

**KAVAYITRI BAHINABAI CHAUDHARI NORTH MAHARASHTRA
UNIVERSITY, JALGAON**

Under UGC ordinance 181

**Dr. Annasaheb G. D. Bendale Mahila Mahavidyalaya,
Jalgaon**

Certificate Course in Beekeeping

**Faculty
Science & Technology**

**Academic Year
2021-22**

**Department of Zoology,
Dr. Annasaheb G. D. Bendale Mahila Mahavidyalaya,
Jalgaon**

College Name : Dr. Annasaheb G. D. Bendale Mahila Mahavidyalaya, Jalgaon

Title of the Course : Certificate Course in Beekeeping Under UGC ordinance 181

Aim/ Objectives of the Course : 1. To inculcate importance of Bee keeping and honey processing in relation with entrepreneurship development.
2. To give knowledge about various techniques of Bee keeping
3. To teach techniques of construction of Bee Hives and its maintenance.

Duration of course : 06 Months

Fee Structure : Rs. 1000/-

Course Structure : 02 Theory papers & 01 Practical paper

Eligibility for admission : 12th pass

Skeleton of course :

Sr No	Paper	Name of the subject	Theory/ Practical	Teaching hours	Maximum marks allotted			Passing			Credit
					Int	Ext	Total	Int	Ext	Total	
1	PAPER-I	Basics of Beekeeping	Theory	90	40	60	100	16	24	40	06
2	PAPER-II	Bee enemies, diseases, pesticide poisoning	Theory	90	40	60	100	16	24	40	06
3	PAPER-III	Practicals based on Paper I & II	Practical	120	40	60	100	16	24	40	08
		Field work									

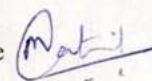
*Internal marks are divided in 3 parts e.g. 05 marks for attendance, 10 marks for Home Assignment/ Tutorial & 25 marks for internal test.

Minimum Staff: 08

Mode of examination: Written

Co-ordinator: Mr Shubham Pingale

Detailed Syllabus: Pg 2-4



Certificate course in Beekeeping and Honey processing (Under UGC ordinance 181)

Programme Outcomes:

1. To understand the basics of beekeeping tools, equipments and managing beehives.
2. To understand the primary lifecycle of the honey bees.
3. To learn and manage beehives for honey production and pollination.
4. To provide self-employment to the learners.
5. To aware the usefulness of beekeeping in pollination of the flora.
6. To understand the various bee products.

Course outcomes

PAPER I - Basics of Beekeeping

1. To manage beehives for honey production and pollination.
2. To provide self-employment to the learners.
3. To aware the usefulness of beekeeping in pollination of the flora.
4. To understand the various bee products.

PAPER II - Bee enemies, diseases, pesticide poisoning

1. To understand bee enemies and various types of bee diseases.
2. To understand pollination conservation methods.
3. To understand pesticide poisoning and health of bees.

PAPER III Practicals in Beekeeping

1. To learn and handle honey bees' colony.
2. To learn life cycle and economic importance of Honey bees.
3. To learn the social behavior of honey bees.
4. To learn the process of feeding and honey extraction methods and management of bee diseases.

Theory Syllabus of One Year Course

Program of the Course:

1. Course will be of 20 Credits, each credit will have 15 hours (45min.)
2. Out of 20 credits 8 credits will be assigned to field work/project/training
3. The candidate required to attend 75% lectures/periods.

