

“Education for Knowledge, Science and Culture”

-Shikshanmahashri Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikashan Sanstha's

Vivekanand College, Kolhapur (Autonomous)

Department of Zoology

Academic Year 2019-2020

Add On Course on Bee-Keeping and honey processing

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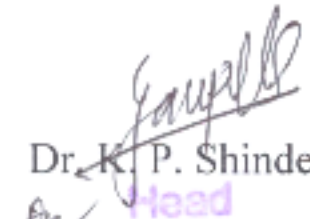
Vivekanand College, Kolhapur (Autonomous)

Department of Zoology

Date : 05/10/2019

NOTICE

All the students of Vivekanand College, Kolhapur (Autonomous) are hereby informed that Department of Zoology will going to conduct add-on course - **Bee- keeping and honey processing** for the academic year 2019-2020 in the month of December and January. Interested students are hereby requested to confirm their admissions for the same.


Dr. K. P. Shinde
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Vivekanand College,
Kolhapur

VIVEKANAND COLLEGE, KOLHAPUR
(Autonomous)
DEPARTMENT OF ZOOLOGY
ADD-ON COURSE IN
BEEKEEPING AND HONEY PROCESSING

| Sr. No. | Heading | Particulars |
|----------------|--|---|
| 1. | Title of the Course | Ad-on Course in Bee Keeping and Honey Processing |
| 2. | Eligibility for Admission | Candidate who passed 10+2 examination with at least 45% marks in aggregate in Arts/ Commerce/ Science |
| 3. | Passing Marks for the course | The candidate must obtain 35 % of the total marks in theory and practical separately to pass the course. |
| 4. | No. of Years | One Year |
| 5. | Level | Add-on |
| 6. | Pattern | Annual |
| 7. | Intake Capacity | 50 |
| 8. | Fees | Rs. 2000/- |
| 9. | Expenditure of Course | 46010/- |
| 10. | Job opportunities | Self employment, Government and Private sectors |
| 11. | To be implemented from the Academic Year | From Academic Year -June 2018-2019 |

The present add-on course '**Beekeeping and Honey Processing**' is introduced for undergraduate students of Science, Commerce and Arts faculty to enhance employability for students. This syllabus is emphasizing on development of knowledge and skills amongst the students. This syllabus is design and offering opportunity to learners to study techniques in bee keeping theoretically, practically as well as experimentally.

Objectives of the course:

- 1) To inculcate importance of Bee keeping and honey processing
- 2) To give knowledge on Bee keeping, honey and its marketing to make them self sustainable
- 3) To teach techniques of construction of Bee Hives and its maintenance
- 4) To teach students about Honey production and medicinal values
- 5) To aware about economic importance of bee wax, honey etc

JOB OPPORTUNITIES

For bee keeping courses there are several opportunities for self employment. Beekeepers can produce honey on small scale or large commercial scale. Beekeepers may be skillful and kin in a specific area of interest such as honey production, pollination, bee breeding and other sectors. Beekeepers may also find work with some schools where children have the chance to learn beekeeping skills. In addition, there are opportunities in education at the college level, animal science departments, university and industries. The bee industry is especially strong in several countries for production of honey and honey products. There are many national job opportunities with major commercial operations if a beekeeper wishes to work hard.

Total Fees: Rs. 2000/-

Syllabus of the course

Title of the course: Bee keeping and honey processing.

Total Lectures: 60

Total Marks: 100

| Course | Unit | Topic | L/Unit |
|----------------|------|--|--------|
| Add-on | I | ➤ Introduction to Apiculture - scope, importance ➤ Honey Bee morphology, Anatomy and Life cycle | 15 |
| Annual pattern | II | ➤ Honeybee health and diseases ➤ Honey - its properties and application in various fields | 15 |
| | III | ➤ Bee keeping: Tools and Equipments ➤ Honeybee Plants and Floral Calendar. | 15 |
| | IV | ➤ Honey Processing and Bee Hive Products ➤ Economics of bee keeping | 15 |

Theory- Unit-I to Unit-IV

UNIT – I

Introduction to Apiculture - scope, importance (15 L)

- History of bee keeping: Definition, Bee keeping in India, and Worldwide
- Apiculture development in India - Institutions involved. Role of Central Honey Bee Research & Training Institute.

