

## ZOOLOGY COMPONENT – DSC

### DISCIPLINE SPECIFIC CORE COURSE (DSC 05)

#### 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
		Lecture	Tutorial	Practical/ Practice		
Animal Physiology and Metabolism ALS ZOO DSC 05	4	2	0	2	Class 12 <sup>th</sup> Pass with Science	NIL

#### Learning Objectives:

The learning objectives of this course are as follows:

- to impart knowledge about the functions of organs and organ systems of the body.
- to distinguish between normal and diseased states of the body functions.
- to apprise the students about correlation of the structure of organs with their functions.
- to enable the students to learn the working of different metabolic pathways of the body.

#### Learning Outcomes:

By studying this course, students will be able to:

- understand the physiology of different systems of the human body.
- comprehend and analyse problem-based questions on physiological aspects.
- recognize and explain the working of physiological systems in unison to maintain homeostasis in the body.

#### Unit 1: Nerve and Muscle

(5 Hours)

Types of muscles, ultrastructure of muscle, characteristics of muscle twitch. Structure of neuron, action potential, propagation of nerve impulse (myelinated and non-myelinated nerve fibre).

**Unit 2: Digestion** **(5 Hours)**

Digestion and absorption of carbohydrates, fats and proteins.

**Unit 3: Respiration** **(4 Hours)**

Ventilation, external and internal respiration, transport of oxygen and carbon dioxide in blood.

**Unit 4: Heart** **(4 Hours)**

Structure of heart, origin and conduction of heart beat, cardiac cycle.

**Unit 5: Excretion** **(3 Hours)**

Structure of nephron, mechanism and regulation of urine formation.

**Unit 6: Endocrine Glands** **(2 Hours)**

Structure and function of endocrine glands.

**Unit 7: Metabolism of Carbohydrates, Proteins and Lipids** **(7 Hours)**

Glycolysis, TCA cycle, electron transport chain (respiratory chain), Urea cycle,  $\beta$ -oxidation of fatty acids.

**PRACTICAL** **(60 Hours)**

1. Preparation of temporary mount of neuron and striated muscle.
2. Estimation of haemoglobin using Sahli's Haemoglobinometer.
3. Preparation of haemin crystals.
4. Study of oesophagus, stomach, duodenum, ileum, liver, pancreas, trachea, lung,

kidney (of mammals) through permanent slides.

5. Study of endocrine glands of mammal using permanent slides: pituitary, thyroid parathyroid, pancreas, adrenal, ovary and testis.
6. Study of the activity of salivary amylase under optimal conditions.
7. Interpret the recording of frog's heartbeat (*in situ*) under normal conditions.
8. Study of muscle twitch through videos/photographs and interpret the recording of muscle twitch.

**Essential/recommended readings:**

1. Tortora, G.J. and Derrickson, B. H. (2017) *Principles of Anatomy and Physiology*. 15<sup>th</sup> Edition, Wiley Publishers.
2. Campbell and Reece (2020). *Biology*. Pearson Education, (Singapore) Pvt. Ltd.

**Suggestive readings:**

1. Vander A., Sherman J. and Luciano D. (2017) *Vander's Human Physiology: The Mechanism of Body Function*. 7<sup>th</sup> Edition, McGraw Hills.

**Note:** Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.