

**YEAR PLAN 2018 -2019**  
**Grade XI Biology**

**The academic year is divided into three sessions.**

**Session One:** June to August 2018

**Session Two:** September 2016 to December 2018

**Session Three:** January 2018to March 2018

**Monthly Test:** June, July, October, January

**Summative Assessment I-** August-September 2018

**Summative Assessment II-**November-December 2018

**Summative Assessment III** -February-March 2019

**Aims:** To develop a scientific attitude towards biological phenomena and acquire the ability to apply the knowledge of biology in unfamiliar situations.

To develop experimental skills needed in Biology practical work.

**Enduring Understanding:** To create awareness on environmental issues and find solution to these problems.

To develop interest in plants and animals in their respective environment.

**Objectives:** To enable students to acquire the knowledge and to develop an understanding of biological terms, concepts, facts, principles and formulae.

To develop experimental skills in Biology practical work.

**Guest Speakers:** 1. Dr Radhika Nair, Rajiv Gandhi Institute of Biotechnology, Trivandrum

2. Mr. Satheesh Kumar, Scientist, JNTBGRI, Plant Genetic Resource Division, Palode.

3. Dr. C. Bhaskaran, Former Professor and Head, Dept. of Agri. Extension, College of Agriculture.

**Field Trips:**

1.To TGBRI

2.To Rajiv Gandhi centre For Biotechnolgy / CTCRI Sreekariyam

3.To Vayuvanthol Waterfalls , Chathanacde

4. To Veli lake

**Session One: June – August 2018**

Duration	Topics	Specific learning objectives	Activities /project work/record work	Resources
<b>Session One:</b> June 2018 to August 2018  June	<b>2.Structural organization in Plants.</b> (i) Morphology of Flowering Plants (a) Morphology and modifications of root, stem and leaves	<ul style="list-style-type: none"> <li>Types of roots, stems, leaves</li> <li>Modifications for mechanical support, protection, storage, reproduction,</li> <li>Insectivorous Plants</li> </ul>	Observation of preserved Specimens.	<ul style="list-style-type: none"> <li>Lab Manual</li> <li>Power point presentation</li> </ul>
	(b)Morphology of flower, fruit and seed	<ul style="list-style-type: none"> <li>Structure of a typical flower</li> <li>Types of inflorescence-cymose and racemose</li> <li>Classification of fruits</li> <li>Structure of dicot and monocot seed</li> <li>Description of families</li> </ul>	Flower examination. Inflorescence examination. Demonstration of dry and fleshy fruits Seed examination. Family Identification-Dissection of the flowers, floral formula, floral diagram of Malvaceae, Solanaceae, Fabaceae and Liliaceae	<ul style="list-style-type: none"> <li>Live specimens</li> </ul>
	(ii) Anatomy of flowering plants (a) Plant tissues (b) Secondary growth in dicot stem and dicot root.	<ul style="list-style-type: none"> <li>Types of plant tissues</li> <li>Structure and functions of tissues</li> <li>Dicot and monocot, stem, root and leaf</li> <li>Secondary growth in dicot stem</li> </ul>	Anatomy Temporary Slide preparation T.S of dicot root, monocot root, dicot stem and monocot stem Identification-Dicot and monocot leaf Presentation by students on Plant Tissues	<ul style="list-style-type: none"> <li>Permanent slides</li> <li>Live specimens</li> </ul>
	<b>2. Structural organization in Animals</b>  (a)Animal Tissues	<ul style="list-style-type: none"> <li>Location structure and function of various animal tissues:</li> <li>Epithelial, Connective, Muscular and Nervous tissues.</li> </ul>	Observation of permanent slides through microscope Identification of characteristics of each type Drawing diagrams	Permanent slides

