



BISHOP SCOTT BOYS' SCHOOL
STUDENT CURRICULUM MANUAL

Subject : BIOLOGY

Class : XII

Academic Plan : 2025 -26

<u>Month</u>	<u>Course Description</u>	<u>Learning Objectives</u>	<u>Activity</u>	<u>No. of Periods</u>	<u>Portion for PT & TERM Assessment</u>
April	<p><u>Chapter - 1 :</u> <u>Sexual Reproduction in Flowering Plants :</u></p> <p>1) Flower – a Fascinating Organ of Angiosperms 2) Parts of Flower 3) Pollination (Kinds and Agents) 4) Fertilization Process 5) Post Fertilization in Plant of their Structures and Events 6) Development of Embryo 7) Apomixis</p>	<p>1) Flower and its Significance 2) Accessory Organs; Essential Parts of Flower (Androecium and Gynoecium) 3) Outbreeding devices and Artificial Hybridization ; Self and Cross Pollination 4) Abiotic and Biotic Agents 5) Double Fertilization and their Significance; Syngamy and Triple Fusion 6) Development of Endosperm and their types; Seed; Fruit 7) Embryogenesis of Dicot and Monocot 8) Classification; Recurrent, non recurrent, and Adventive</p>	<p>1) Dissect the Flower showing their Reproductive parts (Androecium and Gynoecium) 2) Flowers adapted to Pollination by different Agencies (Wind , Insect , Bird and Water) 3) Pollen Germination on Sigma through a Permanent Slide 4) Controlled Pollination - Emasculation ; Bagging and Tagging</p>	20	<p><u>Portion for PT - 01</u> 01) Sexual Reproduction in Flowering Plants 02) Human Reproduction 03) Reproductive Health 04) Principles of Inheritance and Variations</p>
	<p><u>Chapter - 2 :</u> <u>Human Reproduction :</u></p> <p>1) Male and Female Reproductive System 2) Gametogenesis 3) Menstrual Cycle 4) Fertilization and Implantation 5) Pregnancy and Embryonic Development</p>	<p>1) Gonads and their Accessory glands 2) Spermatogenesis and Oogenesis 3) Different Phases of Menstrual Cycle and their disorders; Hygiene and Disposal of Napkins 4) Places of Fertilization and Implantation 5) Cleavage; Morula; Blastula and Gastrula stages; Placenta formation.</p>	<p>1) Identification of stages of Gamete Development (T.S.Testis and T.S.Ovary through Permanent Slides) 2) T.S. of Blastula (Mammalian) through Permanent Slide</p>		

May	<p>Chapter - 3 : Reproductive Health : 1) Reproductive Health for Mother and Child 2) Population Explosion (Rising Population a Global Threat) 3) Population Stabilization and Birth Control 4) Medical Termination of Pregnancy (MTP) 5) Sexual Transmitted Diseases (STDs) 6) Infertility</p>	<p>01) Specially Health for Mother and Child Health Care and also for Goals of such Programmes 02) Reasons and Impact of Population Explosion ; Methods to Control Population Explosion 03) Contraceptive methods (Temporary and Permanent) 04) Causes of Legal and Illegal Abortion 05) Examples of Sexual Transmitted Diseases ; Effects of such diseases damage to Reproductive Tract 06) Abbreviated forms and Importance of IVF-ET , ICSI , GIFT , ZIFT , IUT , IUI ; Adoption</p>		14	
	<p>Chapter - 4 : Principles of Inheritance and Variations : 01)Introduction 02)Mendelism 03)Terminology Related to Mendelism 04)Mendel's Experiments on Pea Plant 05)Monohybrid Cross 06)Dihybrid Cross 07)Test Cross and Back Cross 08)Mendelian Inheritance - Mendel's Law of Inheritance 09)Extension of Mendelian Genetics (Deviation from Mendelism)</p>	<p>01) Father of Genetics Modern Genetics 02) Reasons for Mendel's success ; Advantages of Selecting Pea Plant for Experiment by Mendel 03) Dominant ; Recessive ; Phenotype ; Genotype ; Allele ; Trait ; Gene ; Heredity ; Inheritance ; Mutation ; Linkage ; Chromosome ; Punnett Square 04) Having Seven Contrasting Traits ; Their Results Fast and Accurate 05) Representation of Monohybrid Cross with Phenotype and Genotype Ratios 06) Representation of Dihybrid Cross with Phenotype and Genotype Ratios 07) Test Cross, Back Cross Phenotype, Genotype Ratios 08) Three Laws - Dominance ; Segregation and Independence Assortment ; Law of Purity 09) Intragenic Interactions - Incomplete Dominance ; Dominance ; Codominance ; Multiple Alleles ; Pleiotropy ; Polygenic Inheritance</p>	<p>01) Analyze the seed samples of Pisum sativum in Mendelian Monohybrid Cross which shows the ratio 3:1 02) Analyze the seed samples of Pisum sativum in Mendelian Dihybrid Cross which shows the ratio 9:3:3:1</p>		

