

"Dissemination of Education for Knowledge, Science and Culture"

-Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur (Empowered Autonomous)
Department of Zoology
Academic year: 2024-25

Annual Teaching Report (Term I)

1. Dr. G. K. Sontakke
2. Dr. T. C. Gaupale
3. Dr. S. P. Khairmode
4. Dr. S. S. Desai
5. Mr. G. H. Fadake
6. Ms. N. A. Patel
7. Dr. T. C. Patil
8. Ms. P. S. Shetfalkar
9. Ms. N. A. Jadhav
10. Ms. P. R. Gaikwad



Dr. G. K. Sontakke

HEAD

DEPARTMENT OF ZOOLOGY
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

"Dissemination of Education for Knowledge, Science and Culture"
 -Shikshanmaharshi Dr. Bapuji Salunkhe
 Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur (Empowered Autonomous)
Department of Zoology
Academic year: 2024-25

Annual teaching plan

Name of the Teacher: Dr. G. K. Sontakke

Term: I

Class: B.Sc. III

Name of the Paper: Molecular Biology and Biotechniques ((DSE-1008E1)

Month	Module unit	Sub unit
June- 2024	UNIT-I	1. Concept of gene 2. DNA replication in prokaryotes and eukaryotes: Semi-conservative type
July- 2024	UNIT-I	3. DNA damage and repair mechanism
August- 2024	UNIT-I	4. Transcription in prokaryotes and eukaryotes - Initiation, Elongation and Termination
September-2024	UNIT-I	5. RNA splicing 6. Genetic code and its properties
October- 2024	UNIT-I	7. Translation in prokaryotes and eukaryotes -Initiation, Elongation and Termination

Class: B.Sc. I (PR)

Practical: ZOOLOGY LAB(1): 2DSC03ZOO19 (Practical I)

Month	Practical
July- 2024	1. Study of the following specimens with respect to classification and morphological peculiarities: Phylum Porifera to Echinodermata 3. Study of the following permanent slides: a. T.S. or L.S. of Sycon b. T.S. of male and female Ascaris lumbricoides 4. Mounting of mouth part in cockroach/honey bee/ any insect
August- 2024	5. Temporary preparation of spicules and sponging fibres. 6. Study of life history stages of Taenia solium 7. Study of life cycle of Ascaris lumbricoides 8. Preparation of Paramecium culture 9. Temporary preparation of pedicellaria
September 2024	1. Study of Microscope: Simple and Compound 2. Temporary preparation of mitotic cell from onion roots 3. Temporary preparation of nucleus from W.B.Cs. 4. Extraction of DNA from given sample
October-2024	5. Stained squash preparation of salivary gland chromosomes 6. Study of Cell organelles (any three) by using microphotographs 7. Stained preparation of mitochondria from oral mucosa/ onion peels 8. Effect of tonicity of solutions on plasma membrane of RBCs 9. Field Visit-Museum, National Park, Sea shore

Month	Practical
July- 2024	<ol style="list-style-type: none"> To prepare hemin crystals from a given blood sample/own blood To detect ABO blood groups in human blood. To determine the bleeding time of own blood To determine the clotting time of own blood. To determine Erythrocyte Sedimentary Rate (E.S.R) To Estimate of Hb by Sahli's haemometer
August- 2024	<ol style="list-style-type: none"> To Count the total RBCs of own blood To Count the total WBCs of own blood To study Differential WBCs of own blood To Measure human blood pressure To Interpret the ECG. Measurement of lung capacity
September 2024	<ol style="list-style-type: none"> Study of dialyzer unit Study of permanent slides of duodenum, liver, pancreas, salivary gland Study of permanent slides of spinal cord, lung, kidney, blood vessels (artery & vein) Study of fossil evidences from plaster cast models and pictures Study of homology and analogy from suitable specimens/ pictures Study of Phylogeny of human evolution
October-2024	<ol style="list-style-type: none"> Study of Phylogeny of horse Study of Darwin's finches with diagrams/ cut-outs of beaks of different species Study of adaptive radiation in marsupial Study of fossil animals- Peripatus, Dipnoi fish, Archaeopteryx Selection of fruit fly in relation to diet Example based on Hardy-Weinberg law

Class: B.Sc. II (VSC) (PR) ZOOLOGY LAB (3) Practical: VSC03ZOO39 (Practical II)

Month	Practical
June 2024	<ol style="list-style-type: none"> Types of silk moths classification and description Life cycle of silk Worm <i>Bombyx mori</i> (L)
July- 2024	<ol style="list-style-type: none"> Life cycle of Vanya / Non-Mulberry Silkworm Difference between male and female silk moths of <i>Bombyx mori</i> Sex separation in larva, pupa and adult of silkworm General anatomy of silkworm (Photographs/Images/dissections) Identification of egg, larva, pupa and moths of different non-mulberry silk moths (Photographs/Images).
August- 2024	<ol style="list-style-type: none"> Dissection and display (Photographs/Images/ dissections): <ol style="list-style-type: none"> Digestive system of larva. Silk glands. Reproductive system of male and female moths. Mounting of larval mouth parts and spiracle. Nervous system of silkworm larva. Silkworm rearing techniques and its maintenance Mulberry cultivation and its maintenance
September 2024	<ol style="list-style-type: none"> Identification of different Mulberry Varieties / Species Calculation of shell ratio and denier scale by using the formula Identification of major Mulberry pests and diseases
October-2024	<ol style="list-style-type: none"> Identification of major silkworm pests & diseases and their disposal Study of sericulture equipment.

