# Fish Genetics & Breeding Training Course

Professional Development Training Course Outline

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| **Category** | Veterinary and Animal Science | **Duration** | 5 Days |
| **Base Fee** | $1,500 USD | **Delivery Mode** | Online / On-site Hybrid |

## Course Introduction

Fish Genetics & Breeding Training Course is designed for aquaculture professionals, researchers, and enthusiasts seeking to advance their knowledge in genetic improvement, sustainable breeding, and aquaculture productivity. Participants will explore modern breeding technologies, selective breeding programs, molecular genetics, and genome-based strategies to enhance growth performance, disease resistance, and environmental adaptability of commercially important fish species. This program emphasizes hands-on learning, real-world case studies, and applied genetic tools, equipping learners with the skills to implement innovative breeding strategies and sustainable aquaculture practices.

This intensive training combines practical workshops, laboratory exercises, and field studies to deliver an immersive learning experience. Participants will gain insights into population genetics, quantitative trait selection, reproductive technologies, and bioinformatics in aquaculture. With a strong focus on data-driven decision-making and genetic management, this course prepares aquaculture professionals to tackle the challenges of climate change, disease outbreaks, and market demands while promoting high-yield, resilient fish stocks. By integrating emerging trends in genomic selection and breeding optimization, the course ensures participants are at the forefront of innovative fish genetics solutions.

## Programme Curriculum

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**Course Duration**

5 days

**Course Objectives**

1. Understand fundamental principles of fish genetics and heredity
2. Apply molecular markers and genomic tools in selective breeding
3. Design sustainable breeding programs for commercial aquaculture
4. Improve growth rates, feed conversion, and productivity through genetics
5. Enhance disease resistance and stress tolerance in fish populations
6. Implement quantitative trait selection and performance evaluation
7. Utilize bioinformatics and genetic data analysis for breeding decisions
8. Integrate reproductive technologies and broodstock management
9. Develop hybridization and crossbreeding strategies
10. Apply population genetics for conservation and genetic diversity
11. Evaluate genetic improvement programs and breeding outcomes
12. Leverage emerging trends in genome editing and CRISPR in aquaculture
13. Promote sustainable and eco-friendly aquaculture practices

**Target Audience**

1. Aquaculture researchers and geneticists
2. Fish farm managers and hatchery operators
3. Fisheries extension officers
4. Postgraduate and PhD students in aquaculture
5. Biotechnology and molecular biology professionals
6. Marine and freshwater fish breeders
7. Policy makers in fisheries management
8. Environmental and conservation organizations

**Course Modules**

**Module 1: Introduction to Fish Genetics & Breeding**

- Principles of heredity and inheritance in fish
- Overview of fish species and breeding importance
- Genetic variation and population structure
- Ethical and sustainable breeding practices

- Case Study: Selective breeding in Nile tilapia for rapid growth

**Module 2: Molecular Tools in Fish Genetics**

- DNA markers and their applications
- Microsatellites and SNP genotyping
- Genomic selection for breeding programs
- CRISPR/Cas9 and gene-editing applications
- Case Study: Disease-resistant Atlantic salmon development

**Module 3: Breeding Program Design**

- Planning selective breeding programs
- Broodstock selection and mating strategies
- Maintaining genetic diversity
- Recording and evaluating breeding performance
- Case Study: Breeding of hybrid catfish in Southeast Asia

**Module 4: Quantitative Genetics & Trait Selection**

- Heritability and genetic correlations
- Trait measurement and statistical modeling
- Growth, feed efficiency, and quality traits
- Genetic improvement index calculation
- Case Study: Growth rate enhancement in common carp

**Module 5: Reproductive Technologies**

- Hormonal induction and spawning techniques
- Artificial fertilization and larval rearing
- Cryopreservation of gametes
- Hatchery management for genetic integrity
- Case Study: Hormone-induced breeding in ornamental fishes

**Module 6: Bioinformatics & Genetic Data Analysis**

- Genetic databases and software tools
- Sequence analysis and gene annotation
- Marker-assisted selection techniques
- Data-driven decision making in breeding
- Case Study: Genomic selection for tilapia disease resistance

**Module 7: Conservation Genetics**

- Maintaining genetic diversity in wild populations
- Inbreeding management and risk assessment
- Habitat-based genetic conservation strategies
- Stock enhancement and restoration genetics
- Case Study: Conservation of endangered freshwater fish

**Module 8: Emerging Trends & Sustainable Aquaculture**

- Genomic selection and CRISPR applications

- Climate-resilient breeding strategies
- Eco-friendly and responsible aquaculture practices
- Integration of AI and predictive models
- Case Study: Smart breeding technologies in marine aquaculture

### Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

**Register as a group from 3 participants for a Discount**

**Send us an email: info@fineskilltrainingcenter.org or call** *+254769199797*

***Certification***

*Upon successful completion of this training, participants will be issued with a globally- recognized certificate.*

***Tailor-Made Course***

*We also offer tailor-made courses based on your needs.*

**Key Notes**

**a.** The participant must be conversant with English.

**b.** Upon completion of training the participant will be issued with an Authorized Training Certificate

**c.** Course duration is flexible and the contents can be modified to fit any number of days.

**d.** The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

**e.** One-year post-training support Consultation and Coaching provided after the course.

**f.** Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

## Upcoming Scheduled Sessions

| Start Date | End Date | Location | Price |
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| **23 Nov 2026** | 27 Nov 2026 | Online | $1,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $1,500 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $3,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $3,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $6,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $4,500 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $6,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $6,000 |

Ready to enroll or request a customized program? Book online or contact us:

**Register Online Now**

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com