Skill Enhancement Course (SEC)

Practical: 35 Marks for the End Semester Examination (ESE)

Continuous Evaluation (CE): 10 Marks

(CE: Class Test/Seminar/Review/Dissertation/Training/Group Discussion/Workshop etc.)

Attendance: 5 Marks

Total: 50 Marks

Aquarium Fish Keeping and Management

Course objectives:

- To see and practice the paths that lead to the success of any entrepreneurship on live animals like ornamental fishes
- To develop the knowledge of aquarium fish keeping techniques in an operational aquarium for more profit management, feed requirements, etc.
- To make the students well versed in their practical skills starting from setting of aquaria to the aquarium fish production

Learning outcomes:

By successful completion of the course, students will be able to:

- enlighten themselves about the operation of setting, maintenance, feeding and biology of ornamental fishes.
- learn aquarium fish production and fish keeping industry which will generate a source of employment opportunities in rural areas and employment.
- understand the field level structure and functioning of insurance sector and its role in protecting the risks.
- comprehend pertaining skills and their application for promoting insurance coverage.

Practical Syllabus (3 Credits*/Week)

Semester-I

Unit 1: Introduction to Aquarium Fish Keeping:

I) Origin and history of fish keeping; II) Potential scope of aquarium fish industry as a cottage industry; III) Exotic, indigenous and endemic species of aquarium fishes; IV) Various advantages of keeping ornamental fishes

Unit 2: Biology of Aquarium Fishes:

I) Common characters and sexual dimorphism of fresh water and marine aquarium fishes such as guppy, molly, sword tail, gold fish, angel fish, blue morph, anemone fish, platy, parrot fish, koi, gourami, kholisha and butterfly fish; II) Egg laying ornamental fishes: III) Live-bearing aquarium fishes: IV) Reproductive biology of ornamental fishes

Unit 3: Breeding of Aquarium Fishes:

I) Reproductive organs: II) Sexual maturity: III) Sexual dimorphism: IV) Breeding habits

Semester-II

Unit 1: Food, Feeding and Nutrition of Aquarium Fishes:

I) Use of live fish feed organisms; II) Preparation and composition of formulated fish feeds; III) Qualities of a good artificial fish feed; IV) Nutritional requirements of fishes; V) Live feed culture for fishes (Culture of *Artemia sp*.)

Unit 2: Home Aquarium and its Setting:

I) Classification of aquaria (Based on salinity, temperature range and species selection); II) Stocking density of aquarium; III) Setting of a freshwater aquarium; IV) Setting a marine aquarium

Unit 3: Fish Transportation and Aquarium Equipments:

I) Live fish transport; II) Fish handling; III) Packing and forwarding techniques; IV) Aquarium equipments (Aquarium heater, thermometer, air pump, air stone, planting sticks and algal scraper, hose popes, aquarium vacuum cleaner, nets, feeding cups, breeding traps, aqua scaping)

Semester-III

Unit 1: Maintenance of Aquarium and Aquarium Setting Budget:

I) General aquarium maintenance; II) Water quality management (pH of water, hardness, softening water, salinity, oxygen, carbon dioxide, chlorine, ammonia, nitrites, hydrogen sulphide, temperature); III) Budget for setting up an aquarium fish farm as a cottage industry

Unit 2: Public Aquarium:

I) Design and construction of freshwater and marine public aquaria; II) Needs for public aquarium; III) Visiting any successful aquarium fish keeping entrepreneurship farm in adjacent areas

Unit 3: Aquarium Fish Diseases

I) Parasitic diseases; II) Bacterial diseases; III) Viral diseases; IV) Protozoan diseases; V) Fungal diseases; V) Deficiency diseases

Suggested Readings:

1. Home Aquarium and Ornamental Fish Culture (2015), Jayashree K. V., Tharadevi C. S., and Arumugam N., Saras Publication, Tamil Nadu, India
2. Training Manual on Freshwater Ornamental Fish Breeding and Aquascaping Techniques (2019), Haridas, H. et al, ICAR-Central Island Agricultural Research Institute, Port Blair, India

**Credit means the unit by which the course work is measured. It is equivalent to one hour of teaching (Lecture or Tutorial) or two hours of practical work/field work per week.*