BIOLOGY

The present syllabus reinforces the ideas introduced in the lower classes while the students learn new concepts besides getting an exposure to contemporary areas of the subject. The syllabus also aims at emphasizing on the underlying principles which are common to both animals and plants as well as highlighting the relationship of biology with other areas of knowledge. The format of the syllabus allows a simple, clear, consequential flow of concepts without any jarring jumps. The syllabus also stresses on the connection of the study of Biology to real life problems, use of biological discoveries/innovations in everyday life– in environment, industry, health and agriculture. The updated syllabus also focuses on reducing the curriculum load while ensuring that ample opportunities and scope for learning and appreciating basic concepts of the subject continue to be available within its framework.

The prescribed syllabus is expected to

- Promote understanding of basic principles of biology
- encourage learning of emerging knowledge and its relevance to individual and society
- Promote rational/specific attitude to issues related to population, environment and development
- Enhance awareness about environmental issues and problems and the appropriate solutions
- Create awareness amongst the learners about variations amongst the living, and developing respect for the diversities and to appreciate that the most complex biological phenomena are also built on essentially simple processes.

It is expected that the students would get an exposure to various branches of Biology in the syllabus in a more contextual and friendly manner as they study its various units.

BIOLOGY

SYLLABUS FOR HIGHER SECONDARY FINAL YEAR COURSE

One Paper **Time : Three Hours** **Marks 70**

Unitwise Distribution of Marks and Periods :

Unit No.	Title	Marks	Periods
	Group-A : BOTANY		
Unit-6	Sexual Reproduction (1, 2)	6	17
Unit-7	Genetics and Evolution (7)	5	9
Unit-8	Biology and Human Welfare (9, 10)	7	19
Unit-9	Biotechnology and its application (11, 12)	12	30
Unit-10	Ecology (13, 16)	5	15
	Group-B : ZOOLOGY		
Unit-6	Reproduction (3, 4)	5	18
Unit-7	Genetics and Evolution (5, 6)	15	36
Unit-8	Biology and Human Welfare (8, 9)	5	16
Unit-9	Biotechnology and its Application (12)	1	2
Unit-10	Ecology (14, 15, 16, 17)	9	20
	Total	70	180

Unitwise Distribution of Course contents :

Unit-VI : Reproduction :

Chapter 1 : **Reproduction in Organisms :** (i) Asexual Reproduction; (ii) Sexual Reproduction

" 2 : **Sexual Reproduction in Flowering Plants :** (i) Flower-A fascinating Organ of Angiosperms; (ii) Pre-fertilization: Structures and Events; (iii) Double Fertilization; (iv) Post-fertilization: Structures and Events; (v) Apomisix and Polyembryony.

" 3 : **Human reproduction :** (i) The Male Reproductive System; (ii) The Female Reproductive System; (iii) Gametogenesis; (iv) Menstrual Cycle; (v) Fertilization and Implantation; (vi) Pregnancy and Embryonic Development; (vii) Parturition and Lactation.

" 4 : **Reproductive Health :** (i) Reproductive Health-Problems and Strategies; (ii) Population Explosion and Birth Control; (iii) Medical Termination of Pregnancy; (iv) Sexually Transmitted Diseases; (v) Infertility.

Unit-VII : Genetics and Evolution

Chapter 5 : **Principles of Inheritance and Variation :** (i) Mendel's Laws of Inheritance; (ii) Inheritance of One Gene; (iii) Inheritance of Two Genes; (iv) Sex Determination; (v) Mutation; (vi) Genetic Disorders.

" 6 : **Molecular Basis of Inheritance :** (i) The DNA; (ii) The Search for Genetic Material; (iii) RNA World; (iv) Replication; (v) Transcription; (vi) Genetic Code; (vii) Translation; (viii) Regulation of Gene Expression; (ix) Human Genome Project; (x) DNA Fingerprinting.

" 7 : **Evolution :** (i) Origin of Life; (ii) Evolution of Life Formes- A Theory; (iii) Evidences for Evolution; (iv) Adaptive Radiation; (v) Biological Evolution; (vi) Mechanism of Evolution; (vii) Hardy- Weinberg Principle; (viii) A Brief account of Evolution; (ix) Origin and Evolution of Man.

