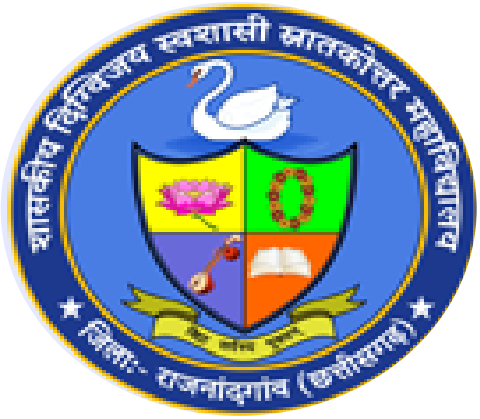
GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE, RAJNANDGAON



TEACHING PLAN

2022-2023

DEPARTMENT OF ZOOLOGY

Teaching plane

B.Sc.III Zoology

KARUNA RAWTE

Paper- I

session 2022-23

Ecology,Environmental Biology,Toxicology,MicrobiologyAnd Medical Zoology

Month	Topic	Unit
July-2022	Unit:Ecology 1.Aims and Scope of Ecology 2.Major Ecosystem of the world 3.Population	I
August-2022	4.Communities and Ecosystem 5.Biogeochemical cycles 6.Air and Water pollution 7.Ecological succession **.Unit:Environmental Biology** 1.Laws of Limiting factors 2.Food Chain in a Freshwater Ecosystem 3.Energy Flow in Ecosystem 4.Conservation of Natural Resources	I&II
September-2022	5.Environmental impact assessment **Unit:Toxicology** 1.Defination of Toxicity 2.Classification of Toxicants 3.Principle of Systematic toxicology	II &III
October-2022 November-2022	4.Toxic Agents and their Action 5.AnimalPoision Unit:Microbiology 1.General and applied Microbiology 2.Microbiology of Domestic Water and Sewage 3.Microbiology of milk and milk products 4.Indrustrial Microbiology Unit: Medical Microbiology 1.Brief Introduction to Pathogenic Microorganism:Rickettsia,Spirochaetes ,Aids And Typhoid	III&IV IV &V
December-2022	Practical 2.Pathogenic Protozoa:Entamoeba,Trypanosoma and Plasmodium 3.Pathogenic Helminths:Schistosoma Practical	V
January 2023	Practical 5.Nematodes:Pathogenic Parasites of Man	V
February	Practical 6. vector insects	

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Teaching plane-2022-23

MSc. Zoology(Final)

Elective A : Fish & Fisheries And Aquaculture

Paper -IV

Karuna Rawate

Fisheries And Aquaculture Month	Topics	Unit
January -2023	Unit : 1.Aquaculter (aims , objectives, strategies adapted) 2.Phisico-chemical and biological characteristics of fish pond. 3.Fish pond (planning ,construction and layout) 4.Maintenance and improvement of the fish form.	I
Febrauary - 2023	5.Aquatic weeds and their control Unit : 1. Principle Cultivable Fisheries. 2. Fish seed (Collection , Identification and Transportation) 3.Induced Breeding in Fishes . 4. Composite Fish culture	I & II
March-2023	5 .Air Breathing fishes. Unit : 1.Paddy -cum -fish culture. 2.Sewage -fed fish forming. 3.Larvicidal fishes (Characteristics, Propagation and introduction in water bodies) 4.Exotic Fishes.	II & III
April - 2023	5.Open water stocking and ranching. Unit : 1.Harvesting The Fishes (harvesting ,sorting ,preservation and processing) 2. Fish by product. 3.Fish Marketing . 4.Prawn fisheries (capture and culture) 5. Fish disease and their control .	IV

