BankimSardar College

A College with Potential for Excellence

Department of Zoology

General CBCS, CU

Programme Specific Outcome (PSO) - Course Outcome (CO)

Programme Specific Outcome (PSO):

- *PSO 01.* To provide basic knowledge about classical Zoology to get familiar with non-chordates and chordates and their economic importance, for taxonomy and conservation.
- PSO 02. To prepare students with the concept applicable in conducting experimental research.
- PSO 03. Present an oral explanation of a biological principle or other biological information.
- PSO 04. Write an explanation of a biological principle or information from the biological literature.
- PSO 05. Create and interpret a graph or other visual representation of information.
- *PSO 06.* To prepare students with modern tools and techniques specially in applied zoology for their future entrepreneurship.
- *PSO 07.* To keep the students aware of the field biology and entomology to build future citizens as more sensible and cautious of depleting biodiversity in and around the surrounding environment.
- *PSO 08.* To build the motivation and fundamental bases in order to carryout higher studies in the subject and related field in academic carrier development as well as to keep them updated with introduction of hand on basis in operating modern tools and techniques in medical diagnosis and animal biotechnology.

Core Courses	Content of CU Syllabus	Course Outcome
Semester 1		
CCG01	Animal Diversity	The students will get a clear picture of
ZOOG- CC1-1-TH	Unit 1: Kingdom Protista General characters and classification up to classes (Levine et. al., 1980); LocomotoryOrganelles and locomotion in <i>Amoeba</i> and <i>Paramecium</i> .	
	Unit 2: Phylum Porifera General characters and classification up to classes (Ruppert and Barnes, 1994, 6th Ed.); CanalSystem in <i>Sycon</i> .	CO 01. Understanding invertebrate and vertebrate classification by
	Unit 3: Phylum Cnidaria	Identification of characteristic

General characters and classification up to classes (Ruppert and Barnes, 1994, 6th Ed.); Metagenesis in Obelia.

Unit 4: Phylum Platyhelminthes

General characters and classification up to classes (Ruppert and Barnes, 1994, 6th Ed.); Lifehistory of *Taeniasolium*.

Unit 5: Phylum Nemathelminthes

General characters and classification up to classes (Ruppert and Barnes, 1994, 6th Ed.); Lifehistory of *Ascarislumbricoides* and its adaptation

Unit 6: Phylum Annelida

General characteristics and Classification up to classes (Ruppert and Barnes, 1994). Metamerism in Annelida.

Unit 7: Phylum Arthropoda

General characters and classification up to classes (Ruppert and Barnes, 1994, 6th Ed.); Eye inCockroach, Metamorphosis in Lepidoptera.

Unit 8: Phylum Mollusca

General characteristics and Classification up to classes (Ruppert and Barnes, 1994); respiration in *Pila sp.*

Unit 9: Phylum Echinodermata

General characteristics and Classification up to classes (Ruppert and Barnes, 1994); Watervascularsystem in Asteroidea.

Unit 10: Protochordates

General Characters; Pharynx and feeding mechanism in *Amphioxus*.

Unit 11: Agnatha

General features of Agnatha and classification of cyclostomes up to classes (Young, 1981).

Unit 12: Pisces

General features and Classification up to orders (Young, 1981); Osmoregulation in Fishes.

Unit 13: Amphibia

General features and Classification up to orders (Young, 1981); Parental care.

Unit 14: Reptiles

General features and Classification up to orders (Young, 1981); Poisonous and non-poisonoussnakes, Biting mechanism.

Unit 15: Aves

General features and Classification up to orders (Young, 1981); Flight adaptations in birds.

features of each taxon upto class level for non-chordates and upto Order level for Chordates.

CO 02. Discussing special features specific to different phyla like locomotion in protest, canal system in Porifera, life history of some platyhelminth and nemathelminth parasites, metamerism in annelids, metamorphosis in arthropods, water vascular system in echinoderms..

