

M.F.Sc. Fish Biotechnology (2nd Semester)

Course: FBT-507 “Aquaculture Biotechnology” (2+1) Lecture Plan (Theory)

S. No.	Unit	Topics	Lecture Plan
1	Unit I Chromosome manipulation	Ploidy manipulation, Sex reversal,	01
2		Androgenesis, Gynogenesis and applications	02
3		Transgenesis in fish: Methods of gene transfer in fishes	02
4		Screening, Applications of transgenic fishes, GMOs: Biosafety regulations, ethics and IPR.	02
5	Unit II Molecular markers for aquaculture	Sources and significance of genetic variation	01
6		Biochemical and molecular markers, Development and applications of Allozymes	01
7		mtDNA markers, RFLP, RAPD, AFLP	02
8		Minisatellites, Microsatellites and SNPs	02
		DNA barcoding of fishes, FISH-BOL	02
9	Unit III Reproductive biotechnology	Overview of broodstock management and seed production	02
10		Induced breeding hormones and analogues	02
11		Seed certification through molecular techniques; Applications of nanotechnology in fish breeding.	02
12	Unit IV Concepts in phylogeny	Indoor, Mass culture, Raceway system	01
13		Enrichment of micro algae with micronutrients	01
		Fuel production from microalgae using biotechnological approaches	01
14		Pharmaceutical products from microalgae; Macroalagecultivation and propagation	01
15	Unit V Biotechnological tools in aquatic animal health management	Concept and techniques for the production of SPF and SPR stocks in crustacean aquaculture	01
		Disease diagnostic procedures (PCR, RT-PCR, LAMP)	02
16		and therapeutics – DNA vaccines and RNAi vaccines	02
17	Unit VI Biotechnological tools in fish nutrition	Probiotics and its role in aquaculture; Microbial flocs as feed for aquatic animals	02
18		Biofilms, Biofloc, Single cell protein, Bio-encapsulated feeds	02
19		Detection of contaminants in fish feed by biotechnology tools; Nutraceuticals, Nutrigenomics	
Total			34

(Dr. Mamta Singh)
Course Teacher

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Course: FBT-507 “Aquaculture Biotechnology” (2+1) Lecture Plan (Practical)

S. No.	Practical	Practical Plan
1	Fish Chromosomal manipulation – Androgenesis, Gynogenesis, Triploidy.	02
2	Allozyme variation by PAGE, Gel imaging and scoring.	01
3	RAPD and interpretation of results.	01
4	PCR-RFLP and interpretation of results.	01
5	AFLP and interpretation of results.	01
6	Development and validation of microsatellite marker.	01
7	Disease diagnosis of shrimp/fish seeds using PCR/RT-PCR.	02
8	Synthesis and characterisation of nanoparticles. Delivery of nanoparticle conjugated hormones/drugs to fish.	02
9	Isolation and screening of probiotic bacteria isolated from fish	02
10	Identification and culture of spirulina. Culture of live food organisms (Artemia/Rotifer/Moina).	02
11	Different methods of gene transfer.	02
12	Development of biofloc	01
	Total	18

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