Karuna

Teaching plane

M.Sc. -previous

Zoology paper - II

KARUNA RAWATE

MONTH	TOPICS	UNIT
August 2022	Organization of Coelom 1. Acoelomates. 2. Pseudoeocoelomates. 3. Protostomia and Deuterostomia.	Unit - I
September -2022	Locomotion – 1. Flagella and cilliary movement in protozoa . 2. Hydrostatic movement in coelenterate ,Annelida and Echinodermata. Nutrition and Digestion – 1. Patterns of feeding and digestion in lower metazoan. (Porifera &Coelenterata) 2. Filter feeding in polychaeta, Mollusca.	Unit – I & II
October -2022	Respiration – 3.Organs of respiration -Gill, Book Lungs and Trachea. 4. Respiratory Pigments. 5. Mechanism of Respiration (Arthropoda,Mollusca). Excretion – 1.Organs of excretion – Coelom, Coelomoducts, Nephridia and Malpighian tubules. 2. Mechanism of excretion .(Annelida , Arthropoda). 3.Osmotic and Ionic regulation in aquatic animals in invertebrates). 4.Osmoregulation in Terrestrial animals . NERVOUS SYSTEM 5.Primitive Nervous System-Coelenterata and Echinodermata. 6.Advanced nervous system -Arthropoda(crustacea) and Mollusca (Cephalopoda) LARVAL FORMS AND MINOR PHYLA 1.Larval forms and significance of Crustacea. 2. .Larval forms and significance of Echinodermata.	II & III
November -2022	3.Larval forms and significance of Platyhelminthies . 4. Structure and affinities of – Ectoprocta,Endoprocta.	IV
December -2022	Revisions and Practical Exam	

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Teaching Plan

Name - Dr. Majid Ali **Subject - Zoology, Industrial Fish and Fisheries**

Session - 2022-23

S. No.	Month	Class	Unit	Topic
1.	July	B.Sc. Part II Zoology	III	Introduction of Evolution
				Basic Concept of Organic evolution
				Theories Of Organic evolution
		B.Sc Part II IFF	I	Milk fish culture, Mullet fish culture, Grouper fish culture
		M.Sc. Sem. III	I	Introduction of Evolution
				Basic Concept of Organic evolution
				Theories Of Organic evolution, Speciation
2.	August	B.Sc. Part II Zoology		Lamarkism, Neo-Lamarkism, Darwinism, Neo-Darwinism
			III	
		B.Sc Part II IFF	I & II	Tiger Prawn Culture, Mud Crab, Lobesters, Edible Oyesteers
		M.Sc. Sem. III	I	Modern Synthetic Theory of Organic Evolution
3.	September	B.Sc. Sem I Zoology	III	Introduction of Biology, Classification of Annelida and Type Study - Earthworm Classification of Arthropoda and Type Study - Palaemon
		B.Sc. Part II Zoology	III & I	Evolution of Horse, Str. and Function of Endocrine system
		B.Sc. Sem I IFF	I	Classification of Pisces Fish Skin and Scales,
		B.Sc Part II IFF	II & II	Pearl, Composite fish culture, Fish cum Duck Culture
		M.Sc. Sem. III	II &III	Species Concept, Isolation, Molecular Clock, Gene Families, Micro and Macro Evolution
		M.Sc. Sem. I	I & II	Classification and Origin of Chordata, Integument, Circulatory System- Comparative Study and Physiology
4.	October	B.Sc. Sem. I Zoology	III & IV	Classification of Mollusca and Type Study - Pila Classification of Echinodermata and Type Study - Sea Star
		B.Sc. Part II Zoology	I	Hormone receptors, Mechanism of Hormone Action, Pituitary, Thyroid, adrenal glands
		B.Sc. Sem. I IFF	II	Coloration, Fins, Locomotion in fishes
		B.Sc Part II IFF	III	Sewage Fed Fisheries, Cage Culture
		M.Sc. Sem. I	II & III	Respiratory System, Osteology, Urinogenital System,
		M.Sc. Sem. III	IV	Evolution of Man and Horse
5.	November	B.Sc. Sem. I Zoology	III & IV	Type Study - Sea Star, larvae of Echinodermata Classification of Hemichordata Type Study - Balanoglossus

