

**COLLEGE OF FISHERIES, KISHANGANJ
BIHAR ANIMAL SCIENCES UNIVERSITY, PATNA**

Lecture plan

**Course Title: Principles of Selection and Selection Methods
Course No.: FGB 503 (2+1)**

Theory

S. No.	Name of Topics	No. of Lectures
1.	Genetic Selection and Breeding: Scope, Application, Role of genetics in fish selection and breeding, National and International scenario of selective breeding programmes in aquaculture	01
2.	Selection: Basis of selection, Introduction to variance components – Estimation of selection differential, intensity of selection	03
3.	Response to selection –Identification of animals with high genetic merit – Estimation of breeding values- variance and accuracy of predicted breeding value	03
4.	Various sources of information - Individual, information from relatives; Least squares and BLUP methods; Accuracy of selection	03
5.	Combined selection: Combined selection –Selection index-selection Objective and criterion	02
6.	Selection criterion coefficients – Methods of selection –Realized heritability, Repeatability	04
7.	Factors affecting rate of genetic improvement – Short term response to selection	01
8.	Variance in response - Bidirectional selection, Selection limits Renewed selection gain – Threshold characters - Heritability of threshold traits, genetic correlation among threshold traits, selection for threshold traits –Scale effects	04
9.	Formulation of breeding plans: Stock improvement plans for different population sizes and environments, Control population and experimental design–Development of new strains/synthetic population; Crossbreeding and hybridization.	02
10.	Domestication and inadvertent selection – Selection and mating designs for select traits: Mating systems and genetic consequences	02
11.	Small stock and inbreeding effects, Inbreeding Depression; causes and methods to overcome; Out breeding; Crossbreeding	01
12.	Utilization of heterotic effects	01
13.	Selection and mating designs for growth, Disease resistance, color enhancement	01
14.	Genotype×Environment interaction and its role in fish/shellfish breeding	01
15.	Major genes and QTLs- Major and minor genes, Tests for detecting major genes	01
16.	Application of markers in selection programmes, Status and their relevance	01
17.	QTL and its application in selection	01
18.	Marker Assisted Selection in Fisheries; Genomic selection	02
Total no. of theory classes		34

Aishwarya

(Ms. Aishwarya Sharma)

Course Teacher

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Practical

S.No.	Name of Topics	No. of classes
1.	Estimation of genetic parameters: heritability, repeatability and genetic correlation	02
2.	Estimation of phenotypic and environmental correlations	01
3.	Estimation of Breeding Values from various sources of information and their accuracies	02
4.	Construction of selection indices	01
5.	Designing and conducting challenge test for disease resistance	01
6.	Selection: basis of selection, genetic gain	02
7.	Response to selection and factors affecting response	01
8.	Aids to Selection	02
9.	Methods of Selection	02
10.	QTL and MAS	02
Total no. of practical classes		16



(Ms. Aishwarya Sharma)

Course Teacher