

**1.2.1. Report of Add-On Courses
(2020 – 21)**

**Water Quality Monitoring and Pollution
Management**

Department of Zoology

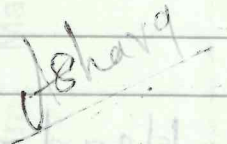
2020 – 21

Notice

Dept of Zoology is offering an Addon course on "Water quality and Pollution Management" during the academic year 2020-21. The courses will be conducted via google meet. Those who wish to join may whatsapp their names to the course Coordinator



Head of the Department



Dr. Asha V. G.
Course Coordinator



Principal
Mahatma Gandhi College
Thiruvananthapuram

ADD-ON COURSE 2020-21

WATER QUALITY AND POLLUTION MANAGEMENT

INSTRUCTIONAL HOURS -30 hrs

COURSE DESCRIPTION

The purpose of the course is to develop understanding of water quality criteria, standards, impacts of water pollutants and treatment methods. It focuses on cause and effects of water pollution and water treatment methods.

Course objectives

1. To understand water quality criteria, and standards
2. To comprehend knowledge about sources, cause and impacts of water pollutants
3. To be abreast with physical, chemical and biological methods of water treatment
4. To build understanding of water quality parameters and their relation to public health and environment.

Learning outcomes

7. Understand meaning of important parameters for measuring water quality;
8. Gain insight into key concepts of water quality, water quality and health
9. Learn how to run accurate water quality tests and to determine how the parameters relate to each other;

Pedagogical approach

Classroom teaching, field work and laboratory work

SYLLABUS

MODULE I

INTRODUCTION-water resources of India - Different ecosystem of Hydrology Riverine, Estuarine and marine - Water quality and health Linkag, - Water borne diseases- Standards of potable water-5hrs

MODULE II

Water quality parameters and their interaction- physical characteristics - turbidity, color - temperature , pH- chemical constituents, taste, color, Chemical constituents -acidity, alkalinity - Co₂, hardness,- BOD, COD-Methods of testing- 5 Hrs

MODULE III

Waste water Treatment (5 Lectures)-Introduction of wastewater, its types and various sources, Concept of sewage, , Necessity of treatment of waste water -Preliminary treatment: screening and grit removal units, oil and grease removal, Primary treatment, Secondary treatment: Activated sludge process, trickling filter, sludge digestion, Stabilization pond (Brief Description only) -10 hrs

Module IV

Water resources and quality management in India- Status of water quality in India-water stress index; status and trend of surface and groundwater; issues and policy interventions; pollution of rivers, lakes and ground water; GAP and National River Action Programme; role of national and international agencies in water health and sanitation. -10hrs

Reference :

1. Hydrology – Principles, analysis and Design- H.M Ragunath, New age International Publications.(1996)
- 2.. Standard methods for the examination of water and wastewater published by APHA 15th ed.



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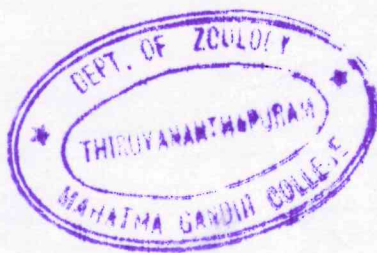
Dr. Balamurali R.S.
Head of Department
Postgraduate and Research Department of Zoology
Mahatma Gandhi College, Thiruvananthapuram 695004

A handwritten signature in green ink, appearing to be "M.G.", written over a horizontal line.

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Thiruvananthapuram

PORTION ALLOTMENT

S L N O	TOPIC	Name of the teacher	Hours
	MODULE I INTRODUCTION-water resources of India - Different ecosystem of Hydrology Riverine, Estuarine and marine - Water quality and health Linkag, - Water borne diseases- Standards of potable water-	AVG	5 hrs
	MODULE II Water quality parameters and their interaction- physical characteristics - turbidity, color - temperature , pH- chemical constituents, taste, color, Chemical constituents -acidity, alkalinity - Co ₂ , hardness,- BOD, COD-Methods of testing-	AVG	5 hrs
	MODULE III Waste water Treatment -Introduction of wastewater, its types and various sources, Concept of sewage, , Necessity of treatment of waste water -Preliminary treatment: screening and grit removal units, oil and grease removal, Primary treatment, Secondary treatment: Activated sludge process, trickling filter, sludge digestion, Stabilization pond (Brief Description only)	AMN	10 hrs
	Module IV Water resources and quality management in India- Status of water quality in India-water stress index; status and trend of surface and groundwater; issues and policy interventions; pollution of rivers, lakes and ground water; GAP and National River Action Programme; role of national and international agencies in water health and sanitation.	PM	10 hrs