		B.Sc. Part II Zoology	II	Reproductive Hormones and Physiology
		B.Sc. Sem. IFF	III & IV	Digestive System, Circulatory System and nervous system of fishes
		B.Sc Part II IFF	IV	Pen Culture, Ornamental Fish Culture, Fish Nutrition
		M.Sc. Sem. I		Comparative anatomy and physiology of chordates Nervous System - Brain, Spinal Cord, Sense organs
		M.Sc. Sem. III		Origin and Evolution of economically important microbes and animal
6.	December	B.Sc. Sem. I Zoology	III & IV	Revision
		B.Sc. Part II Zoology	IV	Ethology
		B.Sc. Sem. I IFF	IV	Urinogenital System, Osmoregulation in fishes Revision
		B.Sc Part II IFF	V	Fish genetics and Biotechnology
7.	January	B.Sc. Sem. II Zoology	V	Intro to cytology, Plasma Membrane
		B.Sc. Part II Zoology	V	Economic Zoology
		B.Sc Part II IFF	V	Fish genetics and Biotechnology
		M.Sc. Sem. II	I	Plasma Membrane- Composition, Models, Cell Junction
		M.Sc. Sem. IV	I	Basic Concept of Limnology, Lotic and Lentic System, River and Lake System,
8.	February	M.Sc. Sem. II	II	Cell signaling, AMIS, Cytoskeleyton
		M.Sc. Sem. IV	II	Pond and Estuaries, Phyto and Zooplanktons
9.	March	M.Sc. Sem. II	III	Cell cycle, Nucleus and Chromosome,
		M.Sc. Sem. IV	III	Light, Heat and Water Movement
10.	April	M.Sc. Sem. II		
		M.Sc. Sem. IV	IV	Oxygen as limiting factor, Carbon complex, Nitrogen cycle and other biogeochemical cycle.

Mr. Chiranjeev Pandey - Department of Zoology

Teaching Plan

Session 2022-23

B.Sc. Semester - I
Course Name - DSE- I
Subject - Zoology
Paper Title - Non-chordates

Month	Name of the Topic	Unit
July	1. General characteristics and Classification up to order (Arthropoda & Mollusca) 2. Type study of Paleamon.	III
August	3. Type study of Pila. 4. Pearl culture.	III
September	5. General characteristics and Classification up to order (Echinodermata & Hemichordata)	III
October	6. Type study of Aesterias.	IV
November	7. Larval forms of Echinodermata.	IV
December	8. Type study of Balanoglossus	IV

B.Sc. Semester - I
Course Name - DSE- I
Subject - IFF
Paper Title - Ichthyology

Month	Name of the Topic	Unit
July	**Classification** 1.Class - Elasmobranchii 2.Class - Holocephali 3.Class - - Dipnoi 4.Class –Teleostomi	I
August	1. Skin of Fishes its structure and function 2. Scales in Fishes.	I
September	1. Coloration in fishes. **2.** Fins in fishes. **3.** Locomotion in Fishes.	II
October	1. Food and alimentary canal: Food, feeding habits, seasonal fluctuation of food. Alimentary canal of Clarias batrachus, Modification of alimentary canal & digestion. 2. Blood vascular system structure and working of the heart, arterial & venous system.	III
November	1. Swim bladder –Structure and function. 2. Respiration- Respiratory organs and mechanism of respiration. 3. Accessory respiratory organ.	III & IV
December	Nervous system – Structure of Brain, Spinal cord and Nerve. The sense organ -taste buds, Eye, Membranous labyrinth, Lateral line system. Excretion and Osmoregulation - structure of kidney, histology. Osmoregulation in freshwater fishes and marine water fishes.	IV

Teaching Plan

B. Sc. part -II

Industrial fish and fisheries

Paper -I

(Fresh water aquaculture & Seed production)