Unit-VIII : Biology in Human Welfare

Chapter 8 : **Human Health and Diseases :** (i) Common Diseases in Humans; (ii) Immunity; (iii) AIDS; (vi) Cancer; (v) Drugs and Alcohol Abuse.

" 9 : **Strategies for Enhancement in Food Production :** (i) Animal Husbandry; (ii) Plant Breeding; (iii) Single Cell Protein; (iv) Tissue Culture

" 10 : **Microbes in Human Welfare :** (i) Microbes in Household Products; (ii) Microbes in Industrial Products; (iii) Microbes in Sewage Treatment; (iv) Microbes in Production of Biogas; (v) Microbes as Biocontrol Agents; (vi) Microbes as Biofertilisers.

Unit-IX : Biotechnology

Chapter 11 : **Biotechnology; Principles and Processes :**
(i) Principles of Biotechnology; (ii) Tools of recombinant DNA Technology; (iii) Processes of Recombinant DNA Technology.

" 12 : **Biotechnology and its Application :**
(i) Biotechnological Applications in Agriculture;
(ii) Biotechnological Applications in Medicine;
(iii) Transgenic Animals; (iv) Ethical Issues.

Unit-X : Ecology

Chapter 13 : **Organisms and Populations :** (i) Organism and its Environment; (ii) Populations.

" 14 : **Ecosystems :** (i) Ecosystem- Structure and Function; (ii) Productivity; (iii) Decomposition; (iv) Energy Flow; (v) Ecological Pyramids; (vi) Ecological Succession; (vii) Nutrient Cycling; (viii) Ecosystem Services.

" 15 : **Biodiversity and Conservation :** (i) Biodiversity; (ii) Biodiversity Conservation; (iii) National Park and Sanctuaries of Assam with special reference to conservation of endangered species.

,, **16 : Bioresources of Assam :** (i) Medicinal and Timber Yielding Plants; (ii) Sericogenic Resources (Muga and Eri)

,, **17 :Environmental Issues :** (i) Air Pollution and its Control; (ii) Water Pollution and its Control; (iii) Solid Wastes; (iv) Agro-chemicals and their effects; (v) Radioactive Wastes; (vi) Greenhouse Effect and Global Warming; (vii) Ozone Depletion in the Stratosphere; (viii) Degradation by Improper Resource Utilization and Maintenanace; (ix) Deforestation.

SYLLABUS FOR BOTANY PRACTICAL

(Marks-15)

1. Study of the reproductive parts of different flowers.
2. Study of flowers adapted to pollination by different agencies (wind, insect).
3. Study of percentage of pollen germination on a slide.
4. To study pollen tube growth on the stigma.
5. To study fruits and seeds of any common fruit (e.g. legume) at different stages of development.
6. To study mitosis in onion root tips (preparation).
7. To study meiosis in onion buds (permanent slide)
8. Exercise on controlled pollination– emasculation, tagging and bagging.
9. Stain tissue section for nucleic acid (aceto carmine stain).
10. To study the pH and water holding capacity of soil. Correlate with the kinds of plants found in them.
11. Study plants found in dry conditions. Comment 'on their adaptations/ ecosystems.
12. To study plants of aquatic conditions. Comment on their adaptations/ ecosystems.
13. Study of plant population density by quadrat method.
14. Study of plant population frequency by quadrat method.
15. To study analogous and homologous organs in various plants.

SYLLABUS FOR ZOOLOGY PRACTICAL

(Marks-15)

1. Study and identify stages of gamete development in T.S. of testis and T.S. of ovary.
2. Study of meiosis in grasshopper testis (through permanent slides)
3. Study of T.S. of blastula through permanent slide.
4. Study of Mendelian inheritance using seeds of different colours/ size of any plant.
5. Prepare pedigree charts for genetic traits such as rolling of tongue, blood groups, window's peak, colourblindness.
6. To identify common 'disease causing organisms' like Ascaris, Entamoeba, Plasmodium, Microsporum. Comment on the symptoms of the disease that they cause.
7. Collect and study soil from different sites and study them for texture and moisture content.
8. Study of animals found in dry conditions. Comment on their adaptations/ ecosystems.
9. Study of animals of aquatic conditions. Comment on their adaptations/ ecosystems.
10. Collect water from different water bodies around you and study them for pH, clarity and presence of any living organisms.
11. Study the amount of suspended particulate matter in air at the two widely different sites.
12. To study analogous and homologous organs in various animals.

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