Class: B.Sc. III (PR)

PRACTICAL-VIII - Based on Paper No XV & XVI

Month	Practical
June - 2024	1. Study of pond ecosystem on field .
July- 2024	2. Collection, preservation and identification of zooplanktons. 3. Study of aquatic insects- Photographs/specimens (Any four)
August- 2024	4. Oxygen consumption by any aquatic animal 5. Determine the amount of turbidity/transparency
September- 2024	6. Estimation of dissolved oxygen 7. Estimation of free carbon dioxide
October- 2024	8. Determination alkalinity of given water sample



Dr. G. K. Sontakke



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Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur (Empowered Autonomous)
Department of Zoology
Academic year: 2024-2025

ANNUAL TEACHING PLAN

Name of the Teacher: Dr. Tekchand Chetanlal Gaupale

Term: I

Class: B.Sc. I (PR)

Practical: Animal diversity I and Cell biology

Month	Sub unit
June- 2024	Study of the following specimens with respect to classification and morphological peculiarities Amoeba, Paramecium, Sycon, Euplectella, Obelia, Physalia, Taenia solium, Male and female Ascaris lumbricoides, Aphrodite, Hirudinaria, Limulus, Periplaneta, Pila, Octopus, Star fish, Antedon
July- 2024	Study of the following permanent slides: T.S. or L.S. of Sycon T.S. of male and female Ascaris lumbricoides Mounting of mouth part in cockroach/honey bee/ any insect Mounting of sponging fibers and spicules
August- 2024	Study of life history stages of Taenia solium Study of life cycle of Ascaris lumbricoides Study of Microscope: Simple and Compound
September-2024	Temporary preparation of mitotic cell from onion roots Extraction of DNA from given sample Study of Cell organelles (any three) by using microphotographs 1
October- 2024	Stained squash preparation of salivary gland chromosomes Stained preparation of mitochondria from oral mucosa/ onion peels

Class: B.Sc. II (Theory)

Title of the Paper: Paper V (Animal Physiology)

Month	Module unit	Sub unit
June- 2024	UNIT-II	Cardiovascular system Composition of blood
July- 2024	UNIT-II	Cardiovascular system Structure of Heart, Origin and conduction of heartbeat, Cardiac cycle, ECG
August- 2024	UNIT-II	Nervous system Structure of a neuron, Neurotransmitter, Synapse- Electrical and chemical synapse, Origin of action potential and its propagation in nerve fibres
September-2024	UNIT-II	Muscle Types of muscle, Ultra-structure of skeletal muscle, Mechanism of muscle contraction
October -2024	UNIT-II	Muscle Mechanism of muscle contraction

Class: B.Sc. II (PR)

Practical: Animal Physiology

Month	Sub unit
June- 2024	To prepare hemin crystals from a given blood sample/own blood To detect ABO blood groups in human blood. To determine the bleeding time of own blood To determine the clotting time of own blood. To determine Erythrocyte Sedimentary Rate (E.S.R)
July- 2024	To Estimate of Hb by Sahli's haemometer To Count the total RBCs of own blood To Count the total WBCs of own blood To study Differential WBCs of own blood To Measure human blood pressure
August- 2024	To Interpret the ECG. Measurement of lung capacity Study of dialyzer unit Study of permanent slides of duodenum, liver, pancreas, salivary gland
September-2024	Study of permanent slides of spinal cord, lung, kidney, blood vessels (artery& vein) Study of fossil evidences from plaster cast models and pictures Study of homology and analogy from suitable specimens/ pictures Study of Phylogeny of human evolution Study of Phylogeny of horse
October- 2024	Study of Darwin's finches with diagrams/ cut-outs of beaks of different species Study of adaptive radiation in marsupial Study of fossil animals- <i>Peripatus</i> , <i>Dipnoi</i> fish, Selection of fruit fly in relation to diet Example based on Hardy-Weinberg law

Class: B. Sc. III (Theory)

Name of the Paper: Paper- XI,

Developmental Biology-I

Month	Module unit	Sub unit
June- 2024	UNIT-I	An introduction and scope and importance of developmental biology. Overview of male & female reproductive system in mammal.
July- 2024	UNIT-I	Gametogenesis: Spermatogenesis and oogenesis w.r.t. mammals Structure of mature egg and sperm in amphibia and human.
August- 2024	UNIT-I	Fertilization: Types - External (amphibians), internal (mammals) and process of fertilization Block to polyspermy- Slow & fast block to polyspermy


September-2024	UNIT- I	Types of egg on the basis of distribution & amount of yolk. Cleavage: Definition, types, planes & patterns and significance.
October- 2024	UNIT- II	Morulation and blastulation Gastrulation: Definition, fate maps, significance of gastrulation.

**Class: B.Sc. III (PR)
and XII**

Practical: Based on Paper No. XI

Month	Sub unit
June- 2024	1. Study of developmental stages of frog (permanent slides/microphotograph)
July- 2024	2. Stages of metamorphosis in frog (permanent slides /microphotographs/specimen)
August- 2024	3. Study of chick embryo (permanent slides /microphotographs)
September-2024	4. Preparation of whole mount chick embryo 5. Study of histological structures of placenta (permanent slides/microphotographs)
October- 2024	6. Examination of gametes: Frog or rat sperm & ovum (permanent slides/microphotographs)


Dr. Tekchand C. Gaupale


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Department of Zoology

Academic year: 2024-2025

Annual teaching plan

Name of the Teacher: Dr. Shilpa Prakash Khairmode

Term: I

Class: B.Sc. I (Theory)

Name of the Paper: Paper I, Animal Diversity

Month	Module unit	Sub unit
June- 2024	UNIT-I	Importance and scope of animal diversity Kingdom Protista- General characters and classification up to classes
July- 2024	UNIT-I	locomotion in Protozoa
August- 2024	UNIT-I	Phylum Porifera- General characters and classification up to classes; Canal System in Sycon
September-2024	UNIT- I	Phylum Cnidaria- General characters and classification up to classes
October- 2024	UNIT- I	Polymorphism in Obelia

Class: B.Sc. II (Theory)

Name of the Paper: Paper-VI, Ethology (MIN03ZOO32)

Month	Module unit	Sub unit
June- 2024	UNIT-I	Animal Behaviour concept and classification: Introduction,
July- 2024	UNIT-I	Ethology as a branch of biology, Animal psychology
August- 2024	UNIT-I	Communication: Introduction, chemical, visual, audio, olfactory, ants
September-2024	UNIT- I	electric, touch; Species specificity of songs
October- 2024	UNIT- I	Communication in bees and

Class: B. Sc. III (Theory)

