

**K. T. S. P. Mandal's**  
**Hutatma Rajguru Mahavidyalaya, Rajgurunagar.**  
**Department of Zoology**  
**Teaching Plan (A.Y.2024–2025)**

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

Month	Title	Teacher Name
<b>Dec</b>	<b>Introduction to medical zoology and its importance:</b>	<b>DRB</b>
<b>Dec</b>	<b>Medico-legal Autopsy:</b> 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.	<b>DRB</b>
<b>Jan</b>	<b>Urine Analysis:</b> 3.1 Physical characteristics, abnormal constituents, renal failure, renal calculi, dialysis.	<b>DRB</b>
<b>Jan</b>	<b>Non infectious Diseases:</b> 4.1 Causes, Types, Symptoms, Complications, Diagnosis and Prevention of Diabetes (Type I and II), Hypertension, Hypotension, Obesity, Atherosclerosis, Myocardial Infraction.	<b>DRB</b>
<b>Jan</b>	<b>Infectious Diseases:</b> 5.1 Causes, Types, Symptoms, Complications, Diagnosis and Prevention of Tuberculosis and Hepatitis.	<b>DRB</b>
<b>Feb</b>	<b>Introduction to Forensic Zoology:</b> 6.1 Definition, Scope and Application of Forensic Zoology. 6.2 Forensic Laboratories in India. 6.3 Basic Principles of Forensic Science with Examples.	<b>DRB</b>
<b>Feb</b>	<b>Forensic Medicine:</b> 7.1 Introduction to Forensic Medicine: Definitions of Forensic Medicine. 7.2 Medical Jurisprudence. 7.3 Medical evidence documentations.	<b>DRB</b>
<b>March &amp; April</b>	<b>Forensic Analysis:</b> 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.	<b>DRB</b>

*DRB*

**Prof. D. R. Borhade**

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

<b>Month</b>	<b>Title</b>	<b>Teacher Name</b>
<b>Dec</b>	<b>1. Microscopy:</b> 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.	<b>DRB</b>
<b>Jan</b>	<b>2. Microtomy: Tissue fixation and Processing</b> 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).	<b>DRB</b>
<b>Feb</b>	<b>3. Haematological Techniques:</b> 3.1 Total count of RBCs, WBCs and Differential count of WBCs and their significance. 3.2 Bleeding time, clotting time and their significance.	<b>DRB</b>
<b>Feb</b>	<b>4. Immunological Techniques:</b> 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.	<b>DRB</b>
<b>March</b>	<b>5. Types of PCR &amp; DNA Barcoding</b>	<b>DRB</b>
<b>March</b>	<b>6. Methods in Biodiversity:</b> 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).	<b>DRB</b>
<b>March</b>	<b>7. Instruments in Field Biology:</b> 7.1 Binoculars, GPS, Basic digital camera techniques: Camera lens -	<b>DRB</b>

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

DBorhade

**Prof. D. R. Borhade**



**T. Y. B. Sc Zoology**

**Course Title: Evolutionary Biology**

**Course Code: ZO 366**

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



DRBhade