Honey Bee morphology, Anatomy and Life cycle (15 L)

- Morphology of Honey bees - Indigenous, Exotic

- Honey bee species and identification- Origin, systematic and distribution of honey bees. Types of honey bees, Species of honey bees. Bee identification.
- Social organization in honey bees: Colony life and social organization – Queen, drone, worker.
- Communicative behavior in Honey bee -Round dance and Waggle dance

UNIT – II

Honeybee Enemies and Diseases (15 L)

- Bee enemies and diseases: Bee enemies – Wax Moth, Ants, Wasps, Microorganisms, Pests and diagnosis
- Mites attacking honey bees: Varroa mites, Mite Biology, Controlling Varroa Mites, Mechanical control, Mite-tolerant stocks, Biopesticides, Chemical or synthetic pesticide treatments.
- 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*.

Honey - its properties and application in various fields (15 L)

- Honey - its medicinal properties - application in various fields and valuable by products of honey bees
- Value added honey products. Properties of honey products, Nutrients and composition of honey
- Types of value added honey products.

UNIT – III

Bee keeping: Tools and Equipment. (15 L)

- Basic requirements of tools for starting bee keeping: Getting Started in Beekeeping - Land and Buildings, Equipment and supplies.
- Bee keeping equipment - introduction to types of bee boxes - BIS standard tools used in apiculture.
- Bee breeding multiplication of colonies - Queen rearing technique.

Honey bee Plants and Floral Calendar. (15 L)

- Bee flora - importance propagation - congenial conditions for starting up of apiculture.
- Migratory Bee Keeping - designing floral Calendar
- Improved Agricultural practices- Crop pollination - Pesticides impact on Honey bees.

UNIT – IV

Honey Processing and Bee Hive Products (15 L)

- Honey extraction & handling - Quality control standards - Honey testing kit
- Processing of honey. Other valuable by products of honey bees
- Bee venom & Royal jelly extraction.

Economics of bee keeping (15 L)

- Economics in small scale and large scale bee keeping. Economic Value of Commercial Beekeeping.
- Preparing bankable bee keeping project: Steps involved in starting a beekeeping project, Funding sources for beekeeping projects.

Practicals

| Sr. No. | Particulars |
|---------|---|
| 1. | To study the morphology of Honeybees and Identification of different species and classes of Honey bees |
| 2. | To Study different stages in life cycle of Honey bees. |
| 3. | To study the behavior of Honeybees |
| 4. | Bee keeping unit - Handling of frames with colonies |
| 5. | Introduction of parts of Bee box - ISI 'A' type 'B' type & Tools used in Bee keeping |
| 6. | Colony inspection, maintenance - writing up of inspection report |
| 7. | Identification of Queen cells, Drone cells & Brood |
| 8. | Sugar feeding of colonies in scarcity period |
| 9. | Identification of swarming tendency in a colony - Removal of Drone cells |
| 10. | Identification of kinds of Queen cells. |
| 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. |
| 13. | Methods of Extraction of Bees wax, Royal Jelly and Bee venom. |
| 14. | Honey testing kit - Physical and chemical methods of analysis. |
| 15. | Fermentation and Granulation of Honey. |
| 16. | Disease management - Identification of symptoms of Nosema. Sac brood Virus, Thai sac brood virus, American foul brood and European foul brood diseases. |
| 17. | Preventive and control measures of the diseases. |
| 18. | Application of antibiotics to colonies - Destruction of diseased colonies and disinfection of frames. |
| 19. | Management of colonies for different hive products. |

Assessment: Theory and Practical

Theory Nature of Question Paper – 3 hours **100 marks**

| | |
|--------------------------------------|----------|
| Q1. Multiple Choice Question | 20 marks |
| Q2. Long Answer question (Any three) | 60 Marks |
| Q3. Short answer question (Any Four) | 20 marks |

Practical Examination Pattern: **100 Marks**

| | |
|------------------------------|----------|
| Q1. Laboratory Experiment | 60 Marks |
| Q2. Identification | 20 Marks |
| Q3. Journal | 10 Marks |
| Q4. Study tour and Viva Voce | 10 Marks |

Field Visit

Visit to any Honey bee Institute

References:

- Prospective 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 India Bee Keeping Association
- Asian Bee Journal
- Online references

Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur (Autonomous)

DEPARTMENT OF ZOOLOGY

2019 – 2020

Add –on Course “Bee keeping and honey processing”

WORKLOAD

Duration of course: 30 hrs

Mode: Offline

Lectures: 40

| | | |
|-------------------|---|----|
| Dr. K. P. Shinde | = | 04 |
| Dr. T. C. Gaupale | = | 05 |
| Ms. N. A. Patel | = | 05 |
| Ms. G. B. Satale | = | 05 |
| Dr. S. S. Desai | = | 05 |
| Ms. K. L. Kamble | = | 04 |
| Dr. T. C. Patil | = | 04 |
| Ms. Y. S. Pujari | = | 04 |
| Ms. J. S. Sathe | = | 04 |

