One Year Skill Development Certificate Course on Fish Farming & Hatchery Operation

at

ICAR-CIFE, Kakinada Centre

Course distribution of Ist semester Skill development certificate course at Kakinada Duration: 1st June-30th Nov.			
Courses no.	**Courses Title.**	**Credit**	**Total credits**
SDK-101	Soil and water quality management	(1+2)	
SDK-102	Seed production and culture of freshwater fishes	(1+2)	
SDK-103	Brackishwater aquaculture	(1+2)	5+10=15
SDK-104	Feed and feeding management in aquaculture	(1+2)	
SDK-105	Shrimp and prawn hatchery management	(1+2)	
Course distribution IInd semester Skill development at Kakinada Duration:1st Dec.- 31st May			
SDK-106	Harvest and post-harvest management	(1+2)	
SDK-107	Management of farm machineries	(0+3)	1+14=15
SKD-108	Learn and Earn	(0+9)	
Total credit distribution in **Theory-25%; Practicals:75%**			

Essential Qualification:

Class 10th pass from any recognized educational board of India.
(ICSE, CBSE, SSC, IB)

Total Seats: 20 Nos (Admission on the merit of class 10th marks)

Fees Structure:

    a. Tuition Fees   :- Rs.10,000/ annum
    b. Hostel Charges: - Rs.1000/ annum
    c. Evaluation Fees:- Rs.100/ annum
    d. Food charges   :- As per actual managed by the participants

Evaluation :-

I) Practicals **-80 marks**

        a) Learn and Earn   - 40 marks

        b) Chart/Posters preparation - 20 marks

        c) Spotting   - 20 marks

II) Viva-voce - **20 marks**

        (Pass marks will be 60% of the total marks)

Lean and Earn: The performance will be assessed on the basis of their working during shrimp farming/fish farming.

SDK-101: SOIL AND WATER QUALITY MANAGEMENT(1+2)

Objective: To develop the skills in soil and water quality monitoring and management

Theory	No. of Classes	Total
Types of soils and its distribution	2	
Physical and chemical properties of soil	2	
Soils suitable for aquaculture	1	
Preventive methods of water seepage	1	
Soil pH correction	1	
Management of acidic and alkaline soils	1	18 hrs
Physical and chemical parameters of water	3	
Productivity study	1	
Calculations for different treatments-liming, fertilizers, KMno4, salt etc.	2	
Soil and water quality standards	1	
soil and water quality monitoring and management	3	

Practicals		
Analysis of soil for aquaculture:		
Collection and preservation of soil samples	2	
Determination of soil moisture and bulk density	2	
Analysis of Soil texture and Water retention capacity.	2	
Analysis of $_pH$	1	
Analysis of water for aquaculture:		
Measurement of Temperature, Transparency, Turbidity .	2	
Estimations of $_pH$, Conductivity , Dissolved oxygen, Free carbon dioxide, Alkalinity, Hardness, Salinity. (Using kit/probe)	2	36 hrs
Estimations of Total Nitrogen, Nitrite, Nitrate, Phosphate, Potassium, Sodium Calcium, Magnesium, Chlorides, Iron.(Using kit/probe)	2	
Estimations of primary productivity	2	
Chlorination and dechlorinaton	1	
Record keeping of water and soil quality parameters	2	
Visit to soil and water testing lab		

SDK-102: SEED PRODUCTION & CULTURE OF FRESHWATR FISHES (1+2)

Objective: To get acquainted with skill related to freshwater aquaculture.

Theory	No. of Classes	Total
Aquaculture: concept, definition, scope of aquaculture, Aquaculture systems and types of aquaculture	2	
Basic requirements for aquaculture: Site selection, soil and water quality, pond preparation, seed and feed	3	
Candidate species for freshwater aquaculture	1	
Brood-stock management	1	
Seed production techniques	2	
Hatchery operation for different species	2	18 hrs
Packaging and transportation of fish seed	1	
Nursery pond management practices	1	
Grow-out pond management	2	
Sampling and Harvesting methods	1	
Transportation for marketing	1	
Common diseases in fresh water aquaculture and their control	1	
Practicals		
Identification of commercially important finfishes	2	
Identification of commercially important shellfishes-prawns	1	
Identification of matured male and female fish, selection of pairs, transportation to spawning pools/ other units	1	
Calculation of inducing agent doses, injection techniques releasing for spawning	2	
Fecundity studies, observation of eggs	2	
Survival estimation and biomass calculation	2	36 hrs
Packing and transportation of fish seed	1	
Preparation of ponds for stocking and grow out pond management	2	
Growout pond management	3	
Collection and preservation of disease samples and disease identification	2	
Visit to freshwater fish hatchery		
Visit to freshwater fish farm		

SDK-103 BRACKISHWATER AQUACULTURE (1+2)

Objective: To get acquainted with skill related to brackish water aquaculture.

