



Rayat Shikshan Sanstha's

# **Dahiwadi College, Dahiwadi**

Tal-Man, Dist.- Satara

## **A Syllabus of Beekeeping and Honey Processing**

For

### **Karmveer Bhaurao Patil Livelihood Business Incubation Center**

Supported by

Under the Scheme of ASPIRE

**Ministry of Micro, Small and Medium Enterprises,  
Govt. of India, New Delhi**

**Year: 2020-2021**

## TRAINING MODULE: BEEKEEPING AND HONEY PROCESSING

Coordinator: Dr. A. N. Dede &  
Mr. S. B. Kumbhar

### I) Aims and Objectives:

- The Training Module will make the incubitee aware about the significance of beekeeping as the economically viable industry.
- It will help the incubitee to understand the biology and behavior of bees.
- The program would clarify the techniques of honey bee rearing, optimization of techniques based on climate and the geographical regions, and various measures to be taken to maximize the benefits.
- It would also help the incubitee to develop entrepreneurial skills required for self-employment in beekeeping sector.

### II) Structure of Syllabus:

Theory Syllabus	70 Hours
Practical Syllabus	170 Hours
Total	240 Hours

## SYLLABUS

### Theory Syllabus

**Total: 70 hours**

#### Unit I: Bee Keeping

**(10 Hrs.)**

##### 1. Bee Keeping –

Present scenario and prospects for bee keeping, Requirements of Commercial Bee Keeping, Pit falls in Bee Keeping. Bee identification and Bee flora.

##### 2. Honey bee species and identification:

Introduction to honey bee; Origin, systematic and distribution, Types of honey bees, Species of honey bees.

#### Unit II: Communication in honey bees

**(10 Hrs.)**

1. Bee learning and communication – Learning – Color learning in honeybees, Color discrimination.
2. Color learning rates and preferences.
3. Color memory, Timing in color learning.
4. Neurobiology of color vision.

5. Communication – Odor plume, Trophallaxis.
6. Swarming and Absconding.

**Unit III: (10 Hrs.)**

**1. Building of comb and colony**

Division of colony, Raw produce generated by different life stages of bees, Month wise Calendar wise operations, drawing details of activities month wise.

**2. Managing Insects and Diseases**

Common pests that attack honey bees and hives, Types of Disease, Management of nuisance in Bee hives.

**3. Use of Bee Boxes and other Tools**

Description and demonstration of use of different boxes, Cleaning of boxes, Other tools in Bee Keeping.

**Unit IV: Bee products (10 Hrs.)**

1. An introduction, honey, pollen, royal jelly, bees wax, propolis & venom, Significance of bee products.
2. Value added honey products. Properties of honey products, Nutrients and composition of honey, Acid content and flavor effects.
3. Types of value added honey products.

**Unit V: Harvesting, Processing and Preservation of Honey (10 Hrs.)**

1. Methods of harvesting honey.
2. Processing of honey.
3. Preservation of honey.

**Unit VI: Costing, Pricing, Packaging & Marketing of Honey (10 Hrs.)**

1. Methodologies adopted for costing, pricing.
2. Packaging, labeling and branding.
3. Marketing Management.

**Unit VII: Agriculture Product Marketing (10 Hrs.)**

Co-operative Credit Societies- Functions, Structure Importance and Problems, District Central Co-operative Banks - Functions, Structure , Importance and Problems, State Co-operative Banks- Role and urban, Urban Co-operative Banks, Nationalized Banks, Regional Rural Bank, Need and Importance, Structure, development and present position of Co-operative Marketing, Problems and Remedies of co-operative marketing, Role of NAFED, E-Marketing, Role of Co-operative Processing Societies in Development, Sugar Co-operatives – Present Position and Problems, Dairy Co-operatives- Present Position and Problems, Poultry Farming, Cotton Industry, Horticultural, Floricultural and Medical Plants Process Industry, Fisheries, Meaning &

definition of Agriculture Transport, Role of Transportation in agriculture, Types of Transportation, Importance of Transportation in Agriculture

**Practical Syllabus**

**Total: 170 Hours**

**Section I**

1. Studies in the morphology of honeybees and identification of different species of honeybees.
2. Studies in the different stages of honeybee life cycle.
3. Study of morphological structures of honey bee through permanent slides/photographs mouth part, antenna, wings, legs (antenna cleaner, mid leg, pollen basket), sting apparatus.
4. Study of artificial hive (Langstroth/Newton), its various parts and beekeeping equipment.
5. Beekeeping unit – Handling of frames with colonies.
6. Identification of queen cells, drone cells & brood.
7. Methods of multiplication of bee colonies and Management of bee diseases and enemies.
8. To study behavior of honey bee and Hive inspection.
9. Swarm management.
10. Preparation of floral calendar.
11. Hive Inspection

