SARDAR PATEL UNIVERSITY
Programme: B.Sc. (ZOOLOGY)
Semester: V
Syllabus with effect from: June 2023

Paper Code: US05CZOO51	**Total Credit: 4**
Title Of Paper: Invertebrate	

Objectives	• To Provide Details about Taxonomy, Metazoans, • To Provide Detail Type studies of Paramecium, Ascaris, Scorpion, Sepia and Starfish • To Provide Details of General facts about Invertebrate
Out Come	• learn about classification and Systematic • Detail learning of Major Types Study of Invertebrate • Detail study of General topics of Invertebrate.

Unit	Description in detail	Weightage (%)
1	History of Animal Taxonomy Types of Classification Taxonomic Hierarchy Binomial nomenclature Modern trends in animal taxonomy: • Taxonomy, Systematic & Biosystematics • Neo taxonomy Type: Paramecium	25%
2	Origin of metazoan **Reproduction in Porifera** **Polymorphism in Coelenterates** Coral and coral reefs Type: Aurelia (Jelly fish) Parasitic Adaptations of Flatworms Helminthes and Human Diseases	25%
3	Type: Ascaris Coelomoducts and nephridia in Annelids Trochophore larva and its significance Type: Scorpion	25%
4	Larvae of crustaceans Crustacean Parasites Type : Sepia Type: Starfish	25%

Basic Text & Reference Books:

Zoology phylum series [Protozoa to Echinodermata] by R LKotpal
Invertebrate zoology by R L Kotpal
Invertebrate zoology by Dhami and Dhami and E. L .Jorden and verma

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Paper Code: US05CZOO52	**Total Credit: 4**
Title Of Paper: Physiology	

Objectives	• To Provide Details Studies of Physiology of Major Tissues and Enocrinal Effects
Out Come	• learn about Muscle, Nervous, Sensory Physiology • Control and Conduction through Nervous and Endocrine System

Unit	Description in detail	Weightage (%)
1	Types of Muscle tissue (structure & Functions of all types) Properties of Muscle tissue Types of muscle protein Mechanism of muscle contraction Muscle metabolism Regeneration of muscle tissue Disorders: Brief account of Mysthenia Gravis, Muscular destrophy, Fibromyalgia, Abnormal contraction of Skeletal muscles	25%
2	General organization of nervous system Histology of nervous tissue Types of neurons Conduction of nerve impulse Neurotransmitters **Central Nervous System and their Functions**	25%
3	Peripheral Nervous System [Spinal Nervous system and Cranial Nervous system] Reflex action The special senses: Olfaction — Tactioception Gustation — Vestibular system Vision — Proprioception system Hearing & equilibrium Disorders: Brief account of Cataracts, Glaucoma, Deafness, Otitis media	25%
4	Comparison of control by the Nervous & Endocrine system Endocrine glands: Histology & functions of Pitutary gland, Thyroid gland, Parathyroid gland, Adrenal gland, Pancreatic Ilets, Pineal gland Hormone activity Mechanisms of hormone action, Control of hormone secretion Hormonal Disorders of above glands Other endocrine tissues & organs, Eicosanoids	25%

Basic Text & Reference Books:

Animal physiology - A.K.Berry

Animal Physiology - M.P. Arora

Principal of anatomy & physiology-

Tortora Human physiology - C.C,Chettergi

Animal physiology - Guyton

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Paper Code: US05CZOO53	**Total Credit: 4**
Title Of Paper: Genetics & Biotechnology	

Objectives	• To Provide Details Studies of Genetic Interaction, Mutation and Human Genetics • To Provide Basis about Biotecnology
Out Come	• To learn about Genetic Interactions, Mutation , Eugenics and Euphenics • To Learn about Polymorphism of DNA and Microscopy • To learn about Basic of Biotechnology and In Vitro Fertilization

Unit	Description in detail	Weighting (%)
1	Epistatic & Non-Epistatic interaction Lethal genes Cytoplasmic or Extra nuclear inheritance: Kappa particle in paramecium, Shell coiling in Limnea Mitochondrial & Chloroplast DNA Sex linked & sex influenced genes Crossing over Gene linkage	25%
2	Mutation: classification Nature of mutation **Human genetics**: pedigree analysis, amniocentesis, twins, disorders due to Mutant genes, karyotyping of human chromosomes, banding techniques. **Eugenics**: positive and negative **Euphenic**s	25%
3	Polymorphism in DNA Types of non genetic RNA Biosynthesis of protein, Component of protein synthesis [amino acid, DNA, RNA, Ribosome, and enzymes]. PCR Electron Microscopy Microtomy: fixation & Staining Cell fractionation Radioimmuno essay HPLC	25%
4	Animal cell and tissue culture: disaggregation, isolation, slide, flask, organ Culture, whole embryo culture. In vitro fertilization [IVF]: types and causes of infertility, assessment of patient, treatment of patient for IVF, oocyte recovery, preparation of semen, oocyte Culture and IVF, fertilization, embryo transfer. Superovulation, IVF and embryo transfer Transgenic animals, Cancer: mutation of the tumor, morphology of cancer cells, carcinogenesis Oncogenesis.	25%

Basic Text & Reference Books:

Genetics: P S Verma.
Genetics: M.P.Arora.
Genetics: P.K.Gupta.
Genetics: C.Sarin.

