

SYLLABUS
COASTAL AQUACULTURE
(PG Degree Standard)

Subject Code:357

Unit - I: Introduction, History of Aquaculture and National Planning of Aquaculture Development

Scope and definition; Cultural and Socio economic basis; Biological and Technological basis; Role of fishery management. Origins and growth of aquaculture; Present status of aquaculture. National priorities and aquaculture development. National resources; Organisation of aquaculture - stakeholder participation; employment opportunities; Industrial scale aquaculture; Aquaculture for rural development; aquaculture for social benefit and participation of local Communities.

Unit - II: Site selection, Design and Construction of coastal aquaculture farms

Soil characteristics, Acid sulphate soil, water quality and availability, sources of pollution and user conflicts, environmental impact assessment, social aspects of site selection and management; Legal empowerment and licensing of farms. Coastal farm pond design and construction. Cement tank and race way farm design and construction; Fin fish and shellfish hatchery layout, design and construction; water supply and source; water recirculation – RAS; Hatchery equipments and accessories.

Unit - III: Selection of candidate species for coastal aquaculture, and its biology and early development

Biological Characteristics; economic and market; Values; Exotic species introduction; Common coastal aquaculture species (fin fishes such as Mulletts, Milkfish, Seabass, Sea bream, Groupers, Rabbit fishes, Pompanos; Crustaceans such as shrimps - *Penaeus indicus*, *Penaeus monodon*, *Litopenaus vannamei*; Crabs – Mudcrabs; Lobsters; Mollusc– Oyster and Mussels, etc.,). Biology and early life history of Coastal aquaculture, candidate fin and shell fishes.

Unit - IV: Fish Nutrition, Nutrient requirements, Nutritional quality of aqua feed.

Feeding habits, Food utilization and energy metabolism; Nutrient requirement and sources of carbohydrates, proteins and essential amino acids, Lipids and essential fatty acids, Vitamins and minerals; Aqua feeds – formulation, formulation soft wares, feed ingredients, feed preparation – Sinking feeds, floating feeds. Aqua feed quality – digestibility, palatability and processed effect of feed ingredients. Broodstock and larval nutrition; Live feeds – Micro algae, copepods, Daphnia, Moina, Blood worm, Tubifex, earth worm etc.,. Functional feed additives.

Unit - V: Reproduction and Genetic selection

Reproductive cycles in candidate species ; Induced breeding, cryo preservation of Milt; Sex Reversal; Selective breeding and hybridization; Chromosome manipulation – Polyploidy; Intra specific cross breeding and inter specific hybridization, Gynogenesis, Androgenesis and cloning.

Unit -VI: Fish Disease and Health Management

Principles of diseases, Disease Management Techniques, Specific Pathogen free (SPF), Specific Pathogen Resistant (SPR) broodstock and larvae, Vaccination. Viral diseases (WSSV, MBV, IHNV,HPV etc.,) Bacterial diseases (Bacterial gill disease, Enteric red mouth disease, Vibriosis etc.,) Fungal diseases (Saprolegnia, Achlya etc.,) and Protozoan diseases (Ich, Costiasis, etc.,) Other parasitic diseases (Argulosis, Lernaeosis etc.,) Integrated disease management.

Unit - VII: Weed, pest and predator control

Aqua weeds – Floating weed, Emergent Weed, submerged weed, Marginal weed, Filamentous algae mats and Algae blooms. Methods of weed control – Manual and Mechanical methods, Chemical methods, Biological methods. Utilization of aquatic weeds. Predators – Predatory weed fishes, Birds (Cormorants, Fish eagles, Herons and King fisher), Frogs and Toads, Otters. Pests – Snails and Polychaeteworms. Control of Predators and Pests.

Unit - VIII: Coastal Aquaculture Practices and Farm Management

Pond preparation, Liming, fertilization – water culture, stocking of fin fish/ shell fish, larvae, water quality management and monitoring Sampling, Feeding and Feed Management, Harvesting. Fish culture – Mullet, Milk fish, Seabass, Sea breams, Groupers, Rabbit fish, Pampano etc., - Shrimp culture, crab and lobster fattening. Oyster and Mussel. Recirculatory Aquaculture system based aquaculture. Biofloc Technology based aquaculture.

Unit - IX :Harvesting and post harvest Technologies

Harvesting methods – drainable ponds, undrainable ponds, Cement Tanks, Raceways. Harvesting of molluscs and depuration, Crabs and Lobsters. Harvested fin fish and shellfish, handling – Chilling, Sorting, transport to seafood processing plants. Live transport.

Unit -X Economics, Financing and Marketing

Economical viability – Assets and Liabilities; Variable and fixed costs; operating income. Evaluation of farm performance, minimum farm size. Financial analysis, cash flow analysis, Socio-economic analysis. Risk and insurance. Marketing outlets, Market research, formulation of market strategies.
