SEMESTER- III

Skill Based Subject – I

ORNAMENTAL FISH CULTURE

Instructional Hrs: 45 **Sub.Code:18ZOUS301**

Max.Marks: CIA-25; ESE-75 **Credits: 3**

Objectives: To acquire basic knowledge on techniques in fish culture, setting up of aquarium, maintenance and management of different ornamental fishes and to provide skills for self sustainability after graduation.

Unit: I **10 Hrs**

Benefits of ornamental fish culture as a hobby. Design and construction of public fresh water aquarium and marine aquarium. Aquarium plants - Types - Importance of aquarium plants, Indigenous aquarium plants of Western Ghats. Water quality management.

Unit: II **8 Hrs**

Fresh water ornamental fishes - Gold fish - Fighter fish - Guppy - Molly - Zebra fish - Koi carp - Platy - Tiger barb - Angel fish.

Unit: III **9 Hrs**

Food and Feeding - Nutritional requirements of ornamental fishes - Types of food - Live food - Artificial food. Live feed culture (Artemia, Infusorians and Spirulina) - Artificial feed preparation - Disadvantage of artificial feed.

Unit: IV **10 Hrs**

Breeding of ornamental fishes - Breeding habits - Pre Spawning - Spawning - Live bearers - Egg layers - Care of eggs, young and spawns. Transport of ornamental fishes. World trade of ornamental fish and export potential.

Unit: V **8 Hrs**

Ornamental fish diseases - Fin rot – Columnaris - White spot disease - Velvet disease - Gill rot - Fish louse - Nutritional deficiency diseases.

REFERENCE BOOKS:

S. No	Authors	Title of the Book	Publishers	Year of Publication
1	Jhingran U.G	Fish and Fisheries in India	Hindustan Publication	1997
2	Thara Devi.C.S and Jayashree K.V	Home Aquarium	Saras Publication	2015
3	Pandey.K and Shukla.J.P	Fish and Fisheries	Rastogi Publication	2012
4	Ranjit Daniels.R.J	Fresh water Fishes of Peninsular India	Universities Press	2002

You tube videos links:

https://www.youtube.com/watch?v=jw8j6kQRlEo

https://www.youtube.com/watch?v=3Ilw1p0FmvI

https://www.youtube.com/watch?v=IUUbINZzURo

CODE	COURSE TITLE
18ZOUCP02	CORE PRACTICAL II

Category	CIA	ESE	L	T	P	Credit
Practical	40	60	-	-	60	4

Preamble

To enhance the practical skills in environmental biology and to observe the developmental stages, behavioural patterns, relationship and evolutionary significance of animal and habitat adaptations

Course Outcomes

On the successful completion of the course, the students will be able to get hands on experience in the field of environmental biology, appreciate faunal diversity through habitat study and analyze the stages of embryonic development and animal adaptations

CO Number	CO Statement	Knowledge Level
CO1	To observe and identify the ecological instruments, different stages of development of frog embryo, planktons and fossils	K_2
CO2	To estimate the physiochemical parameters of water samples and to assess the their quality To examine and distinguish faunal adaptations to various ecological conditions	K_3
CO3	To categorize local Avian fauna with their salient features and the adaptation of animals with the evolutionary significance	K_3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1.	S	S	S	S	S
CO2.	S	S	S	S	S
CO3.	S	S	S	S	S

S- Strong

Syllabus

DEVELOPMENTAL BIOLOGY

Study of different types of eggs - Insect, Frog, Chick (slides/specimen)

Embryology of Frog – Slides

Placenta of Mammals – Sheep and Man

EVOLUTION

Study of any six fossils

ENVIRONMENTAL BIOLOGY

Estimation of dissolved Oxygen (Pond and Polluted water)

Estimation of Salinity ,,

Estimation of pH using pH paper ,,

Estimation of free Carbon dioxide ,,

Estimation of Carbonates ,,

Estimation of Bicarbonates ,,

Estimation of Calcium ,,

Study of Intertidal fauna - Rocky, Muddy and Sandy shore

Analysis of Zooplankton in given water sample

Study of Animal relationship - Commensalism, Mutualism and Parasitism

Ecological field visit to Sea shore / Pond / Wetland / Zoological Park / Wild life Sanctuary / Biosphere reserves - A report to be submitted

A field visit to Local polluted site / Solid waste management unit / Sewage treatment plant - A report to be submitted

ANIMAL BEHAVIOUR

Social behaviour - Honey Bees

Observation of nesting behaviour in Birds

SPOTTERS:

A. Descriptive notes:

Hygrometer, Anemometer, Rain gauge, Mercury Barometer, DO meter and pH meter

B. Draw labeled sketch:

Freshwater/Marine plankton - Nauplius larva, Zoea larva, Mysis larva, Daphnia, Cyclops, and Salpa

C. Stages of development /Embryological Importance:

Egg- Insect, Frog and Hen

Frog embryology - 2 celled stage, 4 celled stage, Blastula and Gastrula

Placenta of Sheep and Man

D. Ecological Adaptations and Animal relationship:

Intertidal fauna - Mytilus, Balanus, Hippa, Solen, Nereis and Starfish,

Animal relationship - Sea anemone and Hermit crab, Shark and Suckerfish, Ascaris

E. Evolutionary Significance:

Fossils - Arca, Nautilus, Natica, Turrilites, Dentalium and Micraster