Dr. Salamurai R.S.
 Head of Department
 Postgraduate and Research Department of Zoology
 Mahatma Gandhi College, Thiruvananthapuram 695001

ENROLLMENT 20-21

Atswayya.

Neethun A. B

1	Aarsha. S. Kumar	2	Akhil Dev	34	Abhishek. B S
2	Akhil Dev	3	Arya R	35	Lekshmi Priyalek
3	Arya R	4	Aswin Amal	36	AKASH S
4	Aswin Amal	5	Devikrishna. M	37	Lekshmi Dinesh
5	Devikrishna. M	6	Dhanush R Bayu	38	Midhila. SS
6	Dhanush R Bayu	7	Ganga Sreekumar	39	Sruthy. S
7	Ganga Sreekumar	8	Jaya krishnan	40	Aiswalya GS
8	Jaya krishnan	9	Kaithika Krishnan	41	AKASH KRISHNA H
9	Kaithika Krishnan	10	Krishna Priya P	42	AKSHAYE. S. AJITH
10	Krishna Priya P	11	M. Akshitha	43	Anand. S. Gini
11	M. Akshitha	12	Manjima Rajendran	44	Archa S.M
12	Manjima Rajendran	13	Megha MS	45	Chanchal. S.U
13	Megha MS	14	Nidhun M R	46	Drusya Gopal
14	Nidhun M R	15	Sandra Vinod	47	Grayathe. P Lajet
15	Sandra Vinod	16	Sreeleekthy S	48	Kanje Santhosh
16	Sreeleekthy S	17	Sruthylekshmi VB	49	Manesaperu. M
17	Sruthylekshmi VB	18	Abhinav-SL	50	Mayoolche Thulas.
18	Abhinav-SL	19	Abhirami B		
19	Abhirami B	20	Anandhu R.T		
20	Anandhu R.T	21	Aparna A P		
21	Aparna A P	22	Aswathy CS		
22	Aswathy CS	23	Aswini P.G		
23	Aswini P.G	24	Jaya krishnan S		
24	Jaya krishnan S	25	Kaithika SS		
25	Kaithika SS	26	MG Mohith		
26	MG Mohith	27	Meghana G		
27	Meghana G	28	Nandhini V		
28	Nandhini V	29	Nikhitha P		
29	Nikhitha P	30	Sarayu Manavally		
30	Sarayu Manavally	31	Sreelekshmi P		



(Signature)

Dr. Balamurali R.S.
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(Signature)

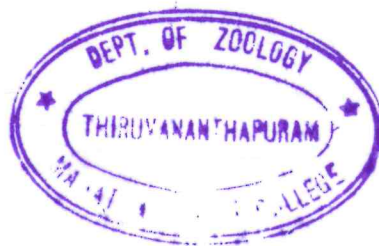
ASSESSMENT QUESTIONS

Time 1hrs

Total Marks : 30

I.. Answer any five of the following Each questions carries 5 marks

1. Comment on the nutritional requirement of aquarium fishes .
- 2.Explain the breeding of marine ornamental fishes ;
- 3.Comment on reef aquarium.
4. . Comment on aquarium plants.
- 5.Give an account on indigenous ornamental fishes in Kerala
- 6Give an account on Live bearers.
- 7.What is a biofilter ?
8. How can we control the growth of snails in aquariums ? (5 x 5=25)



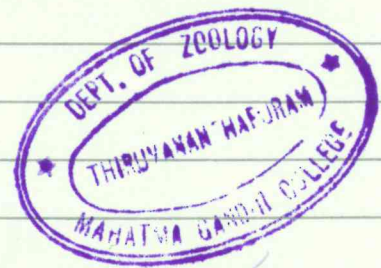
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Post Graduate Research Department of Zoology
Mahatma Gandhi College, Thiruvananthapuram 695004