CO 03. Study on classification and salient features of several protochordates and chordate forms and discussing special features like osmoregulation in fishes, parental care in amphibians, biting mechanism in snake, flight adaptation in birds and exo-skeletal derivatives in mammals.

ZOOG- CC1-1-P	Unit 16: Mammals Classification up to orders (Young, 1981); Hair, Horn & Antler, Nail & claw.	
	Practical	The students will develop the skill to
	Animal Diversity 1. Identification with reasons of the following specimens: Amoeba, Euglena, Paramecium, Sycon, Obelia, Aurelia, Metridium, Taeniasolium, Ascarislumbricoides (Male and female), Aphrodite, Nereis, Hirudinaria, Palaemon, Cancer, Limulus, Apis, Chiton, Dentalium, Unio, Sepia, Octopus, Echinus, Cucumaria and Antedon, Balanoglossus, Branchiostoma, Petromyzon, Torpedo, Labeorohita, Exocoetus, Salamandra, Hyla, Chelone, Hemidactylus, Chamaeleon, Draco, Vipera, Naja, Bat, Funambulus. 2. Key for Identification of poisonous and non-poisonous snakes. 3. Study of anatomy of digestive system, salivary gland, mouth parts of Periplaneta, Study ofreproductive system of female cockroach.	CO 04. Augmenting the theoretical knowledge gained in CCG1 by studying selected preserved museum specimen for each phylum. CO 05. Gaining expertise in invertebrate dissection by studying various systems of Cockroach. CO 06. Preparation of Animal album project.

Core Courses	Content of CU Syllabus	Course Outcome
Semester 2		
CCG02	Comparative Anatomy & Developmental Biology	The students will get a clear picture of
ZOOG- CC2-2-TH	Unit 1: Integumentary System Derivatives of integument with respect to glands in Birds &Mammals.	
	Unit 2: Digestive System Stomach and Dentition.	CO 01. Exploring anatomical variations in different animal systems by
	Unit 3: Respiratory System Brief account of Gills, lungs, air sacs and swim bladder.	studying their brief accounts.
	Unit 4: Circulatory System Evolution of heart and aortic arches.	
	Unit 5: Urino-genital System Succession of kidney, Evolution of urino-genital ducts.	CO 02. Gaining knowledge of early and late embryonic development with relation to sea-urchin, frog, chick
	Unit 6: Early Embryonic Development	and mammals.

	Gametogenesis: Spermatogenesis and oogenesis with respect to mammals. Fertilization: Sea-Urchin; Early development of frog; structure of mature egg and its membranes, patterns of cleavage, fate map, up to formation of gastrula; types of morphogenetic movements; Fate of germ layers. Unit 7: Late Embryonic Development Placenta types and function; Metamorphic events in frog life cycle and its hormonal regulation.	
ZOOG-	Practical	
CC2-2-P	Comparative Anatomy & Developmental Biology Lab	The students will develop the skill to
	 Osteology: Limb bones, girdle and vertebra of Pigeon &Guineapig, Mammalian skulls: One herbivorous; Guinea pig and one carnivorous; Dog. Larval stages: Veliger, Nauplius, Trochophore, Mysis. Study of the different types of placenta- histological sections through photomicrographs. Developmental stages of chick embryo: 24 Hrs., 48 Hrs, 72 Hrs., 96 Hrs. 	CO 03. Visually identifying astrological specimen, gaining knowledge about Larval forms of various Invertebrate Phyla, Learning to identify different types of Placenta and chick embryo Histologically.

Core Courses	Content of CU Syllabus	Course Outcome
Semester 3		
CCG03	Physiology and Biochemistry	
ZOOG- CC3-3-TH	Unit 1: Nerve and muscle Structure of a neuron, resting membrane potential, Origin of Action potential and itspropagation in myelinated and non- myelinated nerve fibres, Ultra-structure of skeletal muscle, Molecular and chemical basis of muscle contraction.	The students will get a clear picture of
	Unit 2: Digestion Physiology of digestion in the alimentary canal; Absorption of carbohydrates, proteins, lipids.	
	Unit 3: Respiration Pulmonary ventilation, Transport of Oxygen and carbon.	CO 01. Gaining knowledge about the basic physiological functions like Digestion, Respiration, Circulation,
	Unit 4: Cardio-vascular system	Excretion, Control and

Composition of blood, Structure of Heart, Origin and conduction of the cardiac impulse, cardiac cycle.

coordination.