Total = 40

Lectures - Every Sunday in the month of December 2019 and January 2020

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Kolhapur

Vivekanand College, Kolhapur (Autonomous)
DEPARTMENT OF ZOOLOGY
ADD-ON COURSE IN
BEE KEEPING AND HONEY PROCESSING
List of the students
Academic year : 2019 - 20

| SR. NO. | NAME OF STUDENTS |
|----------------|----------------------------------|
| 1 | Agalave Prajakta Vinayak |
| 2 | Aralekar Shriya Santosh |
| 3 | Ayarekar Tanaya Snehjeet |
| 4 | Bhandari Rutuja Sanjay |
| 5 | Biranje Sonali Uttam |
| 6 | Borgave Sourabh Kishor |
| 7 | Bugade Payal Dayanand |
| 8 | Chandwani Shradha Nareshkumar |
| 9 | Chawla Simran Sunil |
| 10 | Chokakkar Prafull Madan |
| 11 | Chopade Nikita Abhay |
| 12 | Chougale Suvarna Shivaji |
| 13 | Chougale Tejaswini Bajirao |
| 14 | Datar Pranav Shriram |
| 15 | Desa Rafel Rujay |
| 16 | Desai Pradnya Ramesh |
| 17 | D'souza Priya Motes |
| 18 | Ekal Pooja Suresh |
| 19 | Gaikwad Samrudhi Vijaykumar |
| 20 | Ghatage Hrutik Avinash |
| 21 | Ghodake Pruthviraj Maruti |
| 22 | Ghorpade Harshawardhan Ajitsingh |
| 23 | Ghotane Richa Ranjeet |
| 24 | Godhade Gajanan Jayvant |
| 25 | Gurav Pratiksha Sardar |
| 26 | Gurav Rushikesh Balkrishna |
| 27 | Hajare Snehal Satapa |
| 28 | Hande Vaishnavi Amar |
| 29 | Ingale Anirudh Uday |
| 30 | Jadhav Aditi Ajay |
| 31 | Jadhav Monali Santosh |
| 32 | Jadhav Shila Thavaru |
| 33 | Jadhav Shraddha Mangesh |
| 34 | Jadhav Vinay Subhash |

| | |
|----|--------------------------------|
| 35 | Jagatap Shital Bharat |
| 36 | Jewrani Geeta Rajkumar |
| 37 | Kadam Gauri Dattatray |
| 38 | Kadam Vijay Sanjay |
| 39 | Kalugade Sourabh Ravindra |
| 40 | Kamble Akshata Prafull |
| 41 | Kamble Anjali Sanjay |
| 42 | Kamble Harsha Babaso |
| 43 | Kamble Prasad Machhindra |
| 44 | Kamble Rajani Vasant |
| 45 | Kamble Saurabh Sanjay |
| 46 | Kamle Amruta Suresh |
| 47 | Karade Aishwarya Ananda |
| 48 | Karale Priyanka Bharat |
| 49 | Katkar Aniket Ashok |
| 50 | Kavthekar Safia Mohammad rafis |
| 51 | Kazi Tabasum Arif |
| 52 | Kesarwani Roma Baramdin |
| 53 | Khandekar Rutuja Narayan |
| 54 | Khot Ashwini Shivaji |
| 55 | Khot Swapnil Sanjay |
| 56 | Khot Vaishnavi Nijappa |
| 57 | Koli Mohini Umashankar |
| 58 | Kshirsagar Shradha Vikas |
| 59 | Kulkarni Divya Ashok |
| 60 | Kumbhar Vrushali Sagar |
| 61 | Kurdekar Sakshi Krishna |
| 62 | Lohar Sushma Madhukar |
| 63 | Lokhande Ketki Kisan |
| 64 | Madake Prathamesh Krishnat |
| 65 | Magdum Pranali Manik |
| 66 | Mahadik Ishwari Sadashiv |
| 67 | Malavi Sayali Gautam |
| 68 | Mane Rutuja Sanjay |
| 69 | Mane Shivani Kiran |
| 70 | Mane Snehal Dipak |
| 71 | Marulkar Geetanjali Sugandh |
| 72 | Masute Komal Kiran |
| 73 | Masute Mansi Uday |
| 74 | Mhetri Bhakti Sukumar |
| 75 | Mujawar Aaliya Altaf |
| 76 | Mujawar Fahim Sajid |