Principal
Mahatma Gandhi College
Thiruvananthapuram

Mark list

1	Aarsha.S.Kumar	18	35	Leeshmi Priya.K	32
2	Akhil Jev	22	36	Ahash S	18
3	Arya R	18	37	Leeshmi Dinesh	24
4	Aswin Arul	16	38	Midhila.SS	28
5	Devikrishna.M	28	39	Srutthy.S	30
6	Dhanush R Bayri	19	40	Aiswarya G.S	23
7	Ganga Sreekumar	18	41	Ahath Krishna H	24
8	Jayakrishnan	24	42	Akshaya.S.Ajith	25
9	Karthika Krishnan	28	42	Anand.S.Giri	28
10	Krishna Priya P	19	44	Archa S.M	23
11	M. Akshitha	24	45	Chanchal.S.U	22
12	Manjima Rajendran	25	46	Drisya Gopal	21
13	Megha M.S	29	47	Gayathri.P.Lalitha	23
14	Nidhun M.R	26	48	Kavya Sauthosh	24
15	Sandra Vinod	28	49	Maveeshk.MS	25
16	Sreevathy S	24	50	Mayookha Thulas.	28
17	Srutthy Leeshmi VB	22	51		
18	Abhinav.SL	14			
19	Abhirami.B	16			
20	Anandhu R.J	24			
21	Aparna A.P	28			
22	Aswathy C.S	24			
23	Aswini P.G	29			
24	Jayakrishnan S	24			
25	Karthika SS	22			
26	MG Mohith	19			
27	Meghana G	15			
28	Nandhini V	14			
29	Nikhitha P	12			
30	Sarayu Manavathy	18			
31	Sree Lakshmi.P	24			
32	Sreevathy.SR	26			



Dr. Balamurali R.S.

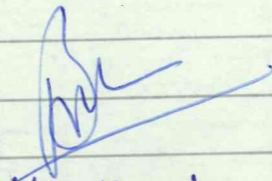
Head of Department

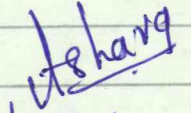
Postgraduate and Research Department of Zoology
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Mahatma Gandhi College

CERTIFICATE

The Add on course on 'Water quality and Pollution management' conducted by the Dept of Zoology was successfully completed


Head of the Dept


Dr. Asha G
Course Coordinator




Principal
Mahatma Gandhi College
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Mushroom Cultivation

Department of Botany

2020 – 21



MAHATMA GANDHI COLLEGE

THIRUVANANTHAPURAM

POST GRADUATE DEPARTMENT OF BOTANY & RESEARCH CENTER

NOTICE

ADD-ON COURSE –MUSHROOM CULTIVATION

Dear students,

We are excited to announce the introduction of an Add-On course titled "Mushroom Cultivation" for the academic year 2020-2021. This course aims to provide students with an in-depth understanding of mushroom cultivation techniques and their practical applications.

Details of the Add-On Course:

Course Duration: 3 months

Start Date: 13/07/2020

End Date: 31/10/2020

Time: 0 hr

Venue: Room 55

Registration Details

Last Date for Registration: 30/06/2020

Seats are limited, and admission to the course will be on a first-come, first-served basis. Interested students are encouraged to register at the earliest to secure their spot.

For any queries or additional information, please contact the course coordinator, Head, Department of Botany at the department office between 10:00 AM to 4:00 PM on weekdays.

