SHRI SHIVAJI EDUCATION SOCIETY AMRAVATI'S

SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR

UG Department of Microbiology
Skill-Based Course: Biofertilizers & Biopesticides
Session 2023-24
Course Coordinator Report

A Skill-Based Course for UG students in the Department Microbiology, Shri Shivaji Education Society Amravati's Science College, Congress Nagar, Nagpur was held from 18th March 2024 to 12th July 2024. The course title was "Biofertilizers & Biopesticides". It is the complete beginner to Expert Course was perfect for anyone who wants to learn Biofertilizers & Biopesticides.

The skill based certificate course syllabus for B.Sc. I, II and III appear students. Fifteen weeks certificate course in BIOFERTILIZERS AND BIOPESTICIDES. A total of 47 students were enrolled to the course. The examination of the course shall comprise of one theory paper of three hours carries 50 marks and a practical of one hour duration carries 50 marks. Internal assessment for the course based on one theory paper of 10 marks shall be conducted by university approved teachers. Internal assessment marks should be included in minimum passing marks of the students. Candidates are expected to pass separately in theory, internal assessment and practical examination.

Students require 40% marks in theory for passing including internal marks. Separate passing in practical examination is required, assignment submission is necessary to get internal marks.

*Internal assessment –Based on student's attendance and performance during unit test exam and assignment/field work.

Based on assignment & activity conducted for Biofertilizer and Biopesicide production the Internal assessment marks were given. For theory and practical marks, the objective mode of examination (M.C.Q.) was conducted.

Action taken: A total of 47 students are enrolled in the course, which is designed to offer a comprehensive understanding of sustainable agricultural practices. The course emphasizes the principles, applications, and benefits of these practices, providing students with both theoretical knowledge and practical experience. One major focus of the course is biofertilizers. Students will

explore what biofertilizers are and learn about their various types, including nitrogen-fixing bacteria and mycorrhizal fungi. The course will delve into how these biofertilizers enhance soil fertility and support plant growth, providing a foundation for understanding their role in sustainable agriculture.

Another key area of study is biopesticides. The course covers the different types of biopesticides, such as microbial pesticides, plant extracts, and natural enemies. Students will gain insight into how these biopesticides contribute to pest management, including their mechanisms of action and various applications. Additionally, the course emphasizes the field application of these sustainable practices. Students will have the opportunity to implement biofertilizers and biopesticides in real-world settings and evaluate their effectiveness and impact on agricultural productivity. By integrating theoretical knowledge with hands-on experience, the course equips students with the skills needed to effectively apply and assess sustainable agricultural methods. It also fosters critical thinking about the broader environmental benefits of these practices, preparing students to make informed decisions in the field of sustainable agriculture.

Dr. Pranita B. Gulhane
Course- Coordinator
Skill-Based Course

SHRI SHIVAJI EDUCATION SOCIETY AMRAVATI'S

SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR

UG Department of Microbiology
Skill-Based Course: Biofertilizers & Biopesticides
Session 2023-24

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY

(Established by Government of Central Provinces Education Department by Notification No. 513 dated the 1st of August 1923 & presently a State Universities governed by Maharashtra Universities Act No. VI of 2017)

DEPARTMENT OF LIFELONG LEARNING AND EXTENSION

Guru Nanak Bhavan, University Campus, Ambazari Bypass Road, Nagpur – 440033 Phone: 2530860

Dr. Nishikant Raut,(Director) Mob. No. 9422803768

To,
The Principal
SSES Amravati' s Science
College , Congress Nagar,
Nagpur.

No.DOLLE/464/23
Dated : 26. 10. 2023

Subject : Sanction for Conducting Short Term Courses under Jeevan Shikshan Abhiyan on No Grant Basis. (2023-24)

Sir/Madam,

With reference to your proposal for conducting Short Term courses indicated below under Jeevan Shikshan Abhiyan of this Department, this is to inform you that your proposal has been accepted and your College has been granted permission to conduct the course on the following conditions:

