

**II SEMESTER  
HARD CORECOURSES  
BSH501ANIMAL PHYSIOLOGY**

**52hrs**

**Course Outcomes:**

*After successful completion of the course, students will be able to :*

- CO 1. Gain in-depth understanding of gastrointestinal system, associated disorders, digestive processes and mechanism of absorption of nutrients.
- CO 2. Comprehend ultrastructure and functioning of nerves and muscles.
- CO 3. Understand the importance of various endocrine glands, associated disorders, hormones and their mode of action
- CO 4. Understand osmoregulation and excretion mechanisms and modes across organisms.
- CO 5. Comprehend the concept of thermoregulation and adaptive features.
- CO 6. Develop in-depth understanding of sensory receptors

**Unit I (13 hours)**

**Gastrointestinal System:** Digestive processes and mechanisms of absorption of dietary carbohydrates, proteins and lipids; coordination of digestive and absorptive activities; gastrointestinal disorders.

**Nervous system:** Neuron and nerve impulse conduction synapses, synaptic transmission and neurotransmitters; reflex mechanisms; functions of the sensory and motor areas of the CNS; autonomic nervous system.

**Unit II (13 hours)**

**Endocrine system:** Hypothalamus. Endocrine glands - pituitary, thyroid, parathyroid, adrenals, pancreas, ovary, testis, pineal, GI tract and placenta: hormones - release, transport, mechanism of action and biological action; Neurohormones of the hypothalamus; endocrine disorders, Neuroendocrine system in Insecta and Crustacea.

**Muscular system:** Contraction of skeletal muscle; molecular basis of muscle contraction; energetics of muscular contraction; neuromuscular transmission and excitation contraction coupling; muscle atrophy and dystrophy.

**Unit III (13 hours)**

**Osmoregulation and excretion:** Biological significance of water; Osmoregulation in aquatic and terrestrial vertebrates; regulatory mechanisms; Major functions of excretory system; Organs of excretion- Basic processes responsible for the formation of the excreted fluid; Functional types- Generalized excretory organs and Specialized excretory organs; Classification of excretory organs and their distribution in the animal Kingdom; General patterns of nitrogen and non-protein nitrogen excretion; physiology of urine formation in mammals; renal diseases.

**Unit IV (13 hours)**

**Thermoregulation:** Thermoregulation-a phenomenon of homeostasis; Thermoregulatory adaptations-Physiological, Physical and Behavioral adaptations; Thermoregulation in aquatic and terrestrial invertebrates; Thermoregulation in Vertebrates-Fishes, Amphibians, Reptiles, Birds and Mammals.

**Receptor system:** Sensory receptors-classification and properties; Receptor Mechanisms: Chemoreceptors- gustatory receptors and olfactory receptors, Mechanoreceptors- Touch or pressure receptors, Pain receptors, Receptors concerned with equilibrium, gravity, acceleration and vibration, Phonoreceptors; Electromagnetic receptors- Photoreceptors

Thermoreceptors; Special Senses- Neurophysiology of Vision, Hearing and Chemicalsenses.

**References:**

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4. Hopkins, W.G. (1995). Introduction to Plant Physiology. John Wiley and Sons Inc. NewYork.
5. Guyton, A.C. & Hall, J.E. (1996). Text Book of Medical Physiology. 9th Ed. W.B. Saunders Company, Philadelphia.
6. Jenson, D. (1976). Principles of Physiology, Appleton CenturyCrafts.
7. Gorbman, A & Bern, H.A. (1974). A text book of Comparative Endocrinology. Wiley Eastern.
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9. Vander, A.J., Sherman, J.H. and Luciano, D.S. (1994). Human physiology – The mechanisms of body function, 6<sup>th</sup>Ed. McGraw Hill, Inc. New Delhi.
10. Rastogi, S. C. (2007).Essentials of animal physiology. New Age International.
11. Schmidt-Nielsen, K. (1997).Animal physiology: adaptation and environment. Cambridge University Press.
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