Name of the Paper: Paper- XI, Developmental Biology-I

Month	Module unit	Sub unit
June- 2024	UNIT-II	Morphogenetic cell movements- Epiboly and emboly
July- 2024	UNIT-II	Fate of germ layers
August- 2024	UNIT-II	Neural tube formation
September-2024	UNIT- II	Extra embryonic membrane
October- 2024	UNIT- II	Placentation in mammals

Class: B.Sc. I (PR)

Practical: ZOOLOGY LAB(1): 2DSC03ZOO19 (Practical I)

Month	Practical
July- 2024	1. Study of the following specimens with respect to classification and morphological peculiarities: Phylum Porifera to Echinodermata 3. Study of the following permanent slides: a. T.S. or L.S. of Sycon b. T.S. of male and female <i>Ascaris lumbricoides</i> 4. Mounting of mouth part in cockroach/honey bee/ any insect
August- 2024	5. Temporary preparation of spicules and sponging fibres. 6. Study of life history stages of <i>Taenia solium</i> 7. Study of life cycle of <i>Ascaris lumbricoides</i> 8. Preparation of <i>Paramecium</i> culture 9. Temporary preparation of pedicellaria
September 2024	1. Study of Microscope: Simple and Compound 2. Temporary preparation of mitotic cell from onion roots 3. Temporary preparation of nucleus from W.B.Cs. 4. Extraction of DNA from given sample
October-2024	5. Stained squash preparation of salivary gland chromosomes 6. Study of Cell organelles (any three) by using microphotographs 7. Stained preparation of mitochondria from oral mucosa/ onion peels 8. Effect of tonicity of solutions on plasma membrane of RBCs 9. Field Visit-Museum, National Park, Sea shore

Class: B.Sc. II (PR)

PRACTICAL-III (MINOR) - Based on Paper No V & VI

Month	Practical
July- 2024	1. Calculate the mean using given data (Any two examples) 2. Calculate the median using the given data (Any two examples) 3. Calculate the mode using the given data (Any two examples) 4. Calculate the standard deviation using the given data. 5. Draw a line/ Bar diagram using the given data.
August- 2024	6. Draw a Histogram by using given data (equal unequal distribution) 7. Draw a Polygon using given data. 8. Draw frequency curve/ Ogive curve using given data. 9. Drawing graphs and tables on a computer using given data. 10. Examples based on regression (Any two examples)
September- 2024	11. Examples based on correlation (Any two examples) 12. To study the locomotory behaviour in - a) Earthworm b) Garden snail 13. To study chemical communication in ant 14. To study simple reflex behaviour in Cockroach 15. To study the reaction of terrestrial woodlice to light and humidity
October- 2024	16. To study the aggression and courtship behaviour in crickets 17. To study the chemoreception in the adult fly 18. To study the courtship behaviour in fruit fly

Class: B.Sc. III (PR)

Practical: Based on Paper No. XI and XII

Month	Sub unit
July- 2024	1. Study of developmental stages of frog (permanent slides/microphotographs) a. Cleavage b. Blastulation
August- 2024	1. Study of developmental stages of frog (permanent slides/microphotographs) c. Gastrulation d. Neurulation
September-2024	2. Stages of metamorphosis in frog (permanent slides /microphotographs/specimen) a. External gill stage b. Internal gill stage c. Forelimb stage
October- 2024	2. Stages of metamorphosis in frog (permanent slides /microphotographs/specimen) d. Hind limb stage e. Tail bud stage f. Juvenile stage


Dr. S. P. Khairmode


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Department of Zoology

Academic year: 2024-2025

Annual teaching plan

Name of the Teacher: Dr. S. S. Desai

Term: I

Class: B.Sc. II (Theory)

Name of the Paper: Paper V, Animal Physiology (DSC03ZOO31)

Month	Module unit	Sub unit
June 2024	UNIT-I	Digestion Brief account of the alimentary canal and digestive glands, Physiology of digestion
July 2024	UNIT-I	Absorption of carbohydrates, proteins, and lipids in alimentary canal Respiration. Brief account of the respiratory system,
August 2024	UNIT-I	Pulmonary ventilation, Respiratory volumes and capacities, Transport of oxygen and carbon dioxide in the blood, Haldane effect, Bohr's effect, Chloride shift
September 2024	UNIT- I	Excretion Brief account of the excretory system, Ultrastructure of the nephron,
October 2024	UNIT- I	Mechanism of Urine formation, Counter-current Mechanism

Class: B. Sc. III (Theory)

Name of the Paper: Paper- XI, Developmental Biology-II (DSE -1008E4)

Month	Module unit	Sub unit
June 2024	UNIT-I	Gene activation, specification (autonomous, conditional, syncytial), determination, competence, differentiation
July 2024	UNIT-I	Dedifferentiation, re-differentiation, trans-differentiation, commitment, Morphogens-Concept & properties of morphogen
August 2024	UNIT-I	Regeneration (w.r.t. Lizard), senescence, ageing and concept of apoptosis. Intercellular communication – Autocrine, paracrine, juxtacrine. Applications of developmental biology in medicine and research.
September 2024	UNIT- II	Medical implication in developmental biology – Genetic disorder in human development , Development of neural tube and brain up to 72 hours of incubation
October 2024	UNIT- II	Development of gut, blood and heart up to 72 hours of incubation

Class: B.Sc. I (PR)

Practical: Zoology Lab (1): 2DSC03ZOO19 (Practical I)

Month	Practical
June 2024	1. Study of the specimens with respect to classification and morphological peculiarities: Phylum Porifera to Phylum Echinodermata 2. Study of the following permanent slides: a. T.S. or L.S. of Sycon b. T.S. of male and female <i>Ascaris lumbricoides</i>
July 2024	3. Mounting of mouth part in cockroach/honey bee/ any insect 4. Mounting of sponging fibers and spicules 5. Study of life history stages of <i>Taenia solium</i> 6. Study of life cycle of <i>Ascaris lumbricoides</i>
August 2024	7. Preparation of <i>Paramoecium</i> culture 8. Temporary preparation of pedicellaria 9. Study of compound Microscope : Simple and Compound 10. Temporary preparation of mitotic cells from onion roots
September 2024	11. Extraction of DNA from given sample 12. Stained squash preparation of salivary gland chromosomes 13. Study of Cell organelles (any three) by using microphotographs 14. Stained preparation of mitochondria from oral mucosa/ onion peels
October 2024	15. Effect of tonicity of solutions on plasma membrane of RBCs