Unit 5: Excretion

Structure of nephron, Mechanism of Urine formation; Countercurrent Mechanism.

Unit 6:Reproduction and Endocrine Glands

Physiology of male reproduction: Histology of testis, hormonal control of spermatogenesis; Physiology of female, reproduction: Histology of ovary, hormonal control of menstrual cycle. Structure and function of pituitary, thyroid, pancreas and adrenal.

Unit 7: Carbohydrate Metabolism

Glycolysis, Kreb's cycle, Glycogenesis, Electron Transport Chain.

Unit 8: Lipid metabolism

Beta oxidation of Palmitic acid {saturated (C 16:0)} and Linoleic acid {unsaturated (C 18:2)}.

Unit 9: Protein Metabolism

Transamination, Deamination, Urea cycle.

Unit 10. Enzyme

Enzyme Classification, factors affecting enzyme action, Inhibition.

Carbohydrates, Lipids and Protein Metabolism. Understanding various concepts of Enzyme actions.

CO 02. Learning various pathways of

ZOOG-CC3-3-P

Practical

Physiology and Biochemistry Lab

- 1. Study of permanent histological sections of mammalian pituitary, thyroid, pancreas, adrenal gland.
- 2. Study of permanent histological sections of mammalian duodenum, liver, lung, kidney.
- 3. Qualitative test for carbohydrate samples.

The students will develop the skill to

CO 03. Identification of some permanent Mammalian Histological sections and quantitative analysis of Carbohydrates samples.

	Apiculture	The students will develop the skill to obtain
SEC-A		and utilize
ZOOG-	Unit 1: Biology of Bees	
SEC-A-3-1-	Classification and Biology of Honey Bees Social Organization of	
TH	Bee Colony.	CO 01. Concepts of Biology of Honeybees,
	Unit 2: Rearing of Bees Artificial Bee rearing; Apiary, Beehives - Newton and Langstroth, Bee Pasturage; Selection ofBee Species for Apiculture; Bee Keeping Equipment; Methods of Extraction of Honey;Indigenous and Modern.	Classification, Bee Rearing Methods, Products of Bee Culture and their Industrial uses, Diseases and pest of Honeybee and their management.
	Unit 3: Diseases and Enemies Bee Diseases and Enemies Control and Preventive measures.	
	Unit 4: Bee Economy Products of Apiculture Industry and its Uses; Honey, Bees Wax, Propolis, Pollen etc.	CO 02. Recent efforts and modern methods employed in Bee-Keeping Industry.
	Unit 5: Entrepreneurship in Apiculture Bee Keeping Industry - Recent Efforts, Modern Methods in employing artificial Beehives forcross.	

Core Courses	Content of CU Syllabus	Course Outcome
Semester 4		
CCG04	Genetics & Evolutionary Biology	The students will get a clear picture of
ZOOG- CC4-4-TH	Unit 1:Mendelian Genetics and its Extension Principles of Inheritance, Chromosome theory of inheritance, Incomplete dominance and codominance,Multiple alleles, lethal alleles, sex linked inheritance in Drosophila (White eyelocus) & Human (Thalassemia).	CO 01. Reinforcing basic concepts of classical Mendelian genetics and learning concepts of it's extension.
	Unit 2: Linkage, Crossing Over Linkage and crossing over, Complete & Incomplete Linkage, Recombination frequency as ameasure of linkage intensity. Holiday Model.	CO 02. Basic concept of recombination using Holiday model, different types of chromosome and gene mutation, fundamental basis of sex determination.
	Unit 3: Mutation Chromosomal mutation, Deletion, duplication, inversion, translocation, aneuploidy, genemutation, induced mutation, types & example.	
	Unit 4: Sex determination	

Genic Balance theory and dosage compensation in Drosophila.

