Curriculum plan (Even Semester 2025-2026)

Teacher Name: **Dr. Shanuja Beri**

Paper name: Evolutionary Biology (Practical)
Assigned Lecture 4
Course: B. Sc. (H) III year
Paper shared with: **Dr. Saurabh Kumar Jha**

Unit to be taken	**Allocated lectures**	**Month wise schedule to be followed**	**Tests/Assignments/ Revision/Presentations etc**
1. Study of fossils from models/pictures. 2. Study of variations in a sample human population: (a) Continuous variation: Height/Weight in relation to age and sex (b) Discontinuous variation: Ability/Inability to taste Phenyl thiocarbamide (PTC). .		Jan	File
1. Construction of cladograms based on morphological characters. 2. Construction of phylogenetic tree with the help of bioinformatics tools (Clustal X, Phylip, MLK) and its interpretation.		February	File
1. Study of homology and analogy from suitable specimens. 2. Study and verification of Hardy-Weinberg Law by *chi* square analysis.		March	File corrections
1. Demonstration of role of natural selection and genetic drift in changing allelic frequencies using simulation studies. 2. Revision		April	File corrections Mock Exam

Curriculum plan (Even Semester 2025-2026)

Teacher Name: **Dr. Shanuja Beri**

Paper name: Fundamental of Biochemistry (Practical)
Assigned Lecture 4
Course: B. Sc. (H) **Zoology Ist Year** (Sem II) Group: All (Practical)
Paper shared with: **Dr Tarkeshwar**

Unit to be taken	**Allocated lectures**	**Month wise schedule to be followed**	**Tests/Assignments/ Revision/Presentations etc**
1. Understanding the structures of biomolecules through ball and stick models. 2. 2. To understand the preparation and roles of two important biological buffer systems:phosphate and bicarbonate; Preparation of buffers and determination of pH. 3. 5. Study the action of salivary amylase under optimum conditions.		Jan	File
1. Identification of the functional groups by qualitative tests: 2. a. Carbohydrates 3. b. Lipids 4. c. Proteins		February	File
1. 4. Separation of amino acids by paper chromatography.		March	File corrections
1. Study the effect of pH, temperature and inhibitors on the action of salivary amylase.		April	File corrections Mock Exam

Curriculum plan (Even Semester 2025-2026)

Teacher Name: **Dr. Shanuja Beri**

Paper name: Fundamental of Biochemistry (Theory)
Assigned Lecture 1
Course: B. Sc. (H) **Zoology Ist Year** (Sem II)

Unit to be taken	**Allocated lectures**	**Month wise schedule to be followed**	**Tests/Assignments/ Revision/Presentations etc**
1. UNIT – III Proteins Structure: purines and pyrimidines, nucleosides, nucleotides, nucleic acids; Cot Curves: Base pairing, Denaturation and Renaturation of DNA; Types of DNA and RNA.	**04 Hours**	Jan	Test
1. **UNIT – V Enzymes** Nomenclature and classification, cofactors; specificity of enzyme action, Isozymes, Mechanism of enzyme action; Enzyme kinetics; factors affecting rate of enzyme-catalysed reactions;	**04 Hours**	February	Revision, Test and Assignments, corrections
2. Derivation of Michaelis-Menten equation, reaction..	**02 Hours**	March	
2. Concept of Km and Vmax, Lineweaver-Burk plot, multi-substrate reactions, enzyme inhibition; Allosteric enzymes and their kinetics; Regulation of enzyme	**02 Hours**	April	Test

Curriculum plan (Even Semester 2025-2026)

Teacher Name: **Dr. Shanuja Beri**

Paper name: Animal Biotechnology (DSC) Practical
Assigned Lecture 4
Course: B. Sc. (H) III Year (Sem V)
Paper shared with: **Dr. Saurabh Kumar Jha**

Unit to be taken	**Allocated lectures**	**Month wise schedule to be followed**	**Tests/Assignments/ Revision/Presentations etc**
1. Construction of circular and linear restriction map from the data provided. 2. Calculation of transformation efficiency from calcium chloride method. 3. Study of different blotting techniques: Southern, Northern and Western. 4. DNA sequencing: Sanger method, Next generation sequencing (Illumina).		Jan	File
5. Study of Polymerase Chain Reaction (PCR) and DNA microarrays. 6. Study and interpretation of DNA fingerprinting.		February	File
7. Isolation of genomic DNA from E. coli. 8. Isolation of plasmid (pUC 18/19) from E. coli. 9. Detection/ Visualization of DNA using Agarose gel electrophoresis.		March	File corrections
		April	Revision Mock

Curriculum plan (Even Semester 2025-2026)

Teacher Name: **Dr. Shanuja Beri**

Paper name: Animal Biotechnology (Theory)
Assigned Lecture 1
Course: B. Sc. (H) **Zoology IIIrd Year** (Sem V)
Paper Shared: Nil

Unit to be taken	Allocated lectures	Month wise schedule to be followed	Tests/Assignments/ Revision/Presentations etc
1. UNIT- 1: Overview of Biotechnology **Aim and scope; applications in biotechnology.** **2. UNIT- 2: Basic Tools for Gene Manipulation** **Cloning vectors: Plasmids, Cosmids, Phagemids, Lambda Bacteriophage, M13, BAC, YAC, MAC and Expression vectors (characteristics); Restriction enzymes; DNA modifying enzymes; Transformation techniques: Calcium chloride method, electroporation and biolistic methods, construction of genomic and cDNA libraries and screening by colony and plaque hybridization..**	**1 Hours** **10 Hours**	Jan	Test
3. UNIT- 3: Advance Tools and Techniques 3 hrs **Gene Editing Tool: Zinc Finger, TALEN, Clustered regularly interspaced short palindromic repeats (CRISPR/Cas9) system.** **4. UNIT- 4: Genetically Modified Animals** **Production of cloned and transgenic animals: Nuclear Transplantation, Retroviral Method, DNA microinjection; Applications of transgenic animals; Production ofpharmaceuticals, production of donor organs, knock-out mice.**	**03Hours** **08Hours**	February	Revision, Test and Assignments, corrections
5. UNIT- 5: Applications of Genetic Engineering	**08 Hours**	March	

Molecular diagnosis of genetic diseases (Cystic fibrosis, Sickle cell anemia): RFLP **based, Allele specific oligonucleotide dot blot method, PCR- Oligonucleotide ligation** **assay;**			
Recombinant DNA in medicines: recombinant insulin and human growth **hormone, Gene therapy.**		April	Test