

Short Term Certificate Course in Apiculture

Syllabus

Department of Zoology

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1) Title of the course: - Short Term certificate course in Apiculture

2) Preamble of the syllabus:

Certificate course in apiculture is the Short term course of six months duration. The course to be implemented through this curriculum would allow students to develop a strong footing in the fundamentals and specialize in the disciplines of his/her liking and abilities. The students pursuing this course would have to develop in depth understanding various aspects of the bee keeping. The working principles design guidelines and practical skills associated with apiculture:

3) Introduction:

Beekeeping involves more than just producing honey. Agriculture Horticulture sector is dependent on healthy pollination of fruit, seed and nut crops for its survival. Beekeeping course includes-1) Hive management 2) Hive construction and maintenance3) Bee behaviour 4) Apiculture industry5) Honey production 6) Business administration and marketing 7) Pollination 8) Bee breeding and rearing 9) Bee diseases. Beekeeping has an essential role to play in this process and beekeeping can train the students to be skilled and highly employable. Beekeeping course offers many exciting career opportunities ranging from the hobbyist beekeeper through to ownership of a commercial beekeeping operation, research, or industry consultancy.

This introductory qualification has been designed for students interested in working with bees. Students gain the foundation skills and knowledge needed for further training in the beekeeping sector and get to explore the career opportunities in the industry. Students will learn all about bees and their behavior, the beekeeping industry, relevant work hazards, and bee

colony diseases. It will be taught how to construct, locate, feed and operate a beehive, and also how to extract honey. The students pursuing this course would have to develop in depth understanding various aspects of the subject .The working principles design guidelines and practical skills associated with apiculture. The course focuses on giving a broad practical skill base that will lead to employment in the beekeeping industry .

4) Objective:

The objective of the certificate course is introducing career and market-oriented, skill that have utility for job, self employment and empowerment of the students.

3) Eligibility:

The candidates having minimum XIIth class from any faculty passed. Admission will be given as per the selection procedure /policies adopted by the college, in accordance with conditions laid down by the SP Pune university, Pune.

4) Examination :

Evaluation of students after completion of theory and practical courses within six months. Examination will be of 100 marks each. Student has to obtain minimum 40% marks in each course. Practical course will be evaluated on the basis of attendance, punctuality, practical skill, result, oral and analysis. Evaluation of theory courses on the basis of multiple choice questions.

5) Structure of course:

Basic structure/pattern (framework) of the proposed certificate course syllabus for the six months.

- 1) Apiculture – Theory Paper I
- 2) Apiculture- Theory Paper II
- 3) Apiculture-Practical Paper III
- 6) Detail syllabus

Apiculture-Theory Paper I

Total lectures: 45

01)	Introduction to Modern Beekeeping & its Management.	4
02)	Honey Bee species.	4
03)	Classification and external morphology of Honey Bee.	3
04)	Scientific Beekeeping with <i>Apis cerana</i> & <i>Apis mellifera</i> .	5
05)	Division of labour and life cycle of honey bee.	7
06)	Bee behaviour (swarming, absconding, bee language etc)	6
07)	Beekeeping equipments & uses.	6
08)	Bee Breeding & colony reproduction.	5
09)	Inspection of Colonies and seasonal management of apiary.	5

Apiculture-Theory Paper II
Total lectures: 45

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| 01) Bee pollination importance of induced pollination in agriculture, horticulture& forest. | 05 |
| 02) Status of Beekeeping in India and abroad. | 05 |
| 03) Bee plants & floral calendar. | 05 |
| 04) Honeybee products & their values, uses & commercial production of honey, beeswax, propolis, pollen, venom, royal jelly. | 06 |
| 05) Economics of beekeeping. | 06 |
| 06) Export of bee products, prospectus & potentials. | 05 |
| 07) Beekeeping & self employment opportunities, Empowerment of women, tribes & farmers. | 04 |
| 08) Pesticidal poisoning in honeybees & its counter measures. | 04 |
| 09) Bee disease & enemies of bees. Preventive & control Measures | 05 |

Apiculture-Practical Paper III

Minimum of 15 practical are to be performed by students

1. Study of honeybee species with the help of domesticated & wild bee colonies.

i. Apis cerena indica ii. Apis mellifera. ii. Apis dorsdata.

iv. Apis florum.

2. Study of caste system & division of labour.
3. Study of modern method of domestication of *Apis cerena indica* and *Apis mellifera*
4. Study of life-cycle of *Apis cerena indica* and *Apis mellifera*
5. Study of beekeeping instruments & method of honey extraction.
6. Study of bee products & their uses.
7. To study method of wire embedding & attaching comb foundation sheet.
8. To study method of preparation of sugar syrup & pollen supplement.
9. To study method of inspection of bee colony. (*Apis cerena indica* and *Apis mellifera*).
10. To study chemical analysis of honey sample for testing its purity.
11. Microscopic observation of pollen grains from honey sample for identification of unifloral and multifloral honey.

12. To study bee enemies and bee disease and their control measures.
13. To demonstrate method of hunting wild colony of *Apis cerena indica* to start scientific beekeeping
14. To study artificial queen rearing by grafting method
15. To study method of colony division in *Apis cerena indica*.
16. To prepare floral calendar of local area
17. Field visit to Apiary/Bee research and training institute / Honey processing unit.
18. Project report based on field studies /laboratory work as per the guidance of academic advisor/ project guide. (The project should innovative ideas / thoughts/creative ideas etc.)
19. Submission of herbarium including the presentation of cross pollinated crops /bee plants.(flower structure)
20. Study of traditional method of beekeeping.

References:

- 1) Destructive and useful insects, their habit and control, 1973.C.L.Metcalf and W. P. Flint, Tata McGraw Hill publication, New Delhi.
- 2) Imms Text Book of Entomology, Vol I and II, Richard and Owen.
- 3) Biology of insects, 1992.S.C.Saxena, Oxford and IBH publishing CO. New Dehli Bombay ,Calcutta.
- 4) Bee and Bee Keeping, 1978, Roger A. Morse, Conell University press, London
- 5) TheBehaviour and social life of Honey Bees, C,R. Ribbandas, Dover publication inc. New York.
- 6) A Text Book of Entomology, 1974 .V.K. Mathur and K. D. Upadhayay, Goel Printing Press Barani.
- 7) Practical bee keeping, Herbert Mace, Ward Lock Limited, London,