Class: B.Sc. II (PR)

Practical: VSC03ZOO39

Month	Practical
June 2024	1. Types of silk moths classification and description 2. Life cycle of silk Worm <i>Bombyx mori</i> (L.)
July 2024	3. Life cycle of Non-Mulberry Silkworm 4. Difference between male and female silk moths of <i>Bombyx mori</i> 5. Sex separation in larva, pupa and adult of silkworm 6. General anatomy of silkworm (Photographs/Images/dissections) 7. Identification of egg, larva, pupa and moths of different non-mulberry silk moths (Photographs/Images):
August 2024	8. Dissection and display (Photographs/Images/ dissections): a. Digestive system of larva. b. Silk glands. c. Reproductive system of male and female moths. d. Mounting of larval mouth parts and spiracle. e. Nervous system of silkworm larva. 9. Silkworm rearing techniques and its maintenance 10. Mulberry cultivation and its maintenance
September 2024	11. Identification of different Mulberry Varieties / Species 12. Calculation of shell ratio and denier scale by using the formula 13. Identification of major Mulberry pests and diseases
October 2024	14. Identification of major silkworm pests & diseases and their disposal 15. Study of sericulture equipments.

Class: B.Sc. III (PR)

Practical: Practical-V (Based on Paper No. IX & X)

Month	Practical
June 2024	1. Genomic DNA isolation from E. coli
July 2024	2. Plasmid DNA isolation from E. coli 3. Restriction digestion of plasmid DNA.
August 2024	4. Construction of circular and linear restriction map from the data provided. 5. Separation of protein by SDS-PAGE
September 2024	6. Separation of DNA by agarose gel electrophoresis 7. Study the following technique through photograph Southern blotting, Northern blotting, Western blotting, DNA sequencing, PCR, DNA finger printing
October 2024	8. Study the following technique through photograph DNA sequencing, PCR, DNA finger printing



Dr. S. S. Desai



Dr. G. K. Sontakke

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Department of Zoology

Academic year: 2024-2025

Annual teaching plan

Name of the Teacher: Mr. Ganesh H. Fadake

Term: I

Class: B.Sc. I (Theory)

Name of the Paper: Paper II, Cell Biology (2DSC03ZOO12)

Month	Module unit	Sub unit
July- 2024	UNIT-I	Introduction-Cell as basic unit of life, Importance of Cell Biology,
August- 2024	UNIT-I	Structure and function of Prokaryotic (E. coli) and Eukaryotic cell (Animal Cell)
September-2024	UNIT- I	Plasma Membrane: Structure, chemical composition and functions of plasma membrane, Fluid mosaic model.
October- 2024	UNIT- I	Ultrastructure and Functions: Mitochondria, Endoplasmic Reticulum, Golgi apparatus, Ribosomes.

Class: B.Sc. II (Theory)

Name of the Paper: Paper-VI, Biostatistics (MIN03ZOO31)

Month	Module unit	Sub unit
July - 2024	UNIT- I	Introduction to Biostatistics Biostatistics
August - 2024	UNIT- I	Definition, Classification of Data, Types and methods of data collection procedure
September-2024	UNIT- I	Different types of scales- nominal, ordinal, ratio and interval, Scope & Importance
October- 2024	UNIT- I	Frequency distribution Principles of frequency distribution,

Class: B. Sc. III (Theory)

Name of the Paper: Paper- X, Molecular biology and biotechniques (DSE -1008E1)

Month	Module unit	Sub unit
June- 2024	UNIT-II	Concept of cloning and cloning vectors: Characteristics & types (plasmid, cosmid, phagemid, lambda, bacteriophage, artificial chromosome)
July- 2024	UNIT-II	Screening techniques: Replica plating & blue white screening
August- 2024	UNIT-II	Restriction enzymes: Nomenclature, detailed study of Type II endonucleases, Southern, northern and western blotting
September-2024	UNIT- II	Polymerase chain reaction, DNA finger printing

October- 2024	UNIT- I	Method of DNA sequencing: Sanger's method Genomic and c-DNA library
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Class: B.Sc. I (PR)

Practical: ZOOLOGY LAB (1); 2DSC03ZOO19 (Practical I)

Month	Practical
July- 2024	1. Study of the specimens with respect to classification and morphological peculiarities: Phylum Porifera to Phylum Echinodermata 2. Study of the following permanent slides: a. T.S. or L.S. of Sycon b. T.S. of male and female <i>Ascaris lumbricoides</i> 3. Mounting of mouth part in cockroach/honey bee/ any insect 4. Mounting of sponging fibres and spicules
August- 2024	5. Study of life history stages of <i>Taenia solium</i> 6. Study of life cycle of <i>Ascaris lumbricoides</i> 7. Preparation of <i>Paramoecium</i> culture 8. Temporary preparation of pedicellaria
September-2024	9. Study of compound Microscope : Simple and Compound 10. Temporary preparation of mitotic cells from onion roots 11. Extraction of DNA from given sample 12. Stained squash preparation of salivary gland chromosomes
October- 2024	13. Study of Cell organelles (any three) by using microphotographs 14. Stained preparation of mitochondria from oral mucosa/ onion peels 15. Effect of tonicity of solutions on plasma membrane of RBCs

Class: B.Sc. II (PR)

Name of the Paper: Paper-VI, Biostatistics (MIN03ZOO31)

Month	Module unit	Sub unit
June- 2024	UNIT-I	Introduction to Biostatistics Biostatistics
July- 2024	UNIT-I	Definition, Classification of Data, Types and methods of data collection procedure
August- 2024	UNIT-I	Different types of scales- nominal, ordinal, ratio and interval, Scope & Importance
September-2024	UNIT- 1	Frequency distribution Principles of frequency distribution,
October- 2024	UNIT- 1	Graphical presentation of data (Line diagram, Bar diagram; Pie chart, Histogram- equal and unequal classes, Polygon and frequency curve, Ogive curve)

