

<b>Year and Sem:</b> P2S2	<b>Course Code:</b> B227	<b>Course Name:</b> Biology	<b>No. of Credits:</b> 4	<b>L-T-P:</b> 2-2-1
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## SYLLABUS

### **UNIT-I: HUMAN BIOLOGY-I**

**Animal tissues-1** (Epithelial and Muscular tissue); **Animal tissues-2** (Connective and Nervous tissue); **Digestive System:** Alimentary Canal, Digestive Glands, Digestion of Food, Absorption, Disorders; **Pulmonary Systems:** Respiratory Organs, Mechanism of Breathing and Exchange of Gases, Regulation, Disorders; **Circulatory System:** Red Blood Cells, Circulatory System and The Heart, Hemoglobin, Components of Blood; **The Kidney and Nephron:** The Kidney and Nephron, Secondary Active Transport in The Nephron;

### **UNIT-II: HUMAN BIOLOGY-II**

**The Neuron and Nervous System:** Anatomy of a Neuron, Overview of Neuron Structure and Function, The Membrane Potential; **The Synapse:** Electrotonic and Action Potentials, Saltatory Conduction in Neurons, Neuronal Synapses (Chemical), Neurotransmitters and Receptors; Central Nervous system- forebrain, midbrain and hind brain; **Muscles:** Myosin and Actin, Muscle Contraction, Anatomy of a Skeletal Muscle Fiber; **The Endocrine System:** Endocrine Glands and Hormones; Hormones of Heart, Kidney, and Gastrointestinal Tract, Mechanism of Hormone Action; **Human Reproductive System** (male and female).

### **UNIT-III: IMMUNOLOGY**

**Immunology:** Types of Immune Responses: Innate and Adaptive, Humoral Vs. Cell-Mediated, B Lymphocytes (B Cells), Professional Antigen Presenting Cells (APC) and MHC II Complexes, Helper T Cells, Cytotoxic T Cells and MHC I Complexes, Review of B Cells, CD4+ T Cells and CD8+ T Cells, Role of Phagocytes in Innate or Nonspecific Immunity, Inflammatory Response.

### **UNIT-IV: EVOLUTION, THE TREE OF LIFE**

**Evolution and Natural Selection :** Introduction, Darwin, Evolution and Natural Selection, Variation in a Species; **Evidence For Evolution;** **Population Genetics:** Hardy-Weinberg Equation, Allele Frequency and The Gene Pool; Mechanisms of Evolution, Genetic Drift, Bottleneck Effect and Founder Effect; Natural Selection in Populations; **Species and Speciation:** Biodiversity and Natural Selection, Genetic Variation, Gene Flow, and New Species, **Evolutionary Trees:** Introduction to phylogenetic tree.

### **UNIT-V: ECOLOGY**

**Introduction to Ecology:** Ecosystems and Biomes, Flow of Energy and Matter Through Ecosystems, Food Chains and Food Webs; **Population Growth and Regulation:** Exponential and Logistic Growth in Populations, Population Regulation, Predator-Prey Cycles; **Community Ecology:** Interactions in Communities, Ecological Interactions, Niches and Competition, Ecological Succession; **Intro to Biogeochemical Cycles:** Introduction to Biogeochemical Cycles, The Water Cycle, The Carbon Cycle, The Nitrogen Cycle, The Phosphorus Cycle and Eutrophication.

### **UNIT-VI: BIODIVERSITY AND CONSERVATION**

**Biodiversity:** Global Biodiversity, Biodiversity Hotspots; **Levels of Biodiversity:** Genes, Ecosystem and Biodiversity; **Threats to Biodiversity:** Human Activities, Introduced Species,

Extinction of Biodiversity; **Protecting Biodiversity:** Conservation and The Race to Save Biodiversity; The Power of The Individual, Local and Global Policies;

**PRACTICALS:**

1. Demonstration of Blood Groups-(A, B, O and AB)
2. Hardy-Weinberg equilibrium problems.
3. Water holding capacity.
4. pH of soil , hardness of water, DO , Salinity, alkalinity of Water.
5. Field trip

**REFERENCES:**

1. [www.khanacademy.org](http://www.khanacademy.org)
2. NCERT (Biology) and Telugu Academy (Zoology and Botany)
3. Organic Evolution -Dr. Veer Bala *Rastogi*
4. Eugene Odum - Ecology
5. Textbook of Medical Physiology - Guyton
6. Immunology Textbook by Barbara A. Osborne and Janis Kuby