Unit 5: Origin of Life

Chemical Origin of life.

Unit 6: Evolutionary Theories

Lamarckism, Darwinism, Neo-Darwinism.

Unit 7: Process of Evolutionary changes

Isolating mechanism, Natural Selection.

Unit 8: Speciation

Sympatric, Allopatric, Parapatric.

ZOOG- CC4-4-P

Practical

Genetics and Evolutionary Biology Lab

- 1. Verification of Mendelian Ratio using Chi square test.
- 2. Identification of Human Aneuploidy using photo graph of karyotype.
- 3. Phylogeny of horse with diagram of limb and skull.
- 4. Study and identification of Darwin Finches from photographs.
- 5. Visit to natural history museum and submission of report.

- *CO 03.* Describing chemical origin of life on earth.
- CO 04. Understanding various theories of evolution, learning how isolating mechanisms and natural selection favour evolution and origin of new species.

The students will develop the skill to

- *CO 05.* Study of concepts of Human aneuploidy, Phylogeny of horse and evolution of Darwin finches using photographs.
- CO 06. Develop idea about evolutionary basis in fossil and extant animals and importance of conservation of museum specimens.

	Aquarium Fish Keeping	The stu	dents will develop the skill to
SEC-B ZOOG- SEC-B-4-2- TH	Unit l: Introduction to Aquarium Fish Keeping The potential scope of Aquarium Fish Industry as a Cottage Industry, Exotic and Endemicspecies of Aquarium Fishes.	CO 01.	Study of Aquarium fish keeping as a vocation based course by realizing
	Unit 2: Biology of Aquarium Fishes Common characters and sexual dimorphism of Fresh water and Marine Aquarium fishes such asGuppy, Molly, Sword tail, Gold fish, Angel fish, Blue morph, Anemone fish and Butterfly fish.		the scope and future prospects of this industry.
	Unit 3: Food and feeding of Aquarium fishes Use of live fish feed organisms. Preparation and composition of formulated fish feeds.	CO 02.	Understanding of different species of cultivable and ornamental fish.
	Unit 4: Fish Transportation Live fish transport - Fish handling, packing and forwarding techniques.	CO 03.	Designing and management of Aquarium.
	Unit 5: Maintenance of Aquarium General Aquarium maintenance - budget for setting up an Aquarium Fish Farm as a Cottage.		

Core Courses	Content of CU Syllabus	Course Outcome
Semester 5 DSEA1	Applied Zoology	The students will get a clear picture of
ZOOG- DSE-A-5-1- TH	Unit I: Host & Parasite Relationship Type of Host, Types of Parasites, Other types of Relations. Unit 2: Epidemiology of Diseases Transmission, Prevention and Control of Tuberculosis and Typhoid. Unit 3: Parasitic Protozoa Life History and pathogenicity of Entamoebahistolytica, Plasmodium vivax and Trypanosomagambiense. Unit 4: Parasitic Helminthes Life History and pathogenicity of Ancylostomaduodenale, Wuchereriabancrofti. Unit 5: Insect of Economic Importance Biology, Control and Damage caused by Heliocoverpaarmigera,	CO 01. Concepts of Host- Parasite interaction, Life history of Economically important Protozoan, Helminthes, Arthropod Parasite/Disease causing organisms/ Pests.

Pyrillaperpusilla, Sytophilusoryzae and Triboliumcasteneum.

Unit 6: Insect of Medical Importance

Medical Importance and control of Anopheles.

Unit 7: Animal Husbandry

Preservation and artificial insemination in cattle; Induction of early puberty and synchronization of estrus in cattle.

Unit 8: Poultry Farming

Principles of poultry breeding, Management of breeding stock and broilers, Processing and preservation of eggs.

