NEET Syllabus 2025

Biology

UNIT 1: Diversity in Living World

> What is living?
> Biodiversity; Need for classification
> Taxonomy & Systematics
> Concept of species and taxonomical hierarchy
> Binomial nomenclature
> Five kingdom classification:
  - Salient features and classification of Monera
  - Protista and Fungi into major groups
  - Lichens
  - Viruses and Viroids
> Salient features and classification of plants into major groups:
  - Algae, Bryophytes, Pteridophytes, Gymnosperms (three to five salient and distinguishing features and at least two examples of each category)
> Salient features and classification of animals:
  - Nonchordate up to phyla level and chordate up to classes level (three to five salient features and at least two examples)

UNIT 2: Structural Organisation in Animals and Plants

> Morphology and modifications
> Tissues
> Anatomy and functions of different parts of flowering plants:
  - Root, stem, leaf, inflorescence- cymose and recemose, flower, fruit and seed (To be dealt along with the relevant practical of the Practical Syllabus)
  - Family (malvaceae, Cruciferae, leguminoceae, compositae, graminae)
> Animal tissues
> Morphology, anatomy and functions of different systems (digestive, circulatory, respiratory, nervous and reproductive) of an insect (Frog). (Brief account only)

UNIT 3: Cell Structure and Function

> Cell theory and cell as the basic unit of life
> Structure of prokaryotic and eukaryotic cell
> Plant cell and animal cell
> Cell envelope, cell membrane, cell wall
> Cell organelles:
  - Structure and function
  - Endomembrane system-endoplasmic reticulum, Golgi bodies, lysosomes, vacuoles
  - mitochondria, ribosomes, plastids, micro bodies
  - Cytoskeleton, cilia, flagella, centrioles (ultra structure and function)
  - Nucleus-nuclear membrane, chromatin, nucleolus
> Chemical constituents of living cells: Biomolecules-structure and function of proteins, carbohydrates, lipids, nucleic acids
> Enzymes:
  - Types, properties, enzyme action

- Classification and nomenclature of enzymes

> Cell division:

- Cell cycle, mitosis, meiosis and their significance

UNIT 4: Plant Physiology

> Photosynthesis:

- Photosynthesis as a means of Autotrophic nutrition
- Site of photosynthesis take place
- Pigments involved in Photosynthesis (Elementary idea)
- Photochemical and biosynthetic phases of photosynthesis
- Cyclic and non cyclic and photophosphorylation
- Chemiosmotic hypothesis
- Photorespiration C3 and C4 pathways
- Factors affecting photosynthesis

> Respiration:

- Exchange gases
- Cellular respiration-glycolysis, fermentation (anaerobic), TCA cycle and electron transport system (aerobic)
- Energy relations- Number of ATP molecules generated
- Amphibolic pathways
- Respiratory quotient

> Plant growth and development:

- Seed germination
- Phases of Plant growth and plant growth rate
- Conditions of growth
- Differentiation, dedifferentiation and redifferentiation
- Sequence of developmental process in a plant cell
- Growth regulators- auxin, gibberellin, cytokinin, ethylene, ABA

UNIT 5: Human Physiology

> Breathing and Respiration:

- Respiratory organs in animals (recall only)
- Respiratory system in humans
- Mechanism of breathing and its regulation in humans-Exchange of gases, transport of gases and regulation of respiration Respiratory volumes
- Disorders related to respiration-Asthma, Emphysema, Occupational respiratory disorders.

> Body fluids and circulation:

- Composition of blood, blood groups, coagulation of blood
- Composition of lymph and its function
- Human circulatory system-Structure of human heart and blood vessels
- Cardiac cycle, cardiac output, ECG, Double circulation
- Regulation of cardiac activity
- Disorders of circulatory system-Hypertension, Coronary artery disease, Angina pectoris, Heart failure.

> Excretory products and their elimination:

- Modes of excretion- Ammonotelism, ureotelism, uricotelism
- Human excretory system-structure and function
- Urine formation, Osmoregulation

- Regulation of kidney function-Renin-angiotensin, Atrial Natriuretic Factor, ADH and Diabetes insipidus
- Role of other organs in excretion
- Disorders; Uraemia, Renal failure, Renal calculi, Nephritis
- Dialysis and artificial kidney.

> Locomotion and Movement:

- Types of movement- ciliary, flagellar, muscular
- Skeletal muscle- contractile proteins and muscle contraction
- Skeletal system and its functions (To be dealt with the relevant practical of Practical syllabus)
- Joints
- Disorders of muscular and skeletal system-Myasthenia gravis, Tetany, Muscular dystrophy, Arthritis, Osteoporosis, Gout.

