

Date: 25/05/2022

Ref: MSRASC/MB/21-22/008

**CIRCULAR**  
**DEPARTMENT OF MICROBIOLOGY**

The Department of Microbiology is organizing Value added on Programme on "Biofertilizer Production Technology from 09/06/2022. Kindly find the attached brochure and details are also available in the college website.

Register your names through the link provided:

<https://forms.gle/hHAVsJlmxReFw5u46>

Note Only 30 students per batch; selection based on first come first served basis.

**Name of the Co-ordinator:** Dr Pushpa H

**Resource persons:** Dr Puspha H and Dr Triveni A G

**Venue:** Louis Pasteur Laboratory, RCASC.

  
Head of the Department  
**Head of the Department**  
**MICRO BIOLOGY**  
**Ramaiah College of Arts,**  
**Science & Commerce**  
**Bangalore - 560 054**

  
Principal,  
M.S. Ramaiah College of Arts, Science & Commerce  
MSRIT Post, MSR Nagar  
Bangalore - 560 054

**Department of Microbiology**  
**Valued-added Programme**  
**Biofertilizer Production Technology**

**Total: 30 hours**

**Theory:**

**I. Biofertilizers: (10 hrs)**

Introduction, types of biofertilizers- *Rhizobium*, *Azospirillum*, *Azotobacter*, Cyanobacteria, *Azolla*, Phosphate solubilising microorganism.

Production, quality control and applications of biofertilizers.

**III Practicals: (10 units)- 20 hours**

1. Isolation and identification of symbiotic (*Rhizobium* sp.), Non symbiotic (*Azotobacter* sp.) and Associative (*Azospirillum* sp.) nitrogen fixing microorganism.

2. Production and assay of *Rhizobium* sp., *Azotobacter* sp., and *Azospirillum* sp.

3. Isolation, identification and mass production of Cyanobacteria.

4. Isolation and identification of Phosphate solubilising microorganisms.

5. Mass production of *Azolla* sp.

6. Production of vermicompost.

7. Industrial visit

8. Dissertation/Record

**List of equipment required**

1. Autoclave-1
2. Incubator-1
3. Hot Air Oven-1
4. Laminar Air Flow apparatus-1
5. Centrifuge-1
6. Refrigerator-1
7. Orbital shaker-1
8. Algae growth chamber-1
9. Fermentor-1
10. Micropipettes of different capacities
11. Weighing Balance-01
12. Green house (Exclusively for Microbiology experiments)



**Course outcome:**

- Understand the role of microorganism in improving the fertility of soil and also in control the pest and other pathogens.
- Will know the techniques involved in mass production, quality control and application of Bioinoculants in organic farming
- Students will have an opportunity to work in research laboratory, biofertilizer industry and can also be an bio-entrepreneurs.

Course Coordinators: Dr. Pushpa. H. Professor and HOD, Microbiology Department  
Dr. Triveni AG, Assistant Professor, Microbiology

## Value added course- Biofertilizer Production Technology

**About the course:**

The unselective use of synthetic chemical fertilizers during past four decades for increasing the agricultural yield has affected soil fertility, the water retention capacity and micronutrients content in the soil. Hence, the concept of biofertilizers is being promoted all over the world. The biofertilizers nothing but tiny beneficial microbes that enhances availability of plant nutrients to host plant and protect plants from pathogen challenges when applied. Application of biofertilizers is being advocated by the environment for sustainable agriculture. However, both availability and quantity with quality biofertilizers is confined to limited areas. Besides, there is a need to popularize the biofertilizer use among the farmers. In spite of the efforts, well trained skilled manpower to start-up small biofertilizer production units is not much available in the country. In this regard we have proposed to start this skill development certificate course.

**Objectives:**

- To promote organic farming in the region through technical capacity building of all stake holders
- To facilitate the students to understand basics of biofertilizers
- To impart training to develop skill both handling, cultivation and propagation of quality microbial inoculants
- To make students ready for industry as entrepreneurs
- To improve the professional competencies and upgrade the knowledge and develop technical skills of biofertilizer production

**Eligibility:**

- Start-up entrepreneurs willing to undertake biofertilizer business
- UG/PG Students looking forward to research and development work in biofertilizer industry after completion of program

**Course duration:**

3 months (30 hours); start from 9<sup>th</sup> June 2022

**Intake:** 50 only First come first served basis

**Plan of action:**

- The course has been designed taking the inputs from experts from industries of various domains.
- The course will be conducted both online and offline mode (Hands on skills).
- Guest Lectures by Industrial experts and successful entrepreneurs..
- Hands-on practical exposures, case studies, industrial visits and live project works.

