

Course Code: ZOO 302

Course Title: Fish Farm Management

Number of Credits: 3

Effective from AY: 2020 -21

<b>Prerequisite for the Course:</b>	Basic knowledge on animal anatomy, physiology and endocrinology	
<b>Objectives:</b>	To understand the various aspects of fisheries farm management. To understand the potentiality of ornamental fisheries in India, more particularly in Goa	
<b>Content</b>	<p><b>Module 1:</b> 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.</p> <p><b>Module 2:</b> 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.</p> <p><b>Module 3:</b> 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</p>	<p>12 hrs</p> <p>12 hrs</p> <p>12 hrs</p>

	<p>practices of ornamental fish farms</p> <p>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;</p> <p>Aquarium fish feeds: dry, wet and live feeds. Preparation of aquarium feeds and storage.</p>	
<b>Pedagogy:</b>	Lectures/ tutorials/assignments/self-study	
<b>Learning Outcome:</b>	<ol style="list-style-type: none"> <li>1. Understanding the scope of ornamental fisheries.</li> <li>2. Acquiring the basic knowledge about the management of fish farm.</li> <li>3. To set entrepreneurship in fish farm.</li> </ol>	
<b>References /Reading</b>	<ol style="list-style-type: none"> <li>1. Dick Mills. (1998). Aquarium fishes, Dorling Kindersly Ltd, London.</li> <li>2. Jameson, J.D. and Santhanam, R. (1996). Manual of ornamental fishes and farming technologies, Fisheries College and Research institute, Tuticorin</li> <li>3. Stephen Spottee.(1993.) Marine aquarium keeping. John wiley and sons, U.S.A</li> <li>4. Joshua,K. et al. (1993). Shrimp Hatchery Operation and Management. Marine products Export Development Authority, Kochi, India</li> <li>5. Thakur,N.K. et al. (1998) Culture of live food organisms for aqua hatcheries. Training manual. CIFE (ICAR), Mumbai.</li> <li>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.</li> <li>7. Ramanathan, N. and Francis, T. (1996.) Manual on breeding and larval rearing of cultivable fishes, Fisheries College and Research Institute, Tuticorin.</li> <li>8. Ayyappan, S., (2011). Handbook of Fisheries and Aquaculture, ICAR Publications, New Delhi</li> </ol>	