CLASS - XII

SEMESTER – III

SUBJECT : BIOLOGICAL SCIENCE (BIOS)

FULL MARKS : 35 **CONTACT HOURS : 90 Hours**

COURSE CODE : THEORY

UNIT No.	TOPICS	CONTACT HOURS	MARKS
UNIT VI REPRODUCTION	Chapter 1: Sexual Reproduction in flowering plants Flower structure;Development of male and female Gametophytes; Pollination — Types, Agencies and examples; Out breeding 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; Seed dispersal and fruit formation and their significance.	15	33
	Chapter 2: Human reproduction Male and female reproductive systems; Anatomy and Histology of testis and ovary, Gametogenesis-Spermatogenesis and Oogenesis; Menstrual cycle; Fertilization,embryo development up to blastocyst, formation and implantation; Pregnancy and placenta formation and function;Parturition: mechanism and neuroendocrine system involved in this mechanism, Lactation.	15	
	Chapter 3: Reproductive health Need for reproductive health and prevention of sexually transmitted diseases (STDs); Birth control-need and methods, Contraception and medical termination of pregnancy(MTP); Amniocentesis;Infertility and Assisted reproductive technologies-IVF,ZIFT,GIFT(elementary idea for general awareness).	3	
UNIT-VII (GENETICS AND EVOLUTION)	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 honeybees; Linkage and crossing over; Sex linked inheritance-hemophilia,colour blindness; Mendelian disorders in humans-Thalassemia; Pedigree Analysis; chromosomal disorders in humans; Down's syndrome, Turner's syndrome and Klinefelter's syndrome.	20	57

UNIT No.	TOPICS	CONTACT HOURS	MARKS
	Chapter 5: Molecular basis of inheritance Search for genetic material and DNA as genetic material(experiments on bacterial transformation by F. Griffith; Avery, MacLeod and McCarty; Experiment by Hershey and Chase; Structure of DNA and RNA, DNA packaging, DNA replication; Central Dogma; Genetic Code, Translation, gene expression and regulation-lac operon; Genome, Human and Rice genome projects; DNA fingerprinting.	25	
	Chapter 6: Evolution Origin of life;Biological evolution and evidences for biological evolution(Palaeontology, Embryology and molecular evidence); Darwin's contribution, modern synthetic theory; Mechanism of evolution – Variation (Mutation and Recombination) and Natural selection with examples, types of natural selection; Gene flow and genetic drift; Hardy-Weinberg Principle; Adaptive radiation; Human evolution.	12	

CLASS - XII

SEMESTER – IV

SUBJECT : BIOLOGICAL SCIENCE (BIOS)

FULL MARKS : 35 **CONTACT HOURS : 58 Hours**

COURSE CODE : THEORY

UNIT No.	TOPICS	CONTACT HOURS	MARKS
UNIT-VIII (BIOLOGY AND HUMAN WELFARE)	Chapter 7: Human health and diseases Basic concept of immunology.-Immune system, Antigen, Antibody, antigen-antibody reaction, Types of immunity - vaccine and vaccinations; Pathogens: Parasites causing human diseases: Malaria, Filariasis, Chikungunya, Dengue, Ascariasis, Typhoid, Pneumonia, Common Cold, Amoebiasis, Ringworm, SARS (COVID), Allergy and Autoimmune disorders –Symptoms of disease, Name of causative agents, Mode of transmission. Preventive measures. Cancer, HIV and AIDS — Symptoms of diseases; Causative agents, Mode of transmissions, Preventive measures. Adolescence: Drug and alcohol abuse.	13	20
	Chapter 8.Improvement In food production Plant breeding, Tissue culture, Single cell Protein.	2	
	Chapter 9: Microbes in Human Welfare Microbes in food processing, Industrial production, Sewage treatment, Energy generation, Microbes as bio-control agents and biofertilizers, Antibiotics: Production and judicious use.	5	
UNIT –IX (BIOTECHNO-LOGY AND ITS APPLICATION)	Chapter 10: Biotechnology and its applications Principle, Process of genetic engineering. (Recombinant DNA technology), Application of biotechnology in health and agriculture, Human Insulin and vaccine production, Stem cell therapy, Gene therapy; Genetically modified organisms: Bt Crops; Transgenic animals. Biosafety issues, Biopiracy and patents.	15	15
UNIT- X (ECOLOGY AND ENVIRON-MENT)	Chapter 11: Organisms and Populations Meaning of Environment. Habitat and niche, Population interactions – Mutualism; Competition; Predation; Parasitism. Population attributes – Growth, birth rate and death rate, age distribution.	10	23
	Chapter 12: Ecosystem. Ecosystem and its pattern; Components of ecosystem. Productivity and Decomposition. Energy flow, Pyramids of number, Biomass and energy, Ecological succession.	5	
	Chapter 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.	4	

UNIT No.	TOPICS	CONTACT HOURS	MARKS
	Chapter 14: Environmental issues Solid waste management; Radioactive waste management; Success stories addressing environmental issues-Chipko movement, Dasholi Gram Swarajya Mandal movement (DGSM) Silent Valley movement, Amrita Devi Bishnoi (Jaipur)Movement.	4	

CLASS : XII

SUBJECT : BIOLOGICAL SCIENCE (BIOS)

COURSE CODE : PRACTICAL

FULL MARKS : 30 **CONTACT HOURS : 30 HOURS**

Time allowed : 3 hours. **Max. Marks : 30**

EVALUATION SCHEME.	MARKS
One major experiment. 5.	6
One minor experiment. 2 and 3.	5
Slide preparation. 1 and 4. (Any one)	3
Spotting. (three)	6(2x3)
Practical record+Viva voce	5(3+2)
Investigatory project viva voce	5(3+2)
Total : SEM-I= 12 PRACTICAL CLASSES + SEM-II = 10 PRACTICAL CLASSES (14.66 HRS).	30

A. List of experiments.

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 method.
4. Prepare a temporary mount on onion root tip to study mitosis.
5. Isolate DNA from available plant material, such as Spinach, Green pea seeds, Papaya or any other suitable materials.

B. Study and observe the following. (Spotting)

1. Flowers adapted to pollination by different agencies (Wind, Insects, Birds,etc.).
2. Pollen germination on stigma through a permanent slide.
3. Identification of stages of gamete development i.e.,T.S. of Mammalian Testis and TS of Mammalian Ovary through permanent slides.

4. Meiosis in Onion Bud cell or Grasshopper testis through permanent slides.
5. TS of Blastula through permanent slides (Mammalian.)
6. Prepare pedigree charts of any one of the genetic traits, such as rolling of tongue, blood groups, ear lobes, Widow's peak and colour blindness.
7. Common disease 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
8. Models, specimen showing symbolic association in root nodules of leguminous plants, Cuscuta on host, Lichens.
9. Flash card models showing examples of homologous and analogous organs.

[Note:*22 **Hours** reserved for Remedial classes, Tutorials and Home Assignments.]