Basic Human Genetics: S.Mange.
Genetics: R.P.Meyyan
Molecular biology and Genetics engineering: P.K.Gupta.
Cell biology, Genetics and Molecular biology: P.S.Verma.

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Paper Code: US05CZOO54	**Total Credit: 4**
Title Of Paper: Ecology and Animal Behavior	

Objectives	• To Provide Details Studies of Ecology, Biodiversity, behavior and Chronology
Out Come	• To learn about Deferent Ecosystems, Biodiversities and Behaviors • To learn about Biological behavior and Biological Clock

Unit	Description in detail	Weighting (%)
1	**Community Ecology:** Species richness, Dominance, Diversity, Abundance, Vertical Statification, Ecotone and edge effect. **Ecological Niches:** Parameters of the neches, Parallel niches, Niche sepration, Niche overlap	25%
2	**Biodiversity:** Measuring species diversity, Importance of Biodiversity, Loss of Biodiversity, Natural Biodiversity, Benefits of Biodiversity, Threatened of Biodiversity, Endangered species manegment. **Major anthropogenic Global environmental problems**: • Acid rain, greenhouse effect • Ozone depletion • Eutrophication • Global warming & climatic change	25%
3	**Methods of studying behaviour:** Naturalistic, Experimental, Statical **Reproductive behviour:** Introduction, Type of fertilization, Characteristics of courtship Attention and courtship: Visual, Sound, Light, Tactile, Courtship on Stickle back fish. **Sexual behaviour:** Asymmetry of sex, Sexual dimorphism, Mate choice, Intra-sexual selection(Male rivalry),Inter- sexual selection (Female choice), Sexual conflict in Parental care.	25%
4	Chronobiology: Biological clock and Biological Rhythm Circardian Rhythm, Circaannual Rhythm, Lunar Rhythm, Tidally Rhythm, Photoperiod and regulation of Seasonal reproduction of Vertebrate Role of Meletonin Chronopharmocology	25%

Basic Text & Reference Books:

Ecology & Environment: P.D.Sharma

Ecology: Mohan P. Arora

Environmental biology: P.S.Verma & V.K.Agrawal

Zoology for IAS: Satguru Prasad

Animal behavior: Reena mathur

Text Book of Animal Behaviour: Fatik Baran Mandal

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Paper Code: US05CZOO55	
Title Of Paper: Practical Based on papers US05CZOO51-52-53-54	**Total Credit: 4**

Objectives	• To Provide Hands on Practical experience to the students
Out Come	Part-1: To learn Culture and Identity of Invertebrate Animals based on their systematic characters, Soil characteristics. Part-2: To learn Mitosis and Meiosis stages from relevant organisms and Genetic preparations Part-3: To learn about Preparation of Blood components and Behavior studies

Part -1	• Protozoa: Entamoeba, Difflugia, Foramenifera,Actinospherium, Rediolaria,Monocystis, stentor,Balantidium • Porifera: leucosolenia, euspongea, Chalina, • Coelentrata: plumularia, porpita, lucernaria, alcyonium, corelium, vergularia,medrepora. • Platyhelminthes: schistosoma, Echinococcus, • Nematoda: Trichinella spiralis, Trichuris. • Annelida:sabella, heteronereis, serpula,bonelia • Arthropoda: Branchipus, cyptris, argulus, mysis, gammarus, squeilla, centipede, locust, belostoma. • Mollusca: patella, cypraea, dories, snail, slug, mytilus, pectin,terido,loligo. • Echinodermata: starfish pedicellaria, , bipinaria, branchiolaria,ophiopluteus,Echinopluteus,auricularia, • Hemichordata: ptychodera. • Mouth parts of insects [housefly, mosquito, moth] • Soil and water analysis • To study abiotic components.[pH , turbidity, Temperature and light intensity] • Protozoan culture	2 credits
Part-2	• Study of mitosis by Squash preparation of onion root tip. • Study of meiosis from grass hopper testis. • Mounting of giant chromosomes from chironomous larva. • Study of different characteristics of drosophila.	2 credits

	• Genetics problems. • Isolation of DNA from tissue. • Bioinformatics.[phylogeny] • Study of animal relationship through chart /specimen/live observation. • Study of different animals with reference to their behavior. • Visit to SICART	
Part-3	• Total count of RBC • Total count of WBC • Estimation of blood glucose. • Estimation of serum protein. • Estimation of blood cholesterol. • Estimation of serum creatinine. • Mammalian histology by permanent slides.[Types of Muscle fibers and Nerve Fibers, Spinal Cord, Pituitary gland, Thyroid, Parathyroid, Adrenal] • Preparation skeletal and smooth muscle. • Preparation nerve tissue. • ESR	

Basic Text & Reference Books:

Practical zoology invertebrate: P S Verma.
Practical zoology invertebrate: S S Lal.

Practical physiology anatomy and biochemistry: Patel and goel
Practical biochemistry: Plumer