June	<p>Chapter - 4 : <u>Principles of Inheritance and Variations :</u></p> <p>10) Chromosomal Theory of Inheritance 11) Comparison Between Gene and Chromosome Behaviour 12) Linkage and Recombination 13) Sex Determination 14) Concept of Mutation 15) Pedigree Analysis 16) Genetic Disorders</p>	<p>10) Differentiate between Mitotic and Meiotic Chromosomal Numbers and their Inheritance 11) Chromosomal Behaviour during Laws of Segregation and Independent Assortment 12) Types of Linkage and their Recombination 13) Sex Determination in Human beings ; Birds and Honey bees 14) Types of Mutation ; Mutagenic Agents ; Chromosomal Mutations 15) Pedigree Chart ; Autosomal and Sex-linked ; Dominant and Recessive characters ; Their Appropriate Genotypes 16) Examples of Genetic Disorders ; Mendelian Genetics Diseases ; Chromosomal Abnormalities</p>	<p>03) Preparation of the Pedigree Chart of Genetic Traits of Sex-linked Haemophilia / Colour blind / Tongue rolling / Blood Groups / Widow 's Peak showing at least three generations and also showing their genotypes.</p>	11	
Month	Course Description	Learning Outcome	Activity	No. of Periods	Portion for PT & TERM Assessment
July	<p>Chapter - 5 : <u>Molecular Basis of Inheritance :</u></p> <p>01) Introduction 02) Deoxyribonucleic Acid (DNA) and its Structure 03) Packaging of DNA Helix 04) Operon Concept 05) Human Genome Project 06) DNA Fingerprinting Technique</p>	<p>01) Position of Nucleic acid and their types 02) Discovery ; Composition of DNA ; Functional units (Genes); Seeds of Technology ; Structure of Polynucleotide chain ; Salient Features of the Double-helix Structure of DNA 03) Packaging in Prokaryotes and Eukaryotes ; Search for Genetic material ; Transforming Principle (Griffith's Experiment) ; Biochemical characterisation of Transforming Principle and their Experiment ; Hershey and Chase Experiment ; Properties of Genetic Material (DNA Viruses RNA) ; RNA World ; DNA Replication ; Function of DNA (Autocatalytic Heterocatalytic); Process of Semiconservative Replication of DNA (Replication fork , Leading and Lagging strands , Experimental Proof , Machinery and Enzymes) ; Protein</p>	<p>1) Isolation of DNA from Plant materials like Pea Seed, Spinach , Onion</p>	18	

		<p>Synthesis(Transcription and Translation ; Central Dogma) ; Types of RNA and uses of their Process ; Genetic Code(Characteristics features and their Mutation) ; Regulation of Gene Expression</p> <p>04) Operon ; Lac Operon(Lactose)</p> <p>05) Goal and Salient Features of Human Genome Project</p> <p>06) Steps involved in DNA Fingerprinting and their Applications</p>			
	<p><u>Chapter - 6 :</u> <u>Evolution :</u></p> <p>01) Origin and Evolution of Universe and Earth</p> <p>02) Theories of Origin of Life</p> <p>03) Evolution of Life Form – Theory</p> <p>04) Evidences for Biological Evolution</p> <p>05) Theories of Biological Evolution</p> <p>06) Organic Evolution</p> <p>07) Hardy Weinberg’s Principle</p> <p>08) Human Evolution</p>	<p>01) Introduction</p> <p>02) Origin of Life ; Different theories prove Origin of Life</p> <p>03) Different theories</p> <p>04) Different Evidences proves Biological Evolution</p> <p>05) Adaptive Radiation ; Darwinian ; Modern Synthetic Theory of Evolution ; Genetic Variation ; Natural Selection ; Isolation</p> <p>06) Introduction and their Different Theories</p> <p>07) Equilibrium proves their principle</p> <p>08) Different Concepts for Human Evolution</p>	<p>1) Morphological and Anatomical Evidences for showing Evolutionary changes (Homologous and Analogous) and proving with appropriate examples</p> <p>2) Numerical based for proving Equilibrium</p>		

