K. T. S. P. Mandal's

Hutatma Rajguru Mahavidyalaya, Rajgurunagar.

Department of Zoology

Syllabus Completion Report (A.Y.2024–2025)

T.Y. B. Sc.
Course Title: Medical & Forensic Zoology
Course Code: ZO-361

Month	Title	Teacher Name
Dec	**Introduction to medical zoology and its importance:**	**DRB**
Dec	**Medico-legal Autopsy:** 2.1 Death and its Causes- External examination of deceased body – Internal Examination - Determination of time since death and cause of death. 2.2 Injuries – Classification - Medico-legal aspects of injuries. 2.3 Post-mortem changes - collection of post-mortem samples and Preservation.	**DRB**
Jan	**Urine Analysis:** 3.1 Physical characteristics, abnormal constituents, renal failure, renal calculi, dialysis.	**DRB**
Jan	**Non infectious Diseases:** 4.1 Causes, Types, Symptoms, Complications, Diagnosis and Prevention of Diabetes (Type I and II), Hypertension, Hypotension, Obesity, Atherosclerosis, Myocardial Infraction.	**DRB**
Jan	**Infectious Diseases:** 5.1 Causes, Types, Symptoms, Complications, Diagnosis and Prevention of Tuberculosis and Hepatitis.	**DRB**
Feb	**Introduction to Forensic Zoology:** 6.1 Definition, Scope and Application of Forensic Zoology. 6.2 Forensic Laboratories in India. 6.3 Basic Principles of Forensic Science with Examples.	**DRB**
Feb	**Forensic Medicine:** 7.1 Introduction to Forensic Medicine: Definitions of Forensic Medicine. 7.2 Medical Jurisprudence. 7.3 Medical evidence documentations.	**DRB**
March	**Forensic Analysis:** 8.1 Examination of Biological Materials: Examination of Hair, Fibres, Diatoms, plants materials, human tissues. 8.2 Examination of Body Fluid: Blood, Semen and Saliva.8.3 Forensic Importance of Insects: Insects of forensic importance -indicators of time of death stages of insect development & comparative decomposition of human body - colonization - Evidence collection of insects – Territorial & Aquatic Insects. 8.4 DNA Fingerprint Technique and Examination of Biological Traces: Liquid blood, blood stains, & swabs, semen, Seminal stains, tissues, Bones, Hairs, Teeth, Saliva, Skeletal remains. 8.5 Toxicological Investigations: Poisons – Definition, Forms of Poison – Physical, Chemical & Mechanical state. Introduction with examples of – Neurotoxic Poisons – Cerebral & Spinal, Cardiovascular Poisons, Asphyxiants, Miscellaneous poisons – Pesticides, Pharmaceutical drugs, Petroleum poisons, Food poisons, Radioactive poisons.	**DRB**

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Prof. D. R. Borhade

T. Y. B. Sc. Zoology
Course Code: ZO – 365
Course Title: Techniques in Biology

Month	Title	Teacher Name
Dec	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.	**DRB**
Jan	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).	**DRB**
Feb	**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.	**DRB**
Feb	**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**.**	**DRB**
March	**5. Types of PCR & DNA Barcoding**	**DRB**
March	**6. Methods in Biodiversity:** 6.1 Introduction to sampling and sample size. 6.2 Biodiversity Indices - Species richness, Simpson Diversity Index, Shannon Diversity Index. 6.3 Measuring Biodiversity- Quadrat sampling, Transect sampling, Insect survey - Active (sweep netting, aquatic nets) and Passive methodology (Pit fall traps, Light traps).	**DRB**
March	**7. Instruments in Field Biology:** 7.1 Binoculars, GPS, Basic digital camera techniques: Camera lens -	**DRB**

	prime and kit lens, Aperture mode, Shutter mode, Megapixels, Telephoto lens, macro lens. 7.2 Adapters for camera and microscopes, Mobile's camera**.**	
April	**8. Laboratory techniques:** 8.1 Microphotographic techniques - CCD and CMOS camera, digital camera. 8.2 Software for image analysis - Image J and GIMP**.**	**DRB**

As per mention above 100% syllabus of Semester VI is completed.

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Prof. D. R. Borhade

T. Y. B. Sc Zoology
Course Title: Evolutionary Biology
Course Code: ZO 366

Month	Title	Teacher Name
Dec	**1.Introduction:** 1.1 Concept of Evolution. 1.2 Origin of life. 1.3 Origin of eukaryotic cell (Origin of mitochondria, plastids) **2. Evidences of Evolution:** 2.1 Analogy and Homology. 2.2 Embryological Evidences of Evolution. 2.3 Evolutionary & Paleontological Evidences.	**DRB**
Dec & Jan	**3. Historical Review of Evolutionary Concept:** 3.1 Theories of Evolution. 3.2 Lamarckism. 3.3 Darwinism and Neo Darwinism. 3.4 Mutation Theory. 3.5 Modern Synthetic theory. **4. Sources of Variations:** 4.1 Variation and Mutations.	**DRB**
Jan	**5. Isolation**	**DRB**
Feb	**6.Speciation:** 6.1 Types of speciation (Allopatric & Sympatric). 6.2 Mechanism of speciation. 6.3 Patterns of speciation. 6.4 Factors influencing speciation.	**DRB**
Feb	**7.Population Genetics:** 7.1 Hardy-Weinberg Law & Genetic Drift. 7.2 Types of Natural Selection.	**DRB**
March	**8.Origin of Man:** 8.1 Evolution of Man (Evolution of anthropoids including man) - Kenyapithecus to Homo sapiens**.**	**DRB**
March	**9.Zoogeographical Realms With reference to fauna:**	**DRB**
March	**10.Extinctions:** **10.1** Extinction - An Overview**.**	**DRB**

As per mention above 100% syllabus of Semester V is completed.

Prof. D. R. Borhade