

**DEPARTMENT OF ZOOLOGY**  
C M S COLLEGE  
KOTTAYAM

**BENEFITS**

- *Job resource*
- *income source*
- *bolster one's credentials*
- *eco friendly*
- *provides competitive advantage*
- *boosting confidence*

For details contact- Course coordinator :

Dr. Baaby Job-8589015-016

# Applied biology for sustainable livelihood I

value added Programme



Course	Details				
Code	ZYA181201				
Title	Applied biology for sustainable livelihood-I				
Degree	Undergraduate				
Branch(s)	Zoology				
Year/Semester	I/II				
Type	Value added Programme				
Credits	2	Hrs/Week	2	Total hours	36

<i>Objectives</i>	
1	To develop expertise in the preparation of indigenous cow based products and promote the conservation and rearing of local breeds of cattle
2	Equip the students to acquire additional income through mushroom cultivation and promote self-employment

CO No.	<i>Expected Course Outcomes</i> <i>Upon completion of this course, the students will be able to:</i>	Cognitive Level	PSO No.
1	Understanding the scope, need of conservation and benefits of indigenous breeds of cattle	U	4
2	Apply the concept of organic farming through the preparation of cow products and biopesticides	Ap	4
3	Create an awareness program on indigenous breeds and organic farming through organic product fest	C	4
4	Understand the concept of mushroom cultivation, types, substrates and diseases	U	4
5	Apply the concept of Mushroom cultivation in the preparation of mushroom bed	Ap	4

\*PSO-Program Specific outcome; CO-Course Outcome;  
Cognitive Level: R-Remember; U-Understanding; Ap-Apply; An-Analyze; E-Evaluate; C-Create

<b>Module</b>	<b>Course Description</b>	<b>Hrs</b>	<b>CO No.</b>
<b>1.0</b>	<b>Conservation of indigenous cattle breeds of Kerala and its applications</b>	<b>7</b>	<b>1-7</b>
1.1	Scope and importance of indigenous cattle rearing.	1	1
1.2	Major breeds of cattle in India and indigenous cattle breeds of Kerala	2	4
1.3	Common management practices of indigenous cattle rearing & milking. A1 and A2 milk and its implication	2	2
1.4	Value-added products of cattle rearing	1	3,5
1.5	Organic farming and its present relevance, biopesticides and its relevance	1	3,5
<b>2.0</b>	<b>Mushroom Cultivation</b>	<b>9</b>	<b>6,7</b>
2.1	Mushrooms – Nutritional and health benefit	1	6
2.2	Common edible mushrooms.	2	6
2.3	Introduction to mushroom cultivation (Button mushroom, Paddy straw mushroom, Oyster mushroom)	2	6
2.4	Substrates for mushroom cultivation	2	6
2.5	Diseases of mushrooms	2	6
3.0	<b>Practical</b>	<b>18</b>	
3.1	Identification of different local cattle breeds of Kerala	1	4
3.2	Production of value added products from local cattle	4	3
3.3	Biopesticide preparation (any 3)	3	3
3.4	Disinfection methods of mushroom beds	2	
3.5	Preparation of 4terilized mushroom beds and management	5	
3.6	Mushroom spawn production	3	

## Reference

1. Shubhrata R Mishra. Techniques of mushroom cultivation
2. Tradd Cotter. Organic Mushroom Farming and Myco-remediation: Simple to Advanced and Experimental Techniques for Indoor and Outdoor Cultivation
3. Creed Lane, E.C. (1900) Cow-keeping in India; a simple and practical book on their care and treatment, their various breeds, and the means of rendering them profitable THACKER, SPINK & CO. London
4. F. Ware (2017). Survey of Some Important Breeds of Cattle and Buffaloes in India. Printed by the Government of India Press, Delhi – 1942
5. Subratam. Dattas.V. Ngachan Biswas Mushrooms: A Manual for Cultivation

