

**DIRECTORATE OF SCHOOL EDUCATION, GOVERNMENT OF TAMILNADU, CHENNAI - 600 006.  
BIOLOGY SYLLABUS**

**Part A - Botany**

**STANDARD XI**

<b>Expected Specific Outcomes of Learning</b>	<b>Content in terms of Concepts</b>	<b>Curriculum Transactional Strategies</b>	<b>Illustrations</b>	<b>Evaluation</b>	<b>Suggested No. of Periods</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
1.1 Classifies Kingdom systems 1.2 Recognises salient features of plant groups 1.3 Analyses the characteristics of Virus 1.4. Analyses the characteristics of bacteria 2.2 Analyses Cell Theory 2.3 Discriminates between prokaryotes and Eukaryotes 2.4 Recognises uses of TEM, &SEM 2.5 Sees relationship between prokaryotic and Eukaryotic Cells	<b>Unit I : Biodiversity</b> <b>1.1. Systematics : Two Kingdom and Five Kingdom Systems</b> <b>1.2 Salient features of various Plant Groups (Algae, Fungi, Bryophytes, Pteridophytes and Gymnosperms)</b> <b>1.3 Viruses</b> <b>1.4 Bacteria</b> <b>Unit II - Cell Biology</b> <b>2.1. Cell as the basic Unit of life.</b> <b>2.2 Cell Theory</b> <b>2.3 Prokaryotic and Eukaryotic Cell (Plant Cell)</b> <b>2.4 Light Microscope and Electron Microscope (TEM &amp; SEM)</b> <b>2.5 Ultra Structure of Prokaryotic and Eukaryotic Cells</b>	Uses appropriate charts and sketches on the black board and explains  Explains the salient features using actual specimens and charts	Appropriate sketches and Charts	1. Describe the Two Kingdom & Five kingdom systems  2. Describe the salient features of plant groups  3. Differentiate between a Virion and a Bacterium  4. Draw ultra - structure of prokaryotic and Eukaryotic Cells and label the parts.	12 periods

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<p>2.7. Analyses plant membranes</p> <p>2.8. Relates structure and function of cell organelles</p> <p>2.9. Differentiates between Mitosis and Meiosis</p> <p>3.1. to 3.3. Recalls the structure of plant parts and their modifications</p> <p>4.2. Interprets data with reference to Mendelism</p> <p>4.3. to 4.5. Analyses various basis of Inheritance</p>	<p><b>2.6. Cell Wall</b></p> <p><b>2.7. Cell Membrane (Fluid Mosaic Model)</b></p> <p><b>Membrane Transport Model.</b></p> <p><b>2.8 Cell organelles : Nucleus, Mitochondria, Plastids, Ribosomes</b></p> <p><b>2.9. Cell Divisions : Amitosis, Mitosis &amp; Meiosis and their significance</b></p> <p><b>Unit III - Plant Morphology</b></p> <p><b>3.1. Structure and Modification of Root, Stem and Leaf</b></p> <p><b>3.2 Structure and Types of Inflorescences</b></p> <p><b>3.3 Structure and Types of Flowers, Fruits and Seeds</b></p> <p><b>Unit IV - GENETICS</b></p> <p><b>4.1 Concept of Heredity and Variation</b></p> <p><b>4.2 Mendel's Laws of Inheritance</b></p>	<p>Explains with sketches</p> <p>Explains with sketches and specimens</p> <p>Explains Mendelian laws with sketches</p> <p>Explains with Sketches</p>	<p>Appropriate Sketches</p> <p>Labelled sketches &amp; Specimens of Modified Stems, Roots Leaves, etc.,</p> <p>Charts on Mendelism</p>	<p>Describe with labeled sketches the (Cell Organelles)</p> <p>Draw &amp; Describe the stages of Mitosis &amp; Meiosis</p> <p>Explain the significance of Mitosis and Meiosis</p> <p>Describe the Mendel's Laws of inheritances with examples</p> <p>Describe Non-mendelian Inheritance with examples.</p>	<p>8 periods</p> <p>8 periods</p>

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<p>4.3. to 4.5.</p> <p>Analyses various basis of Inheritance gives examples of Epistasis</p> <p>5.1. Analyses various physiological processes prescribed for study.</p>	<p><b>4.3 Chromosomal basis of Inheritance</b></p> <p><b>4.4. Intermediate Inheritance (Incomplete Domiance)</b></p> <p><b>4.5. Epistasis</b></p> <p><b>Unit - V PLANT PHYSIOLOGY</b></p> <p><b>5.1 Cell as a Physiological Unit</b></p> <p><b>(a) Properties of Protoplasm</b></p> <p><b>(b) Water relations</b></p> <p><b>(c) Absorption and movement : Diffusion, Osmosis, Plasmolysis, Imbibition</b></p>	<p>Explains with sketches on the BB</p> <p>Explains with sketches on the BB</p>	<p>Labelled sketches</p> <p>Experimental set-up on Osmosis</p>	<p>Explain Epistasis</p> <p>Describe the properties of protoplasm</p> <p>Explain Osmosis with an illustration</p> <p>Explain Plasmolysis with an example</p> <p>Explain Imbibition with an example</p>	<p>12 periods</p> <p>8 periods</p>