Month	Name of the Topic	Unit
July	1. Definition and history of aquaculture, scope important status of aquaculture in different countries. 2. Importance of water in fish production, its physical & chemical parameters. 3. Importance of soil in aquaculture, important properties & type. 4. Preparation of fish form – principles of site selection for various kinds of fish form.	**I**
August	**. Management of pond** 1. Control of weeds and algal blooms. 2. Liming and fertilization. 3. Management of nutritive elements.	**II**
September	1. Control of predators and aquatic insects. 2. Procurement of seeds, transportation and stocking. 3. Post stocking management.	**II**
October	**Aquaculture in fresh water** 1. Extensive, semi-intensive culture of Carp fishes. 2. Reproduction and seed production. (A) Induced breeding (B) Bund breeding.	**III**
November	(A) Hatchery methods – (Different types of hatcheries including Chinese hatchery) (B) Different stages of seed- spawn, fry & fingerlings. (C) Breeding of common carp. (D) Preparation of nursery and rearing pond & their management.	**III**
December	1. Culture of air breathing fishes. 2. Cold water aquaculture. 3. Larvivorous fish culture	**IV**
January	**1.** Breeding and culture of fresh water prawn. **2.** Tilapia culture and its importance. **Fish Feeding -** 1. Characters and types of food. 2. Natural and artificial food.	**IV**
February	1. Importance of nutritive elements of fish food. 2. Methods of food preparation. 3. Storing of fish food.	**V**

Teaching Plan

B.Sc. part - III

Industrial Fish and Fisheries

Paper - I

Construction and management of Aquarium

Month	Name of the Topic	Unit
July	1. Introduction – Fish keeping aquarium, aquarium fish and role of aquarists. 2. Water and its management, N Cycle in the aquarium, Mulm and artificial light. 3. Aeration and its structure.	**I**
August	4. Filtration – Structure and different type of filters. **Fish keeping** 5. Setting of fresh water aquarium, post setting steps. 6. Construction of all glass aquarium tank bedding material for aquarium	**I**
September	7. Transporting and stocking of fresh water aquarium. 8. Tools and accessories used in aqua	**II**
October	9. Décor. 10. Food, feed and feeding.	**II**
November	11. Breeding –Breeding tank, breeding habit. 12. Fish health and hygiene – stress and Ailment 13. Common aquarium plants, Morphology.	**III**
December	14. Marine aquaria and its management. 15. Marine ornamental Fishes 16. Fresh water ornamental Fishes .	**III & IV**
January	17. Other ornamental organism – Sea - Anaemone, Octopus, Star-fish etc 18. Philosophy and principles of Extension education. 19. Extension teaching method.	**IV & V**
February	20. Effective field visits, group discussion and case method. 21. Role of Simple visuals in communication.	**V**

Teaching Plan

M.Sc. Semester - I
Paper - I
Subject - Taxonomy

Month	Name of the Topic	Unit
July	**Biosystematics** 1. History of systematics. 2. Importance & applications of biosystematics in biology.	**I**
August	**3.** Material basis characteristics of Biosystematics. **4.** Species concept. **Trends in biosystematics** 5. Chemotaxonomy. 6. Cytotaxonomy.	**I & II**
September	7. Molecular taxonomy. 8. Immuno taxonomy. **Dimensions of Speciation & Taxonomic characters** 9. Theories of biological classification, hierarchy of categories.	**II & III**
October	10. Origin of Reproductive isolation - biological mechanism of genetic incompatibility. 11. Speciation.	**III**
November	**Procedure keys in Taxonomy** 12. Types of taxonomic keys - Merits & Demerits. 13. Taxonomic procedures – Taxonomic collections, preservation, curetting process and identification.	**IV**
December	14. International code of Zoological nomenclature (ICZN) its operative principles and application of important rules. 15. Zoological nomenclature Formation of scientific names of various taxon.	**IV**

Teaching Plan

B.Sc. Semester - II

Course Name - DSE- II

Subject - Zoology

Paper Title - Cell Biology

Month	Name of the Topic	Unit
January	Overview of Cells Prokaryotic and Eukaryotic cells. • Plasma Membrane various models of plasma membrane structure.Transport across membranes: Active, Passive transport and Facilitated transport.	**III**
February	Structure and Functions: • Endoplasmic Reticulum • Golgi Apparatus • Lysosomes • Mitochondria • Centrosome • Ribosome	**III**
March	Structure and Functions • Nucleus & Nucleolus. • Chromosomes types and structure. • Structure of DNA. • Structure & types RNA.	**III**
April	Cell cycle. Cell Division - Amitosis, Mitosis & Meiosis.	**IV** **IV**
May	-	
June	-	

