
- It will help in understanding how these systems interact among themselves to maintain stability or homeostasis.

Learning Outcomes

By studying this course, students will be able to:

- Appreciate human physiology and have its enhanced knowledge.
- Recognize and identify principal and physiology of digestion.
- Understand the functions of important physiological systems including the digestive, circulatory, renal and respiratory system.
- Learn an integrative approach to understand how these separate systems interact to yield integrated physiological responses to maintain homeostasis in the body along with feedback mechanisms.
- Amalgamate ideas to make the connection between knowledge of physiology and real-world situations, including healthy lifestyle decisions and problems faced due to homeostatic imbalances.
- Perform, analyze and report on experiments and observations in physiology.
- Know the fundamentals and understand advanced concepts so as to develop a strong foundation that will help them to acquire skills and knowledge to pursue an advanced degree.

SYLLABUS OF DSC-9

UNIT- I Physiology of Digestion 7 hrs

Overview of gastrointestinal tract and its associated glands; digestion; Absorption of carbohydrates, lipids, proteins; Hormonal control of secretion of enzymes in gastrointestinal tract.

UNIT- 2 Blood 4 hrs

Structure and functions of haemoglobin; Blood clotting system, Fibrinolytic system.

UNIT- 3: Physiology of Heart 7 hrs

Structure of heart; Coronary circulation; Origin and conduction of cardiac impulses; Cardiac cycle; Cardiac output and its regulation; nervous and chemical regulation of heart rate.

UNIT- 4: Physiology of Respiration 6 hrs

Overview of respiratory system; Mechanism of respiration, Respiratory volumes and capacities; Transport of oxygen and carbon dioxide in blood; Dissociation curves and the factors influencing it; regulation of respiration.

UNIT- 5: Renal Physiology 6 hrs

Structure of kidney and its functional unit; Mechanism of urine formation; Regulation of water balance; Regulation of acid-base balance.

Practical 60 hrs

(Laboratory periods: 15 classes of 4 hours each)

1. To understand the components of blood, their functions and Hematopoiesis.
2. To study whole blood hemolysis with ammonium chloride solution.
3. Preparation of haemin and haemochromogen crystals.
4. Measurement and statistical analysis of variations observed in the student population in the class for the following parameters:
   a) White blood cells using haemocytometer
   b) Red blood cells using haemocytometer
   c) Hemoglobin
   d) Blood pressure
5. Examination of histological sections of mammalian oesophagus, stomach, duodenum, ileum, rectum, liver, trachea, lung, kidney.
6. Study of Electrocardiogram; Analysis of ECG records and calculation of heart rate.
7. Detection of abnormal constituents in urine and their physiological significance.

Essential/recommended readings

1. Tortora, G.J. and Derrickson, B.H. (2017). Principles of Anatomy and Physiology. XV Edition, John Wiley and Sons, Inc.
2. Ganong W.F. (2019). Review of Medical Physiology 26th ed. Mc Graw-Hill.
3. Widmaier E, Raff H and Strang K. (2013) Vander's Human Physiology: The Mechanism of Body Functions. XIII Edition, McGraw-Hill Education.
4. Guyton, A.C. and Hall, J.E. (2011) Textbook of Medical Physiology. XII Edition, Harcourt Asia Pvt. Ltd/ W.B. Saunders Company.
5. Eroschenko, Victor P. (2012) Di Fiore's Atlas of Histology with Functional Correlations; 12th edition, CBS Publishers and Distributors Pvt. Ltd.

Suggestive readings

1. Chatterjee, C.C. (2021) Human Physiology, 14th Edition, Volume 1 & Volume II, CBS Publishers and Distributors Pvt. Ltd.
2. Vander A, Sherman J, and Luciano D (2014). Vander's Human Physiology