	(b) Cockroach	Morphology, anatomy and functions of different systems	Observation and Identification of permanent slides of animal tissues Drawing diagrams Identifying mammalian blood cells from stained preparations  Examining the specimen or picture and identifying the parts	Specimen or Picture
<b>Session Two:</b> September 2018 to December 2018  September	<b>3.Cell: Structure and Function</b> (i)Cell- the Unit of life	<ul style="list-style-type: none"> <li>Cell theory, Cell membrane</li> <li>Cell organelles- ultra structure and function</li> </ul>	To study the effect of thawing, heat and alcohol on the permeability of beet root cell membrane	
	(ii)Biomolecules	<ul style="list-style-type: none"> <li>Carbohydrates, proteins and fats-classification and functions</li> <li>Structure of nucleic acids and their functions</li> <li>Enzymes-General properties, classification, lock and key hypothesis</li> <li>Factors affecting enzyme action</li> <li>Competitive inhibitors</li> <li>Enzymes-General properties, classification, lock and key hypothesis</li> <li>Factors affecting enzyme action</li> <li>Competitive inhibitors</li> </ul>	Food tests for starch, glucose, sucrose, proteins and fats <b>Presentation By Students</b>	
		(iii)Cell cycle and cell division	<ul style="list-style-type: none"> <li>Cell cycle</li> <li>Significance of mitosis and meiosis</li> </ul>	Preparation of temporary slides on stages of mitosis in the root tips of onions <a href="http://www.youtube.com/watch?v=1Z9pqST72is">http://www.youtube.com/watch?v=1Z9pqST72is</a> power point presentations with videos
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	<b>4.Plant physiology</b> (i) Transport in Plants	<ul style="list-style-type: none"> <li>Movement of water, gases and nutrients</li> <li>Plant-water relations</li> <li>Long distance transport of water</li> <li>Stomatal mechanism</li> <li>Mechanism of ascent of sap</li> <li>Mineral uptake by active and passive transport</li> <li>Mechanism of translocation</li> </ul>	Demonstration of plasmolysis Demonstration of osmosis Comment on experimental setups of transpiration, transpiration pull, osmosis	<ul style="list-style-type: none"> <li>Lab Manual</li> </ul>
	(ii)Mineral nutrition	<ul style="list-style-type: none"> <li>Macronutrients and micronutrients</li> <li>Criteria for essentiality of elements</li> <li>Hydroponics</li> <li>Passive absorption (ion exchange mechanism) and active absorption of mineral ions</li> <li>Nitrogen fixation and importance of leghaemoglobin pigment.</li> <li>Phases of growth, seed germination, apical dominance, senescence and abscission</li> </ul>	Observing the root nodule in some legumes. Observation and identification of rhizobium under light microscope.	<ul style="list-style-type: none"> <li>Lab manual-Vol I</li> <li><a href="http://biology.about.com/">http://biology.about.com/</a></li> <li>Power point presentations</li> <li>Permanent slides</li> </ul>
	(iii) Photosynthesis	<ul style="list-style-type: none"> <li>Photosynthetic pigments</li> <li>Mechanism of photosynthesis</li> <li>Photorespiration</li> <li>C3 and C4 pathways</li> <li>Factors affecting photosynthesis</li> </ul>	Separation of plant pigments from leaves by chromatography Effect of different carbon dioxide concentrations on the rate of photosynthesis Demonstration of oxygen evolution during photosynthesis	<ul style="list-style-type: none"> <li>Lab manual</li> <li>Experimental setups</li> </ul>
(iv) Cellular Respiration	<ul style="list-style-type: none"> <li>Types of Respiration</li> </ul>	To study the rate of respiration in flower buds and	<a href="http://kidshealth.org/kid/htbw">http://kidshealth.org/kid/htbw</a>	

October	in plants	<ul style="list-style-type: none"> <li>Aerobic and anaerobic respiration</li> <li>Steps in respiration</li> <li>Respiratory Quotient Mechanism of respiration- Glycolysis, Krebs' cycle, oxidative phosphorylation</li> <li>Amphibolic pathway</li> </ul>	germinating seeds	<a href="#">/lungs.html</a> power point presentations
	(v)Plant growth and Development	<ul style="list-style-type: none"> <li>Role of growth regulators</li> <li>Definition of hypogeal, epigeal and viviparous germination.</li> <li>Brief account of phytochromes</li> <li>Short day, long day and day neutral plants</li> <li>Photoperiodism and vernalisation</li> </ul>	Explanation with suitable examples. Discussion	<a href="http://www.biologycorner.com/lesson-plans/plants/">http://www.biologycorner.com/lesson-plans/plants/</a>
	(vi) Seed Dormancy	Seed germination Kinds of germination. Senescence	Explanation with suitable examples. Discussion	Power point presentation
	(vii) Photomorphogenesis	Perception of light stimuli  Vernalisation		
	<b>5.Human Physiology</b>			
	(i)Digestion and Absorption	<ul style="list-style-type: none"> <li>Digestive system in humans</li> <li>Hormonal control of digestion</li> <li>Absorption and assimilation</li> <li>Calorific value of food</li> </ul>	Explanation with suitable examples. Discussion. Enzyme related experiments	Power point presentation
	(ii)Breathing and exchange of gases	<ul style="list-style-type: none"> <li>Organs involved in human respiration</li> <li>Mechanism of pulmonary gas exchange</li> </ul>	Experimental set up with balloons to show inhalation and exhalation	Charts and models Slides of Blood smear videos
November	(iii)Body fluids and Circulation	<ul style="list-style-type: none"> <li>Circulatory system</li> <li>Disorders of the circulatory system</li> <li>Blood groups</li> <li>Disorders related to circulatory system</li> </ul>	Study the permanent slides of arteries and veins	videos
	vi)Excretory system	<ul style="list-style-type: none"> <li>Understanding of the structure and function of Kidneys and other excretory organs</li> <li>Brief idea about dialysis</li> </ul>	Discussion Improving the drawing skills	Charts and models Videos
	Locomotion and movement	<ul style="list-style-type: none"> <li>Types of movement</li> <li>Human skeletal system</li> <li>Muscular system</li> <li>Disorders of skeletal and muscular system</li> </ul>	To study the different types of joints Study of the model of skeleton , lab activity	Videos, board work
	Neural control and coordination	<ul style="list-style-type: none"> <li>Central Nervous system</li> <li>Autonomic nervous system</li> <li>Transmission of impulse</li> <li>Reflex actions and reflex arcs</li> </ul>	Explanation with suitable examples.	Ppt, board work, ppt
	Chemical Co-ordination and Integration	<ul style="list-style-type: none"> <li>Human endocrine system- Pituitary, Hypothalamus, Pineal gland, Thyroid, Pancreas, Adrenal, gonads,</li> <li>Hormones of the heart, Kidney and Gastro intestinal tract</li> </ul>	Explanation with suitable examples.	Ppt, board work, ppt