Warm regards,

Head, Department of Botany

Principal
Mahatma Gandhi College
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**MAHATMA GANDHI COLLEGE
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Re-accredited with B+ Grade by NAAC

**ADD ON COURSE
MUSHROOM CULTIVATION
COURSE STRUCTURE AND SYLLABUS**

BY

**POST GRADUATE DEPARTMENT &
RESEARCH CENTRE OF BOTANY**



(2018 onwards)

OBJECTIVES OF THE COURSE

- **Understanding Mushroom Biology:** Studying mushroom cultivation involves gaining a deep understanding of the biology, life cycle, and growth requirements of different mushroom species.
- **Cultivating Edible Mushrooms:** One of the main objectives of studying mushroom cultivation is to produce edible mushrooms for consumption and commercial purposes. This involves learning about the specific cultivation techniques, substrate preparation, spawn production, and environmental conditions required for different mushroom species.
- **Disease Management:** Studying mushroom cultivation includes researching and developing strategies for the prevention and management of diseases that can affect mushroom crops. This objective focuses on understanding common pathogens, identifying disease-resistant strains, implementing proper sanitation practices, and exploring alternative disease control methods.
- **Economic Viability and Market Development:** This objective includes conducting market research, evaluating consumer preferences, analyzing production costs, and exploring value-added product development to support successful commercialization and entrepreneurship in the mushroom industry.


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EXPECTED OUTCOMES OF THE COURSE

- **Increased Knowledge and Understanding:** Studying mushroom cultivation leads to a deeper understanding of mushroom biology, cultivation techniques, and the factors influencing mushroom growth and development.
- **Improved Cultivation Techniques:** Through research and study, new and improved cultivation techniques can be developed. Improved techniques can result in higher yields, better quality mushrooms, and more efficient production processes.
- **Enhanced Disease Management Strategies:** Research on mushroom cultivation helps in identifying and developing effective strategies for disease prevention, early detection, and management.
- **Sustainable Cultivation Practices:** Studying mushroom cultivation promotes the development and adoption of sustainable practices. This includes exploring alternative and renewable substrates, implementing recycling and waste management strategies, minimizing the use of synthetic inputs, and reducing the environmental footprint of mushroom cultivation.
- **Increased Commercial Viability:** By improving cultivation techniques, optimizing production processes, and developing marketable products, the profitability and competitiveness of mushroom farming can be enhanced. This benefits farmers, entrepreneurs, and the overall mushroom industry.
- **Training and Education Opportunities:** Studying mushroom cultivation creates opportunities for training programs, workshops, and educational resources.


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COURSE STRUCTURE

DURATION : 30 Hrs

ASSESSMENT & CERTIFICATION : The trainee will be tested for his skill, knowledge and attitude during the period of training and at the end of the training programme including practical examinations.


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MUSHROOM CULTIVATION

SYLLABUS

(Total 30 hrs)

MODULE-I

(10 hrs)

- History and introduction of Edible and Poisonous mushrooms.
- Common Indian mushrooms.
- Systematic position, morphology, distribution, structure of *Agaricus* and *Pleurotus*.

MODULE- II

(5 hrs)

- Nutritional value, medicinal value and advantages- types- milky, straw, button and poisonous mushrooms
- Production level, economic return, Foreign exchange from Mushroom cultivating countries and international trade.

MODULE- III

(10 hrs)


- Cultivation of Paddy straw mushroom, Oyster mushroom, white button mushroom and milky mushrooms
- Spawn making, Substrate preparation, Maintenance and Harvesting
- Composting

MODULE- IV

(5 hrs)

- Diseases- Common pests, disease prevention and control measures- *Agaricus*, *Pleurotus* and *Volverilla*.
- Processing and storage of mushrooms

Field Study: Visit to a mushroom cultivating Laboratory and handson training for processing.


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POST GRADUATE DEPARTMENT AND RESEARCH CENTRE OF BOTANY

THIRUVNANTHAPURAM

ADD ON COURSE –2020- 2021


LIST OF STUDENTS-MUSHROOM CULTIVATION

SL.NO	NAME OF STUDENT	CLASS/ SEMESTER
1	GREESHMA G S	II PG
2	KAVYA VIJAYAN B	II PG
3	LEKSHMI S PRADEEP	II PG
4	AARCHA J S	I PG
5	ANJALI KRISHNAN A B	I PG
6	ANUPAMA A V	I PG
7	ARDRAJS	III UG
8	BKARTHIKAKRISHNAN	III UG
9	DHANAKRISHNA.R.R	III UG
10	G.GOPIKRISHNA	III UG
11	KARTHIKAMOCHAN	III UG
12	KRISHNAGADHAM	III UG
13	LEKSHMI.S.S	III UG
14	MEGHANATH.A	III UG
15	NAVYABS	III UG
16	SREELEKSHMIPS	III UG
17	SUFANANOUSHAD	III UG
18	ANAKHA.A.NAIR	III UG
19	ARYA.A.S	III UG
20	KAVYA.T.NAIR	III UG
21	KAVYASHAJI.C.S	III UG
22	PARAMESWAR V A	II UG
23	RESHMA BAIJU	II UG
24	SAINA SAIFUDEEN	II UG
25	SOORYA DUTT.S	II UG
26	SRUTHI RAJ L	II UG
27	SURAJ M	II UG
28	VISHNUMOHAN M . A	II UG

