

COLLEGE OF FISHERIES, KISHANGANJ
BIHAR ANIMAL SCIENCES UNIVERSITY, PATNA

Lecture plan for course FGB 504 (Fish Breeding Plans)
Credit – 3 (2+1) Batch- 2025 Semester- 2nd

Sl. No.	Topic	No. of classes
THEORY		
1.	Historical development of fish breeding and domestication, Current status of aquaculture in the world and India, maintaining pedigree, Physical and molecular tagging, and maintaining breeding records	3
2.	Economic traits in cultured species-Performance- Growth, Disease resistance, productive and reproductive traits.	2
3.	Recapture frequency, Behavior, Quality traits and their inheritance, Recording economic traits, Study of growth curves and their components, Influence of non-genetic factors on economic traits.	2
4.	Formation of base population, Designing mating plans, Effect of breeding program on genetic diversity of farmed animals.	2
5.	Present status of breeding, crossbreeding in aquaculture; Broodstock management –Inbreeding depression and heterosis in various economic characters –Role of Breeders' associations in national breeding programs	2
6.	Fish breeding guidelines, Policies, Programs and economic analyses of breeding programs, their present status in India and the world, Prospectus and challenges	2
7.	Reproductive cycle, Factors affecting sexual maturation, Adaptability and reproduction, Age at maturity, Gonadal development stages in fin/shellfish and levels of hormonal intervention;	3
8.	Sex determination, Cryopreservation of gametes, Live feed development for larvae, Larval feeding and maintenance, Packaging and transport of fish; Nursery systems and their operation; Biosecurity.	2
9.	Application of recent technologies in stock improvement –Biosafety issues involved with genetically modified organisms.	2
10.	Release and registration of new varieties, Quality seed; Classes, production practices and maintenance of pure seed, Seed purity standards; Seed quality and fish seed certification.	2
11.	Shellfish breeding: Reproductive cycle of the shellfish; controlled mating of the shellfish; Economic traits and their recording.	3
12.	Ornamental fish breeding: Introduction to ornamentation and their inheritance; selection and mating systems; inbred strains; transgenic strains.	2
13.	Production of gene knock-out fish, Genetic control and monitoring.	2
14.	Record keeping and ethics.	3
Total number of classes (Theory)		32
PRACTICAL		
1	Study of fish tagging methods (physical, electronic and molecular) and maintenance of breeding records	2
2	Construction of growth curves and standardization of performance records for estimation of genetic parameters	2
3	Preparation of breeding plans and design of breeding programs based on successful case studies	2
4	Morphometric analysis and truss network analysis for stock characterization	2
5	Synchronization of spawning and hormone-induced ovulation in fishes	2
6	Establishment of closed life cycle and controlled mating techniques	2
7	Collection of fish gametes and assessment of gamete quality	2
8	Cryopreservation of fish gametes: Freezing, storage and thawing procedures	2
Total number of classes (Practical)		16
Total number of classes(Theory+ Practical)		48



(Dr. S. O. Khairnar)

