K.T. S. P. Mandal's

Hutatma Rajguru Mahavidyalaya, Rajgurunagar.

Department of Zoology

Syllabus Completion report

A.Y.-2021-2022(Semester VI)

T. Y. B. Sc.

Course Title: Molecular Biology

Course Code: ZO-363:

Month	Title	Teacher Name
April	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**
April	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**
May	3. Lac operon:	**PPS**
May	4. DNA repair mechanism: Photo repair, dark repair, base excision repair.	**PPS**
June	5. Recombinant DNA Technology: Introduction, restriction enzymes, cloning vector, PCR (polymerase chain reaction), DNA finger printing.	**PPS**

Prof. P. P. Shindekar

T.Y.B.Sc

Course Title: Techniques in Biology

Course Code: ZO 365

Semester: VI

Month	Title	Teacher Name
March	**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**
April	**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**
May	**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**
May	**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**
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).	
June	**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**
June	**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 first week of June

Prof. P. P. Shindekar

Syllabus completion Report (A.Y.2021 – 2022)

T. Y. B. Sc. Zoology

Course Code: ZO – 353

Course Title: Biological chemistry

Sr. no.	Month	Topics	Teacher
1.	**Oct**	**Introduction of Biochemistry:** Importance of Biochemistry in Life Sciences.	PPS
2.	**Dec**	**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.	**Dec**	**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.	**Jan**	**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.	**Jan**	**Enzymes:** 5.1Nomenclature, 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.	**Feb**	**Lipids:** 6.1 Introduction. 6.2. Fatty acids - Types and nomenclature (saturated and unsaturated). 6.3 Clinical significance (obesity, atherosclerosis, myocardial infarction). 6.4 Biological importance of lipids.	PPS

As per above mention theory syllabus of Semester I completed successfully. For completion of this syllabus 45 lectures are conducted.

Prof. P. P. Shindekar

Syllabus completion Report (A.Y.2021 – 2022)

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.	Nov	**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.	Nov & Dec	**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	**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,	PPS

		Prophylaxis and Treatment.	
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**

As per above mention theory syllabus of Semester I completed successfully. For completion of this syllabus 39 lectures are conducted.

Prof. P. P. shindekar