

Core Course

LS 454—ANIMAL PHYSIOLOGY [3 credits]

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S No	Topic	Contact Hours
1.	Tissue system and their functions: Epithelial tissue, Connective tissue, muscular tissue and Nervous tissue	DS 2 lectures
2.	Principles of physiology: relationship between structure and function, Adaptation, Acclimatization, Acclimation, Homeostasis, Feedback-control systems, Conformity and Regulation	DS 2 lectures
3.	Methods for exploring physiological mechanisms: Molecular techniques, Cellular techniques, Biochemical techniques, Techniques for studying behavior	DS 2 lectures
4.	Molecule, Energy and Biosynthesis-Types, Interactions and functions	ACM 3 lectures
5.	Comparative account of the nervous system in invertebrates and vertebrates	DS 4 lectures
6.	Endocrine system: Glands and Hormones: Secretory mechanisms, Endocrine and Neuro-endocrine systems. Cellular mechanism of hormone action. Physiological effects of hormones	DS 2 lectures
7.	Muscle and animal movement: Electrophysiology and biochemistry of contraction in skeletal, cardiac and visceral muscles	DS 3 lectures
8.	Circulatory systems: general plan, electrical and mechanical properties of myogenic and neurogenic hearts. Heart cycle including electrocardiogram, Hemodynamics. Cardiovascular response to extreme conditions like exercise, diving and hemorrhage. Neural control of cardiovascular system. Immune responses	SJ 6 lectures
9.	Respiratory system: respiratory pigments, transport of gases in blood, regulation of body pH, respiratory response to extreme conditions like hypoxia, diving and exercise. Physiology of respiration (mammals) and neural control of breathing	SJ 5 lectures
10.	Excretory system: Osmoregulation, osmoregulators Conformers, obligatory exchanges of ions and water. Osmoregulation in water and terrestrial environment. Physiology of mammalian and non-mammalian kidneys	SJ 6 lectures
11.	Digestive system: Acquisition of Energy: Types of feeding, Digestion (motility and Secretions), Metabolism, and absorption, Physiology of gastrointestinal system (mammals) including neural and hormonal regulatory mechanisms	ACM 5 lectures
12.	Energetics of metabolism expenditure: Body size and metabolic rate, Energetics of locomotion, body rhythms and energetics, energetics of reproduction	ACM 2 lectures

13.	Thermoregulation: Temperature dependence of metabolic rate, determinants of body heat and temperature, thermal biology of ectotherms, heterotherms and endotherms	ACM 2 lectures
14.	Reproductive system: Asexual and sexual reproductive system, Gonads, gametes, Gamatogenesis and hormonal control, Fertilization, Capacitation	ACM 3 lectures

Suggested reading:

Total: 47 lectures

1. Animal Physiology by Hill, Wyse & Anderson (2004)
2. Animal physiology by Randall Burggren & French (2005)
3. Guyton-text book of Medical physiology

DS: Prof. Deepak Sharma; ACM: Dr. Amal Chandra Mondal; SJ: Dr. Sushil Jha