Class: B.Sc. III (PR)

PRACTICAL-VII - Based on Paper No XIII & XIV

Month	Practical
June - 2024	1. Calculate the mean using given data (Any two examples) 2. Calculate the median using the given data (Any two examples) 3. Calculate the mode using the given data (Any two examples) 4. Calculate the standard deviation using the given data. 5. Draw a line/ Bar diagram using the given data.
July- 2024	6. Draw a Histogram by using given data (equal unequal distribution) 7. Draw a Polygon using given data. 8. Draw frequency curve/ Ogive curve using given data 9. Drawing graphs and tables on a computer using given data.
August- 2024	10. Examples based on regression (Any two examples) 11. Examples based on correlation (Any two examples) 12. To study the locomotory behaviour in - a) Earthworm b) Garden snail 13. To study chemical communication in ant 14. To study simple reflex behaviour in Cockroach
September-2024	15. To study the reaction of terrestrial woodlice to light and humidity 16. To study the aggression and courtship behaviour in crickets 17. To study the chemoreception in the adult fly 18. To study the courtship behaviour in fruit fly
October- 2024	1. Calculate the mean using given data (Any two examples) 2. Calculate the median using the given data (Any two examples) 3. Calculate the mode using the given data (Any two examples) 4. Calculate the standard deviation using the given data. 5. Draw a line/ Bar diagram using the given data.

Gadake

Mr. Ganesh H. Fadake

Gita

Dr. G. K. Sontakke

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Department of Zoology
Academic year: 2024-2025

Annual teaching plan

Name of the Teacher: Ms. N. A. Patel

Term: I

Class: B.Sc. I (Theory)

Name of the Paper: Paper II, Cell Biology (2DSC03ZOO12)

Month	Module unit	Sub unit
July- 2024	UNIT-II	Giant chromosome- Polytene chromosome, Lampbrush chromosome
August- 2024	UNIT-II	Overview of cell cycle, Phases and significance of mitosis and meiosis
September-2024	UNIT- II	Structure and organization of microtubules, microfilaments
October- 2024	UNIT- II	Structure and organization of intermediate filaments

Class: B.Sc. II (Theory)

Name of the Paper: Paper-VI, Ethology (MIN03ZOO32)

Month	Module unit	Sub unit
July - 2024	UNIT- I	Innate behaviour Communication: Introduction, chemical, visual, audio, olfactory, electric,
August - 2024	UNIT- I	touch; Species specificity of songs; Communication in bees and ants
September-2024	UNIT- I	Ecological Aspects of Behaviour: Introduction, habitat selection, food selection
October- 2024	UNIT- I	Optimal forage theory, anti-predation defenses, aggression, homing, territoriality

Class: B. Sc. III (Theory) Name of the Paper: Paper- X, Animal Biotechnology (DSE -1008E2)

Month	Module unit	Sub unit
June- 2024	UNIT-I	Cloning techniques- Nuclear transplantation
July- 2024	UNIT-I	Production of transgenic animals- Transformation techniques- calcium chloride method, DNA microinjection
August- 2024	UNIT-I	Production of transgenic animals- Transformation techniques - retroviral and electroporation method
September-2024	UNIT- I	Knockout mice- Production & applications Applications of transgenic animals
October- 2024	UNIT- I	Production of transgenic plants: Agrobacterium mediated transformation.

Class: B.Sc. I (PR)

Practical: ZOOLOGY LAB (1): 2DSC03ZOO19 (Practical I)


Month	Practical
July- 2024	1. Study of the specimens with respect to classification and morphological peculiarities: Phylum Porifera to Phylum Echinodermata 2. Study of the following permanent slides: a. T.S. or L.S. of Sycon b. T.S. of male and female <i>Ascaris lumbricoides</i> 3. Mounting of mouth part in cockroach/honey bee/ any insect 4. Mounting of sponging fibres and spicules
August- 2024	5. Study of life history stages of <i>Taenia solium</i> 6. Study of life cycle of <i>Ascaris lumbricoides</i> 7. Preparation of <i>Paramecium</i> culture 8. Temporary preparation of pedicellaria
September-2024	9. Study of compound Microscope : Simple and Compound 10. Temporary preparation of mitotic cells from onion roots 11. Extraction of DNA from given sample 12. Stained squash preparation of salivary gland chromosomes
October- 2024	13. Study of Cell organelles (any three) by using microphotographs 14. Stained preparation of mitochondria from oral mucosa/ onion peels 15. Effect of tonicity of solutions on plasma membrane of RBCs

Class: B.Sc. III (PR)

PRACTICAL-VII - Based on Paper No XIII & XIV

Month	Practical
June - 2024	1. Demonstration of primary lymphoid organs- bone marrow & thymus
July- 2024	2. Demonstration of secondary lymphoid organs- lymph node, spleen, mucosal associated lymphoid tissue (MALT), tonsils, gut associated lymphoid tissue (GALT)
August- 2024	3. Histological study of spleen, thymus and lymph nodes 4. Preparation of stained blood film to study various types white blood cells.
September-2024	5. Enumeration of total WBC count from a given blood sample. 6. Antigen antibody reaction by double immuno-diffusion method.
October- 2024	7. Agglutination reactions- Latex agglutination reactions.