Teaching Plan

M.Sc. Semester - IV

Paper - I

Subject Limnology

Month	Name of the Topic	Unit
January	1. Characteristics of water. 1. Lotic ecosystem. 2. Rivers and lake-forms and origin of lake. 3. Lentic ecosystem.	I
February	1. Pond ecosystem and communities. 2. Phytoplankton of fresh water. 3. Zooplankton of fresh water. 4. Estuaries.	II
March	**Physical condition of water** 1. Light (light as a limiting factors, penetration and thermal radiation). 2. Heat (thermal stratification, flow of heat,). 3. Water (properties of water, hydrological cycle, global water balance). 4. Water movement (flow of water, motion in epilimnion, motion in thermocline, motion in hypolimnion).	III
April	**Chemical component of fresh water** 1. Oxygen (oxygen as a limiting factors, measurement in waters, pollution monitoring and productivity measurement). 2. Carbon complex (carbon as a limiting factor, productivity measurement, seasonal variations, utilization).	IV
May	1. Nitrogen (cycle, forms of N_2 in lakes, seasonal distribution, nitrogen fixation and Di- nitrification). 2. Phosphorus (distribution, cycle, recycling). 3. Iron, silica and sulphur (cycle, bacterial transformation).	IV

Chiranjeev Pandey
Assistant Professor Zoology

Teaching plane

Industrial Fish & Fisheries (CBCS and LOCF Pattern)

B.Sc PART-II

ZOOLOGY PAPER-I 2022-23

Anatomy & Physiology

MONTH:- 15 July

Unit-I Comparative Anatomy of various organ systems of Vertebrate

- Integument & its derivative: structure of scales, hair & feather

August:- • Alimentary Canal & digestive glands in vertebrate

- Respiratory Organ Gills & Lug, Air sacs in Birds

Unit II - 1 Endoskeleton - Limbs, girdles & vertebrae.

2. Circulatory System - Evolution of Heart & Aortic Arches.

3. Uringenital system - Kidney & excretory duct.

September

Unit III - 1. Nervous System - General plan of brain & Spinal Cord

2. Endocrine gland - classification & histology.

3. Gonades & Genital ducts

October - Unit IV

1. Digestion & absorption of dietary components.

2. physiology of Heart. Cardiac cycle and ECG.

November - 3 Blood Coagulation

4. Respiration - Mechanism & Control of breathing

December 22 1 Physiology of Excretion - Osmoregulation

2. Physiology of Muscles Contraction

January. 3. physiology of Nerve impulse, Synaptic transmission

4. Ear & Eye - Structure & function

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Teaching plane

Industrial Fish & Fisheries (CBCS and LOCF Pattern)

Tools & Technique in Biology
2022-23

September 2022 - Unit I - Principle & uses of analytical instruments
- Balances (Single Pan Balance), pH meter, Colorimeter, Spectrophotometer
- Ultra centrifuge, ESR Spectrometer, NMR Spectrometer.

October - 2022 - Unit II Microscopy
- Principle & of light transmission & functions of Light microscope
- electron microscope
- Phase contrast & fluorescence microscope.
- Cryotechnique in microscopy.

NOVEMBER - 2022 - Unit III - Seperation technique in Biology
- Molecular seperation by chromatography (Paper & thin layer Column chromatography mono & two dimension)
- Electrophoresis.
- Orgenell seperation by centrifugation
- Cell seperation by Flow cytometery, density gradient Centrifugation Unit - gravity Centrifugation

DECEMBER - 2022 - Unit IV - Microbiology
1. Tissue culture
2. Animal cell culture
3. Media preparation
4. Sterlization
5. Cell Proliferations.

