

BIOLOGY (044)

MONTH	CHAPTER/ UNIT (Topic)	PEDAGOGY TOOLS	E-CONTENT	LEARNING OUTCOMES
April	Unit VI Reproduction Ch1 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	Discussion Brainstorming Questioning Contextual teaching and learning	Reproduction in flowering plants. https://youtu.be/qJMhi2AeV3k?si=UvMYkIkV9GuKAJgW	Students will be able to understand: the structure and function of floral parts including sepal, petal, stamen, carpel. How Gametes are produced by pollen grain and Embryo sac. Different pollination methods, Artificial hybridization and various outbreeding devices students will understand the structure of seed and functions of the following parts, Testa, plumule radical embryo, cotyledon. Classification of plants into monocots and dicots. they will understand the terms seed dormancy advantages of dormancy importance of hybrid seed production, Apomixis.
	Ch2 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).	Discussion. Brainstorming. Questioning Contextual teaching and learning		Students will be able to understand: the structure and functions of male and female reproductive systems. Describe the process of gametogenesis and menstrual cycle. Explain the process of fertilization and implantation Understand the stages of embryonic development and the process of parturition and lactation.
	Ch3 Reproductive Health Need for reproductive health and prevention of Sexually Transmitted Diseases (STDs); birth control -	Contextual teaching and learning. *Chalk and Board	https://youtu.be/dwoqbEdPrg0?si=oDS3PaSPtl9yJani	Students will gain awareness of the different methods of contraception and their advantages and disadvantages and the importance of making choices about contraception. Knowledge of the legal and ethical

	need and methods, contraception and medical termination of pregnancy (MTP); amniocentesis; infertility and assisted reproductive technologies - IVF, ZIFT, GIFT (elementary idea for general awareness).			aspects of medical termination of pregnancy MTP including the conditions under which MTP can be performed and the responsibilities of medical practitioners in providing safe and legal MTP services understanding the causes of infertility and the different treatment options available for couples struggling with infertility
MAY	Revision and Unit 1 Exam			
JULY	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 humans, 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	Discussion. Brainstorming. Questioning Contextual teaching and learning	principal of inheritance https://youtu.be/ZJ2RniQzUw?si=MnGludt_kgdN5AV	Understand the basic principles of Mendelian inheritance Describe the chromosomal theory of inheritance Mutations and causes Understanding of sex determining factors. Understanding of inherited diseases and genes related to it. Knowledge of chromosomal disorders.
	Ch5 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.	Contextual teaching and learning Chalk and Board Concept Mapping Brainstorming	https://youtu.be/IJvzFiXiCAA?si=kLsbDEEe2Y3s_tzq	Explain the molecular basis of inheritance Understanding of scientific enquiry the work of Gregor Mendel and other scientist in the field of genetics exemplifies the scientific method including testing data collection Students will understand how DNA fingerprinting helps in diagnosing the diseases and identifying the culprits

	Ch6: 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.	Discussion. Brainstorming. Questioning Contextual teaching and learning	https://youtu.be/nNNWK6rthjQ?si=9hP0-mRDjLAYfMSK	Understanding the concept of evolution students will learn about the basic concept of evolution and how it will late to the diversity of life on earth. Students will learn about the various lines of evidence that support the theory of evolution including the Fossil record bio geographic comparative and at me and Molecular Biology Students will learn about the mechanism of evolution including natural selection, genetic drift, gene floor and mutation. Students will learn how human activities such as habitat destruction, climate change and pollution are affecting the evolution of species and develop scientific skills including critical thinking and analysis testing through the examination of evidence of evolution.
	Unit 8: Biology and Human Welfare Ch7: Human Health and DiseasesPathogens; 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.	Tools :Contextual teach and learning *Chalk and Board *Concept Mapping		Students will learn about the different types of diseases that affect human including infectious non-infectious diseases They will also understand the cause symptoms and treatment of these diseases Students will learn the understanding of the mun system and its role in protecting the body against diseases. They will learn about different types of immune cells and their functions including production of antibodies. They will also learn about the measures and that can be taken to prevent the spread of diseases.
August	Chap 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	Tools Contextual teaching and learning Chalk and Board Concept Mapping Brainstorming		Understanding the role of microbes in nutrient cycling and soil fertility. Identify the various types of microbes used in biogas production and their importance in generating energy Analysing the use of microbes in sewage treatment and their significance maintaining the cleanliness of the environment beverage products.

