

Domain Subject: BIOTECHNOLOGY

III year B. Sc. – Semester – V

Course 6C Apiculture

(Skill Enhancement Course (Elective), 05 Credits)

Max Marks: Theory:100 + Practical:50

I. Learning outcomes

Students after successful completion of the course will be able to

1. Understand the basic concepts of Apiculture.
2. Obtain the elementary knowledge of different species and races of honey bees
3. Appreciate the importance of health and hygiene in Beekeeping
4. Maintain the Bee hives in a scientific way

Unit 1: Biology of Bees

10 hrs

History, Classification and Life Cycle of Honey Bees. Social Organization of Bee Colony.

Unit 2: Rearing of Bees

10 hrs

Artificial Bee rearing (Apiary), Beehives – Newton and Langstroth. Methods of Extraction of Honey (Indigenous and Modern).

Unit 3: Diseases and Enemies

10 hrs

Bee Diseases and Enemies. Control and Preventive measures.

Unit 4: Economy and Entrepreneurship

10 hrs

Products of Apiculture Industry and its Uses (Honey, Bee Wax, Propolis) and Pollen.

Unit 5. Entrepreneurship in Apiculture

10 hrs

Bee Keeping Industry: Present and future, Role of Bees in cross pollination in horticulture and agri- culture. Prospects of apiculture as self-employment venture.

Practical Syllabus: Course 6C Apiculture

III. Skills Outcomes:

On successful completion of this practical course, student shall be able to:

1. Maintain the Bee hives in a scientific way.
2. Clean & Maintain Bee Boxes
3. Use of other tools required in Bee Keeping
4. Building and division of colony
5. Understand the methodologies of extracting, preservation and marketing of honey and other products of honey bee

IV. Practical syllabus

1. Handling of tools and techniques for Apiculture
2. To study the morphological and anatomical characteristics of queen and worker bees
3. Identification of different species of honey bees
4. Preparation of honey bee trays for beekeeping, maintenance and colony inspection
5. Extraction of honey and bee wax
6. Processing of honey, packing and storing
7. Identification of honey adulteration

V. References:

1. Prost, P. J. (1962). Apiculture. Oxford and IBH, New Delhi.
2. Graham, J M (1992) The hive and the honey bee. Dadant and Sons, Hamilton, Illinois.
3. Mishra R.C. (1995) Honey bees and their management in India. ICAR Publication New Delhi.

4. Singh, S. (1971) Beekeeping in India, ICAR publication..
5. Bisht, D.S. (2004). Agricultural Development in India, Anmol Pub. Pvt. Ltd.
6. Singh S.(1964). Beekeeping in India, Indian council of Agricultural Research, NewDelhi
7. Mehrotra, K.N. Bisht, D.S. (1981). Twenty-five years of apiculture research at IARI. Apiculture in relation to agriculture.

**Suggested Question Paper Model for Practical
Examination Semester – V/ Biotechnology Course – 6C
(Skill Enhancement Course) Apiculture**

Max. Time: 3 Hrs.

MaxMarks: 50

1. Identification of different species of honey bees 'A' 8 M
2. Demonstration of use of different boxes and other tools in Bee Keeping 'B' 8 M
3. Methods of harvesting, processing and preservation of honey 'C' 12 M
4. Scientific observation and data analysis 4 x 3 = 12 M
 - A. Identify tools for Apiculture /photograph
 - B. Identification of morphological and anatomical characteristics of queen and worker bees / photograph
 - C. Identify Common pests that attack honey bees and hives / photograph
 - D. Building of comb and colony /photograph
5. Record + Viva-voce 6+4 = 10 M

