

**LS 454—ANIMAL PHYSIOLOGY [3 credits]**

SK Jha\* or Amal C Mondal (alternate years)

| <b>S No</b> | <b>Topic</b>  | <b>Contact Hours</b> |
|-------------|---|----------------------|
| 1.          | Tissue system and their functions: Epithelial tissue, Connective tissue, muscular tissue and Nervous tissue   | 2                    |
| 2.          | 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.  | 4                    |
| 3.          | Muscle and animal movement: Electrophysiology and biochemistry of contraction in skeletal, cardiac and visceral muscles   | 3                    |
| 4.          | Comparative account of the nervous system in invertebrates and vertebrates.   | 1                    |
| 5.          | Thermoregulation: Temperature dependence of metabolic rate, determinants of body heat and temperature, thermal biology of ectotherms, heterotherms and endotherms   | 2                    |
| 6.          | Endocrine system: Glands and Hormones: Secretory mechanisms, Endocrine and Neuro-endocrine systems. Cellular mechanism of hormone action. Physiological effects of hormones   | 3                    |
| 7.          | Reproductive system: Asexual and sexual reproductive system, Gonads, gametes, Gametogenesis and hormonal control, Fertilization, Capacitation   | 3                    |
| 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 | 5                    |
| 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   | 4                    |
| 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   | 5                    |
| 11.         | Osmoregulation: Conformers, obligatory exchanges of ions and water. Osmoregulation in water and terrestrial environment. Acid-base balance, body buffer system.   | 2                    |

**Suggested reading:**

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