Directorate of Education, GNCT Delhi
ANNUAL SYLLABUS (2026-27)
CLASS-12, SUBJECT: BIOLOGY (044)

Unit	Title	Marks
VI	Reproduction	16
VII	Genetics and Evolution	20
VIII	Biology and Human Welfare	12
IX	Biotechnology and its Applications	12
X	Ecology and Environment	10
	Total	**70**

Orientation and Recapitulation: Discussion on importance of Biology, scope of Biology and other topics of interest.

Unit-VI Reproduction:
Marks 16

Chapter-1: 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 dispersal and fruit formation

Chapter-2: Human Reproduction

Male and female reproductive systems; microscopic anatomy of testis and ovary; gametogenesis - spermatogenesis and oogenesis; menstrual cycle; fertilisation, embryo development upto blastocyst formation, implantation; pregnancy and placenta formation (elementary idea); parturition (elementary idea); lactation (elementary idea).

Chapter-3: Reproductive Health

Need for reproductive health and prevention of Sexually Transmitted Diseases (STDs); 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).

Practicals (Practicals should be conducted alongside the concepts taught in theory classes.)

- Prepare a temporary mount to observe pollen germination.
- Flowers adapted to pollination by different agencies (wind, insects, birds).
- Controlled pollination - emasculation, tagging and bagging.
- Identification of stages of gamete development, i.e., T.S. of testis and T.S. of ovary through permanent slides (from grasshopper/mice).
- T.S. of blastula through permanent slides (Mammalian).

Unit-VII Genetics and Evolution:
Marks 20

Chapter-4: Principles of Inheritance and Variation

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 human being, birds and 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.

Chapter-5: 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, Human and rice genome projects; DNA fingerprinting.

Chapter-6: Evolution

Origin of life; biological evolution and evidences for biological evolution (palaeontology, comparative anatomy, embryology and molecular evidences); 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.

Practicals (Practicals should be conducted alongside the concepts taught in theory classes.)

- Meiosis in onion bud cell or grasshopper testis through permanent slides.
- Prepared pedigree charts of any one of the genetic traits such as rolling of tongue, blood
- groups, ear lobes, widow's peak and colour blindness.
- Mendelian inheritance using seeds of different colour/sizes of any plant (monohybrid and dihybrid ratio verification)
- Flash cards or models showing examples of homologous and analogous organs

Unit-VIII: Biology and Human Welfare,
Marks: 12

Chapter-7: Human Health and Diseases

Pathogens; parasites causing human diseases (malaria, dengue, chikungunya, filariasis, ascariasis, typhoid, pneumonia, common cold, amoebiasis, ring worm) and their control; Basic concepts of immunology - vaccines; cancer, HIV and AIDS; Adolescence - drug and alcohol abuse.

Chapter-8: Microbes in Human Welfare

Microbes in food processing, industrial production, sewage treatment, energy generation and microbes as bio-control agents and bio-fertilizers. Antibiotics; production and judicious use.

Practicals (Practicals should be conducted alongside the concepts taught in theory classes.)

- Common disease-causing organisms like Ascaris, Entamoeba, Plasmodium, any fungus

causing ringworm through permanent slides, models or virtual images. Comment on symptoms of diseases that they cause.

Unit-IX Biotechnology and its Applications,
Marks: 12

Chapter-9: Biotechnology - Principles and Processes

Genetic Engineering (Recombinant DNA Technology).

Chapter-10: Biotechnology and its Application

Application of biotechnology in health and agriculture: Human insulin and vaccine production, stem cell technology, gene therapy; genetically modified organisms - Bt crops; transgenic animals; biosafety issues, biopiracy and patents.

Practicals (Practicals should be conducted alongside the concepts taught in theory classes.)

- Prepare a temporary mount of onion root tip to study mitosis.
- Isolate DNA from available plant material such as spinach, green pea seeds, papaya, etc.

Note:

- **The above mid-term syllabus is to be completed by September 5, 2026**

Revision of syllabus for Mid –Term Examination 2026.

Mid –Term Examination 2026

Unit-X Ecology and Environment,

Marks: 10

Chapter-11: Organisms and Populations

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

Chapter-12: Ecosystem

Ecosystems: Patterns, components; productivity and decomposition; energy flow; pyramids of number, biomass, energy.

Chapter-13: Biodiversity and its Conservation

Biodiversity - Concept, patterns, importance; loss of biodiversity; biodiversity conservation; hotspots, endangered organisms, extinction, Red Data Book, Sacred Groves, biosphere reserves, national parks, wildlife, sanctuaries and Ramsar sites.

Practical (Practicals should be conducted alongside the concepts taught in theory classes.)

- Study the plant population density by quadrat method.
- Study the plant population frequency by quadrat method.
- Models specimen showing symbiotic association in root modules of leguminous plants, *Cuscuta* on host, lichens.

***PROJECT**:* Submission of Project Report

Note:

- The entire syllabus is to be completed by **December 5, 2026.**
- Revision of entire syllabus for ***Pre-board*** and **Annual Examination 2027.**

For more information kindly visit to CBSE Academic:

https://cbseacademic.nic.in/web_material/CurriculumMain26/SrSec/Biology_SrSec_2026-27.pdf

The following topics are included in the syllabus but will be assessed only formatively to reinforce understanding without adding to summative assessments. The reduces academic stress while ensuring meaningful learning. Schools can integrate these with existing chapters as they align well. Relevant NCERT textual material is enclosed for reference.

Environmental Issues (available as a part of CBSE Reading Material):

Air pollution and its control, Water pollution and its control, Solid Wastes, Agro-chemicals and their effects. Radioactive wastes, Greenhouse effect and global warming. Ozone depletion in the stratosphere, Degradation by improper resource utilization and maintenance, deforestation.

PRACTICALS

Time:3 Hours **Max.Marks:30**

Evaluation Scheme	Marks
One Major Experiment 5	**5**
One Minor Experiment 2& 3	**4**
Slide Preparation 1 & 4	**5**
Spotting	**7**
Practical Record + Viva Voce	**4**
Investigatory Project and Its Project Record + Viva Voce	**5**
Total	**30**

A: List of Experiments

1. Prepare a temporary mount to observe pollen germination.

2. Study the plant population density by quadrat method

3 Study the plant population frequency by quadrat method

4. Prepare a temporary mount of onion root tip to study mitosis

5. Isolate DNA from available plant material such as spinach, green pea seeds, papaya, banana etc.

B. Study and observe the following (Spotting):

1. Flowers adapted to pollination by different agencies (wind, insects, birds).

2. Pollen germination on stigma through a permanent slide or scanning electron micrograph.

3. Identification of stages of gamete development, ie., T.S. of testis and T.S. of ovary through permanent slides (from grasshopper/mice).

4. Meiosis in onion bud cell or grasshopper testis through permanent slides.

5. TS. of blastula through permanent slides (Mammalian),

6. Mendelian inheritance using seeds of different colour/sizes of any plant.

7. Prepared pedigree charts of any one of the genetic traits such as rolling of tongue, blood groups, ear lobes, widow's peak and colour blindness

8. Controlled pollination - emasculation, tagging and bagging.

9 Common disease causing organisms like Ascaris, Entamoeba, Plasmodium, any fungus causing ringworm through permanent slides, models or virtual images or specimens. Comment on symptoms of diseases that they cause.

10. Models specimens showing symbiotic association in lichens, root nodules of leguminous plants, and parasitic mode of nutrition shown by Cuscuta on host.

11. Flash cards/models showing examples of homologous and analogous organs