Ms. N. A. Patel


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Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Zoology

Academic year: 2024-5

Annual teaching plan

Name of the Teacher: Dr. Tejashri C. Patil

Term: I

Class: B.Sc. II

Name of the Paper: Evolution ((DSC03ZOO32)

Month	Module unit	Sub unit
July- 2024	UNIT-II	Evidences of Evolution: Fossils, Types of fossils, Process of fossilization
August- 2024	UNIT-II	dating of fossils, comparative anatomy, vestigial Structures
September-2024	UNIT-II	Species concept: Biological species concept (Advantages and limitations); Isolating mechanisms, Modes of speciation (Allopatric, Sympatric, Peripatric and Parapatric)
October- 2024	UNIT-II	Extinction: Mass extinction (Causes, Names of five major extinctions, K-T extinction in detail), Role of extinction in evolution

Class: B.Sc. III

Name of the Paper: Animal Biotechnology DSE -1008E2

Month	Module unit	Sub unit
June- 2024	UNIT-II	1. Animal cell culture: a. Cell culture techniques-Mechanical and chemical disaggregation and types of cell culture (primary, secondary and cell line)
July- 2024	UNIT-II	a. Requirements of animal cell culture-Laboratory design, equipment's used- (CO ₂ incubator, phase contrast and fluorescence microscope, laminar Air flow) b. Types of media-Natural and artificial media (serum containing, serum free, chemically defined and protein free)
August- 2024	UNIT-II	c. Sterilization technique- Physical and chemical methods d. Applications of animal cell culture
September-2024	UNIT-II	2. Stem cell types 3. Gene therapy- Types and applications
October- 2024	UNIT-II	4. Recombinant DNA in medicines: Production of recombinant insulin and human growth hormone 5. Application of biotechnology in animal husbandry, medicine and agriculture

Class: B.Sc. I Batch B3 Practical: Based on: Animal Diversity I Zoology and Cell Biology

Month	Practical
July- 2024	<ol style="list-style-type: none"> 1. Study of the following specimens with respect to classification and morphological peculiarities: Phylum Porifera to Echinodermata 3. Study of the following permanent slides: <ol style="list-style-type: none"> a. T.S. or L.S. of Sycon b. T.S. of male and female <i>Ascaris lumbricoides</i> 4. Mounting of mouth part in cockroach/honey bee/ any insect
August- 2024	<ol style="list-style-type: none"> 5. Temporary preparation of spicules and sponging fibres. 6. Study of life history stages of <i>Taenia solium</i> 7. Study of life cycle of <i>Ascaris lumbricoides</i> 8. Preparation of <i>Paramecium</i> culture 9. Temporary preparation of pedicellaria
September 2024	<ol style="list-style-type: none"> 1. Study of Microscope: Simple and Compound 2. Temporary preparation of mitotic cell from onion roots 3. Temporary preparation of nucleus from W.B.Cs. 4. Extraction of DNA from given sample
October-2024	<ol style="list-style-type: none"> 5. Stained squash preparation of salivary gland chromosomes 6. Study of Cell organelles (any three) by using microphotographs 7. Stained preparation of mitochondria from oral mucosa/ onion peels 8. Effect of tonicity of solutions on plasma membrane of RBCs 9. Field Visit-Museum, National Park, Sea shore


Class: B.Sc. II Batch Z1 Practical: Based on: Animal Physiology (DSC03ZOO31) and Evolution (DSC03ZOO32)

Month	Practical
July- 2024	<ol style="list-style-type: none"> 1. To prepare hemin crystals from a given blood sample/own blood 2. To detect ABO blood groups in human blood. 3. To determine the bleeding time of own blood 4. To determine the clotting time of own blood. 5. To determine Erythrocyte Sedimentary Rate (E.S.R) 6. To Estimate of Hb by Sahli's haemometer
August- 2024	<ol style="list-style-type: none"> 7. To Count the total RBCs of own blood 8. To Count the total WBCs of own blood 9. To study Differential WBCs of own blood 10. To Measure human blood pressure 11. To Interpret the ECG. 12. Measurement of lung capacity
September 2024	<ol style="list-style-type: none"> 13. Study of dialyzer unit 14. Study of permanent slides of duodenum, liver, pancreas, salivary gland 15. Study of permanent slides of spinal cord, lung, kidney, blood vessels (artery& vein) 16. Study of fossil evidences from plaster cast models and pictures 17. Study of homology and analogy from suitable specimens/ pictures 18. Study of Phylogeny of human evolution
October-2024	<ol style="list-style-type: none"> 19. Study of Phylogeny of horse 20. Study of Darwin's finches with diagrams/ cut-outs of beaks of different species 21. Study of adaptive radiation in marsupial 22. Study of fossil animals- <i>Peripatus</i>, <i>Dipnoi</i> fish, <i>Archaeopteryx</i> 23. Selection of fruit fly in relation to diet 24. Example based on Hardy-Weinberg law

Class: B.Sc. III Batch TA Practical: Based on: Practical-VII (On Paper No XIII And XIV)

Month	Practical
June- 2024	1. Demonstration of primary lymphoid organs- bone marrow & thymus
July- 2024	2. Demonstration of secondary lymphoid organs- lymph node, spleen, mucosal associated lymphoid tissue (MALT), tonsils, gut associated lymphoid tissue (GALT)
August- 2024	3. Histological study of spleen, thymus and lymph nodes 4. Preparation of stained blood film to study various types white blood cells.
September 2024	5. Enumeration of total WBC count from a given blood sample. 6. Antigen antibody reaction by double immuno-diffusion method.
October 2024	7. Antigen-Antibody reactions – Agglutination (Blood group test).


Dr. Tejashri C. Patil


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Department of Zoology
Academic year: 2024-2025

Annual teaching plan

Name of the Teacher: Ms. P. S. Shetfalkar

Term: I

Class: B.Sc. II (Theory)

Name of the Paper: Paper-VI, Ethology (MIN03ZOO32)

Month	Module unit	Sub unit
July - 2024	UNIT- II	Social Behaviour: Introduction, aggression, aggregations- schooling in fishes,
August - 2024	UNIT- II	flocking in birds; herding in mammals, group selection, kin selection,
September- 2024	UNIT- II	Social organization in insects and primates Reproductive Behaviour: Introduction, mating systems, courtship, sexual selection
October- 2024	UNIT- II	Biological rhythms: Introduction, Circadian and Circannual rhythms, Orientations and navigation, Migration of fishes and birds

Class: B. Sc. III (Theory)

Name of the Paper: Paper- XII, Developmental Biology II (DSE -1008E4)