Details of the Course

Sr. No.	Name of the Course	Name of Course Coordinator	Duration	Credit	No.of Candidates to be admitted	Fees to be Charged per Student	Fees to be Deposited With the Deptt.
1. 35	Certificate Course in Biofertilizer and Biopesticide Production.	Dr. Pranita.B. Gulhane.	45 hrs. T-37 hrs. P-08 hrs.	2	80	500/-	10%
2.	Certificate Course in Ground Water Exploration.	Dr. P .B . Zamarkar.	45 hrs. T-36 hrs. P-09 hrs.	2	100	500/-	10%
3. 19	Certificate Course in Mushroom Cultivation.	Dr. Rupali . H. Mahakhode.	40 hrs. T-20 hrs. P-20 hrs.	2	80	500/-	10%
4. 47	Certificate Course in Fruit Processing and Wine Technology.	Dr. Pranita B. Gulhane.	45 hrs. T-37 hrs. P-8 hrs.	2	80	500/-	10%
5. 12	Certificate Course in Environment and water Management.	Dr. Priyadashani N . Deshmukh.	45 hrs. T-30 hrs. P-15 hrs.	2	150	500/-	10%
6. 36	Certificate Course in Immunology and Immunodiagnostics .	Dr. Sapna. Baghel .	44 hrs. T-36 hrs. P-08 hrs.	2	80	500/-	10%

Rules & Regulations of this Department regarding these courses should be strictly followed.

1. **This sanction is valid for this particular Batch only.**
2. Fees for the course should be charged as per the norms prescribed.
3. Expenditure on the course should be incurred as per norms.
4. Course should be started within a Month from **the date of sanction.**
   Please communicate your acceptance within **a month and submit the Initial Report**
5. **Submit the List of Students admitted in the excel format attached herewith.**
6. **Geotagged Photographs clicked during theory and practical classes have to be submitted along with the final report. Other than geotagged photographs will not be accepted.**
7. **Complete details and evidences (along with geotagged photographs) for theory & pratical exam / assessment will have to be submitted. Guidelines for allottment of grades should be strictly followed.**
8. **After Completion of the course the dates for assessment /exam should be informed to the Department at teast 10 days in advance.**

Your's faithfully,

26/10/23

for Director

SHRI SHIVAJI EDUCATION SOCIETY AMRAVATI'S

SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR

UG Department of Microbiology

NOTICE

Date: 04/03/2024

All the students are informed that **U.G. Department of Microbiology** runs a skill-based Course: Biofertilizers & Biopesticides for the session 2023-24. Interested students of B.Sc. are requested to provide their names to the course Coordinator Dr.Pranita B. Gulhane on or before 11/03/2024.

Science College, Congress Nagar, Nagpur. SEAL

Dr. Pranita B. Gulhane
Course- Coordinator
Skill-Based Course

U.G. DEPARTMENT OF MICROBIOLOGY,
SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR

AccreditedwithCGPAof3.51at'A+'GradebyNAAC,Bangalore
A College with Potential for Excellence
An Institutional Member of APQN
Recognized Center for Higher Learning & Research
A Mentor College under Paramarsh Scheme of UGC, New Delhi
A Mentor College under Paris Sparsh Scheme of Maharashtra State

Skill Based Course for the Session 2023-24

on

Biofertilizers and Biopesticides

Skill-Based Course: Biofertilizers & Biopesticides

Course Co-ordinator: Dr. Pranita B. Gulhane

Course Introduction

Increase in world population has put tremendous pressure on agriculture. When technologies and interventions get improved, productivity also get increased, however, still one billion people lack access to adequate food and nutrition worldwide. Biofertilizers and biopesticides are prepared from natural materials such as animals, plants, bacteria, and certain minerals widely used for controlling insects and disease-causing pathogens. Bio-fertilizers are living microorganisms of bacterial, fungal and algal origin. Depending on their mode of action and requirement of the crop, they can be applied alone or in combination. Thus biofertilizers and biopesticides are important areas to fulfill the challenges in a sustainable way.

Course Objectives

- Introduction to biofertilization production techniques and instrumentation.
- Hands-on practice in Biofertilizer production
- Data acquisition and processing
- Applications of Biofertilizer & Biopesticides in Agriculture
-

Registration Date: 11/03/2024

Prof. Atul Bobdey
Coordinator
Dept. of Biotechnology

Prof. Mahendra Dhore
Principal
Science College, Nagpur

Dr. Pranita B. Gulhane
Course- Coordinator
Skill-Based Course

UG Department of Microbiology

Skill- Based Course: Biofertilizers & Biopestocides (Session 2023-24)

Course Co-ordinator: Dr.Pranita B. Gulhane

Course Introduction

Increase in world population has put tremendous pressure on agriculture. When technologies and interventions get improved, productivity also get increased, however, still one billion people lack access to adequate food and nutrition worldwide. Biofertilizers and biopesticides are prepared from natural materials such as animals, plants, bacteria, and certain minerals widely used for controlling insects and disease-causing pathogens. Bio-fertilisers are living microorganisms of bacterial, fungal and algal origin. Depending on their mode of action and requirement of the crop, they can be applied alone or in combination. Thus biofertilizers and biopesticides are important areas to fulfill the challenges in a sustainable way.