> Neural control and coordination:

- Neuron and nerves
- Nervous system in humans-central nervous system, peripheral nervous system and visceral nervous system
- Generation and conduction of nerve impulse

> Chemical coordination and regulation:

- Endocrine glands and hormones
- Human endocrine system-Hypothalamus, Pituitary, Pineal, Thyroid, Parathyroid, Adrenal, Pancreas, Gonads
- Mechanism of hormone action (Elementary Idea)
- Role of hormones as messengers and regulators, Hypo-and hyperactivity and related disorders (Common disorders e.g. Dwarfism, Acromegaly, Cretinism, goiter, exopthalmic goiter, diabetes, Addison's disease). (Imp: Diseases and disorders mentioned above to be dealt in brief.)

UNIT 6: Reproduction

> Sexual reproduction in flowering plants:

- Flower structure
- Development of male and female gametophytes
- Pollination-types, agencies and examples
- Outbreeding devices
- Pollen-Pistil interaction
- Double fertilization
- Post fertilization events- Development of endosperm and embryo, Development of seed and formation of fruit
- Special modes- apomixis, parthenocarpy, polyembryony
- Significance of seed and fruit formation

> Human Reproduction:

- Male and female reproductive systems
- Microscopic anatomy of testis and ovary
- Gametogenesis-spermatogenesis & oogenesis
- Menstrual cycle
- Fertilisation, embryo development upto blastocyst formation, implantation
- Pregnancy and placenta formation (Elementary idea)
- Parturition (Elementary idea)

- Lactation (Elementary idea)

> Reproductive health:

- Need for reproductive health and prevention of sexually transmitted diseases (STD)
- Birth control–Need and Methods, Contraception and Medical Termination of Pregnancy (MTP)
- Amniocentesis
- Infertility and assisted reproductive technologies – IVF, ZIFT, GIFT (Elementary idea for general awareness)

UNIT 7: Genetics and Evolution

> Heredity and variation:

- Mendelian Inheritance
- Deviations from Mendelism– Incomplete dominance, Co-dominance, Multiple alleles and Inheritance of blood groups, Pleiotropy
- Elementary idea of polygenic inheritance
- Chromosome theory of inheritance
- Chromosomes and genes
- Sex determination–In humans, birds, honey bee
- Linkage and crossing over
- Sex linked inheritance–Haemophilia, Colour blindness
- Mendelian disorders in humans–Thalassemia
- Chromosomal disorders in humans; Down’s syndrome, Turner’s and Klinefelter’s syndromes.

> Molecular basis of Inheritance:

- Search for genetic material and DNA as genetic material
- Structure of DNA and RNA
- DNA packaging
- DNA replication
- Central dogma
- Transcription, genetic code, translation
- Gene expression and regulation– Lac Operon
- Genome and human genome project
- DNA finger printing, protein biosynthesis

> Evolution:

- Origin of life
- Biological evolution and evidences for biological evolution from Paleontology, comparative anatomy, embryology and molecular evidence)
- Darwin’s contribution, Modern Synthetic theory of Evolution
- Mechanism of evolution– Variation (Mutation and Recombination) and Natural Selection with examples, types of natural selection
- Gene flow and genetic drift
- Hardy–Weinberg’s principle
- Adaptive Radiation
- Human evolution

UNIT 8: Biology and Human Welfare

> Health and Disease:

- Pathogens; parasites causing human diseases (Malaria, Filariasis, Ascariasis, Typhoid, Pneumonia, common cold, amoebiasis, ring worm, dengue, chikungunya)
- Basic concepts of immunology–vaccines
- Cancer, HIV and AIDS
- Adolescence, drug and alcohol abuse. Tobacco abuse

> Microbes in human welfare:

- In household food processing, industrial production, sewage treatment, energy generation and as biocontrol agents and biofertilizers.

UNIT 9: Biotechnology and Its Applications

> Principles and process of Biotechnology: Genetic engineering (Recombinant DNA technology)

> Application of Biotechnology in health and agriculture:

- Human insulin and vaccine production, gene therapy
- Genetically modified organisms–Bt crops
- Transgenic Animals
- Biosafety issues–Biopiracy and patents

UNIT 10: Ecology and Environment

> Organisms and environment:

- Population interactions–mutualism, competition, predation, parasitism
- Population attributes–growth, birth rate and death rate, age distribution

> Ecosystem:

- Patterns, components
- productivity and decomposition
- Energy flow
- Pyramids of number, biomass, energy

> Biodiversity and its conservation:

- Concept of Biodiversity
- Patterns of Biodiversity
- Importance of Biodiversity
- Loss of Biodiversity
- Biodiversity conservation
- Hotspots, endangered organisms, extinction, Red Data Book, biosphere reserves, National parks and sanctuaries, Sacred Groves.