Unit 9: Fish Technology

Genetic improvements in aquaculture industry; Induced breeding and transportation of fish seed.

ZOOG-DSE-A-5-1-P

Practical

Applied Zoology

- 1. Study of *Plasmodium vivax*, *Entamoebahistolytica*, *Trypanosomagambiense*, *Ancylostomaduodenale* and *Wuchereriabancrofti* and their life stages through permanent-slides/photomicrographs orspecimens.
- 2. Study of arthropod vectors associated with human diseases: *Pediculus, Culex, Anopheles, Aedes*
- 3. Study of insect damage to different plant parts/stored grains through damaged products/photographs.
- 4. Identifying feature and economic importance of *Helicoperva*; *Heliothisarmigera*, *Papiliodemoleus*, *Pyrillaperpusilla*, *Callosobruchuschinensis*, *Sitophilusoryzae* and *Triboliumcastaneum*.
- 5. Visit to poultry farm or animal breeding centre. Submission of visit report.
- 6. Maintenance of freshwater aquarium(demonstration only).

CO 02. Concepts of Animal Husbandry,
Poultry farming and Fish
technology.

The students will develop the skill to obtain knowledge from

CO 03. Photographic studies of Disease causing organisms/Vectors/Pests.

DSEA2	Aquatic-Biology	The stud	lents will get a clear picture of
ZOOG- DSE-A-5-2- TH	Unit 1: Aquatic Bionics Brief introduction of the aquatic biomes: Freshwater ecosystem; lakes, wetlands, streams andrivers, estuaries, intertidal zones, oceanic pelagic zone, marine benthic zone and coral reefs.	CO 01.	Understanding concepts related to Fresh water Ecosystem, Marine Ecosystem, Management of Aquatic Resources.
	Unit 2: Freshwater Biology lakes Origin and classification, Lake as an Ecosystem, Lake morphometry, Physico-chemicalCharacteristics: Light, Temperature, Thermal stratification, Dissolved Solids, Carbonate, Bicarbonates, Phosphates and Nitrates, Turbidity; dissolved gases; Oxygen, Carbon dioxide. Nutrient Cycles in Lakes-Nitrogen, Sulphur and Phosphorous. Streams: Different stages of stream development, Physico-chemical environment, Adaptation ofhill-stream fishes. Unit 3: Marine Biology	CO 02.	Understanding special features of biomes, lake, streams, basic concept of physic-chemical properties affecting helath of aquatic ecosystem.
	Salinity and density of Sea water, Continental shelf, Adaptations of deep sea organisms, Coralreefs, Sea weeds. Unit 4: Management of Aquatic Resources Causes of pollution: Agricultural, Industrial, Sewage, Thermal and Oil spills, Eutrophication, Management and conservation; legislations, Sewage treatment Water quality assessment – BODand COD.	CO 03.	Conceptualize basic understanding of nutrient recycling, coral reef biology, eutrophication, sewage treatment and water quality assessment.
ZOOG- DSE-A-5-2- P	Practical Aquatic-Biology 1. Determine the area of a lake using graphimetric and gravimetric method. 2. Identify the important macrophytes, phytoplanktons and zooplanktons present in a lake ecosystem. 3. Determine the amount of dissolved Oxygen, and free Carbon dioxide, in water collected from a nearbylake / water body. 4. Visit to any aquatic Ecosystem and preparation and submission	co 04.	Practical demonstration of a few concepts of Aquatic Biology in Fresh water Ecosystem like area determination, use of planktons as indicators, O2 and Co2 measurement. Documentation of health status of
	of report.		any aquatic ecosystem on field approach.

SEC-A1 ZOOG-SEC-A-5-3-TH

Sericulture

Unit 1: Introduction

Sericulture: Definition, history and present status; Silk route; Types of silkworms, Distributionand Races Exotic and indigenous races Mulberry and non-mulberry Sericulture.

Unit 2: Biology of Silkworm

Life cycle of Bombyxmori; Structure of silk gland and secretion of silk.