Course Objectives

1. To develop skill for the efficient production of Biofertilizers and Biopesticides.
2. To inculcate learn and earn sprit among students.
3. To replace conventional chemical fertilizers so that their use can be reduced with the resulting economic and environmental benefits.
4. To carry out large scale production of Biofertilizers and Biopesticides for farmer's use.
5. To develop awareness among people for the use of Biofertilizers and Biopesticides instead of chemical one.

Instructional Strategies: Theory class, Practical, Video clips, Models etc.

Evaluation Strategies: Oral discussions and Final MCQ examination

Course Outcomes: By the end of this course, participants will be able to

1. Understand the principles and importance of biofertilizers in biological research & agriculture.
2. Interpret the given data and draw meaningful conclusions.
3. Apply concepts in addressing biological questions related to health and disease.

Duration of course: 15 Weeks

Science College, Congress Nagar, Nagpur. SEAL

Gulhane

Dr. Pranita B. Gulhane
Course- Coordinator
Skill-Based Course

UG Department of Microbiology

Skill-Based Course: Biofertilizers & Biopesticides (Session 2023-24)

Module: The Structure of Syllabus and system of evaluation

The structure of syllabus for certificate course along with distribution of marks is displayed in the following table.

Course	Theory papers and Practicals	Marks			Total Marks
		Theory	Internal Assessment	Practical	
Certificate course in Biofertilizers and Biopesticides	1. Theory paper- Biofertilizers and Biopesticides	50	10		100
	2. Practicals based on course			40	
		Grand Total			100

Dr. Pranita B. Gulhane
Skill Based Course Coordinator

SEAL

Dr. Amitabh Halder
IQAC Coordinator
ternal Quality Assurance Cell
(IQAC)
S. S. E. S. A. Science College
Congress Nagar, Nagpur.

Prof. Mahendra Dhore
Principal
Principal
S. S. E. S. Amravati's
Science College, Nagpur.

UG Department of Microbiology

Skill-Based Course: Biofertilizers & Biopesticides (Session 2023-24)

Syllabus of Skill-Based Course: Biofertilizers & Biopesticides

Course Units

Theory: Biofertilisers and Biopesticides in Agriculture

Unit I: Definition and Introduction of Biofertilisers and Chemical Fertilisers, History of Biofertilisers, Microbes as biofertilisers, Indian Farming Scenario, Need of biological inputs in agriculture, Scope and Necessity of Biofertilisers. Types of Biofertilisers, Advantages of Biofertilisers and Chemical Fertilisers use in Agriculture, Limitations of Fertilisers use and its remedy.

Unit II: Definition and Introduction of Biopesticides and Chemical Pesticides, History of Biopesticides, Need of Biopesticides in Agriculture, Scope of Biopesticides. Types of Biopesticidess, Advantages of Biopesticides and Chemical Pesticides use in Agriculture, Limitations of Pesticides use and its remedy.

Unit III: Introduction to vermiculture. Definition, meaning, history, economic important, their value in maintenance of soil structure, role as four r's of recycling, reduce, reuse, recycle, restore. Small Scale Vermicompost Technology by Earthworm farming for home gardens - Earthworm compost for home gardens. Vermiwash collection, composition & use

Unit IV: Algal biofertilizers - Blue green algae-distribution-occurrence. Azolla-Anabaena symbiosis-Importance- Azolla growth behavior, multiplication- sporulation etc.