Unit I (FEBRUARY 2023) - Demography & Population
1. Gross & Net Reproductive Rate, Life table
2. Population growth - Exponential & logistic theory
3. Population density
4. Population Evolution.

Unit II - Mutualism & Population Regulation
(MARCH) 1. Evolution of Mutualism
2. Plant Pollinator & animal-animal interaction
3. Role of Predation in Nature
4. Ecological Modelling fundamentals of constructing model

Unit III - April - Biostatistics
1. Distribution of Data through mean, mode & median
2. Probability & their properties
3. Sampling theory
4. Correlation
5. Regression theory
6. Bar Diagram, Simple Bar diagram, bi-directional bar diagram, sub divided bar diagram, Percentage Subdivided Bar Diagram & Compound Bar diagram

Unit IV MAY - Bio mathematics & mathematical Modelling
1. General idea about matrices
2. General idea about mathematical modelling & its properties
3. Cycling of Nutrients in an Ecosystem & Eutrophication.
4. Optimal size in Birds
5. [illegible]

Teaching plane

Industrial Fish & Fisheries (CBCS and LOCF Pattern)
Subject - Fresh water aquaculture

Mahesh Ku.Ladekar

Session 2022-23

Month	Topic	Unit
September-2022	(A) Definition and history of aquaculture, scope important status of aquaculture in different countries (B) Importance of water in fish production, its physical & chemical parameters. (C) Importance of soil in aquaculture, important properties & type. (D) Preparation of fish form – principles of site selection for various kinds of fish form.	I
October-2022	Control of weeds and algal blooms.Liming and fertilization, Management of nutritive elements. Control of predators and aquatic insects. Reproduction and seed production. Induced breeding Bund breeding	II
November	Hatchery methods – (Different types of hatcheriesincluding Chinese hatchery) Different stages of seed- spawn, fry & fingerlings. Breeding of common carp. Procurement of seeds, transportation and stocking, Post stocking management.	III
December-2022	Preparation of nursery and rearing pond & their managemen Extensive, semi-intensive culture of Carp fishes. Culture of air breathing fishes	III & IV
January 2023	. Cold water aquaculture. Larvivorous fish culture. Breeding and culture of fresh water prawn.	IV
February 2023	Tilapia culture and its importance **Fish Feeding -** Characters and types of food. Natural and artificial food.	V

HEAD
DEPTT. OF ZOOLOGY
GOVT. DIGVIJAY COLLEGE
RAJNANDGAON (C.G.)

Teaching plane

B.Sc.III Zoology

Mahesh Ku.Ladekar

Paper- I

Session 2022-23

Ecology, Environmental Biology, Toxicology, Microbiology And Medical Zoology

Month	Topic	Unit
July-2022	Unit:Ecology 1.Aims and Scope of Ecology 2.Major Ecosystem of the world 3.Population	I
August-2022	4.Communities and Ecosystem 5.Biogeochemical cycles 6.Air and Water pollution 7.Ecological succession **.Unit:Environmental Biology** 1.Laws of Limiting factors 2.Food Chain in a Freshwater Ecosystem 3.Energy Flow in Ecosystem 4.Conservation of Natural Resources	I&II
September-2022	5.Environmental impact assessment **Unit:Toxicology** 1.Defination of Toxicity 2.Classification of Toxicants 3.Principle of Systematic toxicology	II &III
October-2022 November-2022	4.Toxic Agents and their Action 5.AnimalPoision Unit:Microbiology 1.General and applied Microbiology 2.Microbiology of Domestic Water and Sewage 3.Microbiology of milk and milk products 4.Indrustrial Microbiology Unit: Medical Microbiology 1.Brief Introduction to Pathogenic Microorganism:Rickettsia,Spirochaetes ,Aids And Typhoid	III&IV IV &V
December-2022	Practical 2.Pathogenic Protozoa:Entamoeba,Trypanosoma and Plasmodium 3.Pathogenic Helminths:Schistosoma Practical	V
January 2023	Practical 5.Nematodes:Pathogenic Parasites of Man	V
February	Practical 6. vector insects	

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DEPTT. OF ZOOLOGY
GOVT. DIGVIJAY COLLEGE
RAJNANDGAON (C.G.)