August	<p><u>Chapter - 7 :</u> <u>Human Health and Diseases :</u> 01) Introduction 02) Common Diseases in Human beings 03) Immunity 04) Types of Immunity 05) Vaccination and Immunization 06) Allergies (Hypersensitivity) 07) Autoimmunity 08) Human Immune 09) Sexual Transmitted Diseases (STD) 10) Cancer 11) Drugs and Alcohol Abuse 12) Infections and Non Infectious Disease 13) Maintaining Good Health , Yuga , Exercise</p>	01) Good Health 02) Common Diseases like Bacterial , Viral , Parasitic , Fungal 03) Introduction 04) Innate immunity and Acquired immunity 05) Differentiate Vaccination and Immunization 06) Allergens causes Allergies 07) Introduction and their meaning 08) Lymphoidal organs and their types 09) Introduction with appropriate examples STDs and other Diseases of the Reproductive Tract 10) Introduction ; Difference between Normal Cell and Cancer Cell ; Causes, Detection, Diagnosis, Treatment of Cancer 11) Effect of Adolescence-Drugs and Alcohol Abuse ; Addiction and Dependent ; Effects, Prevention and Control of such Abuses 12) Effects of Infectious and Non Infectious Diseases 13) Maintain Good Health by different means	1) Given Specimen / Permanent Slide showing Common Diseases like Amoebiasis , Malaria , Ascariasis , Ring worm	22	<p><u>Portion for TERM – 01</u> 01) Sexual Reproduction in Flowering Plants 02) Human Reproduction 03) Reproductive Health 04) Principles of Inheritance and Variations 05) Molecular Basis of Inheritance 06) Evolution 07) Human Health and Diseases 08) Microbes in Human Welfare</p>

<p>September</p>	<p>Chapter - 8 : Microbes in Human Welfare :</p> <p>01) Microbes in Household Products</p> <p>02) Microbes in Industrial Production</p> <p>03) Microbes in Sewage Treatment</p> <p>04) Microbes in Production of Biogas</p> <p>05) Microbes as Biocontrol Agents</p> <p>06) Importance of Microbes in Human Welfare</p>	<p>01) Different Food Processing ; Single Cell Protein (SCP)</p> <p>02) Production of Alcoholic Beverages , Organic Acids , Vitamins , Antibiotics and Enzymes also Gibberellin</p> <p>03) Composition of Sewage and Micro organism , and Process of Sewage Treatment</p> <p>04) Methanogens and Biogas Plant</p> <p>05) Appropriate Examples for Microbial bio-control agents ; Biofertilisers and their sources</p> <p>06) Microbes in Food Preparation</p>		<p>10</p>	
<p>October</p>	<p>Chapter - 9 : Biotechnology - Principles and Processes :</p> <p>01) Process and Principles of Biotechnology</p> <p>02) Technique of Gene Cloning and rDNA Technology</p>	<p>01)Introduction of Biotechnology</p> <p>02)Tools of Recombinant DNA Technology ; Restriction Enzymes ; Cloning Vectors ; Competent Host(For Transformation with Recombinant DNA) ; Process of Recombinant DNA Technology</p>	<p>1)A temporary Acetocarmine stained mount of the onion root tip and point out the Interphase , Prophase , Metaphase, Anaphase , Telophase of Mitosis Cell Division.</p>	<p>14</p>	<p>Portion for PT – 02</p> <p>09) Biotechnology – Principles and Processes</p> <p>10) Biotechnology – and its Application</p>