Practical Sessions:

1. Preparation of culture media for microorganisms.
2. Screening of microorganisms from soil and root nodules by pour plate method.
3. Isolation of Rhizobium from root nodules.
4. Isolation of Azotobacter from rhizosphere soil.
5. Qualitative estimation of Phosphate Solubilising Bacteria from soil.
6. Qualitative estimation of Potassium solubilising bacteria.
7. Isolation of Bacillus thuringiensis from soil.
8. Preparation of Algal Biofertilizer.
9. Study of Vermiculture, Vermiwash & Vermicompost equipments, devices

Dr. Pranita B. Gulhane
Course- Coordinator
Skill-Based Course

UG Department of Microbiology

Skill-Based Course: Biofertilizers & Biopesticides (Session 2023--24)

Week-wise teaching plan:

Hours	Lectures/ Topics/ Sub topics
14 hours	**Unit I**
1	History of Biofertilizer
1	History of Biopesticides
1	Chemical Fertilizers
1	Chemical Pesticides
1	Need of biological inputs in agriculture
1	Scope and Necessity of Biofertilizers
1	Different types of Biofertilizers
1	Different types of Chemical fertilizers
1	Microbes as Biofertilizers
1	Types of microbes used
1	Preparation of Culture media
1	Different types of culture media
1	Morphological characteristics of bacteria
1	Biochemical characterization of plant growth promoting bacteria
8 hours	**Unit II**
1	Role of microbes in Biofertilizer production
1	Plant growth promoting bacteria and its role
1	Advantages of Biofertilizers and Biopesticides
1	Limitations of Biofertilizers and Biopesticide &its remedy
1	Principle of different culture media used
1	Introduction of Equipments used
1	Different types of sterilization
1	Moist heat sterilization
9 hours	**Unit III**
1	Introduction to vermiculture
1	Definition, meaning, history, economic importance
1	Value of vermiculture in maintenance of soil structure
1	Role as four r's of recycling, reduce, recycle, restore.
1	Small Scale Vermicompost Technology
1	Earthworm farming for home gardens
1	Earthworm compost for home gardens
1	Vermiwash collection
1	Vermiwash composition &use.

6 hours	**Unit IV**
1	Introduction of Algal biofertilizers
1	Blue green algae
1	Algal distribution & occurrence
1	Azolla-Anabaena Symbiosis
1	Importance of Azolla growth behavior
1	Algal multiplication- sporulation
8 hours	**Practical**
1	Preparation of culture media for microorganisms
1	Screening of microorganisms from soil & root nodules
1	Isolation of *Azotobacter* from rhizosphere soil
1	Qualitative estimation of Phosphate Solubilising Bacteria from soil
1	Qualitative estimation of Potassium solubilising bacteria
1	Isolation of *Bacillus thuringiensis* from soil
1	Preparation of Algal Biofertilizer
1	Preparation & study of Vermicompost

Science College, Congress Nagar, Nagpur. SEAL

Dr. Pranita B. Gulhane
Course- Coordinator
Skill-Based Course

UG Department of Microbiology

Skill- Based Course: Biofertilizers & Biopestocides (Session 2023)

Time Table

w.e.f. 18/03/2024

S.S.E.S.A'S SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR

Department of Microbiology

Time-Table Session -2023-24 (Skill Based Course) **w.e.f. -18.03.2024**

Days	Class	1 07:30- 08:18	2 08:18- 09:06	3 09:06- 09:54	4 10:00- 10:48	5 10.48- 11:36	6 11:36- 12:24	7 12:44- 01:32	8 01:32- 02:20	9 02:20- 03:08	10 3.12- 5.36
Monday & Tuesday	Sem II	--------- MB (B1) ----- ND					MB- B2 (B1,B2) PRG MB- B2 (B5, B6) ND				Skill Biofertilizer PG
	Sem IV				--------- MB (B1, B2) ------ ST+PB				MB- C6 (B1, B2) PB	MB- B3 (B5, B6) ST	Skill Biofertilizer PG
	Sem VI	--------- MB (B1) ----- PRG			MB- B3 (B5, B6)- Mon- SS Tue- ND	MB- A9 (B1, B2)- Mon- ND Tue- SS		--------- MB (B6)--------- SS+S G			Skill Biofertilizer PG
Wednesday & Thursday	Sem II		MB- B3 (B5,B6) ST			MB- C10 (B1,B2) Wed-PRG+ Thu-ND		--------- MB (B5) --------- PB+ ST			Skill Biofertilizer PG
	Sem IV	--------- MB (B6) --------- ND						MB- C5 (B1, B2, B5, B6) SS			Skill Biofertilizer PG (Practical)
	Sem VI				--------- MB B2 --------- SS+SG			MB-C6 (B1,B2,B5, B6) Wed-ND+Thu-PB			
Friday & Saturday	Sem II			MB- C6 (B1,B2) ND	MB- C7 (B5, B6) Fri- PB, Sat- ND			--------- MB (B2, B6) --------- PRG+SS			
	Sem IV							MB- C7 (B1, B2) ST	MB-C5 (B5, B6) PB		PRCT MB B5 ST
	Sem VI	--------- MB B5 --------- PB+ND						MB- B3 (B1, B2) B5, B6) SG			

