SARDAR PATEL UNIVERSITY B.Sc. SEMESTER – III, ZOOLOGY PAPER CODE: US03CZOO51 TITLE OF PAPER: INVERTEBRATA, ECONOMIC ZOOLOGY & TOXICOLOGY SYLLABUS EFFECT FROM: JUNE 2022 (TOTAL CREDIT: 4)		
Objectives	• To Give an Overview Invertebrate, Applied Zoology, and Basics of Toxicology • To provide Detail about the Types study of Major Invertebrates and General account. • To Provide out line of Economic aspect of Zoology and Toxicity.	
Out Come	• The students can have General account Idea of the Invertebrates and Economic Usefulness of Invertebrate Animals. • Type study will provide detail about anatomy and physiology of the Major Invertebrate animals.	
Unit-1	• Locomotion in Protozoa • Canal system in Porifera • Skeleton of sponges • Type: Hydra (Habit & Habitat, External morphology, Internal structure, Nematocysts, Locomotion, Nutrition, Respiration, Excretion, Osmoregulation, Nervous, Behaviour, Reproduction, Regeneration, Immortality in Hydra)	25%
Unit-2	• Type: Liver fluke (Habit & Habitat, External Morphology, Digestive System, Respiration, Excretory System, Nervous System, Reproductive System, Life cycle & Development, Parasitic Adaptations of Fasciola, Liver Rot. • Type: Leech ((Habit & Habitat, External Morphology, Body wall, Locomotion, Digestive System, Respiration, Excretory System, Nervous System, Sense organs, Reproductive System, Life cycle & Development, Parasitic Adaptations of Leech)	25%
Unit-3	• Type: Prawn (Habit & Habitat, External Morphology, Locomotion, Digestive System, Respiratory system, Excretory System, Nervous System, Sense organs, Reproductive System, Life cycle & Development) • Types of mouth parts in Insects • House hold insects and methods of Insects control • Respiration in Arthropod	25%

Unit-4	• Economic Zoology: Apiculture, Lac culture, Sericulture, Prawn culture, Pearl culture • Toxicology : Introduction, Branches, Toxic Chemicals: Fertilizers, Pesticides, Automobile, Heavy Metals	25%

Basic text & Reference Books:

- Modern Text book of Zoology – Invertebrate by R.L.Kotpal.
- Invertebrate Zoology by- Jordan &Verma
- Economic Zoology by Shukla & Upadhyay
- Environmental Biology and Toxicology by P. D. Sharma

SARDAR PATEL UNIVERSITY B.Sc. SEMESTER – III, ZOOLOGY PAPER CODE: US03CZOO52, TITLE OF PAPER: PHYSIOLOGY & ADAPTATION SYLLABUS EFFECT FROM: JUNE 2022 (TOTAL CREDIT: 4)		
Objectives	• To Provide details about the three system Physiology of mammals like human • To provide adaptive changes which acquired by the animals in different ecosystem.	
Out Come	• the students will learn about detail physiology of digestive, Respiratory and Circulatory Systems • The students will learn about the acquired adaptations due to different ecosystem	
Unit-1	DIGESTION • Digestive organs and Digestive glands • Digestion of food • Absorption of food • Defecation • Disorders: Peptic Ulcer, Ulcerative Colitis, Gastro enteritis.	25%
Unit-2	RESPIRATION • Respiratory Organs • Pulmonary Ventilation • Lung Volumes & Capacity • Transport of Gases • Regulation of respiration • Disorders: Asthma, Cystic fibrosis, Emphysema, Pneumonia, Bronchitis, Tuberculosis.	25%
Unit-3	CIRCULATION • Circulatory media, Blood composition & functions • Formation of blood cells, Types & functions of Blood cells • Structure & working mechanism of Heart • Cardiac Cycle & ECG • Blood group ABO System & Rh factor • Blood transfusion • Disorders: Anemia, Hypertension, Coronary artery disorders	25%

Unit-4	ADAPTATIONS IN ANIMALS • Terrestrial: Desert, Burrowing, Cursorial, Arboreal, Volant • Aquatic adaptation • Special: Mimicry, Camouflage, Echolocation in Bat, Electric organs in Fish.	25%

Basic Text & Reference Books:

- A Text book of Animal Physiology by A.K.BERRY.
- Animal Physiology by M.P.ARORA.
- Principles of Anatomy & Physiology by TORTORA and GRABOWSKI
- Zoology for IAS by SATGURU PRASAD.
- Animal Ecology by SUKLA & UPADHYAY.

