

**VIMALA COLLEGE (AUTONOMOUS), THRISSUR
DEPARTMENT OF ZOOLOGY**

Value addition Course -2nd Year UG students (2020-2021)

Name of Course : **Apiculture**

Course code : VMVALZ001

Is the course offered by a faculty or department? : Yes, Department of Zoology

Nature of course : Value addition

Collaboration with : **Kerala State horticultural products development corporation, Kallimel P.O, Mavelikkara, Alappuzha, Pin: 690509**

External Resource person : **Mr. Sunil, Regional Manager, Kerala State horticultural products development corporation, Ph.No.8129615260**

Duration of course : One year, 35 hrs of instruction

Expected no. of participants (Minimum 36) : Minimum 36 (open to all Departments)

Fee structure : 500/- per student

Whether MoU/Academic linkage? (Copy to be attached) : No

Syllabus outline (to be attached) : Yes

Is it open to all students? : Yes

No. of times conducted per year : One

Proposed course schedule : Two days in a week (Thursdays), Proposed date of Start - August 2020

Course Co-ordinator, II DC tutor : Dr. Feebarani John (Ph.No.9447459761)

Asst.Professor, Dept. of Zoology

OBJECTIVES (BACKGROUND ON INTRODUCING THE COURSE)

The syllabus content in the core course 'Animal diversity-Non-chordate-part II (ZOL2B02T) of II Semester B.Sc. Zoology Core programme and Module 2 of complementary course 'Economic Zoology' (ZOL2C02T) of II semester B.Sc. Zoology Complementary course was not adequate to meet the employability requirement of the students. The matter was discussed in the Board of studies meeting and the board recommended introducing an entrepreneurial skill development course for the students on the topic 'Apiculture' of 40 hours duration, in collaboration with Beekeeping Centre, Kerala State Horticultural Products Development Corporation, Alappuzha for the II year UG students. The course is open to all students. Certificate will be provided by the College for the participants.

COURSE OUTCOME:

Illustrate the steps in beekeeping and management

Describe various steps in apiculture

Attain practical skill in keeping the bee hive and maintain bee colonies

Identify the role of beekeeping in enhancing women entrepreneurial skill

Understand the composition and applications of bee products

Describe the market value of bee products

Identify various products from honey bees

Understand the biology, morphology, species composition and social life of honey bees

SYLLABUS

(35 hrs)

Unit I

(6 hrs)

1. History of bee keeping
2. Species diversity of honey bees
3. Pollination support through beekeeping -Role of honeybees in ecosystem
4. Domestication of Indian bees and Italian bees
5. Bee hives and peculiarities

6. Capturing of bee colonies

7. Bee keeping equipments

Unit II

(5 hrs)

8. Biology and social life of honey bees

Morphology and identification of Queen, drones and worker bees, cast system in honey bees-family and cast, division of labor, bee dance and communication in bees
Honey Bee biology-emerging of queen, swarming, mating, egg laying, life span
Collection of pollen by bees, morphological modifications - modified legs, extraction of pollen

Royal jelly and hormonal influence

Bee wax, wax glands

Nesting pattern of bees

Bee sting, bee venom, venom gland

Architectural design of bee hives, types of cells

Unit III

(8 hrs)

9. Basic operational principles of bee colonies

Selection of location

Up keeping of bee colonies

Off seasonal management of bee colonies

Growth period management

Honey flow-seasonal management

Diseases and parasites of honey bees-control measures

Unit IV

(7 hrs)

10. Honey and its ingredients

Composition of honey, conversion of nectar to honey,

11. Economic importance of honey and other bee products

Medical value of honey, special properties and uses of honey, processing and value addition of honey

Bee wax and uses, extraction, purification, processing and value addition of bee wax

Bee pollen and bee venom - uses

Unit V

(5 hrs)

12. Marketing aspects of bee products
13. Role of Govt and Non-Govt agencies in promoting apiculture in Kerala
14. Present status and future scope of apiculture as a small scale industry in Kerala
15. Present scenario and Scope of apiculture in India

Unit VI -Practical Session

(4hrs)

16. Identification of different castes in honeybees-Queen, drones and workers
17. Structure of honey comb-different type of cells for queen, drones and workers
18. Morphological peculiarities of worker bees-Honey and pollen storage structures
19. Familiarize bee keeping instruments and bee hives

REFERENCES

- Graham, J M (1992) The hive and the honey bee. Dadant and Sons, Hamilton, Illinois.
- Mishra R.C. (1995) Honey bees and their management in India. ICAR Publication, New Delhi.
- Singh, S. (1971) **Beekeeping** in India, ICAR publication.
- Gupta, J.K., Sharma, H K and Thakur, R K. **2009**. Practical Manual on Beekeeping. Department of Entomology and Apiculture, Dr Y S Parmar University of Horticulture and Forestry, Nauni, Solan, p 83.

- Gupta, J K. 2010. Spring management of honey bee colonies. In "OAPI-012 Management of honey bee colonies; Seasonal and specific management (Block 2), Indira Gandhi National open university, school of Agriculture, New Delhi, UNIT-I, pp 5-14, p 105.
- Gupta, J K. 2010. Management in summer. In "OAPI-012 Management of honey bee colonies; Seasonal and specific management (Block 2), Indira Gandhi National open university, school of Agriculture, New Delhi, UNIT-II, pp 15-25, p 105.
- Gupta, J K. 2010. Management in monsoon season. In "OAPI-012 Management of honey bee colonies; Seasonal and specific management (Block 2), Indira Gandhi National open university, school of Agriculture, New Delhi, UNIT-III, pp 26-33, p 105.
- Gupta, J K. 2010. Management in autumn season. In "OAPI-012 Management of honey bee colonies; Seasonal and specific management (Block 2), Indira Gandhi National open university, school of Agriculture, New Delhi, UNIT-IV, pp 34-40, p 105.
- Gupta, J K. 2010. Management in winter. In "OAPI-012 Management of honey bee colonies; Seasonal and specific management (Block 2), Indira Gandhi National open university, school of Agriculture, New Delhi, UNIT-V, pp 41-50, p 105.
- Gatoria, G.S., Gupta, J. K., Thakur, R.K. and Singh, J. 2011. Mass queen bee rearing and multiplication of honey bee colonies. All India Co-ordinated project on honey bees and pollinators, ICAR, HAU, Hisar, p70.

ASSESSMENT METHOD

At the end of the course, a written examination of 2 hrs duration with a maximum marks of 40, will be conducted by the Zoology department in consultation with the course operator cum resource person,

Mr. Sunil B, Regional Manager, Beekeeping Centre, Kerala State Horticultural Products Development Corporation, Mavelikkara P.O, Alappuzha, Pin-690509.

Head of the Department

Dr.Honey Sebastian