Unit 3: Rearing of Silkworms

Selection of mulberry variety and establishment of mulberrygarden Rearing house and rearingappliances Disinfectants: Formalin, bleaching powder, RKO Silkworm rearing technology:

Early age and Late age rearing Types of mountages; Spinning and harvesting and storage of cocoons.

Unit 4: Pests and Diseases

Pests of silkworm: Uzi fly, dermestid beetles and vertebrates Pathogenesis of silkworm diseases:Protozoan, viral, fungal and bacterial Control and prevention of pests and diseases.

Unit 5: Entrepreneurship in Sericulture

Prospectus of Sericulture in India: Sericulture industry in different states, employment, potentialin mulberry and non-mulberry sericulture.

Visit to various sericulture centres.

The students will develop the skill to

- *CO 01.* History, development and organization of sericulture industry.
- *CO 02.* Understanding biology of silkworm, rearing.
- CO 03. Gaining knowledge of Techniques of Mulberry garden establishment, cultivation, pruning and management.
- *CO 04.* Harvesting and storage of silk, silkworm pests and diseases.
- *CO 05.* Future and prospects of silk industry in India.
- *CO 06.* Visiting sericulture centres to gain an insight of the concepts learned in theory and familiarity with various sericulture practices.

Courses		
Semester 6		
DSE-B1	Biology of Insect	
	Diology of Miseco	The students will get a clear picture of
ZOOG- DSE-B-6-1- TH	Unit 1: Introduction to Insects General Features of Insects, Morphological features, Head, Eyes, Types of antennae, Mouthparts with respect to feeding habits.	
	Unit 2: Concept of Vectors Brief introduction of Carrier and Vectors; mechanical and biological vector, Reservoirs, Hostvectorrelationship, Adaptations as vectors, Host Specificity	CO 01. Identification of general and Morphological features of Insects as
	Unit 3: Insects as Vectors Classification of insects up to orders, detailed features of orders with insects as vectors -Diptera, Siphonaptera, Siphonaptera, Hemiptera.	Vectors, concepts of Vectors and carriers.
	Unit 4: Dipteran as Disease Vectors Dipterans, as important insect vectors - Mosquitoes, Sand fly, Houseflies; Study of mosquitobornediseases - Dengue, Viral encephalitis, Filariasis; Control of mosquitoes.	
	Unit 5: Siphonaptera as Disease Vectors Fleas as important insect vectors; Host-specificity, Study of Fleaborne diseases - Plague, Typhus fever; Control of fleas.	CO 02. Concepts of Host- Vectors relationship, Host specificity, Control of Vectors and Prevention
	Unit 6: Siphunculata as Disease Vectors Human louse; Head, Body and Pubic louse as important insect vectors; Study of louse-bornediseases -Typhus fever, Relapsing fever, Trench fever; Control of human louse.	of Disease.
	Unit 7: Hempitera as Disease Vectors Bugs as insect vectors; Blood-sucking bugs; Chagas disease, Bed bugs as mechanicalvectors, Control and prevention measures.	
ZOOG- DSE-B-6-1-	Practical Biology of Insect	
P	1. Study of different kinds of mouth parts of insects	The students will develop the skill to obtain
	2. Study of following insect vectors through permanent	knowledge from
	slides/photographs: Aedes, Culex, Anopheles,Pediculushumanuscapitis, Pediculushumanuscorporis, Phlebotomusargentipes, Muscadomestica.	CO 03. Identification of Insect Vectors and their mouth parts using permanent slides / Photographs, Preparation of Project Report on any one Insect
	3. Submission of a project report on any one of the insect vectors and disease transmitted by the insect.	Vector / Disease transmitted by it.

DSEB2

Ecology & Wild life Biology

ZOOG-DSE-B-6-2-TH

Unit 1: Introduction to Ecology

Ecosystem, Autecology and synecology, Levels of organization, Laws of limiting factors, Study of Physical factors, The Biosphere.