## DEPARTMENT OF MICROBIOLOGY

### Report on

### Value added Programme on "Biofertilizer Production Technology"

### Under DBT-Star College Scheme

09-06-2022 to 19-08-2022

**Name of the Co-Ordinator:** Dr Puspha H

**Resource Persons:** Dr Pushpa. H and Dr Triveni A G

**Venue:** Louis Pasteur Laboratory, MSRCASC

**Number of Participants:** 29

Food security and sustainable agriculture are now on top of the global development agenda. Growing population, shrinking cultivable land, biotic and abiotic stress, climate change, excessive use of synthetic fertilizers, pesticides and scarcity of groundwater etc. are creating new challenges for the global agricultural research system.

In this fast-changing scenario world over, there is a need for new-age technologies and practices that could increase agricultural productivity at various levels of the supply chain. Moreover, there is a huge interest in industry to use sustainable agricultural technologies to help yield healthier crops, control pests, monitor soil, and growing conditions to support for the farmer in reducing the workload, and improve a wide range of agriculture-related tasks in the entire food supply chain.


#### Objectives of the program:

- To promote organic farming in the region through technical capacity building of all stake holders
- To facilitate the students to understand basics of biofertilizers
- To impart training to develop skill both handling, cultivation and propagation of quality microbial inoculants

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W [www.msramc.edu.in](http://www.msramc.edu.in)

  
**Head of the Department**  
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**Ramaiah College of Arts,**  
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**Bangalore - 560 054**

- To make students ready for industry as entrepreneurs
- To improve the professional competencies and upgrade the knowledge and develop technical skills of biofertilizer production

Twenty-seven students of II and III BSc registered for the course. The sessions were divided into 4 modules for 30 hours which included theory and hands on exposure.

First week the programme was inaugurated by Dr Pushpa H HOD, Microbiology, MSRCASC welcomed and addressed the students for the value-added programme and gave an overview of the same. The course was conducted in blended mode all the theory classes was online, the recorded video lecture with assignment was given to the students and the interaction on the topics were done during laboratory sessions.



To give an industrial and research exposure, industrial/institutional visit was organized to Department of Agricultural Microbiology, University of Agricultural Sciences, GKVK on 15<sup>th</sup>



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June 2022. There Dr. Maya, Senior Research Fellow, explained the process isolation, production, mass multiplication, carrier-based inoculum production, quality control process, marketing, dispatch and application of biofertilizers and biopesticides in detail. Through this student got an exposure to the mass production and entrepreneurship of Biofertilizer.

Later on every Saturday and after 4 pm during weekdays students were exposed for hands on training of isolation of Rhizobium from various leguminous plants, Azotobacter, Azospirillum, Azolla, Phosphate Solubilizers, Blue Green Algae, identification, mass production etc. Students also learnt about the process of compost preparation, Vermicompost preparation, Bioenzyme production using domestic kitchen waste and these process were also processed in our garden. The program was just to given an exposure to the process. How ever our students are in the process of the production of these fertilizers and are being used in the garden of our college campus. Finally, the course was ended on 8<sup>th</sup> August 20



Azotobacter



Rhizobium



Microscopic observation



Azospirillum

*Sulima.H*  
Head of the Department  
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*Vainavij*  
Principal,  
M.S. Ramiah College of Arts, Science & Commerce  
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**MASS PRODUCTION OF BIOFERTILIZERS**



**Bengaluru, Karnataka, India**  
 Ramaiah Institute Of Technology Aryabhata Block, Marri Boy's Hostel, M S Ramaiah  
 Nagar, Mathikere, Bengaluru, Karnataka 560054, India  
 Lat 13.032351°  
 Long 77.564987°  
 20/08/22 01:27 PM

*Shubra H*  
**Head of the Department**  
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**Bangalore - 560 054**

*Katbala Y*  
**Principal,**  
**M.S. Ramaiah College of Arts, Science & Commerce**  
**MSRIT Post, MSR Nagar**  
**Bangalore - 560 054**

**Course Outcome:**

- Students could understand the role of microorganism in improving the fertility of soil and also in control the pest and other pathogens.
- Will know the techniques involved in mass production, quality control and application of Bioinoculants in organic farming
- Students will have an opportunity to work in research laboratory, biofertilizer industry and can also be a bio-entrepreneurs



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UNIVERSITY OF AGRICULTURAL SCIENCES, BANGALORE  
College of Agriculture, GKVK, Bengaluru-560 065

Dr.N.B.Prakash, Dean(Agri.)