	Unit 9: Biotechnology and its Application Ch9 Biotechnology-principles and processes Genetic Engineering (Recombinant DNA Technology).	Discussion. *Brainstorming. *Questioning *Contextual teaching and learning	https://youtu.be/kFitbn-cwN4?si=bxL-ByDTLGgemYuk	Biotechnology can be used to develop sustainable agriculture practices that reduce the use of pesticides and fertilizers conserve water resources and minimise erosion Understanding the process of biotechnology tools used in biotechnology their role in creating jobs and economic growth through the development of new products and technology such as biopharmaceuticals and biofuels.
	Ch10: Biotechnology and its Applications 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.	Contextual teaching and learning Chalk and Board Concept Mapping Brainstorming	https://youtu.be/kFitbn-cwN4?si=bxL-ByDTLGgemYuk	Biotechnology is rapidly involving field that is constantly pushing the boundaries of what is possible students will learn the importance of innovation and creativity in biotechnology research. As well as need to stay up to date with the latest scientific and technological advances. Students get encouragement and think about the global implications of biotechnology to address the various challenges in the world.
September	Term 1 Exam			
OCTOBER	Unit10: Ecology and Environment Ch11 :Organism and Population Population interactions - mutualism, competition, predation, parasitism; population attributes - growth, birth rate and death rate, age distribution	Tools : Contextual teaching and learning *Chalk and Board *Concept Mapping		This chapter develops a more holistic and integrated approach to problem solving and decision making. By studying this chapter organism and population students will develop scientific enquiry critical and thinking skills they will analyse the data. Development hypothesis test theories
	Ch12 : Ecosystem Ecosystems: Patterns, components; productivity and decomposition; energy flow; pyramids of number, biomass, energy.	Discussion. Brainstorming. Questioning Contextual teaching and learning	https://youtu.be/j7VLLM6sMwE?si=nL6kNws8SBvHd6fl	Student students will understand the concept of ecosystem its component's structure and functions They will understand different types of ecological pyramids and their significance Students will understand the importance of decomposition process and how it contributes in nutrient cycling and analyses the factors affecting the productivity of an ecosystem

	Ch 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.	Contextual teaching and learning Chalk and Board Concept Mapping Brainstorming	Student will understand and define biodiversity at the genetic, species, and ecosystem levels while connecting these variations to the essential services ecosystems provide to humanity. You will be equipped to diagnose the primary drivers of biodiversity loss—such as habitat destruction and overexploitation—and critically evaluate the effectiveness of <i>in-situ</i> versus <i>ex-situ</i> conservation
Nov	Revision & Evaluation Test		
December	Pre Board Examination		
LIST OF PRACTICALS			
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		
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 SPOTTING			
1	Flowers adapted to pollination by different agencies		
2	Pollen germination on stigma through a permanent slide or scanning electron micrograph		
3	Identification of stages of gamete development		
4	Meiosis in onion bud cell or grasshopper testis through permanent slides		
5	T.S. of blastula through permanent slides		
6	Mendelian inheritance using seeds of different colour/sizes of any plant		
7	Prepare Pedigree charts of any one of the genetic traits such as rolling of tongue, blood groups, earlobes, widow’s peak and colour blindness		
8	Controlled pollination emasculation, tagging and bagging		
9	Common diseases 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	Model's specimens showing symbiotic association in lichens, root nodules of leguminous plants and parasitic mode of nutrition shown by <i>Cuscuta</i> on host.

