

## Syllabus for the Requirement for Trained Graduate Teachers BIOLOGY

### Unit – I

**Life Processes:** Need for the Nutrition, different modes of nutrition in animals, Photosynthesis -photo system I and II, Mechanism of light and dark reactions, C3 and C4 plants and CAM plant respiration. Mechanism of aerobic respiration, fermentation, RQ, Factors affecting respiration. Transportation in Human being: body fluids, Blood and lymph. Circulatory system, Respiratory system. Transportation in plants: Ascent of sap, absorption of water, transpiration, translocation in plants. Transportation in animals – transport of CO<sub>2</sub> & O<sub>2</sub>. Excretory system in Animals, Excretion in plants.

### UNIT-II

**Control and co- ordination** : Structure and functions of central nervous system, neuron, nerve impulses and its co- ordination, reflex action, sense organs: Eye and Ear structure and functions and their defects and correction. Co-ordination in plants, plant movements, geotropism, phototropism, chemotropism, turgor pressure, movement due to growth, plants growth regulators–Auxins, Gibberellins, Cytokinins and Abscisic acid Human endocrine and exocrine glands, Secretion of hormones and their functions.

### UNIT –III

The fundamental Unit of life: Essential components of living being, structure and functions of cell and its organelles. Cell divisions-mitosis and meiosis. Plant tissues-meristematic and permanent tissue. Anatomy of roots, stems and leaf of dicot and monocot plants, secondary growth, Animal tissues: structure and functions of tissues- Epithelial, connective, muscular and Nervous tissue.

### UNIT –IV

**Diversity of Living Organism:** - Aims and components of systematic, Introduction to identification, nomenclature, phylogeny and classification basis of classification. Taxonomical Hierarchy. Plants classification: Bentham and Hooker classification, Classification of Animals: non-chordates and chordates classification and relationship of various phyla up to class, Binomial nomenclature.

### UNIT-V

**Reproduction** :- Mode of reproduction used by single celled organism, sexual reproduction in plants, development of male and female gametophytes, pollination, double fertilization, incompatibility, embryo development, parthenogenesis and parthenocarpy. Sexual reproduction in cockroach and frog. Human reproductive system: gametogenesis, fertilization, development of zygote up to 3 germinal layers, general aspects of placenta, parturition. Reproductive health, problems and strategies, Family planning.

## UNIT –VI

Heredity and Evolution :Mendel's Laws of inheritance, monohybrid and dihybrid crosses, Pattern of inheritance: Dominant / Recessive, Sex linked inheritance, incomplete dominance, co-dominance, polygenic inheritance, Hereditary variation, multiple alleles, Sex determination, polyploidy and mutation. Gene expression (operation mode), gene transfer technology. Evolution, Interrelationship (Paleontological, morphological, embryological and biographical). Theories of evolution: Lamarckism, Darwinism and modern synthetic theory of Human evolution.

## UNIT- VII

**Health and Diseases:** Health; diseases and their causes, types of diseases, infectious and non- infectious diseases. Prevention of diseases, immunization, inherited disease, sex-linked diseases, genetic incompatibility and genetic counselling.

## UNIT-VIII

**Natural Resources:** Our Environment, Ecosystem-structure and functions, productive energy flow, ecological succession its types and mechanism, Role of atmosphere in climate control, wind, rain, environment, pollution , global warming, green house effect, acid rain, particulate matter, polluted smog , formation of Photo chemical smog, depletion of ozone layer, Water pollution: sources and abatement, BOD, COD, Bio-magnification, soil pollutants. Recycling of wastes. Biogeochemical cycles (Gaseous and Sedimentary), Carbon cycle, Nitrogen cycle, Phosphorus cycle and sulphur cycle. Biodiversity; Loss of Biodiversity; Biodiversity conservation.

## UNIT –IX

**Improvement in food Resources:** Improvement in crop yields. Animal's husbandry, need for intercropping crops, Plants breeding, bio- fertilizers and Bio-pesticides.