No.D (Agri.)B/Visit/M.S.R-B/2022-23 / 984

04.07.2022

Dear Sir,

**Sub:** Visit by students and staff of M.S.Ramaiah, Bangalore.....reg.

**Ref:** Your e-mail letter No. Nil dated 30.07.2022

B.Sc. Microbiology students (50 Nos.) and faculty / staff (02 Nos.) of M.S.Ramaiah, College of Horticulture are permitted to visit the Department of Agril. Microbiology, College of Agriculture, GKVK, Bengaluru on 15.07.2022 at 9.00 AM.

In this regard, you are required to remit Rs. 1,400/- (Rupees One thousand four hundred only) by cash, on the day of your visit as fee, towards the visits to Assistant Comptroller, College of Agriculture, GKVK, Bangalore.

Arrangements have been made for the visit.

It is the discretion of the University to cancel the visit without prior intimation at any time due to unforeseen circumstances.

With regards,

Yours Sincerely,

4-7-2022  
Dean(Agri.)  
Dean (Agri.)

College of Agriculture  
UAS, GKVK, Bengaluru-560 065

To

Dr.Pushpa.H  
Program Coordinator, DBT-Star College  
Scheme, Professor and Head of Department,  
Microbiology, MSRCASC,  
Bangalore.  
(e-mail: [pushpa\\_microbio@msrcase.edu.in](mailto:pushpa_microbio@msrcase.edu.in))

To follow CAB (Covid appropriated  
behavior ) for Covid -19 prevention  
as per the guidelines of UGC /  
ICAR

Copy to: 1. Prof. & Head, Depts. of Agril. Microbiology, CoA, GKVK with a request to  
arrange for the visit on the above mentioned date.

2. Asst. Comptroller, Accts. Sec., CoA, GKVK to collect the requisite fee.

3. File.

Principal,  
Bommalu College of Arts, Science & Commerce,  
K.V.S.3877 Post, K.V.S.R. Nagar,  
Vijayanagara - 560 054

List of students enrolled of Biofertilizer Production Technology  
Organized by Department of Microbiology

Sl No.	Name of the Students	Registration Number	Course	Semester	15.06.07	12:30	12:30-
1	SA VESHRUTHA	S1914562	BSc MB, BT, Chem	VI Semester	present	16/7/22	12:30
2	Nehal Subha	S1914536	BSc MB, BT, Chem	VI Semester	absent	16/7/22	12:30
3	Ramzana Banu S	S1914554	BSc MB, BT, Chem	VI Semester	present	15/7/22	12:30
4	Deekshitha BK	S2014486	BSc MB, BT, Chem	IV Semester	present	16/7/22	12:30
5	Shreyas M	S1914576	BSc MB, BT, Chem	VI Semester	present	15/7/22	12:30
6	T N RAMYASHREE	S1914593	BSc MB, BT, Chem	VI Semester	present	15/7/22	12:30
7	Shwetha B R	S1914578	BSc MB, BT, Chem	VI Semester	present	15/7/22	12:30
8	HARSHITH REDDY C K	S2014503	BSc MB, BT, Chem	IV Semester	present	15/7/22	12:30
9	D S SHREYAS	S2014485	BSc MB, BT, Chem	IV Semester	present	15/7/22	12:30
10	Madhhu shree M	S2014532	BSc MB, BT, Chem	IV Semester	present	15/7/22	12:30
11	bhavana.S	S2014475	BSc MB, BT, Chem	IV Semester	present	15/7/22	12:30
12	Harshitha Shree B.S	S2014422	BSc MB, Gen, Biochem	IV Semester	present	15/7/22	12:30
13	Madhuri r	S2014531	BSc MB, BT, Chem	IV Semester	present	15/7/22	12:30
14	HARINI A KHEMKAR	S2014500	BSc MB, BT, Chem	IV Semester	present	15/7/22	12:30
15	Vidya shree m	S2014455	BSc MB, Gen, BC	IV Semester	present	15/7/22	12:30
16	Monisha G	S2014429	BSc MB, Gen, Biochem	IV Semester	present	15/7/22	12:30
17	Mudith Kumar R	S2014538	BSc MB, BT, Chem	IV Semester	present	15/7/22	12:30
18	Yashitha.k	S2014458	BSc MB, Gen, Biochem	IV Semester	present	15/7/22	12:30
19	Preetam A Rao	S2014562	BSc MB, BT, Chem	IV Semester	present	15/7/22	12:30
20	Pratheeksha	S2014437	BSc MB, BT, Chem	IV Semester	present	15/7/22	12:30
21	Tejaswini Lokesh	S2014454	BSc MB, Gen, Biochem	IV Semester	present	15/7/22	12:30
22	Swarupa Banerjee	S1914591	BSc MB, BT, Chem	VI Semester	present	15/7/22	12:30
23	Prajwal NS	S2014559	BSc MB, BT, Chem	IV Semester	present	15/7/22	12:30
24	Hemalatha K	S2014505	BSc MB, BT, Chem	IV Semester	present	15/7/22	12:30
25	Deepika S	S2014488	BSc MB, BT, Chem	IV Semester	present	15/7/22	12:30
26	Dushyanth R	S2014496	BSc MB, BT, Chem	IV Semester	present	15/7/22	12:30
27	Ritanika Mukherjee	S1914556	BSc MB, BT, Chem	VI Semester	present	15/7/22	12:30
28	Sakshi N Ullal	S2014580	BSc MB, BT, Chem	IV Semester	present	15/7/22	12:30

