


























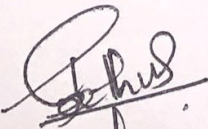
# MANNAM MEMORIAL NSS COLLEGE, KOTTIYAM

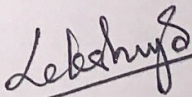
## STUDENT ENROLMENT LIST (2022-23)

Name of department : Department of Zoology

Name of course : Apiculture

Sl No	Name of Student	Signature
1	AKASH AJAYAN	
2	AKASH KRISHNAN S	
3	AKHIL CHAND B	
4	ALEENA S S	
5	ATHIRA A	
6	BEEGUM SULTHANA A	
7	FATHIMA S	
8	GOURI A	
9	INDHUJA M	
10	JOY A	
11	KARTHIKA KISHORE	
12	KEERTHANA B S	
13	MALAVIKA B P	
14	MEGHARAJ	
15	POOJA R	
16	RAHUL SURENDRAN	
17	SOUPARNIKA P. S	
18	VINAYAK G	
19	ABHINANDH M	
20	ATHULYA L	
21	DEVIPRIYA M S	
22	GAUTHAM KRISHNA S	
23	GOURI M S	
24	SOORAJ S. S	
25	SOORYA S	

  
Co-ordinator

  
HOD.



**DEPARTMENT OF ZOOLOGY**  
**MMNSS COLLEGE, KOTTIYAM**  
**ADD ON COURSE 2022-23**  
**APICULTURE**

**Total hours: 30**

**Course Objectives:**

- To learn about life history and social structure of honey bee species.
- To study bee rearing and farming methods and the equipment involved.
- To learn about apiculture benefits and different byproducts & their economic scope.
- To study the different bee diseases and predators and their control measures

**Course outcome:** By successfully completing the course, students will be able to:

- To understand and describe the life stages and social organization of honey bee species.
- To correctly explain and perform bee rearing, farming and harvesting practices.
- Appreciate the economic importance of derivative benefits and byproducts of apiculture.
- To identify and take remedial measures against the different bee diseases and predators.

**Syllabus**

**MODULE 1: Biology of Bees (5 hrs)**

History, Classification and Biology of Honeybees and Social Organization of Honey bees.

**MODULE 2: Rearing of Honey Bees (10 hrs)**

Artificial Bee Rearing (Apiary), Bee hives- Newton and Langstroth, Bee Pasturage, Selection of Bee Species for apiculture, Bee keeping equipment, Methods of extraction of honey (Indigenous and Modern) and procedures used in keeping of artificial bee hives.



### MODULE 3: Diseases and Enemies (7 hrs)

Bee diseases and enemies, Control and preventive measures.

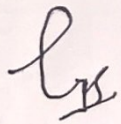
### MODULE 4: Economy of Bees and Entrepreneurship (8 hrs)


Products of Apiculture industry and its uses (Honey, Bee wax, Propolis, Pollen etc.).

Bee-keeping industry- Recent efforts, Modern methods in employing artificial believes for Cross pollination in horticulture gardens.

#### Reference:

1. Apiculture - Prost, P. J. (1962), Oxford and IBH, New Delhi.
2. Apiculture - Bisht D. S., ICAR Publications.
3. Bee Keeping in India - Indian Council of Agricultural Research, New Delhi

  
Dr. Greethu G  
Course Coordinator

  
**Dr. LENSHMY. S**  
Head, Dept. of Zoology  
M.M.N.S.S. College  
Kottiyam, Kollam

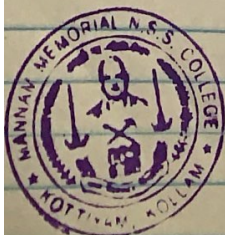




## COURSE

## COURSE SCHEDULE - APICULTURE

DATE	TIME	TOPIC
07/11/2022 (Monday)	3.30 - 4.30 pm	Biology of Bees
09/11/2022 (Tuesday)	3.30 - 4.30 pm	History, Classification
10/11/2022 (Wednesday)	3.30 - 4.30 pm	Social Organization of Honey bees
11/11/2022 (Thursday)	3.30 - 4.30 pm	Artificial Bee Rearing
12/11/2022 (Friday)	3.30 - 4.30 pm	Bee hives
14/11/2022 (Monday)	3.30 - 4.30 pm	Bee Pasturage
15/11/2022 (Tuesday)	3.30 - 4.30 pm	Selection of Bee Species
16/11/2022 (Wednesday)	3.30 - 4.30 pm	Bee keeping equipment
17/11/2022 (Thursday)	3.30 - 4.30 pm	Methods of extraction of honey
18/11/2022 (Friday)	3.30 - 4.30 pm	procedures used in keeping of artificial bee hives
19/11/2022 (Saturday)	9.00 - 1.00 pm	Bee diseases
21/11/2022 (Monday)	3.30 - 4.30 pm	Control and preventive measures
22/11/2022 (Tuesday)	3.30 - 4.30 pm	Products of Apiculture
23/11/2022 (Wednesday)	3.30 - 4.30 pm	Uses of bee products
25/11/2022 (Friday)	3.30 - 4.30 pm	Bee keeping industry
26/11/2022 (Saturday)	9.00 - 1.00 pm	Modern methods
28/11/2022 (Monday)	3.30 - 4.30 pm	Apiary management
29/11/2022 (Tuesday)	3.30 - 4.30 pm	Honey extraction
30/11/2022 (Wednesday)	3.30 - 4.30 pm	Brood diseases
01/12/2022 (Thursday)	3.30 - 4.30 pm	Marketing strategies
02/12/2022 (Friday)	3.30 - 4.30 pm	Marketing methods
07/12/2022	END COURSE EVALUATION	



By  
Course Coordinator  
Dr. Greetha G.