Teaching Faculty: SS- Sanchari Sarkar, PRG- Priya Gaidhane, ND- Nupur Deshmukh, ST- Sarika Tekade, PB –Pallavi Butle, SG-Shivani Gohane PG-Dr.Pranita Gulhane

Dr. Pranita Gulhane

Science College, Congress Nagar, Nagpur. SEAL

Gulhane

Dr. Pranita B. Gulhane
Course- Coordinator
Skill-Based Course

SHRI SHIVAJI EDUCATION SOCIETY AMRAVATI'S

SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR

UG Department of Microbiology

EXAMINATION NOTICE

Date: 08/07/2024

All the students enrolled for **Skill-Based Course: Biofertilizers & Biopesticides** for the session 2022-23 are informed that Theory and Practical Exam of the course is scheduled on 17/07/2024. All the appearing students are informed to remain present in Microbiology Laboratory at 10:30 – 11:30AM AM for Theory Exam and at 12:30PM – 5:30PM for Practical Exam.

Science College, Congress Nagar, Nagpur. SEAL

Dr. Pranita B. Gulhane
Course- Coordinator
Skill Based Course

S.S.E.S.A's Science College, Congress Nagar, Nagpur

DEPARTMENT OF MICROBIOLOGY

Skill based Certificate Course: Biofertilizers and Biopesticides

Session 2023- 2024

Attendance Sheet for Theory Exam

Date 15-07-2024

Sr. No	Roll No.	Name of the Candidate	Signature of the Candidate	Signature of the of the Invigilator
1.	2023001	Abhilasha Chandrashekhar Mahant		
2.	2023002	Ashwini Nandanwar	-ABSENT-	
3.	2023003	Anchal Bole		
4.	2023004	Astha Bhadade		
5.	2023005	Bhumika Sushil Shriwas		
6.	2023006	Darshika Dindayal Nipane		
7.	2023007	Divya Singh		
8.	2023008	Diksha Choube	-ABSENT-	
9.	2023009	Gungun Laxman Wasnik		
10.	2023010	Gunjan Sherkar		
11.	2023011	Janhvi Parbat	-ABSENT-	
12.	2023012	Komal Nibrad	-ABSENT-	
13.	2023013	Kanchan Wankhede		
14.	2023014	Kaniz Sheikh		
15.	2023015	Kanika Sharma		
16.	2023016	Mrunali Bhushanwar		
17.	2023017	Nayan Datarkar		
18.	2023018	Neha Raut		
19.	2023019	Netra Raut		
20.	2023020	Nimmi Kumbhare		
21.	2023021	Nisha Khaparde	-ABSENT-	

22.	2023022	Nikita Dhole	Dhole	Tekade
23.	2023023	Pradhnya Wasnik	P.Cwasnik	Tekade
24.	2023024	Payal Kodhwate kodwate		MMBorkar
25.	2023025	Pratiksha Teltumbade	-ABSENT-	MMBorkar
26.	2023026	Piyush Kale		MMBorkar
27.	2023027	Radha Powar	-ABSENT-	MMBorkar
28.	2023028	Ritika Tandekar	Ritika	MMBorkar
29.	2023029	Ruchi Kale		MMBorkar
30.	2023030	Sakshi Mahalle	Sakshi	MMBorkar
31.	2023031	Sakshi Vaikar		MMBorkar
32.	2023032	Shreya Urkude	S.Urkude	MMBorkar
33.	2023033	Sejal Nilatkar	-ABSENT-	MMBorkar
34.	2023034	Sushma Likhare	-ABSENT-	MMBorkar
35.	2023035	Shivani Vikhar		MMBorkar
36.	2023036	Sejal Nilatkar	-ABSENT-	MMBorkar
37.	2023037	Shreyasha Borkar	-ABSENT-	SBaghel
38.	2023038	Shivani Khorgade	S.V.Khorgade	SBaghel
39.	2023039	Shreya Jenekar		SBaghel
40.	2023040	Suhasini Naidu		SBaghel
41.	2023041	Surbhi Kakde		SBaghel
42.	2023042	Vanshika Gandhre		SBaghel
43.	2023043	Vaishnavi Shende		SBaghel
44.	2023044	Vaishnavi Panda		SBaghel
45.	2023045	Vaidehi Bawankar		SBaghel
46.	2023046	Vishakha Bante		SBaghel
47.	2023047	Yash Digrase		SBaghel

Name of Invigilators

1) Manasi M. Borkar MMBorkar.