6. Malcolm I. Hunter, JR. and James Fundamentals of conservation biology (3<sup>rd</sup> ed.) Gibbs. Blackwell publishing.
7. Gary K. Meffe and C. Ronald Carroll Principles of Conservation biology. Sinauer Associates Inc.
8. David MacDonald and Katrina. Key topics in conservation biology. Edited by Service. Blackwell publishing
9. Shubhrata R Mishra. Techniques of mushroom cultivation
10. Tradd Cotter. Organic Mushroom Farming and Myco-remediation: Simple to Advanced and Experimental Techniques for Indoor and Outdoor Cultivation
11. Creed Lane, E.C. (1900) Cow-keeping in India; a simple and practical book on their care and treatment, their various breeds, and the means of rendering them profitable THACKER, SPINK & CO. London
12. F. Ware (2017). Survey of Some Important Breeds of Cattle and Buffaloes in India. Printed by The Government of India Press, Delhi – 1942
13. The Complete Book on Organic Farming and Production of Organic Compost NPCS Board of Consultants & Engineers 2008. Asia Pacific Business Press Inc.
14. The Complete Technology Book on Biofertilizer and Organic Farming (2<sup>nd</sup> Revised Edition) [NI115] by NIIR Board.
15. The Complete Technology Book on Vermiculture and Vermicompost [NI116] by NPCS Board of Consultants and Engineers
16. Biopesticides Handbook [NI210] by NPCS Board of Consultants & Engineers
17. H. Panda, Manufacture of Biofertilizer and Organic Farming [NI239]



18<sup>th</sup> Monday 2019 (November)

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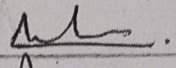
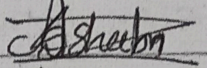
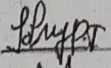
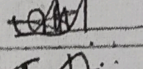
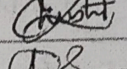
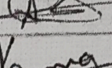
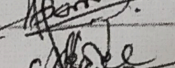
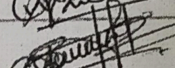
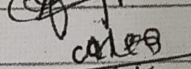
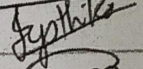
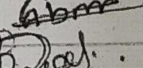
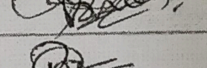
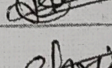
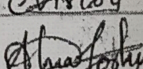
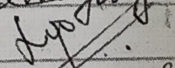
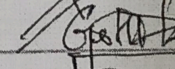
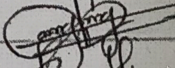
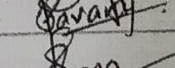
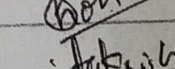
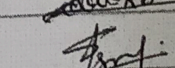
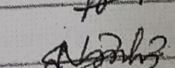
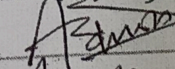
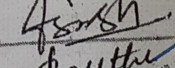
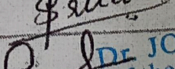
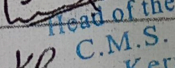


	Name of the Student	Signature
	Lakshmi Nair	Laksh
	Devu Krishna S	Devu
3.	Achsaah Susan Mathew	Achsa
4.	Mahana Sherin. O	Sherin
5.	APARNA. S	Aparna
6.	Vannima. V. Nair	Vannima
7.	Leena. C. P	Leena
8.	Abhinna mol Baiju	Abhinna
9.	Iyothika Biju	Iyothika
10.	Arumtha Dajeev	Arumtha
11.	Geeethu C.A	Geeethu
12.	Chinnumol K. Joshy	Chinnumol
13.	Sheeba Mariya John	Sheeba
14.	Neethu George	Neethu
15.	Malavika Prasanna	Malavika
16.	Anjali prasad.	Anjali
17.	Anto George	Anto
18.	Emmanuel Sam Johns	Emmanuel
19.	GOVIND GERRAT	Govind
20.	Ridhik. K. Babu.	Ridhik
21.	ABHIJITH. T. A	Abhijith
22.	AASHISH. BOMMEN MATHEWS	Aashish
23.	SRUTHI MARIAM MATHAI	Sruthi
24.	Riya Tolly	Riya
25.	Christeena Mary Sebastian	Christeena
26.	Akhila. K. Nirmalkumar	Akhila
27.	Swapna Darshini M	Swapna
28.	Aleena Nazim Muhammed M	Aleena
29.	Johny P.J	Johny
30.	Nila. M	Nila