Month	Module unit	Sub unit
June- 2024	UNIT-II	Chick Embryology Structure of sperm, Structure of egg and vitellogenesis
July- 2024	UNIT-II	Fertilization and cleavage. Blastula and its fate map
August- 2024	UNIT-II	Process of gastrulation. Organizer (Development of eye)
September- 2024	UNIT- II	Organogenesis a. Development of neural tube and brain up to 72 hours of incubation b. Development of gut up to 72 hours of incubation
October- 2024	UNIT- II	c. Development of blood and heart up to 72 hours of incubation Foetal membranes and significance

Class: B.Sc. I (PR)

Practical: ZOOLOGY LAB (I): 2DSC03ZOO19 (Practical I)

Month	Practical
July- 2024	1. Study of the specimens with respect to classification and morphological peculiarities: Phylum Porifera to Phylum Echinodermata 2. Study of the following permanent slides: a. T.S. or L.S. of Sycon b. T.S. of male and female Ascaris lumbricoides 3. Mounting of mouth part in cockroach/honey bee/ any insect 4. Mounting of sponging fibres and spicules

August- 2024	5. Study of life history stages of <i>Taenia solium</i> 6. Study of life cycle of <i>Ascaris lumbricoides</i> 7. Preparation of <i>Paramecium</i> culture 8. Temporary preparation of pedicellaria
September- 2024	9. Study of compound Microscope : Simple and Compound 10. Temporary preparation of mitotic cells from onion roots 11. Extraction of DNA from given sample 12. Stained squash preparation of salivary gland chromosomes
October- 2024	13. Study of Cell organelles (any three) by using microphotographs 14. Stained preparation of mitochondria from oral mucosa/ onion peels 15. Effect of tonicity of solutions on plasma membrane of RBCs

Class: B.Sc. II (PR)

PRACTICAL-III (MINOR) - Based on Paper No V & VI


Month	Practical
July- 2024	1. Calculate the mean using given data (Any two examples) 2. Calculate the median using the given data (Any two examples) 3. Calculate the mode using the given data (Any two examples) 4. Calculate the standard deviation using the given data. 5. Draw a line/ Bar diagram using the given data.
August- 2024	6. Draw a Histogram by using given data (equal unequal distribution) 7. Draw a Polygon using given data. 8. Draw frequency curve/ Ogive curve using given data. 9. Drawing graphs and tables on a computer using given data. 10. Examples based on regression (Any two examples)
September- 2024	11. Examples based on correlation (Any two examples) 12. To study the locomotory behaviour in - a) Earthworm b) Garden snail 13. To study chemical communication in ant 14. To study simple reflex behaviour in Cockroach 15. To study the reaction of terrestrial woodlice to light and humidity
October- 2024	16. To study the aggression and courtship behaviour in crickets 17. To study the chemoreception in the adult fly 18. To study the courtship behaviour in fruit fly

Class: B.Sc. III (PR)

PRACTICAL-VIII - Based on Paper No XV & XVI

Month	Practical
June - 2024	1. Study of pond ecosystem on field .
July- 2024	2. Collection, preservation and identification of zooplanktons. 3. Study of aquatic insects- Photographs/specimens (Any four)
August- 2024	4. Oxygen consumption by any aquatic animal 5. Determine the amount of turbidity/transparency
September- 2024	6. Estimation of dissolved oxygen 7. Estimation of free carbon dioxide
October- 2024	8. Determination alkalinity of given water sample


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Department of Zoology
Academic year: 2024-2025

Annual Teaching Plan

Name of the Teacher: Miss. Namrata Ajit Jadhav

Term: I- Theory

Class: B.Sc. I Sem.-I

Name of the Paper: Paper-I, Animal Diversity-I, (2DSC03ZOO11)

Month	Module Unit	Sub-unit
July- 2024	UNIT-I	Origin of Life and evidences of evolution: Life's beginnings: Chemogeny, RNA World, Biogeny, the origin of photosynthesis, Evolution of eukaryotes, Geological time Scale
August- 2024	UNIT-I	Introduction to evolutionary theories Lamarckism, Weismann's theory of germplasm, Darwinism, Mutation theory
September-2024	UNIT- I	Neo-Darwinism, Processes of Evolutionary Change: Natural selection (Example: Industrial melanism); Types of natural selection (Directional, Stabilizing, Disruptive)
October- 2024	UNIT- I	Artificial selection, Adaptive radiation- Darwin's finches

Class: B.Sc. II Sem.- III (Major)

Name of the Paper: Paper-VI, Evolution (DSC03ZOO32)

Month	Module Unit	Sub-unit
July- 2024	UNIT-II	Phylum Platyhelminthes: General characters and classification up to classes, Life history of <i>Taenia solium</i> and its parasitic adaptations
August- 2024	UNIT-II	Phylum Nematelminthes- General characters and classification up to classes; Life history of <i>Ascaris lumbricoides</i> and its parasitic adaptations Phylum Annelida- General characters and classification up to classes; Metamerism in Annelida
September-2024	UNIT- II	Phylum Arthropoda- General characters and classification up to classes; Metamorphosis in insects Phylum Mollusca- General characters and classification up to classes, Sense organ in Mollusca
October- 2024	UNIT- II	Phylum Echinodermata- General characters and classification up to classes, Water-vascular system in star fish

Class: B.Sc. I Sem.- (PR) (Batch- B6)

Practical: ZOOLOGY LAB (1): DSC03ZOO19 (Practical I),

Practicals based on Animal diversity I (DSC03ZOO11) and Cell biology (DSC03ZOO12)

Month	Practical
July- 2024	1. Study of the specimens with respect to classification and morphological peculiarities: Kingdom- Protista to Phylum-Echinodermata 2. Study of the following permanent slides: a. T.S. or L.S. of <i>Sycon</i> b. T.S. of male and female <i>Ascaris lumbricoides</i> 3. Mounting of mouth part in cockroach/honey bee/ any insect 4. Mounting of sponging fibres and spicules
August- 2024	5. Study of life history stages of <i>Taenia solium</i> 6. Study of life cycle of <i>Ascaris lumbricoides</i> 7. Preparation of <i>Paramecium</i> culture 8. Temporary preparation of pedicellaria
September-2024	9. Study of compound Microscope : Simple and Compound 10. Temporary preparation of mitotic cells from onion roots 11. Extraction of DNA from given sample 12. Stained squash preparation of salivary gland chromosomes
October- 2024	13. Study of Cell organelles (any three) by using microphotographs 14. Stained preparation of mitochondria from oral mucosa/ onion peels 15. Effect of tonicity of solutions on plasma membrane of RBCs

