

K.T. S. P. Mandal's
Hutatma Rajguru Mahavidyalaya, Rajgurunagar.

Department of Zoology

Teaching Plan

A.Y.-2022-2023 (Semester VI)

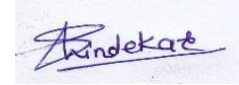
T.Y.B.Sc. Zoology

Course Code: ZO – 356

Course Title: Parasitology

Sr. No.	Month	Topic	Teacher
1.	Sept	1. Introduction, Scope and Branches of Parasitology: 1.1. Definition: host, parasite, vector, commensalisms, mutualism and parasitism. 1.2. Branches of parasitology	PPS
2.	Sept	2. Types of Parasites and Hosts: 2.1 Ectoparasites 2.2 Endoparasites and its subtypes. 2.3 Types of hosts - Intermediate, definitive, paratenic and reservoir.	PPS
3.	Oct	3. Host - Parasite relationship: 3.1 Host specificity. 3.2 Types of host specificity: structural specificity, physiological specificity and ecological specificity. 3.3 Effects of parasite on host.	PPS
4.	Oct	4. Study of Parasitic Protists: 4.1 Entamoeba histolytica - Morphology, Life Cycle, Prevalence, Epidemiology, Pathogenicity, Diagnosis, Prophylaxis and Treatment. 4.2 Plasmodium vivax - Morphology, Life Cycle, Prevalence, Epidemiology, Pathogenicity, Diagnosis, Prophylaxis and Treatment.	PPS
5.	Nov	5. Study of Parasitic worms: 5.1 Ascaris lumbricoides - Study of Morphology, Life Cycle, and Prevalence. 5.2 Epidemiology, Pathogenicity, Diagnosis, Prophylaxis and Treatment. 5.3 Taenia solium (Tapeworm) - Study of Morphology,	PPS

		Life Cycle, Prevalence, Epidemiology, Pathogenicity, Diagnosis, Prophylaxis and Treatment.	
6.	Nov	6. Study of Parasitic Arthropoda: Morphology, pathogenicity and control measures of – 6.1 Soft tick. 6.2 Head louse. 6.3 Rat flea. 6.4 Bed bug.	PPS



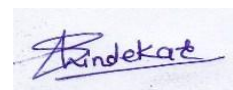
Prof. P. P. shindekar



Course Code: ZO – 353

Course Title: Biological chemistry (A.Y. 2022-2023)

Sr. no.	Month	Topics	Teacher
1.	Sept	Introduction of Biochemistry: Importance of Biochemistry in Life Sciences.	PPS
2.	Sept	pH and Buffers: 2.1 Concept of pH. 2.2 Concept of pH scale, biological significance of p H 2.3 Concept of acid and base, Ionization of acids and bases. 2.4 Derivation of Henderson-Hassel Balch equation & its applications. 2.5 Buffer - Definition, Concept, Functions, Types of buffer and Buffering Capacity.	PPS
3.	Oct	Carbohydrates: 3.1 Definition, Classification & Biological importance of Carbohydrates. 3.2 Isomerism in carbohydrates - Structural and Stereoisomerism. 3.4 Significance of Gluconeogenesis, Glycogenolysis & Glycogenesis. 3.3 Clinical Significance - Hypoglycemia and Hyperglycemia.	PPS
4.	Oct	Amino acids and Proteins: 4.1 General Structure of amino acids and Peptide bond. 4.2 Essential and non-essential amino acids. 4.3 Types of proteins, protein structures (primary, secondary, tertiary and quaternary structures with suitable example), Forces responsible for their stability. 4.4 Biological importance of proteins – Biocatalysts, Carrier proteins Contractile proteins, Hormonal role of proteins.	PPS
5.	Nov	Enzymes: 5.1 Nomenclature, Types and properties of enzymes. 5.2 Regulatory and non-regulatory enzymes. 5.3 Enzyme inhibition. 5.4 Factors influencing enzyme activity (pH, temperature, substrate concentration). 5.5 Introduction of isoenzymes and cofactor. 5.6 Clinical significance of enzymes - PKU and AKU.	PPS
6.	Nov	Lipids: 6.1 Introduction. 6.2. Fatty acids - Types and nomenclature (saturated & unsaturated). 6.3 Clinical significance (obesity, atherosclerosis, myocardial infarction). 6.4 Biological importance of lipids.	PPS



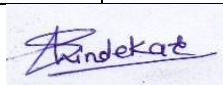
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F. Y. B. Sc.