Teaching plan

SEMESTER - III
PAPER II
ANIMAL BEHAVIOUR

Mahesh Ku. Ladekar

Session-2022-23

Month	Topics	Unit
SEPTEMBER	Unit :**Ethology** 1. Historical perspectives of ethology. 2. Behavioural patterns. 3. Biological rhythms • Types of rhythm • Biological Clock	I
OCTOBER	**UNIT-** 1. Communication a. Auditory b. Visual c. Chemical 2. Learning and Memory a. Conditioning b. Habituation c. Reasoning d. Reproductive behaviour	II
NOVEMBER	**UNIT-Orientation** 1. Echolocation in bats. 2. Bird Migration and Navigation. 3. Fish migration. 4. Neural and hormonal control of behaviour.	III
DECEMBER	**UNIT-Hormonal effect on behavioural patterns** 1. Social behaviour. 2. Social organization in insect and primates. 3. Schooling in fishes and flocking in birds. 4. Homing, territoriality, dispersal. 5. Reproductive behaviour.	IV

HEAD
DEPTT. OF ZOOLOGY
GOVT. DIGVIJAY COLLEGE
RAJNANDGAON (C.G.)

Dr. Kiran Lata Damle

Teaching Plan

B.Sc. Zoology (Semester – I) - 2022 - 2023

Paper –I (Non-Chordates) M.M.-80

August 2022	Unit I	General Characteristics & Classification Up To Order (Phylum - Protozoa) - Type Study of Paramecium
September 2022	Unit II	General Characteristics & Classification Up To Order (Phylum - Porifera & Coelenterate) - Type Study of Sycon - Type Study of Obelia
October 2022	Unit III	General Characteristics & Classification Up To Order (Phylum - Platyhelminthes, & Nemathelminthes) - Type Study of Fasciola, - Ascaris)
November 2022	Unit IV	General Characteristics & Classification Up To Order (Phylum - Annelida) - Type Study of Pheretima)

Dr. Kiran Lata Damle

Dr. Kiran Lata Damle
Teaching Plan
M.Sc. Zoology (Semester – I)
(2022 - 2023)
Paper –I (Biosystematics & Taxonomy) M.M.-80

August 2022	Unit I	**Biosystematics** 1. History of systematics. 2. Importance & applications of biosystematics in biology. 3. Material basis characteristics of Biosystematics. 4. Species concept.
September 2022	Unit II	**Trends in biosystematics** 1. Chemotaxonomy. 2. Cytotaxonomy. 3. Molecular taxonomy. 4. Immuno taxonomy.
October 2022	Unit III	**Dimensions of Speciation & Taxonomic characters** 1. Theories of biological classification, hierarchy of categories. 2. Origin of Reproductive isolation - biological mechanism of genetic incompatibility. 3. Speciation.
November 2022	Unit IV	**Procedure keys in Taxonomy** 1. Types of taxonomic keys - Merits & Demerits. 2. Taxonomic procedures – Taxonomic collections, preservation, curetting process and identification. 3. International code of Zoological nomenclature (ICZN) its operative principles and application of important rules. Zoological nomenclature Formation of scientific names of various taxon.

Dr. Kiran Lata Damle

Dr. Kiran Lata Damle
SUBJECT: ZOOLOGY (M.Sc.)
(2022 - 2023)
SEMESTER - III
Paper –III
GAMETE AND DEVELOPMENTAL BIOLOGY **MM- 80**

August 2022	Unit I	1.Comparative account of different gonads in invertebrate and vertebrates. 2.Heterogamy in eukaryotes. 3.Leydig cells- (a) Morphology (b) differentiation (c) functions and its regulation.
September 2022	Unit II	1.Spermatogenesis in rodents and in invertebrates. 2.Oogensis and vitellogenesis (follicular growth differentiation, molecular and endocrinal aspects). 3.Fertilization - pre and post fertilization events and biochemistry of fertilization. 4.Parthenogenesis.
October 2022	Unit III	1. Cleavage. 2. Fat map and cell lineage. 3. Gastrulation. (Frog & Chick) 4. Germinal layers and their fate. (Frog) 5. Extra Embryonic membrane.
November 2022	Unit IV	1. Organogenesis - (Frog). 2. Metamorphosis. 3. Collection and Cryopreservation of gametes and embryos. 4. Transgenic animals.