Unit 2: Population

Attributes of population: Life tables, fecundity tables, survivorship curves, dispersal and dispersion. Geometric, exponential and logistic growth, equation and patterns, Populationregulation: density-dependent and independent factors.

Unit 3: Community

Community characteristics: species diversity, abundance, dominance, richness, Verticalstratification, Ecotone and edge effect.

Unit 4: Ecosystem

Types of ecosystem with an example in detail, Food chain: Detritus and grazing food chains, Linear and Y-shaped food chains, Food web, Energy flow through the ecosystem, Ecological pyramids and Ecological efficiencies.

Unit 5: Wild Life

Wildlife Conservation (in-situ and ex-situ conservation): Necessity for wildlife conservation; National parks & sanctuaries, Tiger conservation - Tiger reserves in India; Managementchallenges in Tiger reserve.

ZOOG-DSE-B-6-2-P

Practical

Ecology & Wild life Biology

1Identification of flora, mammalian fauna, avian fauna.

- 2. Demonstration of basic equipment needed in wildlife studies use, care and maintenance (Compass,Binoculars, Spotting scope, Range Finders, Global Positioning System, Various types of Cameras and lenses).
- 3. Familiarization and study of animal evidences in the field; Identification of animals through pug marks,hoof marks, scats, pellet groups, nest, antlers, etc.
- 4. Study of an aquatic ecosystem: Phytoplankton and zooplankton, Measurement of area, temperature, salinity, determination of pH, and Dissolved Oxygen content (Winkler's method), Chemical

The students will get a clear picture of

CO 01. Understanding concepts of Ecosystem, Autoecology, Synecology, Attributes of Population, different growth curves, r- and k- selection, population regulation Community characteristics.

CO 02. Understanding concepts of energy flow in ecosystem, food chain, pyramids, Wildlife management and conservation challenges.

The students will develop the skill to obtain knowledge from

- CO 03. Practical aspects of wildlife biology on field approach towards their identification and conservation implications.
- *CO 04.* Documentation of wildlife with use of modern tools like Range finder, GPS, camera trap, etc.
- CO 05. Different density measurement protocols in field like mark and recapture, area, DO₂ and COD measurement.

SEC-B1
ZOOG-
SEC-B-6-4-
TH

Medical diagnosis

Unit 1: Diagnostics Methods Used for Analysis of Blood

Blood composition, Preparation of blood smear and Differential Leucocyte Count (D.L.C) usingLeishman's stain, Platelet count using haemocytometer, Erythrocyte Sedimentation Rate (E.S.R)

Unit 2: Diagnostic Methods Used for Urine Analysis

Urine Analysis: Physical characteristics; Abnormal constituents, Urine culture.

Unit 3: Non-infectious Diseases

Causes, types, symptoms, complications, diagnosis and prevention of Diabetes (Type I and Type II), Hypertension (Primary and secondary), Testing of blood glucose using Glucometer/Kit

Unit 4: Infectious Diseases

Causes, types, symptoms, diagnosis and prevention of Tuberculosis and Hepatitis, Malarial parasite(Microscope based and ELISA based).

Unit 5: Clinical Biochemistry

Lipid profiling, Liver function test. PSA test.

Unit 6: Clinical Microbiology

Antibiotic Sensitivity Test.

Unit 7: Tumours

Types (Benign/Malignant), Detection and metastasis; Medical imaging: X-Ray of Bone fracture.

Unit 8: Visit to Pathological Laboratory and Submission of Project

The students will develop the skill to

- CO 01. Gaining knowledge of Diagnostic methods used for analysis of Blood and Urine like DLC ESR, Platelet count, Urine Culture etc.
- CO 02. Study of Causes, Types, Symptoms,
 Diagnosis and Prevention of
 Infectious and Non infectious
 Diseases.
- CO 03. Understanding concepts of Clinical Biochemistry, Clinical Microbiology and Tumour Detection.
- CO 04. Understanding hands on scenario of pathological labs and modern tools and techniques used for medical diagnosis.