

1. Identify and comment on the item provided: (Western blotting / Southern blotting / Northern blotting / PCR)
2. Write down the procedure involved in DNA isolation

## **BIOINFORMATICS**

1. Download/use print out/pictures of genome sequences of any 2 organisms. Identify and mention the characteristic features of both.
2. Download/ use print out/pictures of a protein sequence , identify it & comment on its amino acid composition
3. Download / use print out/pictures of a macromolecule. Write a brief note on the bioinformatics tool used to visualize its structure.

## **MOLECULAR BIOLOGY**

1. Identify and comment on its molecular composition / structural orientation / functional significance (Any tissue / Cell organelles/ DNA, DNA replication, RNA different types using models or diagrams)

## **V1 SEMESTER. ZY6CRT12**

### **CORE COURSE XII**

### **OCCUPATIONAL ZOOLOGY .**

**(APICULTURE, VERMICULTURE, QUAIL FARMING & AQUACULTURE)**

**54 Hrs**

**Credits 3**

### **Objectives:**

1. To equip the students with self employment capabilities.
2. To provide scientific knowledge of profitable farming.
3. To make the students aware of cottage industries.

### **Module 1. APICULTURE**

**18 Hrs**

Definition, Different species of honey bees, Organization of honey bee colony, Social life and adaptation of honey bees. Communication among honey bees. Bee keeping methods and equipments, Management and maintenance of an apiary, Growth period, honey flow period and dearth period Division of the colony, uniting two colonies, , replacing old queen with new queen, swarming management, monsoon management. Enemies of bees. Diseases of bees,.Bee pasturage. Uses of honey bees, By-products of honey bees, Honey and wax composition. Testing the quality of honey.Extraction of wax, Uses of honey and wax.Royal jelly, Propolis. Apitherapy, Agencies supporting apiculture.

Activity :Visitto an apiculture unit.

Field visit and report submission - 10 Hrs

Field visit and report submission on any two items are taken for internal evaluation.

## **MODULE: 2. VERMICULTURE**

**8 Hrs**

Introduction, Ecological classification of earth worms. Species of earth worms used for vermiculture, Reproduction & life cycle, Role of earth worm in solid waste management, in agriculture, in medicine etc. Preparation of vermibed, Maintenance & monitoring, Preparation of vermicompost, Preparation of vermiwash.

Activity : Submission of a report after preparing a vermiculture unit or visiting a vermicomposting unit.

## **MODULE: 3.QUAIL FARMING (*Coturnix coturnix*)**

**4 Hrs**

Introduction, care of quail chicks, care of adult quails, care of breeding quails, ration for quail, care of hatching eggs, health care, use of quail egg and meat.Sources of quality chicks.

## **MODULE: 4. AQUACULTURE.**

**24 Hrs**

Advantages and salient features of aquaculture, Types of Aquaculture, Biotic and abiotic features of water, Importance of algae in aquaculture, Common cultivable fishes of Kerala, Fish diseases, Composite fish culture, Integrated fish culture, Carp culture, Prawn culture Mussel culture Pearl culture. Processing & Preservation.

Aquarium management - Setting up of an aquarium, Biological filter & Aeration, Breeding of gold fish, gourami (*Osphronemus*), fighter and Guppy (live bearer). Nutrition and types of feed for aquarium fishes, Establishment of commercial ornamental fish culture unit. Fish Transportation - Live fish packing and transport Common diseases of aquarium fishes and their management. Aquaponics (a brief introduction only).

Activity – Setting up of an Aquarium

Field visit – Visiting an Aquaculture farm

## References

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- Chauhan, H.V.S. Poultry, Disease, diagnosis and treatment, Wiley eastern Ltd Delhi.
- Otieno.F.O 2014. Quail farming: markets & market strategies
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- Harisankar J. Alappat& A. Bijukumar, Aquarium Fishes. B. R. Publ. Corporation, Delhi.
- MPEDA, A hand Book on Aquafarming Ornamentalfishes, MPEDA, Kochi.
- Amber Richards. 2014. Aquaponics at home.
- Pradip.V.Jabde. 1993. Text book of applied zoology
- Venkitaraman, P.R,1983, Text book of Economic zoology(SudharsanaPuubl. Kochi)
- Addison Webb, Bee Keepingfor profit and pleasure, Agrobios Ltd.
- Edwards.C.A.&Lafty, J.R.1972 Biology of earthworms(Chapman & Hall Led.London)
- Applied Zoology, Study Material Zoological Society of Kerala , CMS college Campus
- George cust& Peter Bird, Tropical Fresh water Aquaria, Hamlyn London.
- Verreth J. Fish larval nutrition, Chapman & Hall Publ.
- Bone Packer. 2014. Aquaponic system

**PRACTICAL**  
**OCCUPATIONAL ZOOLOGY**

**36 Hrs**

**Credit 1**

1. General Identification, Economic importance, Morphology, scientific names and common names of the following

- a) Economic important and morphology of culturable fishes (Catla, Rohu, Grass carp, Common carp, Silver carp, *Etroplus suratensis*, *Oreochromis /Tilapia*, *Mugil cephalus* and *Anabas Testudineus* )
- b) Identification and morphology of ornamental fishes (gold fish, fighter, Gourami, Angel fish, Guppy
- c) Two species of earthworms used in Vermiculture
- d) Four species of honey bees
- e) Economic importance and morphology of shell fishes (Any three species of prawn, two marine mussels, two oysters one rock oyster - *Crasostrea* and pearl oyster - *Pinctada fucata* and freshwater mussel - *Lamellidens marginalis*).

2. Castes of bees

3. Principle & uses of - Aquarium filters, Aquarium aerator, Aquarium plants, Oven, Pelletiser, Screw Press, die plate

4. Identification and study of fish parasites and diseases (five numbers each) using slides/pictures

5. Bee keeping equipments, Beehive, Smoker, honey extractor, Queen Cage,

6. Bees wax, Honey, Vermicompost (Identification-Uses)

7. Formulation of artificial feed for aquarium fishes – demonstration

8. Tests for determining the adulteration in honey.

9. Mounting of pollen basket

10. Mounting of mouth parts of honey bee

11. Separation of cocoon from worm castings.