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|-----|----------------------------|
| 77 | Mujawar Sania Abdulgani |
| 78 | Mulani Arbaz Yunus |
| 79 | Mulla Jabiulla Abuloakar |
| 80 | Mulla Samiya Isak |
| 81 | Naik Sushmita Prakash |
| 82 | Naikawadi Firdaus Anjum |
| 83 | Nalawade Sadanand Gangaram |
| 84 | Nangare Vrushali Pandurang |
| 85 | Navale Sumit Rajendra |
| 86 | Nigade Samruddhi Subhash |
| 87 | Ombase Tejas Bajirao |
| 88 | Pange Pratiksha Prabhakar |
| 89 | Parande Parhina Yasin |
| 90 | Patil Bhagyashri Balasaheb |
| 91 | Patil Bhagyashri Bhimarao |
| 92 | Patil Dhanashree Shankar |
| 93 | Patil Harshada Hambirrao |
| 94 | Patil Kirti Vijay |
| 95 | Patil Manasvi Sardar |
| 96 | Patil Omkar vilas |
| 97 | Patil Onkar Narayan |
| 98 | Patil Rajvardhini Jaysing |
| 99 | Patil Rutwik Subhash |
| 100 | Patil Sandhyarani Namdev |
| 101 | Patil Sanket Nemgonda |
| 102 | Patil Shrutika Satish |
| 103 | Patil Snehal Maruti |
| 104 | Patil Suchita Dattatray |
| 105 | Patil Suyog Raosaheb |
| 106 | Patil Vaishnavi Suresh |
| 107 | Pattankude Chaitali Shital |
| 108 | Powar Phulabai Prakash |
| 109 | Powar Sakshi Santosh |
| 110 | Powar Swanand Bajiravo |
| 111 | Rajput Nilesh Mansing |
| 112 | Ramane Suraj Balavant |
| 113 | Ranage Snehal Kundan |
| 114 | Ranamale Pooja Bandopant |
| 115 | Redekar Snehal Ramchandra |
| 116 | Rugge Poonam Kiran |
| 117 | Sakhalkar Veda Sunil |
| 118 | Salavi Akansha Rajaram |

| | |
|-----|--------------------------------|
| 119 | Salavi Sonali Mahadev |
| 120 | Salwankar Siddhi Dhananjay |
| 121 | Sangar Srushti Santosh |
| 122 | Sangawadekar Niranjandas Anand |
| 123 | Sarvagode Priti Vikas |
| 124 | Sawant Shreya Gopal |
| 125 | Sawat Mrunal Krishnat |
| 126 | Shahapurkar Samruddhi Anil |
| 127 | Shelar Samiksha Umesh |
| 128 | Shevale Yogiraj Shivaji |
| 129 | Shinde Omkar Dilip |
| 130 | Shirke Abhishek Chandrakant |
| 131 | Shivtankar Shubham Anant |
| 132 | Singh Varsha Rajesh |
| 133 | Sutar Akshata Parshuram |
| 134 | Upadhe Anjiri Sachin |
| 135 | Wadkar Rushikesh Dhondiram |
| 136 | Warake Pratiksha Namdeo |
| 137 | Yegade Ganesh Shankar |
| 138 | Yevaluje Swapnali Madhukar |

Dr. Gayatri
 Head
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Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur (Autonomous)
Department of Zoology
 Academic year-2019-2020

Add On Course "Beekeeping and honey processing"

RESULT

| Sr. No. | No. of students with Grade A ⁺ | No. of students with Grade A | No. of students with Grade B ⁺ | No. of students with Grade B | Total No. of students |
|---------|---|------------------------------|---|------------------------------|-----------------------|
| 1 | 42 | 18 | 11 | 67 | 138 |

A⁺ - Above 80

A - Between 70 & 80

B⁺ - Between 60 & 70

B - Below 60

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Shri Swami Vivekanand Shikshan Sanstha's

VIVEKANAND COLLEGE , KOLHAPUR (AUTONOMOUS)

NAAC Accredited 'A' Grade with CGPA 3.24, ISO 9001:2015 Certified

Affiliated to Shivaji University, Kolhapur



DEPARTMENT OF ZOOLOGY

CERTIFICATE



This is to certify that Mr./Ms. Patil..... Bhagyashri..... Balasahel.....


of B.Sc. I /II /III / Roll No. 50..... has successfully completed the Add on Course

" Bee Keeping and Honey Processing " carried out in the Department of Zoology, Vivekanand

College, Kolhapur (Autonomous) during academic year 2019-2020. This certificate is

awarded to him / her after passing theory and practical examination.


Co-ordinator


PRINCIPAL
Vivekanand College
Kolhapur