

COLLEGE OF FISHERIES, KISHANGANJ
BIHAR ANIMAL SCIENCES UNIVERSITY, PATNA

Lecture plan for course FGB-510 (Microbial Genetics)
Credit – 2(2+0) Batch- 2025 Semester- 1st

Sl. No.	Topic	Name of the course teachers	No. of classes
THEORY			
1	Basics of microbial existence: Why study prokaryotic genetics? History of Microbiology –Bacterial genetics, Conjugation, Sex factors; High frequency recombination; Transduction (generalized and specialized), Bacterial transformation; Mutation types, Repair mechanism, Selection of mutants	Ms. Aishwarya Sharma	04
2	Genetics of Bacteriophage, Bacteriophage classification, Types, Phage T4-Structure, Gene expression and genome organization, Lamda phage replication, Lytic and lysogenic cycles	Dr. S. O. Khairnar	04
3	Mechanisms of repressor synthesis and its control, Auto regulation, One-step growth curve; Importance of bacteriophages, Coalescent of bacterial population, Population reproduction models, Time and effective population size, Demography – Recombination and gene conversion.	Ms. Aishwarya Sharma	04
4	Linkage, Selection and the clonal complex- Recombination, Linkage and substructure, Neutrality versus Selection, Clustering Techniques; Sequence-based population structure analysis.	Dr. S. O. Khairnar	04
5	Population Genetics-Natural Selection, Methods for detecting the presence of natural selection, Measure of genetic diversity, The concept of Effective population size, Population subdivision, Population Genomics, Population structure and genetic evolution, Similarities and differences,	Dr. S. O. Khairnar	04
6	Bacterial Population genomics, MLVA and SNP for analysis in population genetic study, Phylogenetic resolution, Phylogeographic resolution.	Ms. Aishwarya Sharma	02
7	Gene Maps, Tools and protocols World Wide Web Databases, Genetically modified organisms (GMOs) Technological advances Controls and cautions.	Ms. Aishwarya Sharma	04
8	Transposable Elements: IS elements, Tn3 family and medical significance, The Genetic and evolutionary significance of transposable elements; Use in genetic analysis and evolutionary issues.	Ms. Aishwarya Sharma	04
9	Microbial strain improvement techniques; Identification of ideal microorganisms for bioprocess, Microbial strain improvement, Genetic engineering and evolutionary engineering, Bioprocess optimization and applications in industry, Agriculture and health.	Dr. S. O. Khairnar	04
Total number of classes (theory)			34




(Dr. S. O. Khairnar & Ms. Aishwarya Sharma)