Theory	No. of classes	Total
Basics of brackishwater aquaculture: Definition, scope of brackishwater aquaculture, Brackishwateraquaculture :systems and types .	2	18 hrs
Basic requirements for brackishwater aquaculture: Site selection, soil and water quality, pond preparation, seed and feed.	3	
Important cultivable species- finfish-milk fish, grey mullet, sea bass, pearl spot, and GIFT tilapia.	2	
Important cultivable species- shellfish- *P. monodon, P. indicus, P. merguiensis* and SPF *L. vannamei* and mud crabs	1	
Pre stocking pond preparation	2	
Transportation, acclimatization and stocking of seed/PL	2	
Sampling of shrimp in growout ponds	1	
Post stocking pond management	1	
Harvesting methods	1	
Transportation for marketing	1	
Common diseases in brackishwater aquaculture and their control	1	
Guidelines for Better management Practices(BMP)	1	
Practicals :		
Identification of commercially important finfishes	2	36 hrs
Identification of commercially important shellfishes	1	
Pre-stocking pond management	2	
Seed quality estimation-stress test	1	
Post-stocking pond management	3	
Survival estimation and biomass calculation.	2	
Biosecurity measures (Bird netting and crab fencing)	2	
Collection and preservation of disease samples and Disease identification	2	
Calculation of doses and application of chemical/probiotic/medicine	3	
Visit to brackish water fish farm		

SDK -104 FEED AND FEEDING MANAGEMENT IN AQUACULTURE (1+2)

Objective: To get acquainted with feed and feeding management in aquaculture

Theory	No. of Classes	Total
Concept of feed based aquaculture	1	18 hrs
Types of feed	2	
Food and feeding: food and feeding habits of commercially important fisnfishes and shellfishes	2	
Natural and formulated feed	2	
Feed ingredients	1	
Feed additives	1	
Feed formulation	3	
Feeding management: Feeding methods and techniques ;Feeding time and monitoring ;Feeding frequency and ration ,Feed evaluation criteria	5	
Storage of feeds	1	
Practicals		
Identification of common feed ingredients	2	36 hrs
Identification of different types of feed for fish and shrimp	2	
Identification of different size of feed for fish and shrimp	1	
Exercises on feed formulation	2	
Feed preparation for carp	2	
Biomass and survival estimation of fish and shrimp	2	
Feed intake estimation and preparation of feeding chart- finfish	1	
Feed intake estimation and preparation of feeding chart– shellfish	1	
Making and Operation of Check tray	2	
Calculation of FCR	1	
Dispensing of medicine/probiotic through feed	2	
Visit to fish feed meal		

SDK-105 SHRIMP AND PRAWN HATCHERY MANAGEMENT(1+2)

Objective: To develop skill competence in hatchery management of prawn and shrimp

Theory	No. of Classes	Total
Management of maturation unit of prawn	2	18 hrs
Management of maturation unit of shrimp	2	
Maintenance of brood -stock and selection of spawners	1	
Induced maturation techniques	1	
Spawning and hatching techniques	2	
Larval rearing techniques	2	
Management of algal section and maintenance of environmental conditions	2	
Live feed culture, Artemia ,cladocerons rotifers etc	2	
Management of post larval (PL)unit	1	
Harvesting of PL , packing and transportation	1	
Sanitation and hygiene in hatchery	1	
Shutdown procedures	1	
Practicals		
1. Water treatment methods-chlorination, UV, ozone	1	36 hrs
2. Operation of maturation unit of prawn and shrimp	1	
3. Selection and maintenance of bloodstock	1	
4. Induced maturation of shrimp	1	
5. Spawning and hatching of shrimp	3	
6. Preparation of media for algal culture	2	
7. Live feed culture-Artemia, cladocderon, rotifers	2	
8. Identification of suitable feed (microns) for different larval stages	1	
9. Observation and identification of different larval stages	1	
10. Water exchange and Strainers for water exchange in different section	1	
11. Estimation of larval population at different stages	1	
12. Acclimatization of PLs to desired salinity	1	
13. PL packing	2	
14. Visit to prawn and shrimp hatchery		

SDK-106: HARVEST & POST HARVEST MANAGEMENT(1+2)

Theory	No. of Classes	Total
Pre harvest conditioning of shrimp in ponds	1	18 hrs
Study of fish harvesting devices	4	
Maintenance and storage of gears and gear materials	2	
Principles of fish preservation; various processing methods- icing, freezing, salting, drying etc.	5	
Different types of value added fish products	4	
Importance of cold chain	1	
Importance of hygienic handling of fish	1	
Practicals		
Operation of different types of nets	2	36 hrs
Net mending	2	
Handling; Pre-treatment of fish, washing, gutting, beheading, filleting, peeling, deveining etc.	3	
Storage methods of freshly harvested fish/shrimp/prawn	3	
Evaluation of the freshness of the fish.	3	
Preparation of value added fish products; fish and prawn pickles, fish khema, wafers, ready to eat products, fish fillets and fish steaks etc	5	
Visit to cold storages		
Observations on different units in fish processing plant		

SDK-107: MANAGEMENT OF FARM MACHINERIES(0+3)

Objective: To get acquainted with operation and maintenance of farm machineries.

Practicals :	No. of Classes	Total
Aerators–principles, classification, placement and maintenance	5	
Pumps - types, total head horse power and maintenance.	4	
Filters – types, Description, construction and maintenance	4	
Generators- types and maintenance	3	54 hrs
Power sprayers	3	
Boats and onboard motors	4	
Feeders (automatic and demand) and their maintenance	2	
ICTs use in farm management-GPS etc	2	
Visit to workshops		

SKD-108 Learn & Earn (0+9)

		Total
In this course students has do all the activities starting from pond preparation to shrimp / fish production. All the students will be divided into different groups and each group will be evaluated based on their activities assigned to them.		116 hrs