Dr. Kiran Lata Damle

Dr. Kiran Lata Damle
Teaching Plan
B.Sc. III Year Zoology (2022 - 2023)
Paper – II (Genetic's, Cell Physiology, Biochemistry, Biotechnology and Instrumentation) MM-50

July 2022	Unit I	UNIT-I (GENETIC'S) 1. Linkage and Linkage maps 2. Varieties of gene expression - Multiple alleles; lithogenes; Pleiotropic genes; gene interaction ; epistasis. 3. Sex chromosome systems, and sex-linkage. 4. Mutation and chromosomal alterations ; meiotic consequences.
August 2022	Unit I & II	5. Human genetics - chromosomal and single gene disorders (somatic cell genetics. (Cell Physiology) 1. General idea about pH and Buffer. 2. Transport across membrane - cell membrane; Mitochondria and Endoplasmic reticulum. 3. Active transport and its mechanism; Active transport in Mitochondria and Endoplasmic reticulum.
September 2022	Unit III	4. Hydrolytic enzymes - Their chemical nature, Activation and specificity. (Biochemistry) 1. Amino acids and Peptides - Basic structure and biological function. 2. Carbohydrate and its metabolism - Glycogenesis; Gluconeogenesis; Glycolysis, Glycogenolysis; Cosi-cycle.
October 2022	Unit III	3. Lipid metabolism - Oxidation of glycerol; oxidation of fatty acid. 4. Protein metabolism - Deamination, Transamination, Transmethylation; Biosynthesis of Protein;
November 2022	Unit IV	(Biotechnology) 1. Biotechnology - Scope and importance. 2. Recombinant DNA and Gene cloning. 3. Cloned genes and other tools of biotechnology. 4. Applications of biotechnology in (i) Pharmaceutical industry, and (ii) Food processing industry.
December 2022	UNIT-IV	(Biotechnique) Principles and techniques about the following 1 pH. Meter 2. Colorimeter
January 2023	UNIT-V	3. Microscopy-Light microscopes, Phase contrast and Electron microscopes. 4. Centrifugation 5. Separation of biomolecules by chromatography, and Electrophoresis
February 2023	UNIT-V	6. Histrochemical methods for determination of Protein, Lipids, and carbohydrate

Dr. Kiran Lata Damle

Dr. Kiran Lata Damle
Teaching Plan
M.Sc. Zoology (Semester – II)
(2022 - 2023)
Paper –II (General and Comparative Endocrinology) **M.M.-80**

January 2023	I	1. Aims and scope of endocrinology. 1. Endocrine glands their structure and functions (Pituitary gland, Thyroid, Parathyroid, Adrenal, Thymus. 2. Pancreas and other endocrine structure (mucosa of alimentary canal, placenta and sex glands).
February 2023	II	**The chemical structure and evolution of the hormones** 1. Steroid hormones. 2. Peptide hormones. 3. Neuro-hormones of hypothalamus. 4. Growth and placental hormones.
March 2023	III	**General Principle of hormones action** 1. Chemical structure, Biosynthesis and secretion of hormones (thyroid, steroid and peptide). 2. Mechanism of hormone action. 3. Hormonal regulation of Carbohydrate, Lipid and Protein metabolism. 4. Hormones growth and development.
April 2023	IV	1. Hormones and Homeostasis. 2. Hormones and Osmoregulation. 3. Hormones and reproduction (behavior, menstrual and estrous cycle). 4. Hormonal control of metamorphosis (Frog).

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