

Course Code: ZOO 327

Course Title: Fish Farm Management

Number of Credits: 3

Effective from AY: 2020 -21

Prerequisite for the Course:	Basic knowledge on animal anatomy, physiology and endocrinology	
Objectives:	To understand the various aspects of fisheries farm management. To understand the potentiality of ornamental fisheries in India, more particularly in Goa	
Content	Module 1: Fin Fish hatchery: Freshwater and marine fish seed resources; Natural breeding of fin fishes; Gears and methods used for seed collection in India, Spawn quality and quantity indices. Bundh breeding: Concept; Wet and dry bundhs; Collection and hatching of eggs; Factors involved in bundh breeding; Advantages and disadvantages of bundh breeding. Breeding and hatchery management: Site selection for the hatchery, Brood-stock collection, transportation and management; Induced breeding of fishes, Synthetic hormones used for induced breeding of carps. Different types of fish hatcheries: traditional, Indian, Chinese, glass jar and modern hatcheries. Module 2: Shell fish hatchery: Natural seed resources; collection methods and quality of seeds. Life cycle of important shellfishes: <i>Penaeus monodon</i>, <i>Macrobrachium rosenbergii</i>, <i>P. vannamei</i>, <i>Scylla serrata</i>, lobster, edible oyster; Sexual maturity, size t maturity, breeding behaviour and breeding seasons of different species; fecundity and quality of eggs. Hatchery management of Shellfish: Brood stock collection, transportation and maintenance of shell fishes. Breeding and hatchery management of <i>Penaeus monodon</i>, <i>Macrobrachium rosenbergii</i>; <i>Scylla serrata</i>, and molluscs. Larval rearing and health management of shellfish: Food and feeding of larval stages of important shellfishes; Health management in hatcheries. Module 3: Ornamental fish production: World trade of ornamental fish and export potential; Different varieties of exotic and indigenous ornamental fishes. Culture of marine and brackish water ornamental fishes; Common diseases and their control of ornamental fishes.; Breeding and rearing of ornamental fishes; Brood stock management; Application of genetics and biotechnology for producing quality strains; Management	12 hrs 12 hrs 12 hrs

	practices of ornamental fish farms Setting up of an aquarium: Principles of a balanced aquarium; Fabrication, setting up and maintenance of freshwater and marine aquariums; Water quality management: Water filtration systems: biological, mechanical and chemical. Accessories for the aquarium: Types of filters; Aquarium plants and their propagation methods; Lighting and aeration; Aquarium fish feeds: dry, wet and live feeds. Preparation of aquarium feeds and storage.	
Pedagogy:	Lectures/ tutorials/assignments/self-study	
Learning Outcome:	1. Understanding the scope of ornamental fisheries. 2. Acquiring the basic knowledge about the management of fish farm. 3. To set entrepreneurship in fish farm.	
References /Reading	1. Dick Mills. (1998). Aquarium fishes, Dorling Kindersly Ltd, London. 2. Jameson, J.D. and Santhanam, R. (1996). Manual of ornamental fishes and farming technologies, Fisheries College and Research institute, Tuticorin 3. Stephen Spottee.(1993.) Marine aquarium keeping. John wiley and sons, U.S.A 4. Joshua,K. et al. (1993). Shrimp Hatchery Operation and Management. Marine products Export Development Authority, Kochi, India 5. Thakur,N.K. et al. (1998) Culture of live food organisms for aqua hatcheries. Training manual. CIFE (ICAR), Mumbai. 6. Jhingran, V.G. Pullin, R.S.V. (1997). A hatchery manual for the Common, Chinese and Indian Major Carps. Asian Development Bank, International Center for Living Aquatic Resources Management, Philippines. 7. Ramanathan, N. and Francis, T. (1996.) Manual on breeding and larval rearing of cultivable fishes, Fisheries College and Research Institute, Tuticorin. 8. Ayyappan, S., (2011). Handbook of Fisheries and Aquaculture, ICAR Publications, New Delhi	