

# NEET 2022 Biology Syllabus

For National Eligibility cum Entrance Test, NEET (UG) 2022, the National Medical Commission of India (NMC) recommends the following syllabus for admission to MBBS / BDS / BAMS / BSMS / BUMS / BHMS / BPT etc. courses across the country, after review of various State syllabi as well as those prepared by CBSE, NCERT, and COBSE. This is to establish uniformity across the country, keeping in view the relevance of different areas in medical education.

## Core Syllabus

Class 11th		Class 12th	
Sr. No.	Units	Sr. No.	Units
I	Diversity in Living World	VI	Reproduction
II	Structural Organisation in Animals & Plants	VII	Genetics & Evolution
III	Cell Structure & Function	VIII	Biology & Human Welfare
IV	Plant Physiology	IX	Biotechnology & Its Applications
V	Human physiology	X	Ecology & Environment

## Contents of Class XI Biology Syllabus

### Unit I : Diversity in Living World

- **The Living World** : What is living? ; Biodiversity; Need for classification; Three domains of life; Taxonomy & Systematics; Concept of species and taxonomic hierarchy; Binomial nomenclature; Tools for study of Taxonomy : Museums, Zoos, Herbaria, Botanical gardens.
- **Biological Classification** : Five kingdom classification; salient features and classification of Monera; Protista and Fungi into major groups; Lichens; Viruses and Viroids.

- **Plant Kingdom** : Salient features and classification of plants into major groups : Algae, Bryophytes, Pteridophytes, Gymnosperms and Angiosperms (three to five salient and distinguishing features and at least two examples of each category); Angiosperms classification up to class (characteristic features and examples).
- **Animal Kingdom** : Salient features and classification of animals : non-chordate up to phyla level and chordate up to classes level (three to five salient features and at least two examples).

## Unit II : Structural Organisation in Animals & Plants

- **Morphology & Anatomy of Flowering Plants** : Morphology and modifications; Tissues; Anatomy and functions of different parts of flowering plants : Root, stem, leaf, inflorescence - cymose and racemose, flower, fruit and seed (To be dealt along with the relevant practical of the Practical Syllabus).
- **Structural Organisation in Animals** : Animal tissues; Morphology, anatomy and functions of different systems (digestive, circulatory, respiratory, nervous and reproductive) of an insect (cockroach). (Brief account only)

## Unit III : Cell Structure & Function

- **Cell - The Unit of Life** : 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.
- **Biomolecules** : Chemical constituents of living cells: Biomolecules-structure and function of proteins, carbohydrates, lipids, nucleic acids; Enzymes-types, properties, enzyme action.
- **Cell Cycle & Cell Division** : Cell cycle, mitosis, meiosis and their significance.

## Unit IV : Plant Physiology

- **Transport in Plants**: Movement of water, gases and nutrients; Cell to cell transport - Diffusion, facilitated diffusion, active transport; Plant water relations, Imbibition, water potential, osmosis, plasmolysis; Long distance transport of water - Absorption, apoplast, symplast, transpiration pull, root pressure and guttation; Transpiration : Opening and closing of stomata; Uptake and translocation of mineral nutrients,

Transport of food, phloem transport, Mass flow hypothesis; Diffusion of gases (brief mention).

- **Mineral Nutrition** : Essential minerals, macro and micronutrients and their role; Deficiency symptoms; Mineral toxicity; Elementary idea of Hydroponics as a method to study mineral nutrition; Nitrogen metabolism : Nitrogen cycle, biological nitrogen fixation.
- **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 C<sub>3</sub> and C<sub>4</sub> 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 & 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; Seed dormancy; Vernalisation; Photoperiodism.

## Unit V : Human Physiology

- **Digestion & Absorption** : Alimentary canal and digestive glands; Role of digestive enzymes and gastrointestinal hormones; Peristalsis, digestion, absorption and assimilation of proteins, carbohydrates and fats; Caloric value of proteins, carbohydrates and fats; Egestion; Nutritional and digestive disorders : PEM, indigestion, constipation, vomiting, jaundice, diarrhea.
- **Breathing & 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 & 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 & 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 & 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 & Coordination** : Neuron and nerves; Nervous system in humans central nervous system, peripheral nervous system and visceral nervous system; Generation and conduction of nerve impulse; Reflex action; Sense organs; Elementary structure and function of eye and ear.
- **Chemical Coordination & 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, exophthalmic goiter, diabetes, Addison's disease).

(Imp : Diseases and disorders mentioned above to be dealt in brief.)

## Contents of Class XI Biology Syllabus

### Unit VI : Reproduction

- **Reproduction in Organisms** : Reproduction, a characteristic feature of all organisms for continuation of species; Modes of reproduction – Asexual and sexual; Asexual reproduction; Modes - Binary fission, sporulation, budding, gemmule, fragmentation; vegetative propagation in plants.
- **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 VII : Genetics & 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 fingerprinting.
- **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 VIII : Biology & Human Welfare

- **Human Health and Disease** ; Pathogens; parasites causing human diseases (Malaria, Filariasis, Ascariasis. Typhoid, Pneumonia, common cold, amoebiasis, ringworm); Basic concepts of immunology - vaccines; Cancer, HIV and AIDS; Adolescence, drug and alcohol abuse.
- **Strategies for Enhancement in Food Production** : Improvement in food production; Plant breeding, tissue culture, single cell protein, Biofortification; Apiculture and Animal husbandry.
- **Microbes in Human Welfare** : In household food processing, industrial production, sewage treatment, energy generation and as biocontrol agents and biofertilizers.

## Unit IX : Biotechnology & Its Applications

- **Principles and Process of Biotechnology** : Genetic engineering (Recombinant DNA technology).
- **Biotechnology & Its Applications** : 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 X : Ecology & Environment

- **Organisms & Population** : Organisms and environment: Habitat and niche; Population and ecological adaptations; 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; Nutrient cycling (carbon and phosphorous); Ecological succession; Ecological Services - Carbon fixation, pollination, oxygen release.
- **Biodiversity & 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.
- **Environmental Issues** : Air pollution and its control; Water pollution and its control; Agrochemicals and their effects; Solid waste management; Radioactive waste management; Greenhouse effect and global warming; Ozone depletion; Deforestation; Any three case studies as success stories addressing environmental issues.

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