29

Nishal kumar

S2014550

BSc BT, MB, Chem

IV Semster

Present

16/7/22

12:30

12:30

Subharath 19/6/22

**Department of Microbiology**

**Valued-added Programme**

**Under DBT-Star College Scheme**

**Biofertilizer Production Technology**

**Assessment Marks**

Sl No.	Registration Number	Name of the Students	Course	Semester	Demonstration of technique and viva voce 30 Marks
1	S1914562	SA VISHRUTHA	BSc MB, BT, Chem	VI Semester	25
2	S1914536	Nehal Subba	BSc MB, BT, Chem	VI Semester	30
3	S1914554	Ramzana Banu S	BSc MB, BT, Chem	VI Semester	23
4	S2014486	Deekshitha BK	BSc MB, BT, Chem	IV Semester	29
5	S1914576	Shreyas M	BSc MB, BT, Chem	VI Semester	25
6	S1914593	T N RAMYASHREE	BSc MB, BT, Chem	VI Semester	21
7	S1914578	Shwetha B R	BSc MB, BT, Chem	VI Semester	20
8	S2014503	HARSHITH REDDY C K	BSc MB, BT, Chem	IV Semester	30
9	S2014485	D S SHREYAS	BSc MB, BT, Chem	IV Semester	30
10	S2014532	Madhu shree M	BSc MB, BT, Chem	IV Semester	28
11	S2014475	bhavana.S	BSc MB, BT, Chem	IV Semester	30
12	S2014422	Harshitha Shree B.S	BSc MB, Gen, Biochem	IV Semester	25
13	S2014531	Madhuri	BSc MB, BT, Chem	IV Semester	20
14	S2014500	HARINI A KHEMKAR	BSc MB, BT, Chem	IV Semester	21
15	S2014455	Vidya shree m	BSc MB, Gen, BC	IV Semester	25
16	S2014429	Monisha G	BSc MB, Gen, Biochem	IV Semester	26
17	S2014538	Mudith Kumar R	BSc MB, BT, Chem	IV Semester	30
18	S2014458	Yoshitha.k	BSc MB, Gen, Biochem	IV Semester	25
19	S2014562	Preetham A Rao	BSC MB, BT, Chem	IV Semester	30
20	S2014437	Pratheeksha	BSc MB, BT, Chem	IV Semester	29
21	S2014437	Tejaswini Lokesh	BSc MB, Gen, Biochem	IV Semester	27
22	S1914591	Swarupa Banerjee	BSC MB, BT, Chem	VI Semester	24
23	S2014559	Prajwal NS	BSc MB, BT, Chem	IV Semester	21
24	S2014505	Hemalatha K	BSc MB, BT, Chem	IV Semester	25
25	S2014488	Deepika S	BSc MB, BT, Chem	IV Semester	21
26	S2014496	Dushyanth R	BSc MB, BT, Chem	IV Semester	25
27	S1914556	Ritanakar Mukherjee	BSc MB, BT, Chem	VI Semester	30
28	S2014580	Sakshi N Ulla l	BSc MB, BT, Chem	IV Semester	25
29	S2014550	Nisha l Kumar	BSc MB, BT, Chem	IV Semester	25

*Anil H*  
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**RAMAIAH**  
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**DEPARTMENT OF BIOTECHNOLOGY**  
MINISTRY OF SCIENCE & TECHNOLOGY,  
GOVERNMENT OF INDIA

## Certificate

This is to Certify that \_\_\_\_\_

of \_\_\_\_\_

has participated in Value Added Program on

**"Biofertilizer Production Technology"** held from 9<sup>th</sup> July to 19<sup>th</sup> August 2022

**Organized by The Department of Microbiology, M.S. Ramaiah College of Arts,  
Science and Commerce, Bangalore**

**Dr. Pushpa H**

Vice Principal & Head, Department of Microbiology  
MSRCASC, Bangalore

**Dr. Vatsala G**

Principal  
MSRCASC, Bangalore