Class: B.Sc. II Sem.- III (PR) (Minor, Batch- ZM3)

Paper- V & VI ZOOLOGY LAB (3): MIN03ZOO39 (Practical III)

Practicals based on Biostatistics (MIN03ZOO31) and Ethology (MIN03ZOO32)

Month	Practical
July- 2024	1. Calculate the mean using given data (Any two examples) 2. Calculate the median using the given data (Any two examples) 3. Calculate the mode using the given data (Any two examples) 4. Calculate the standard deviation using the given data. 5. Draw a line/ Bar diagram using the given data.
August- 2024	6. Draw a Histogram by using given data (equal unequal distribution) 7. Draw a Polygon using given data. 8. Draw frequency curve/ Ogive curve using given data. 9. Drawing graphs and tables on a computer using given data. 10. Examples based on regression (Any two examples)
September-2024	11. Examples based on correlation (Any two examples) 12. To study the locomotory behaviour in - a) Earthworm b) Garden snail 13. To study chemical communication in ant 14. To study simple reflex behaviour in Cockroach

	15. To study the reaction of terrestrial woodlice to light and humidity
October- 2024	16. To study the aggression and courtship behaviour in crickets 17. To study the chemoreception in the adult fly 18. To study the courtship behaviour in fruit fly

Class: B.Sc. III, (Batch- TB2), PRACTICAL-VI (BASED ON PAPER NO XI AND XII)

Month	Practical
July- 2024	3. Study of chick embryo (permanent slides /microphotographs) a. Whole mount of chick embryo – 18, 24, 33, 48 and 72 hours. b. T.S. of chick embryo – 18, 24, 33, 48 and 72 hours
August- 2024	4. Preparation of whole mount chick embryo
September-2024	5. Study of histological structures of placenta (permanent slide or microphotographs) a. Epitheliochorial b. Endotheliochorial c. Hemochorial d. Syndesmochorial e. Hemoendothelial
October- 2024	6. Examination of gametes- Frog or rat sperm & ovum (permanent slides/microphotographs)



Miss. Namrata Ajit Jadhav



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Department of Zoology

Academic year: 2024-2025

Annual teaching plan

Name of the Teacher: Ms. P. R. Gaikwad

Term: I

Class: B.Sc. I (Theory)

Name of the Paper: Paper II, Cell Biology (2DSC03ZOO12)

Month	Module unit	Sub unit
July- 2024	UNIT-II	Structure of Nucleic acid: DNA
August- 2024	UNIT-II	RNA and its types
September-2024	UNIT- II	Chromosome: Morphology
October- 2024	UNIT- II	types of chromosomes

Class: B. Sc. III (Theory)

Name of the Paper: Paper- XI, Developmental Biology-I (DSE -1008E3)

Month	Module unit	Sub unit
June- 2024	UNIT-II	Gastrulation - Definition, fate maps, significance of gastrulation.
July- 2024	UNIT-II	Placentation in mammals - Definition, types and significance,
August- 2024	UNIT-II	classification on the basis of morphology
September-2024	UNIT-II	classification on the basis of histology, functions of placenta
October- 2024	UNIT-II	Extraembryonic membranes

Class: B.Sc. I (PR) (Batch: B9)

Practical: ZOOLOGY LAB (1): 2DSC03ZOO19 (Practical I)

Practicals based on Animal diversity I (DSC03ZOO11) and Cell biology (DSC03ZOO12)

Month	Practical
July- 2024	1. Study of the specimens with respect to classification and morphological peculiarities: Phylum Porifera to Phylum Echinodermata 2. Study of the following permanent slides: a. T.S. or L.S. of <i>Sycon</i> b. T.S. of male and female <i>Ascaris lumbricoides</i> 3. Mounting of mouth part in cockroach/honey bee/ any insect 4. Mounting of sponging fibres and spicules
August- 2024	5. Study of life history stages of <i>Taenia solium</i> 6. Study of life cycle of <i>Ascaris lumbricoides</i> 7. Preparation of <i>Paramecium</i> culture

	8. Temporary preparation of pedicellaria
September-2024	9. Study of compound Microscope: Simple and Compound 10. Temporary preparation of mitotic cells from onion roots 11. Extraction of DNA from given sample 12. Stained squash preparation of salivary gland chromosomes
October- 2024	13. Study of Cell organelles (any three) by using microphotographs 14. Stained preparation of mitochondria from oral mucosa/ onion peels 15. Effect of tonicity of solutions on plasma membrane of RBCs

Class: B.Sc. II (Minor Batch: ZM5)

Practical: ZOOLOGY LAB (3): MIN03ZOO39 (Practical III)

Practicals based on Biostatistics (MIN03ZOO31) and Ethology (MIN03ZOO32)

Month	Practical
July- 2024	1. Calculate the mean using given data (Any two examples) 2. Calculate the median using the given data (Any two examples) 3. Calculate the mode using the given data (Any two examples) 4. Calculate the standard deviation using the given data. 5. Draw a line/ Bar diagram using the given data.
August- 2024	6. Draw a Histogram by using given data (equal unequal distribution) 7. Draw a Polygon using given data. 8. Draw frequency curve/ Ogive curve using given data 9. Drawing graphs and tables on a computer using given data. 10. Examples based on regression (Any two examples)
September-2024	11. Examples based on correlation (Any two examples) 12. To study the locomotory behaviour in - a) Earthworm b) Garden snail 13. To study chemical communication in ant 14. To study simple reflex behaviour in Cockroach 15. To study the reaction of terrestrial woodlice to light and humidity
October- 2024	16. To study the aggression and courtship behaviour in crickets. 17. To study the chemoreception in the adult fly 18. To study the courtship behaviour in fruit fly



Ms. P. R. Gaikwad



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