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19<sup>th</sup> November 2019.F.N

(10 Am - 1 pm)

Name of Student	Signature.
Deethu George	
Sheeba Mariya John	
Johny PJ	
Achsalu Susan Mathew	
Christy Maria Duvil	
Devkeshina	
Aparna S	
Urmila V Naik	
Ashwarya B Naik	
Aleena stally	
Jyothika Bija	
Abhinav M Baiju	
Chinnuraj K Joshy	
Riya Jolly	
Christeena Mary Sebastian	
Alma K Joshy	
Leena	
Greetha	
Anto George	
Lavanya Subhash	
Shon Joseph	
Yadukrishnan	
Govind Gopal	
Nila	
AASHISH CHANDAN	
ABHINAV	
Sruthi Mathan Mathai	
Emmanuel John Johns	
Ridhika	
Adnan	

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(2-4 PM)

Name of the Student

Signature

1. Johnny P.J
2. Unnima V. Nair
3. Apwarya S. Nair
4. Asiya
5. Swapna Darshini M
6. Chinnumol K Joshy
7. Abhinav T.A
8. shawn josph
9. nira m
10. Aashish somen
11. Mahana Sherin O
12. Aparna S
13. Achsal Susan Mathew
14. Devukrishna S.
15. Lakshmi Nair
16. Alceena Nazim Muhammed M
17. Riya Jolly
18. Christeena Mary Sebastian
19. Geethu G.A
20. Alina K. Joshy
21. Leena C
22. Bruthi Mariam Mathai
23. Anto George
24. Emmanuel Sam Johns
25. GOVIND GEERAN
26. Ridhik K. Babu.
27. Aashish Sommen Mathews
28. Yadu Krishnan S
29. Lavanya Subhash
30. Anyali prasad.
31. Malavika Prasanna

Johnny P.J  
Unnima  
Apwarya  
Asiya  
Swapna  
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Mahana  
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Devukrishna  
Lakshmi  
Alceena  
Riya  
Christeena  
Geethu  
Alina  
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Bruthi  
Anto  
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Ridhik  
Aashish  
Yadu  
Lavanya  
Anyali  
Malavika

MATH  
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20<sup>th</sup> November 2019

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(10 AM - 1 PM)

- 1 Reshma . A . S
- 2 Shuba Mariya John
- 3 Malavika Prasanna .
- 4 Abhinamol Baiju
- 5 Unnima . Y . Nair
6. Aiswarya . S . Nair
7. Aleena stanly .
8. Mahana sherin O.
9. Aparna S
- 10 Riya Jolly
- 11) Christeena Mary Sebastian
- 12) Alina . K . Joshy
- 13 Leena . C . J
- 14) Akhila . K . Nirmalkumar
- 15). Aleena Nazim Muhammed M
- 16) Chinnamol K Joshy
- 17) Meenakshi S Chirayil .
- 18) Lavanya Subhash
- 19) Shon Joseph
- 20) Geethu GA
- 21) Ridhik . k . Babu .
- 22) EMMANUEL SAM JOHNS
- 23) Anto George
- 24) Govind Greeraj
- 25) Yada Krishnan S
- 26) Sruthi Mariyam Mathai
- 27) Neethu George
- 28) Devu Krishnan S
- 29) Lakshmi Nair
- 30) Achsal Susan Mathew .
- 31) Swapna Darshini M
- 32) Asiya
- 33) Johny PJ .