29	KRISHNA M R	II UG
30	APARNA .M . S	II UG
31	NEERAJA M R	II UG
32	PARVATHI M J	II UG
33	ABHIRAMIAR	II UG
34	AKHILABS	II UG
35	AMALV	II UG
36	ANJIMABINOJ	II UG
37	AMALDEVS	I UG
38	ANJANA.M.S	I UG
39	ANJITHAPRASAD.S.L	I UG
40	APARNA.A	I UG
41	CHANDHANANS	I UG
42	GOPIKA.J	I UG
43	KRISHNENDUA.P.	I UG
44	MPRAVEENAPRATHAPAN	I UG
45	NANDANAS.	I UG
46	SANDEEPS	I UG
47	SANDRAUSAJAN	I UG
48	VIJITHASU	I UG
49	AMALKRISHNAM	I UG
50	ANJALIBS	I UG


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**MAHATMA GANDHI COLLEGE
THIRUVANANTHAPURAM**

**DEPARTMENT OF BOTANY
SEMESTER V**

VALUE ADDED COURSE- MUSHROOM CULTIVATION

(Academic year 2020-2021)

QUESTION PAPER

Total marks: 25

Duration: 1 hr

Answer the following questions

(5x1=5)

1. The poisonous compound produced by Amanita
2. Mushroom showing anti cholesterol activity
3. Scientific name of Oyster mushroom
4. Names of any two Mushroom cultivating in India / Kerala
5. Name of two poisonous mushroom

Answer any 5 questions from the following

(5x2=10)

6. Name the nutritional compound seen in mushroom
7. How to avoid mushroom poisoning
8. Explain the morphology of button mushroom
9. Name the essential amino acids present in mushrooms
10. Spawn making
11. Major steps in mushroom cultivation
12. Explain medicinal value of mushrooms
13. Polythene bag method of mushroom cultivation

Write an essay on any one of the following questions

(10x1=10)

14. Different methods of paddy straw mushroom cultivation
15. Nutritive value of mushrooms
16. Write an essay on preservation techniques of mushrooms
17. Explain the organisations meant for mushroom marketing


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THIRUVNANTHAPURAM

ADD ON COURSE – 2020 - 2021

MARK LIST OF STUDENTS - MUSHROOM CULTIVATION

SL.NO	NAME OF STUDENT	CLASS/ SEMESTER	MARK	SIGNATURE
1	GREESHMA G S	II PG	18	<i>Greeshma</i>
2	KAVYA VIJAYAN B	II PG	24	<i>Kavya</i>
3	LEKSHMI S PRADEEP	II PG	26	<i>Lekshmi</i>
4	AARCHA J S	I PG	20	<i>Aarcha</i>
5	ANJALI KRISHNAN A B	I PG	21	<i>Anjali</i>
6	ANUPAMA A V	I PG	19	<i>Anupa</i>
7	ARDRA J S	III UG	26	<i>Ardra</i>
8	B KARTHIKA KRISHNAN	III UG	21	<i>Bharathi</i>
9	DHANAKRISHNA .R.R	III UG	17	<i>Dhanakrishna</i>
10	G.GOPIKRISHNA	III UG	18	<i>Gopika</i>
11	KARTHIKA MOHAN	III UG	24	<i>Karthika</i>
12	KRISHNAGADHA M	III UG	28	<i>Krishna</i>
13	LEKSHMI.S.S	III UG	20	<i>Lekshmi</i>
14	MEGHANATH. A	III UG	22	<i>Megha</i>
15	NAVYA B S	III UG	19	<i>Navya</i>
16	SREELEKSHMI P S	III UG	21	<i>Sreelekshmi</i>
17	SUFANA NOUSHAD	III UG	23	<i>Sufana</i>
18	ANAKHA .A. NAIR	III UG	18	<i>Anakha</i>
19	ARYA.A.S	III UG	26	<i>Arya</i>
20	KAVYA.T.NAIR	III UG	25	<i>Kavya</i>
21	KAVYA SHAJI.C.S	III UG	22	<i>Kavya</i>
22	PARAMESWAR V A	II UG	20	<i>Parameswar</i>
23	RESHMA BAIJU	II UG	08	<i>Reshma</i>
24	SAINA SAIFUDEEN	II UG	28	<i>Saina</i>
25	SOORYA DUTT.S	II UG	20	<i>Soorya</i>
26	SRUTHI RAJ L	II UG	21	<i>Sruthi</i>
27	SURAJ M	II UG	06	<i>Suraj</i>
28	VISHNUMOHAN M . A	II UG	18	<i>Vishnumohan</i>