November	<p><u>Chapter - 10 :</u></p> <p><u>Biotechnology - and its Application :</u></p> <p>01) Introduction</p> <p>02) Biotechnological Application in Agriculture</p> <p>03) Biotechnological Application in Medicine</p> <p>04) Transgenic Animals</p> <p>05) Ethical Issues</p>	<p>01)Introduction of Biotechnology and their Applications</p> <p>02) Production Crop Tolerance Abiotic Stresses,Pest Resistance Crop , Biofortification ; Genetically Modified Organisms (Bt Cotton)</p> <p>03) Genetically Engineered Insulin ; Gene Therapy (ADA) ; Treatment of SCID ; Molecular Diagnosis by PCR, ELISA and Uses of DNA/RNA probe</p> <p>04)For Bioactive products and their Uses</p> <p>05)Biopiracy and Patents ; GEAC(Genetic Engineering Approval Committee)</p>		17	
	<p><u>Chapter - 11 :</u></p> <p><u>Organisms and Population :</u></p> <p>01) Introduction</p> <p>02) Ecology (Organism ; Population ; Community and Biome</p> <p>03) Population Growth</p> <p>04) Population Interactions</p>	<p>01) Introduction to Ecology</p> <p>02) Definition of Habitat and Niche ; Population Attributes ; Life History Variation</p> <p>03) Factors related to such Growth</p> <p>04) Interactions with Predation , Competition , Parasitism , Commensalism , Mutualism , Amensalism</p>	<p>1) Plant Population Density by Quadrat Method</p> <p>2) Plant Population Frequency by Quadrat Method</p>		

<u>December</u>	<p><u>Chapter - 12 :</u> <u>Ecosystem :</u></p> <p>01) Introduction</p> <p>02) Types of Ecosystem</p> <p>03) Ecosystem – Structure and Function</p> <p>04) Productivity</p> <p>05) Energy Flow in an Ecosystem</p> <p>06) Ecological Pyramids</p>	<p>01) Introduction and Interactions in the Ecosystem</p> <p>02) Definition of Stenothermal, Eurythermal , Stenohaline Euryhaline ; Responses to Abiotic Factors ; Allen’s rule</p> <p>03) Definition of Ecosystem ; Components of the Environment ; Productivity, Decomposition, Energy Flow Nutrient Cycling ; Function of Ecosystem (Photosynthetically Active Radiation, Productivity, Trophic Level, Energy Flow, Food Chain and Web, Ecological Pyramids, Decomposition, Biogeochemical Cycle, Types of Ecosystem, Ecosystem Services and Management)</p> <p>04) Primary Production ; Types of Productivity; Detritus ; Steps in Decomposition ; Factors affecting the rate of Decomposition</p> <p>05) Different Trophic Levels of The Ecosystem</p> <p>06) Pyramids of Biomass , Numbers , Energy ; Limitations of Ecological Pyramids</p>	<p>1) Plants Adapted in Xerophytic Condition</p> <p>2) Animals Adapted in Desert Condition</p> <p>3) Plants Adapted in Aquatic Condition</p> <p>4) Animals Adapted in Aquatic Condition</p>	07	<p>01) Sexual Reproduction in Flowering Plants</p> <p>02) Human Reproduction</p> <p>03) Reproductive Health</p> <p>04) Principles of Inheritance and Variations</p> <p>05)Molecular Basis of Inheritance</p> <p>06) Evolution</p> <p>07) Human Health and Diseases</p> <p>08) Microbes in Human Welfare</p> <p>09) Biotechnology – Principles and Processes</p> <p>10) Biotechnology – and its Application</p> <p>11) Organisms and Population</p> <p>12) Ecosystem</p> <p>13) Diversity and its Conservation</p>
	<p><u>Chapter - 13 :</u> <u>Diversity and its Conservation :</u></p> <p>01) Biodiversity</p> <p>02) Patterns of Biodiversity</p> <p>03) Loss of Biodiversity</p> <p>04) Conservation of Biodiversity</p>	<p>01) Species an Earth (India) ; Importance of Species Diversity to the Ecosystem</p> <p>02) Latitudinal and Altitudinal Gradients</p> <p>03) Causes of Biodiversity Loss</p> <p>04)Why and How Conserve Bio diversity</p>			