Course Code: ZO 112

Animal Ecology

Month	Title	Name of Teacher
Sept	1. Introduction to Ecology 1.1 Concepts of Ecology, Environment, Population, Community, Ecosystem, Biosphere, Autecology and synecology. 2. Ecosystem 2.1 Types of ecosystems: Aquatic (Freshwater, estuarine, Marine and terrestrial (Forest, Grassland and Desert) 2.2 Structure and Composition of Ecosystem (Abiotic components and biotic components. 2.3 Food chain: Detritus and grazing food chains, Food web, Energy flow through the ecosystem, Ecological pyramids: Number, Biomass, and Energy. 2.4 concept of Eutrophication in lakes and rivers.	PPS
Oct	3 Population 3.1 Characteristic of population: Density, Natality, Mortality, Fecundity tables, survivorship curves, age ratio, sex ratio, dispersal and dispersion. 3.2 Exponential and logistic growth, 3.3 Population regulation – density-dependent and independent factors. Population interactions, Gause's Principle with laboratory and field interactions, 3.4 Quadrant, line and belt transect methods.	PPS
Nov	4. Community 4.1 Community characteristics: species richness, dominance, diversity, abundance, vertical stratification, Eco tone and edge effect; Ecological succession with one example.	PPS
Nov	5. Animal interactions 5.1 Introduction to Animal interactions 5.2 Types of Animal interactions with at least to suitable examples of each 5.2.1-Competition: Interspecific and intraspecific	PPS



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A.Y.-2022-2023(Semester II)

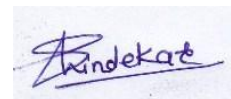
Course Title: Cell biology

Course Code: ZO122

Semester II

Month	Title	Teacher Name
March	<p>Introduction:</p> <p>1.1 Introduction cell biology, 1.2 Cell as basic unit of life. 1.3 Importance of Cell Biology and its applications in industry.</p> <p>Overview of Cells</p> <p>1.3 Introduction to Prokaryotic and Eukaryotic cells. 1.4 Structure and function of Prokaryotic (<i>E. coli</i>) 1.5 Structure and function of Eukaryotic cells (Animal and Plant Cell)</p>	PPS
March & April	<p>Techniques in Cell Biology:</p> <p>3.1 Introduction 3.2 Microscopy: Basic Principle, Simple, Compound and applications of Electron Microscope. 3.3 Stains and dyes: Types of Stain: Acidic, basic and neutral. Dye (Preparation and chemistry of dyes not expected) 3.4 Micrometry.</p>	PPS
April	<p>Plasma Membrane:</p> <p>4.1 Introduction 4.2 Structure of plasma membrane: Fluid mosaic model. 4.3 Transport across membranes: Active and Passive transport, Facilitated transport, exocytosis, endocytosis, phagocytosis – vesicles and their importance in transport. 4.4 Other functions of Cell membrane in brief Protection, cell recognition, shape, storage, cell signalling. 4.5 Cell Junctions: Tight junctions, gap junctions, Desmosomes.</p>	PPS
April	<p>Nucleus: Structure and function</p> <p>5.1 Introduction to Nucleus 5.2 Structure of Nucleus: Nuclear envelope, Nuclear pore complex,</p>	PPS

	<p>Nucleoplasm, Nucleolus</p> <p>5.3 Chromatin: Eu-chromatin and Hetro-chromatin, nature and differences.</p> <p>5.4 Functions of nucleus apparatus, Lysosomes and vacuoles.</p>	
May	<p>Endomembrane System</p> <p>6.1 Introduction</p> <p>6.2 Structure, location and Functions: Endoplasmic Reticulum, Golgi</p> <p>Mitochondria and Peroxisomes</p> <p>7.1 Introduction</p> <p>7.2 Mitochondria: ultrastructure and function of mitochondrion.</p>	PPS
May	<p>7.3 Peroxisomes</p> <p>Cell Division</p> <p>7.1 Introduction</p> <p>7.2 Cell cycle (G1, S, G2, M phases),</p> <p>7.3 Mitosis.</p> <p>7.4 Meiosis.</p>	PPS