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<p>5.2. Analyses various Theories of Water Transport</p> <p>5.2 Analyses the Mechanism of Stomatal Opening and Closing</p> <p>5.3 Recalls Magor &amp; Trace elements &amp; their functions</p> <p>5.3 Analyses Biological Nitrogen Fixation</p>	<p><b>d) Permeability, Water Potential,</b></p> <p><b>5.2 Theories of Water Transport :</b></p> <p><b>a) Root pressure</b></p> <p><b>b) Transpiration pull</b></p> <p><b>c) Factors affecting Rate of Transpiration</b></p> <p><b>d) Mechanism of Stomatal Opening and Closing (Potassium ion theory)</b></p> <p><b>Factors affecting Stomatal Movement</b></p> <p><b>5.3 Mineral Nutrition :</b></p> <p><b>a) Functions of minerals</b></p> <p><b>b) Essential Major elements and Trace elements</b></p> <p><b>c) Deficiency symptoms of elements</b></p> <p><b>d) Theories of Translocation</b></p> <p><b>e) Translocation of Solutes</b></p> <p><b>f) Nitrogen Metabolism and Biological Nitrogen Fixation</b></p>	<p>Explains the Theories of Water Transport</p> <p>Explains the Opening and Closing of Stomata</p> <p>Explains Root pressure with an Experimental Set-up.</p>	<p>Physiological experiments on Root Pressure and Transpiration</p> <p>B.B. Sketches</p> <p>B.B. Sketches of N-Cycle</p>	<p>Explain the theories of Water Transport in Angiosperms</p> <p>Explain the mechanism of Stomatal Opening and closing</p> <p>Describe the role of Trace elements in plant life</p>	10 periods

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<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<p>6.1. Recognises different modes of reproduction in Angiosperms</p> <p>6.2. Analyses different types of pollination and fertilization</p> <p>6.3. (i) Recognises germination of seeds</p> <p>6.3. (ii) Discriminates between Hypogeal and Epigeal types of germination</p>	<p><b>Unit VI - REPRODUCTION BIOLOGY</b></p> <p><b>6.1 Modes of Reproduction in Angiosperms</b></p> <p><b>a) Vegetative propagation (natural and artificial)</b></p> <p><b>b) Micropropagation</b></p> <p><b>6.2. Sexual Reproduction</b></p> <p><b>(i) Pollination : Types</b></p> <p><b>(ii) Double fertilization</b></p> <p><b>6.3. Germination of seed</b></p> <p><b>i) Parts of seed</b></p> <p><b>ii) types of germination</b></p> <p><b>iii) Abscission, Senescence</b></p>	<p>Describes mode of reproduction in Angiosperms</p> <p>Describes types of germination with sketches &amp; charts</p>	<p>Charts on modes of reproduction in Angiosperms</p> <p>Charts on Pollination and Double Fertilisation Actual process to be done by students themselves</p> <p>Germination of seeds</p>	<p>Describe vegetative propagation with examples</p> <p>Describe various types of Cross Pollination with examples</p> <p>Explain Double Fertilisation with labelled sketches</p> <p>Describe Hypogeal &amp; Epigeal types of germination with labelled sketches</p>	<p>10 periods</p>

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<p>7.1. Recalls the factors that affect organisms in various types of environment</p> <p>7.2 Sees relationship between structural adaptations of Hydrophytes and Xerophytes</p> <p>7.3 Recalls the different natural resources and their uses.</p> <p>Recognises the need for Rain Water Harvesting (RWH)</p>	<p><b>Unit VII- Environmental Biology</b></p> <p><b>7.1 Organisms and their environment</b></p> <p><b>Factors :</b></p> <p><b>Air, Water, Soil, Temperature, Light and Biota</b></p> <p><b>7.2 Hydrophytes, Mesophytes, Xerophytes and their adaptations</b></p> <p><b>7.3 Natural Resources - types, uses and misuse Conservation of water (RWH)</b></p>	<p>Describes various ecological factors and their effect on in plant life</p> <p>Enables learners to study various types of Hydrophytes and Xerophytes and find out their adaptations</p> <p>Explains Natural Resources and Conservation of water</p>	<p>Experiments on the effect of various ecological factors on plants</p> <p>Collects Hydrophytes Xerophytes and examines their adaptations</p> <p>Visits RWH System in the local place.</p>	<p>Draw T.S. of stem and root of an Hydrophyte and label the parts.</p> <p>Draw T.S. of Leaf of Nerium and label its parts</p> <p>Explain the Xerophytic adaptations in a selected plant.</p> <p>Explain Hydrophytic adaptation in floating and submerged water plants.</p> <p>Describe Natural Resources and steps taken to conserve water</p>	10 periods