4. The candidate must obtain 40% of the total marks in theory and practical/project work separate to pass the course.

5. Candidate will be offered English/Marathi as a medium of instructions/examination.

6. All 12th examination passed and first year appearing under graduate students are eligible for this course.

PAPER I - Basics of Beekeeping (90L)

Unit I- History of bee keeping: Definition, Bee keeping in worldwide, In India. Traditional bee keeping, Modern beekeeping, Urban or backyard (10L)

Unit II- Apiculture development in India: Institutions involved. Role of Central Honey Bee Research & Training Institute. Beekeeping in Maharashtra (10L)

Unit III- Honey bee species and identification: Origin, systematic and distribution of honey bees. Types of honey bees, Species of honey bees. Bee identification.(15L)

Unit IV- Morphology: Basic concepts of morphology of Honey bees - indigenous, exotic (15L)

UNIT V- Social organization in honey bees: Colony life and social organization – Queen, drone, worker. Annual biological cycle of the bee colony. (15L)

UNIT VI- Bee Behavior and Communication in honey bees: Swarming, Nesting Behavior, Round Dance, Sickle Dance, Waggle Dance, DVAV Dance, Massage dance, Alarm dance, Cleaning dance (15L)

UNIT VII- Honey: properties and application in various fields

Honey-its medicinal properties, application in various fields, other valuable byproducts of honey bees (10L)

PAPER II - Bee enemies, diseases, pesticide poisoning (90L)

UNIT I- Adaption of honey bees: Structural, Behavioral, Ecological and Physiological Adaptations of Bees. Necessities of honey bee adaptations. (15L)

UNIT II- Bee enemies and diseases: An introduction, Bee enemies – Wax Moth, Ants, Wasps, Microorganisms, Pests. Diagnosis and Identification. (15L)

UNIT III- Mites attacking honey bees: Varroa mites, Mite Biology, Controlling Varroa Mites, Mechanical control, Mite-tolerant stocks, Biopesticides, Chemical (synthetic pesticide) treatments. (15L)

UNIT IV- Bacterial, viral, fungal & protozoan diseases: Bacterial disease - American Foulbrood, European Foulbrood, Viral disease - Deformed Wing Virus, Sacbrood Virus, Black Queen Cell Virus, Kashmir Bee Virus, Acute Bee Paralysis Virus; Fungal disease - Chalkbrood, Stonebrood; Protozoan disease - Nosemosis, Nosema cerana. (15L)

UNIT V- Pesticide poisoning of bees and mitigation: Definition of pesticides, types of pesticides and their length of residual toxicity, Pesticides and pollinators, Toxicity to bees – Honey bee health, Colony collapse disorder. (15L)

UNIT VI- Pollinator conservation methods: Pollinators definition, Types of pollinators, Pollinators at Risks, Threats to Pollinators, Actions to Help Pollinators, Conservation methods. (15L)

Reference Books

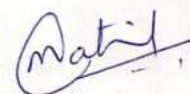
- Perspective in Indian Apiculture-R. C. Mishra
- Rearing queen bees in India- M. C. Suryanarayana et. al.
- Bee Keeping in India – G.K. Ghosh
- Technology and value addition of Honey – Dr. D. M. Wakhle and K. D. Kamble.
- ABC & XYZ of Bee culture – A. I. Root
- Indian Bee Journal – All Indian Bee Keeping Association
- Asian Bee Journal

PAPER III Practicals (120L)

01. To study the morphology of Honeybees and
02. Identification of different species and classes of Honey bees
03. To Study different stages in life cycle of Honey bees.
04. To study the behaviour of Honeybees
05. Study of Mouth parts, sting apparatus, legs
06. Bee keeping unit - Handling of frames with colonies
07. Introduction of parts of Bee box - ISI 'A' type 'B' type & Tools used in Bee keeping
08. Colony inspection, maintenance - writing up of inspection report
09. Identification of Queen cells, Drone cells & Brood
10. Bee flora - Propagation of bee plants - Preparation of floral calendar.
11. Migratory Bee Keeping - measures to be taken while transporting colonies-Mapping of areas for migration.
12. Extraction of Honey using Honey extractor, moisture reduction, packing and storing of Honey.

Reference for practical:

- 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.
- David Cramp, 2009. A Practical Manual of Beekeeping: How to Keep Bees and Develop Your Full Potential as an Apiarist. Spring Hill, London
- Ted Hooper, 2010. Guide to Bees and Honey: The World's Best Selling Guide to Beekeeping. Northern Bee Books. Oxford, 8.



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