~~Reshma~~  
~~Shuba~~  
~~Malavika~~  
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20<sup>th</sup> November 2019

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C2-HPI

- 1 Anto George
- 2 Riya Jolly
- 3 Geethu CA
- 4 Neethu George
- 5 Unnima V. Nair
- 6 Shon Joseph
- 7 Duni Krishna S
- 8 Yodubaiyan S
- 9 Emmanuel Sam John
- 10 Mahana Sheerin D
- 11 Swapna Daashini M
- 12 Akhila K. Nirmalkumar
- 13 Asiya
- 14 Alina K Joshy
- 15 Gee Rithik K Babu
- 16 Leena C P
- 17 Aparna S
- 18 Govind Guraj
- 19 Chennumol K Joshy
- 20 Christena Mary Sebastian
- 21 Aileen Nazim Muhammed M
- 22 Sheeba Mariya John
- 23 Abhinav mol Baiju
- 24 David Lakshmi Nair
- 25 Anto George Aileen Stanley
- 26 Shreshth Mariam Mathai
- 27 Aswarya S Nair
- 28 Reshma - A.S
- 29 Aishah Susan Mathew
- 30 Meenakshi S Chirag
- 31 Aashish Oommen Mathew
- 32 Johnny P.J

~~Anto George~~  
~~Riya Jolly~~  
~~Geethu CA~~  
~~Neethu George~~  
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~~Reshma - A.S~~  
~~Aishah Susan Mathew~~  
~~Meenakshi S Chirag~~  
~~Aashish Oommen Mathew~~  
~~Johnny P.J~~

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REDMI NOTE 5 PRO  
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## Report on Value added programme Applied biology for sustainable livelihood-I

Course offered by- Department of Zoology, CMS College Kottayam (Autonomous)

Course offered to- Second semester B.Sc. Zoology students

The value added program offered by the Department of Zoology 'Applied biology for sustainable livelihood I' to second semester B.Sc. Zoology students began on 18<sup>th</sup> November 2019. The course was designed with 18 hours of both theory and practical to develop expertise in the preparation of indigenous cow-based products and promote the conservation and rearing of local breeds of cattle and to equip the students to acquire additional income through mushroom cultivation and promote self-employment. A total of 40 students enrolled for the programme.

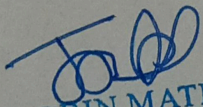
Students were given hands on training on the preparation of gau based fertilizers, organic fertilizers and biofertilizers. The students were also trained on various stages of mushroom cultivation like preparation of hay, preparation of mushroom bed and harvesting and maintaining of mushroom bed.

Classes were conducted mainly on Saturdays as well as during zero hours.

Theory classes mainly focussed on identifying the indigenous cattle breeds of India, especially Kerala, the benefits of desi cows and its products, rearing of desi breeds as well as the need for protecting and promoting the indigenous breeds of our country, identifying different types of mushroom, mushroom as a protein source, do's and don'ts of mushroom cultivation, diseases of mushroom as well as the success stories of different mushroom farmers.



Students preparing mushroom bed

  
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Students using Kahoot

Power point presentation, videos and pictures were used for conveying the main concept of the course. Students were also asked to participate in game-based questions using the platform Kahoot. All these helped the students to understand the concepts and reach the objective of the course.

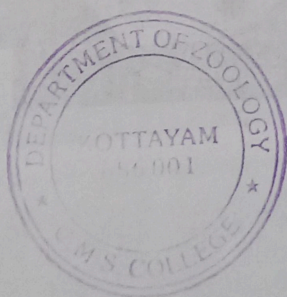
The students were also encouraged to conduct Eco shop for the sale of the products prepared by them. This helped them to boost their entrepreneurial skills and self-confidence, which in future help them for income generation by putting the theory they learned into practice.



Eco shop- sale of mushroom beds, biofertilizers



The evaluation was done using an internal exam of 30 marks on 03/03/2020 and an external exam of 40 marks conducted on 06/03/2020. A feed back from the students enrolled for the course indicated that most of them strongly agreed with the course outcome and will help them earn an income in the future.



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