**Section II**

1. Extraction of honey using honey extractor, packing and storing of honey; Management of different hive products.
2. Analysis of honey – purity, biochemical analysis (Any two constituents).
3. Determination of ash content of honey.
4. Determination of pH and of free acidity of honey by titration.
5. Determination of pH, free acidity, lactones and total acidity: equivalence point titration.
6. Determination of hydroxymethylfurfural after White.
7. Determination of apparent reducing sugars and apparent sucrose.
8. Supplementary feeding and honey extraction.
9. Field visits and interaction with Bee keepers and other support agencies.
10. Project Report.

**References:**

1. Singh S. (1962) Beekeeping in India, Indian Council of Agricultural Research, New Delhi.
2. Mishra, R. C. (1995). Honeybees and their Management in India. Indian Council of Agricultural Research, New Delhi.
3. Jayashree K.V., Tharadevi C.S Arumugam (2000).Text book of Apiculture Saras Publication.

4. Graham J.M (1992) The hive and honey bee. Dadant and Sons, Hamilton Illinois.
5. Craig Hughes (2010). Urban Beekeeping: A Guide to Keeping Bees in the City. e Good Life Press, Preston.
6. Ted Hooper, By (author) Clive De Bruyn, By (author) Margaret Thomas (2014). The Beginner's Bee Book. Stenlake Publishing, Ayrshire.
7. David Cramp (2012). The Complete Step-by-step Book of Beekeeping: A Practical Guide to Beekeeping, from Setting Up a Colony to Hive Management and Harvesting the Honey. Lorenz Books. London.
8. David Cramp (2009). A Practical Manual of Beekeeping: How to Keep Bees and Develop Your Full Potential as an Apiarist. Spring Hill, London.
9. Ted Hooper (2010). Guide to Bees and Honey: The World's Best Selling Guide ekeeping. Northern Bee Books. Oxford.
10. Roger A. Morse, Kim Flottum, (1998). Honey Bee Pests, Predators and Diseases. Wicwas Pr; 3<sup>rd</sup> edition.
11. Dewey M. Caron, (2013). Honey Bee Biology and Beekeeping, Revised Edition. Wicwas Press, Kalamazoo.
12. Pradip V Jabde, (1993). Text Book of Applied Zoology: Vermiculture, Apiculture, Sericulture, Lac Culture, Agricultural Pests and their Controls. Discovery Publishing House, New Delhi.

**Suggested Readings:**

1. Prost, P. J. (1962). Apiculture. Oxford and IBH, New Delhi.
2. Rahman, A. (2017) Beekeeping in India. Indian Council of Agricultural Research, New Delhi
3. Gupta, J. K. (2016). Apiculture, Indian Council of Agricultural Research, New Delhi Master Beekeeping.
4. Dewey M. Caron, (2013). Honey Bee Biology and Beekeeping, Revised Edition. Wicwas Press, Kalamazoo.
5. Pradip V Jabde, (1993). Text Book of Applied Zoology: Vermiculture, Apiculture, Sericulture, Lac Culture, Agricultural Pests and their Controls. Discovery Publishing House, New Delhi.
6. Eva Crane, (1999). The World History of Beekeeping and Honey Hunting. Routledge, India.
7. Ted Hooper, (2010). Guide to Bees & Honey: The World's Best Selling Guide to Beekeeping. Northern Bee Books, Oxford.
10. David & Charles, Newton Abbot. Kim Pezza, (2013). Backyard Farming: Keeping Honey Bees: From Hive Management to Honey Harvesting and More. Hatherleigh Press, U.S.

11. David Cramp, (2012). The Complete Step-by-step Book of Beekeeping: A Practical Guide to Beekeeping, from Setting Up a Colony to Hive Management and Harvesting the Honey. Lorenz Books. London.

**Online Tools and Web Resources:**

1. <https://www.ecornell.com/certificates/beekeeping/master-beekeeping/>
2. Beekeeping (<https://nios.ac.in/media/documents/nsqf/beekeeping%20theory.pdf>)
3. Swayam (MHRD) Portal Vocational Beekeeping (<https://swayam.gov.in/courses/5844-vocational-beekeeping>)

**III) Examination Pattern:**

Theory: 40

Practical: 60

Total Marks: 100

**IV) BOS:**

Dr. M. J. Lubal-Chairman

Dr. A.N. Dede- Coordinator

Mr. S. B. Kumbhar- Coordinator

Mr. Wagh Alpesh-Expert

Mr. H.G. Kayande-Expert