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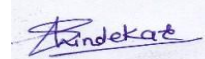
A.Y.-2022-2023 (Semester VI)

T. Y. B. Sc.

Course Title: Molecular Biology

Course Code: ZO-363

Month	Title	Teacher Name
Feb	1. Nucleic Acids and Chromatin: 1.1 Structure of RNA & DNA. 1.2 Types of RNA. 1.3 DNA as genetic material - evidences (Griffith's, Avery et al., Hershey and Chase experiment), RNA as genetic material - TMV 4. 1.4 Structure of Chromatin, packaging of DNA, Heterochromatin, Euchromatin..	PPS
March	2. Central Dogma of Molecular Biology: 2.1 DNA Replication - Semiconservative (Messelson and Stahl experiment), Basic mechanism of replication in prokaryotes and eukaryotes. 2.2 Transcription - 2.2.1 Basic mechanism of transcription in prokaryotes and eukaryotes, RNA polymerase enzyme in prokaryotes. 2.2.2 RNA modifications and processing (splicing - mRNA, modifications at 3' and 5' end). 2.3 Translation - Genetic code, properties of genetic code, Basic mechanism of Translation in E. coli and eukaryotic cells.	PPS
April	3. Lac operon:	PPS
April	4. DNA repair mechanism: Photo repair, dark repair, base excision repair.	PPS
May	5. Recombinant DNA Technology: Introduction, restriction enzymes, cloning vector, PCR (polymerase chain reaction), DNA finger printing.	PPS



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A.Y.-2022-2023 (Semester VI)

T.Y.B. Sc Course

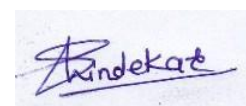
Title: Techniques in Biology

Course Code: ZO 365

Semester: VI

Month	Title	Teacher Name
Feb	1. Microscopy: 1.1 Definitions - Resolving Power, Limit of Resolution and Magnification, Numerical Aperture. 1.2 Basic principle of microscopes - Light, Fluorescence, Phase Contrast, Stereo Microscope, SEM and TEM.	PPS
March	2. Microtomy: Tissue fixation and Processing 2.1 Methods of tissue fixation: Chemical fixation and physical fixation. 2.2 Procurement of tissue and importance of fixation of tissues. 2.3 Dehydration, clearing, impregnation, embedding and block making. 2.4 Types of microtomes. 2.5 Section cutting: steps and precautions, common faults in section cutting, reasons & remedies. 2.6 Mounting and spreading of ribbons. 2.7 General procedure for staining of sections. 2.8 Demonstration of Nucleic acid (Feulgen Reaction).	PPS
April	3. Haematological Techniques: 3.1 Total count of RBCs, WBCs and Differential count of WBCs and their significance. 3.2 Bleeding time, clotting time and their significance.	PPS
April	4. Immunological Techniques: 4.1 Antigen-Antibody Interactions – Immunodiffusion. 4.2 Principle & Working of ELISA. 4.3 Raising Monoclonal Antibodies. 4.4 Application of Immunological techniques in disease diagnosis.	PPS
May	5. Types of PCR & DNA Barcoding	PPS

	<p>6. Methods in Biodiversity:</p> <p>6.1 Introduction to sampling and sample size.</p> <p>6.2 Biodiversity Indices - Species richness, Simpson Diversity Index, Shannon Diversity Index.</p> <p>6.3 Measuring Biodiversity- Quadrat sampling, Transect sampling, Insect survey - Active (sweep netting, aquatic nets) and Passive methodology (Pit fall traps, Light traps).</p>	PPS
May	<p>7. Instruments in Field Biology:</p> <p>7.1 Binoculars, GPS, Basic digital camera techniques: Camera lens - prime and kit lens, Aperture mode, Shutter mode, Megapixels, Telephoto lens, macro lens.</p> <p>7.2 Adapters for camera and microscopes, Mobile's camera.</p>	PPS
May	<p>8. Laboratory techniques:</p> <p>8.1 Microphotographic techniques - CCD and CMOS camera, digital camera.</p> <p>8.2 Software for image analysis - Image J and GIMP.</p>	PPS



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