29	KRISHNA M R	II UG	28	Krishna
30	APARNA . M . S	II UG	18	Aparna
31	NEERAJA M R	II UG	20	Neeraja
32	PARVATHI M J	II UG	19	Parvathi
33	ABHIRAMI A R	II UG	24	Abhirami
34	AKHILA B S	II UG	26	Akhila
35	AMAL V	II UG	20	Amal
36	ANJIMA BINOJ	II UG	24	Anjima Binoy
37	AMAL DEV S	I UG	23	Amal
38	ANJANA . M.S	I UG	21	Anjana
39	ANJITHA PRASAD.S.L	I UG	18	Anjitha
40	APARNA .A	I UG	24	Aparna
41	CHANDHANA N S	I UG	19	Chandana
42	GOPIKA .J	I UG	20	Gopika
43	KRISHNENDU A.P.	I UG	25	Krishnendu
44	M PRAVEENA PRATHAPAN	I UG	25	Praveena
45	NANDANA S.	I UG	20	Nandana
46	SANDEEP S	I UG	19	Sanjiv
47	SANDRA U SAJAN	I UG	16	Sandra
48	VIJITHA S U	I UG	22	Vijitha
49	AMAL KRISHNA M	I UG	24	Amal
50	ANJALI B S	I UG	20	Anjali


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Report on the Add-on Course in Mushroom Cultivation

Academic Year: 2020-2021

Aiming to amalgamate traditional pedagogy with pragmatic experiences, the Department of Botany introduced an auxiliary course centered on mushroom cultivation. Tailored to cater to both Undergraduate and Post Graduate students, this 30-hour program transcended mere academic learning. It was formulated to foster scientific curiosity and instill civic responsibility in students, epitomizing the department's dedication to comprehensive education. Dr. Preetha T S, an esteemed Assistant Professor from the Department of Botany at University College, Thiruvananthapuram, championed the course. She was ably supported by a cadre of faculty members, each contributing their distinct expertise to the course modules.

Kicking off on a Saturday, the course was structured across multiple working days. Sessions were judiciously timed either pre or post the usual college hours. In her inaugural address, Dr. Preetha T S elucidated the expansive world of mushroom cultivation, encompassing the latest research trends. Her dynamic and interactive teaching style resonated with the students, sparking lively discussions. The ensuing curriculum delved into the nuances of mushroom cultivation, from techniques and tools to terminologies. Fresh, avant-garde methodologies were introduced alongside discussions on the cultural significance of mushroom farming. With a focus on promoting dialogue, students were encouraged to seek clarifications, with many expressing interest in personal mushroom cultivation endeavors.

Embedded within the course were periodic review sessions. These interactive meetups played a pivotal role in strengthening students' grasp on the subject matter. After completing the classes, an exam was held, and 48 students out of the total 50 successfully passed. On culminating the course, students were felicitated with certificates, a testament to their dedication and successful course completion. In conclusion, this add-on course on mushroom cultivation exemplifies the Botany Department's commitment to melding theoretical instruction with practical insights.

Principal
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Thiruvananthapuram