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ZOOLOGY PRACTICAL – I (CREDIT: 2)

CLASSIFICATION OF INVERTEBRATES (UPTO ORDERS):

- PROTOZOA & PORIFERA: Ceratium, Arcella, Polystomella, Opalina, Vorticella, Trypanosoma, Sicon, Hylonema, Spongilla, Spicules, Gemmule and Spongin fibres of sponges
- COELENTRATA & HELMINTHES: Hydra, Obelia, Milipora, Aurelia, Pennatula, Zooanthus, L. S. of Hydra, T. S. passing through Testis and Ovary of Hydra, Obelia medusa, Planaria, Bipalium, Pin worm, Guinea worm
- ANNELIDA & ARTHROPODA: Aphrodite, Arenicola, Earthworm, Leech, Centipede, Cyclops, Prawn, Mantis, Beetle, Lac insect, Honey bee, Termite, Limulus, Scorpion
- MOLLUSCA & ECHINODERMATA: Murex, Aplysia, Sepia, Pearl oyster, Nautilus, Starfish, Brittle star, Feather star, Sea urchin, Sea cucumber, Balanoglossus
- Liverfluke life cycle stages
- Types of mouth parts in Insects

Dissection by Simulation, Animation or Charts

- Leech: External characters, Digestive System, Reproductive System, Nervous System

Mountings of Salivary glands, Jaws, Testicular nephridia

- Prawn: External characters, Digestive System, Reproductive System, Nervous System
  Appendages of Prawn
- Field Visit

Objectives	• To Provide detail about animals and their Identification through Preserved animals • Study of system through animation and chart	
Out Come	• The students will learn Characteristics from real preserved animals and type of Animals through Animation	

Basic Text & Reference Books:

- Practical Zoology Invertebrate by S.S. LAL.

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ZOOLOGY PRACTICAL –II (CREDIT: 2)

- Salivary amylase activity
- Mammalian Histology: T.S. of Salivary gland, Stomach, Intestine, Liver, Pancreas, Lung,
- Adaptations in different Animals

HAEMATOLOGY

- Types of blood Cells
- Differential counting of WBCs
- Hb estimation
- Haemin Crystals
- Effects of osmotic pressure on Human RBCs
- Measurement of BP by using Sphygmomanometer and its use
- Project submission

Basic Text & Reference Books:

- A Manual of Practical Zoology- Invertebrate by P.S.VERMA
- Practical Physiology, Anatomy & Biochemistry by SHAH, PATEL& GOEL
- Practical Zoology Invertebrate by S.S. LAL.

Objectives	• To Provide an Idea of mammalian Physiology Through real time practical • To provide Behavioral aspect of Animals	
Out Come	• Students can learn working of enzymes, anatomy of tissues and Blood physiology	

Basic Text & Reference Books:

- Practical Physiology, Anatomy & Biochemistry by SHAH, PATEL& GOEL

SARDAR PATEL UNIVERSITY B.Sc. SEMESTER – IV, ZOOLOGY PAPER CODE: US04CZOO51 TITLE OF PAPER: VERTEBRATA AND ANIMAL BEHAVIOUR SYLLABUS EFFECT FROM: JUNE 2022 (TOTAL CREDIT: 4)		
Objectives	• To provide Detail Anatomy and Physiology about the Major Vertebrate animals • To provide conceptual aspect of animal behavior of animals' life processes.	
Out Come	• Type study will provide detail about anatomy and physiology of the Major vertebrate animals. • The students will learn about the behavior of life processes.	
Unit-1	**Type: Scoliodon:** (External features, digestive system, Respiratory system, Blood & Heart, Nervous system, sense organs and Urinogenital system) Economic importance of fishes. Osmoregulation in fishes.	25%
Unit-2	**Type: Frog:** (External features, Digestive system, Respiratory system, blood & Heart, Nervous system, sense organs, Urinogenital system and Metamorphosis of Frog.	25%
Unit-3	**Type: Calotes:** (External features, Digestive system, Respiratory system, Blood & Heart, Nervous system and Urinogenital system) General account on snakes: (Identification of poisonous and non-poisonous snake, Locomotion, hearing, feeding mechanism, poison apparatus, biting mechanism, snake venom, effects and its first aid treatment)	25%
Unit-4	**Animal behavior:** Introduction, innate and learnt behaviour. Role of pheromones in behaviour : Definition, types, production, mode of action, difference between pheromones and hormones.. Mating strategies: Monogamy, polygamy and polyandry.	25%

Basic Text and Reference books:

- Modern Text Book of Zoology – VERTEBRATES by R. L. KOTPAL
- Chordate Zoology by JORDAN and VERMA
- Animal Behaviour by REENA MATHUR