Dr. LEKSHMI Y. S.  
Head, Dept. of Zoology  
M.M.N.S.S. College  
Kottiyam, Kollam



MMNSS COLLEGE, KOTTIYAM  
DEPARTMENT OF ZOOLOGY  
END COURSE EVALUATION OF ADD ON COURSE 2022-23  
APICULTURE

Max marks: 25

Time: 1 hr

**Section A.** Answer all questions in one or two sentences (5×1= 5)

1. What is a pollen basket?
2. Write the systematic position of Apis
3. What is Royal Jelly?
4. What is Bee Wax?
5. Write the scientific name of Rock Bee

**Section B.** Answer any 4 of the following (4×2=8)

6. Define swarming.
7. What is Propolis?
8. Write two salient features of *Apis dorsata*.
9. Write a brief note on Bee Pasturage.
10. Write in brief on the cause, symptoms and diagnosis of Chalk brood.
11. What are the selective characteristics of honeybees for apiculture?

**Section C.** Answer any 3 of the following (3×4= 12)

12. Write about different casts of honeybees in a colony with their morphological differences along with their activities in a colony.
13. Describe different stages of the life cycle of Honeybee along with a neat diagram.
14. Describe Langstroth hive in detail. State its advantages over the other beehive types.
15. Describe in detail the names and uses of different products of apiculture.
16. Name one prevalent bacterial and one protozoan disease of honeybee. Mention their causative agents, pathogenesis, symptoms and control measures.



**Mark sheet of end course evaluation of the Add on course Apiculture (2022-23)**

Sl. No:	Name	Candidate code	Mark (25)	Signature
1	AKASH AJAYAN	25022116001	19	<i>Akash</i>
2	AKASH KRISHNAN S	25022116002	25	<i>Akash</i>
3	AKHIL CHAND B	25022116003	14	<i>Akhil</i>
4	ALEENA S S	25022116004	18	<i>Aleena</i>
5	ATHIRA A	25022116005	19	<i>Athira</i>
6	BEEGUM SULTHANA A	25022116006	16	<i>Beegum</i>
7	FATHIMA S	25022116007	19	<i>Fathima</i>
8	GOURI A	25022116008	24	<i>Gouri</i>
9	INDHUJA M	25022116009	25	<i>Indhuja</i>
10	JOY A	25022116010	20	<i>Joy</i>
11	KARTHIKA KISHORE	25022116011	25	<i>Karthika</i>
12	KEERTHANA B S	25022116012	23	<i>Keerthana</i>
13	MALAVIKA B P	25022116013	21	<i>Malavika</i>
14	MEGHARAJ	25022116014	25	<i>Megharaj</i>
15	POOJA R	25022116015	25	<i>Pooja</i>
16	RAHUL SURENDRAN	25022116016	25	<i>Rahul</i>
17	SOUPARNIKA P. S	25022116017	25	<i>Souparnika</i>
18	VINAYAK G	25022116018	17	<i>Vinayak</i>
19	ABHINANDH M	25022116019	19	<i>Abhinandh</i>
20	ATHULYA L	25022116020	16	<i>Athulya</i>
21	DEVIPRIYA M S	25022116021	25	<i>Devipriya</i>
22	GAUTHAM KRISHNA S	25022116022	21	<i>Gautham</i>
23	GOURI M S	25022116023	20	<i>Gouri</i>
24	SOORAJ S. S	25022116024	24	<i>Sooraj</i>
25	SOORYA S	25022116025	14	<i>Soorya</i>

*Geethu*  
Dr. Geethu. G (Course Co-ordinator)

*Leekshmy*  
Dr. LEKSHMY S  
HOD, Dept Of Zoology  
M M N S S College  
Kottiyam - 691571



## COURSE REPORT

The certificate course on apiculture involves various aspects about bee keeping, bee keeping equipments, honey harvesting etc. 25 students attended the course and enabled them to set up a small apiculture unit of their own thus be self-employed and generate their own income. This course is specially designed to generate employment opportunities for students in the field of apiculture. The course also aims at environmental conservation as honeybees play a significant role in the ecology of nature. The important topics covered in the course were: Biology of bees, Rearing of honey bees, Diseases and enemies, Economy of bees and entrepreneurship. The start of the course was on 7th November. 28 students were performed well in the end course evaluation conducted on 07/12/2022.

by

Dr. Geethu G  
 Course Co-ordinator

Principal  
 M.M.N.S.S. COLLEGE  
 KOTTIYAM

by  
**Dr. LEKSHMY. S**  
 Head, Dept. of Zoology  
 M.M.N.S.S. College  
 Kottiyam, Kollam

Dr. LEKSHMY. S  
 Head, Dept. of Zoology  
 M.M.N.S.S. College  
 Kottiyam, Kollam



## FEEDBACK REPORT BY STUDENTS

The course on apiculture helped the students to understand the basic life cycle of honey bees, beekeeping tool and equipments. This course is useful for providing self employment to students and enabled the students to understand the marketing of various bee products.

by

Dr. Geethu G  
 Course Co-ordinator

Principal  
 M.M.N.S.S. COLLEGE  
 KOTTIYAM

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