Session Three: January2019 to March 2019

Duration	Topics	Specific learning objectives	Activities /project work/record work	Resources
Session Three: January 2019 to	<b>Section A</b> <b>1.Diversity of living organisms.</b> (i)The Living World	<ul style="list-style-type: none"> <li>Need for classification</li> <li>Definition and explanation of the terms- biodiversity, taxonomy and systematics</li> <li>Three domains of life</li> <li>Major taxonomical hierarchies</li> </ul>	<ul style="list-style-type: none"> <li>Identification of the following specimens-Liverworts, mosses, fern, pinus ,rhizopus, mushroom, lichen, bamboo, petunia and cactus</li> </ul>	<ul style="list-style-type: none"> <li>ISC Biology text book</li> </ul>

March 2019		<ul style="list-style-type: none"> <li>Rules of binomial nomenclature</li> </ul> Aids for study of taxonomy		
January	(ii) Biological classification (a) Five kingdom classification (b) Kingdom Monera:	<ul style="list-style-type: none"> <li>Bacteria-salient features, characteristics and examples.</li> <li>Cyanobacteria-characteristic features</li> <li>Archaeobacteria (methanogens, halophiles and thermoacidophiles)</li> </ul> Viroid (definition)	Explanation with suitable examples. <ul style="list-style-type: none"> <li>Discussion</li> </ul>	<ul style="list-style-type: none"> <li>PowerPoint presentations</li> </ul>
	(c) Kingdom protista:	<ul style="list-style-type: none"> <li>General characteristics and examples of subgroups-Chrysophytes, Dinoflagellates, Euglenoids, Slime moulds and Protozoans.</li> </ul>	Drawing the structure of some common protists	<a href="http://www.microbeworld.org/types-of-microbes/microbial-mergers/fungi-and-bacteria">http://www.microbeworld.org/types-of-microbes/microbial-mergers/fungi-and-bacteria</a>
February	(d) Kingdom fungi  (e) Virus	<ul style="list-style-type: none"> <li>General characteristics of Zygomycetes, Ascomycetes, Basidiomycetes and Deuteromycetes</li> <li>Economic importance of fungi</li> <li>Definition of lichens and mycorrhiza</li> <li>Virus-characteristic features, viroid definition</li> </ul>	Identification of stained preparations of yeast  Observing preserved specimens	<a href="http://www.microbeworld.org/types-of-microbes/microbial-mergers/fungi-and-bacteria">http://www.microbeworld.org/types-of-microbes/microbial-mergers/fungi-and-bacteria</a>  Preserved specimens
	(f) Plant Kingdom	<ul style="list-style-type: none"> <li>To understand the evolution and Classification of plants</li> <li>Algae, Pteridophytes</li> <li>Gymnosperms and Angiosperms</li> </ul>	Collection and Observing specimens	
	(g) Animal Kingdom	Basis of classification Phylum Porifera, Cnidaria, Ctenophora, Platyhelminthes, Aschelminthes, Annelida, arthropoda, Mollusca, Echinodermata, Hemichordata and Chordata	Explanation with suitable examples. Discussion Observing preserved specimens	Text book, videos on Animal Kingdom
<b>Facilitators' name: Mrs Anandhi Krishnan &amp; Mrs. Juhi Sivakumar</b> <b>Textbook:</b> ISC Biology XI by Dr PK Agrawal Dr Subash Tripathi <b>Publisher:</b> Balaji Publications <b>Checked</b>				