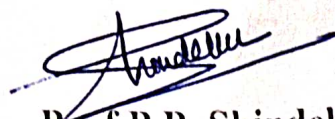


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Hutatma Rajguru Mahavidyalaya, Rajgurunagar
Department of Zoology
A.Y. 2022-2023

F. Y. B. Sc. Zoology
Course Title: Animal Ecology
Course Code: ZO - 112

Sr.No	Month	Topics	Teacher
1	Sep	Introduction to Ecology 1.1 Concepts of Ecology, Environment, Population, Community, Ecosystem, Biosphere, Autecology and synecology.	PPS
2	Sep & Oct	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
3	Oct	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
4	Nov	Community 4.1 Community characteristics: species richness, dominance, diversity, abundance, vertical stratification, Eco tone and edge effect; Ecological succession with one example.	PPS
5	Nov	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 5.2.2- Beneficial Associations: Commensalism (remora fish on shark, Cattle egrets on livestock), Mutualism (Termite and Trichonympha, bees and flowers, cleaning symbiosis in fish by prawns. 5.3 Antagonistic associations: Parasitism (Ascaris and man, lice and humans), Prey predation (Lion and deer).	PPS

As per above mention 95% theory syllabus of Semester I completed and remaining will be complete in last week of November.


Prof. P. P. Shindekar

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Department of Zoology
Syllabus Completion Report
A.Y.2022-2023(Semester II)

Course Title: Cell biology
Course Code: ZO-122
Semester II

Month	Title	Teacher Name
March	Introduction: 1.1 Introduction cell biology, 1.2 Cell as basic unit of life. 1.3 Importance of Cell Biology and its applications in industry. Overview of Cells 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)	PPS
April	Techniques in Cell Biology: 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.	PPS
April	Plasma Membrane: 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.	PPS

April & May	Nucleus: Structure and function 5.1 Introduction to Nucleus 5.2 Structure of Nucleus: Nuclear envelope, Nuclear pore complex, Nucleoplasm, Nucleolus 5.3 Chromatin: Eu-chromatin and Hetro-chromatin, nature and differences. 5.4 Functions of nucleus apparatus, Lysosomes and vacuoles.	PPS
May	Endomembrane System 6.1 Introduction 6.2 Structure, location and Functions: Endoplasmic Reticulum. Golgi Mitochondria and Peroxisomes 7.1 Introduction 7.2 Mitochondria: ultrastructure and function of mitochondrion.	PPS
May	7.3 Peroxisomes Cell Division 7.1 Introduction 7.2 Cell cycle (G1, S, G2, M phases), 7.3 Mitosis. 7.4 Meiosis.	PPS

As per mention above 70% Syllabus is completed. Remaining Syllabus will be complete up to Last week of May.



Syllabus completion Report (A.Y.2022 – 2023)

T. Y. B. Sc. Zoology

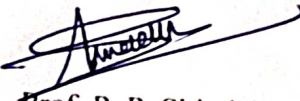
Course Code: ZO – 353

Course Title: Biological chemistry

Sr. no.	Month	Topics	Teacher
1.	Sep	Introduction of Biochemistry: Importance of Biochemistry in Life Sciences.	PPS
2.	Sep	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 and 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.	PPS

	6.2. Fatty acids - Types and nomenclature (saturated and unsaturated).	
	6.3 Clinical significance (obesity, atherosclerosis, myocardial infarction).	
	6.4 Biological importance of lipids.	

As per above mention 95% theory syllabus of Semester I completed and remaining will be complete in last week of November.


Prof. P. P. Shindekar

Syllabus completion Report (A.Y.2022 – 2023)

T. Y. B. Sc. Zoology

Course Code: ZO – 356

Course Title: Parasitology

Sr. No.	Month	Topic	Teacher
1.	Oct	1. Introduction, Scope and Branches of Parasitology: 1.1. Definition: host, parasite, vector, commensalisms, mutualism and parasitism. 1.2. Branches of parasitology	PPS
2.	Oct	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 & Nov	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.	Dec & Feb	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, Life Cycle, Prevalence, Epidemiology, Pathogenicity, Diagnosis, Prophylaxis and Treatment.	PPS

6.	Jan	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
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As per above mention theory syllabus of Semester I completed successfully.



Prof. P. P. shindekar

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Syllabus Completion report

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


T. Y. B. Sc.

Course Title: Molecular Biology

Course Code: ZO-363:

Month	Title	Teacher Name
Feb 2023	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 2023	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
May	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

As per mention above 80% syllabus is completed and remaining will be complete in last week of May.


Prof. Shindekar P. P

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
April	5. Types of PCR & DNA Barcoding	PPS
May	6. Methods in Biodiversity: 6.1 Introduction to sampling and sample size. 6.2 Biodiversity Indices - Species richness, Simpson Diversity Index, Shannon Diversity Index.	PPS

	6.3 Measuring Biodiversity- Quadrat sampling, Transect sampling, Insect survey - Active (sweep netting, aquatic nets) and Passive methodology (Pit fall traps, Light traps).	
May	7. Instruments in Field Biology: 7.1 Binoculars, GPS, Basic digital camera techniques: Camera lens - prime and kit lens, Aperture mode, Shutter mode, Megapixels, Telephoto lens, macro lens. 7.2 Adapters for camera and microscopes, Mobile's camera.	PPS
May	8. Laboratory techniques: 8.1 Microphotographic techniques - CCD and CMOS camera, digital camera. 8.2 Software for image analysis - Image J and GIMP.	PPS

As per mention above 75% syllabus is completed and remaining will be complete in last week of May.



Prof. Shindekar P.P.