SARDAR PATEL UNIVERSITY B.Sc. SEMESTER – IV, ZOOLOGY PAPER CODE: US04CZOO52, TITLE OF PAPER: PHYSIOLOGY AND WILD LIFE SYLLABUS EFFECT FROM: JUNE 2019 (TOTAL CREDIT: 4)		
Objectives	• To Provide details about the three system Physiology of mammals like human • To provide an account of wildlife, Protective areas and agencies.	
Out Come	• the students will learn about detail physiology of Reproduction, Lymphatic and Immunology and Urinary Systems • the students will learn about sanctuary ,national parks and their protocols.	
Unit-1	**Human reproduction:** Male and female reproductive organs. Female reproductive cycle. Fertilization and implantation of embryo, Embryonic and fetal development. Maternal changes during pregnancy and labor. Methods of birth control. Disorders: AIDS and STD.	25%
Unit-2	**Lymphatic system of human:** Structure and function of primary and secondary lymphoid organs **Immunology:** Nonspecific resistance to diseases. Specific resistance to diseases: (Immunity, maturation of T – cells, B – cells, antigen, types of immune response) Cell mediated and antibody mediated immunity. Diseases: Rheumatoid arthritis, myasthenia gravis and multiple sclerosis.	25%
Unit-3	**Human Urinary system:** Structure of kidney. Renal physiology (Glomerular filtration, tubular reabsorption and tubular secretion in brief) Production of dilute and concentrated urine (counter current system) Urine transportation, storage and elimination. Disorders: Polycystic kidney disease, urinary tract infection and renal failure.	25%

Unit-4	**Wild life** Introduction, brief history of wild life. Importance of wild life. Vanishing of wild life. Conservation of wild life in India Sanctuaries and national park of Gujarat. Concept of threatened species. Wild life organizations.	25%

Reference books:

A text book of animal physiology - A. K. Berry
Animal physiology – M.P.Arora
Principles of anatomy and physiology- Gerard J Tortora & Bryan Derrickson
Modern Text Book of Zoology Vertebrates by R L Kotpal

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ZOOLOGY PRACTICAL – I (CREDIT: 2)

Dissection by Simulation, Animation or Charts

- External characters & Digestive system of Scoliodon, Mounting : Placoid Scales
- Urinogenital System of Scoliodon, Mounting : Gills
- Brain of Scoliodon, Mounting : Ampulla of Lorenzini
- External characters , Digestive system of Frog
- Urinogenital System & Development of Frog
- Brain of Frog, Mountings of Muscle & Nerve fibers
- Study of Frog Bones
- Calotes : External characters , Digestive system
- Urinogenital of Calotes
- Brain of Calotes

Objectives	• To Provide detail about animals and their Systems through Preserved animals	
Out Come	• The students will learn Characteristics from real preserved animals and type of Animals through Animation	

Basic Text & Reference Books:

- A Manual of Practical Zoology- Chordata by P.S.VERMA

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ZOOLOGY PRACTICAL – II (CREDIT: 2)

Classification of Chordata upto orders

- **Protochordata , Cyclostomata & Fishes :** Herdmania, Doliolum, Amphioxus, Lamprey, Hammer headed SHARK, Sting ray, Sea horse, Eel, Cat fish, Sucker fish, Flat fish
- **Amphibia & Reptiles : I**chthyophis, Salamander, Axolotal larva, Alytes, Tortoise, Varanus, Chamaeleon, Gecko, Alligator, Krait, Viper, Rat Snake, Sea Snake
- **Aves & Mammals:** Kite, Woodpecker, Kingfisher, Sparrow, Weaver bird, Hedgehog, Rat, Shrew, Loris, Porcupine, Squirrel.
- **Mammalian Histology:** T.S. of Testis, Ovary, Spleen, Kidney & L.S. of Kidney.
- Birth control methods in Human.
- Antigen – Antibody Reaction by Widal Test
- Normal & Abnormal Qualitative Urine Analysis.
- Study of Endangered Species of Gujarat
- Project Submission
- Study Tour

Objectives	• To Provide detail about animals and their Identification through Preserved animals • To provide idea about clinical histology and immunlogy	
Out Come	• The students will learn Characteristics from real preserved animals and type of Animals through Animation • The students will learn about tissue anatomy and immunity	

Basic Text & Reference Books:

- A Manual of Practical Zoology- Chordata by P.S.VERMA
- Practical Physiology, Anatomy & Biochemistry by SHAH, PATEL& GOEL
- Practical Zoology Invertebrate by S.S. LAL.