2) Dr. Sapna Baghel SBaghel

3) Ms. Sarika Tekade Tekade

4) Ms Ankita Manapure Manapure. 15/07/24

Science College, Congress Nagar, Nagpur SEAL

Gulhane 15.07.24

Dr. Pranita Gulhane

S.S.E.S.A's Science College, Congress Nagar, Nagpur

DEPARTMENT OF MICROBIOLOGY

Skill based Certificate Course: BIOFERTILIZERS AND BIOPESTICIDES

Session 2023- 2024

Attendance Sheet for Practical Exam

Date 15-07-2024

Sr. No	Roll No.	Name of the Candidate	Signature of the Candidate
1.	2023001	Abhilasha Chandrashekhar Mahant	Abhilasha
2.	2023002	Ashwini Nandanwar	—ABSENT—
3.	2023003	Anchal Bole	Anchal.
4.	2023004	Astha Bhadade	Astha Bhadade
5.	2023005	Bhumika Sushil Shriwas	Bhumika
6.	2023006	Darshika Dindayal Nipane	Nipane.
7.	2023007	Divya Singh	Singh
8.	2023008	Diksha Choube	—ABSENT—
9.	2023009	Gungun Laxman Wasnik	Gwasnik
10.	2023010	Gunjan Sherkar	Sherkar
11.	2023011	Janhvi Parbat	—ABSENT—
12.	2023012	Komal Nibrad	—ABSENT—
13.	2023013	Kanchan Wankhede	Kwankhede
14.	2023014	Kaniz Sheikh	Kaniz.
15.	2023015	Kanika Sharma	
16.	2023016	Mrunali Bhushanwar	MBhushanwar.
17.	2023017	Nayan Datarkar	Datarkar
18.	2023018	Neha Raut	Raut.
19.	2023019	Netra Raut	NRaut.
20.	2023020	Nimmi Kumbhare	—ABSENT—
21.	2023021	Nisha Khaparde	—ABSENT—

22.	2023022	Nikita Dhole	
23.	2023023	Pradhnya Wasnik	
24.	2023024	Payal Kodwate Kodwate	
25.	2023025	Pratiksha Teltumbade	— ABSENT —
26.	2023026	Piyush Kale	
27.	2023027	Radha Powar	— ABSENT —
28.	2023028	Ritika Tandekar	
29.	2023029	Ruchi Kale	
30.	2023030	Sakshi Mahalle	
31.	2023031	Sakshi Vaikar	
32.	2023032	Shreya Urkude	
33.	2023033	Sejal Nilatkar	— ABSENT —
34.	2023034	Sushma Likhare	— ABSENT —
35.	2023035	Shivani Vikhar	
36.	2023036	Sejal Nilatkar	— ABSENT —
37.	2023037	Shreyasha Borkar	— ABSENT —
38.	2023038	Shivani Khorgade	
39.	2023039	Shreya Jenekar	
40.	2023040	Suhasini Naidu	
41.	2023041	Surbhi Kakde	
42.	2023042	Vanshika Gandhre	
43.	2023043	Vaishnavi Shende	
44.	2023044	Vaishnavi Panda	
45.	2023045	Vaidehi Bawankar	
46.	2023046	Vishakha Bante	
47.	2023047	Yash Digrase	

Science College, Congress Nagar, Nagpur. SEAL

15.07.24

Dr. Pranita Gulhane

Rashtrasant Tukadoji Maharaj Nagpur University

Exam Name: Skill based Certificate Course Examination, Summer- 2024

Duration: 1hr

Name of Subject: Biofertilizer and Biopesticides

Max Marks:50

Medium: English

Marks Obtained

Centre Name: Shri Shivaji Science College Congress Nagar, Nagpur

Date: 15/07/2024

Name of Student:

Year: B.Sc Group

Note: (1) Attempt any 25 questions.

(2) Each question carries 2 marks

(3) No negative marking

Q.1) Which of the following is not a free living nitrogen-fixing bacteria?

a) Azotobacter

b) Clostridium

c) Klebsiella

d) Xanthomonas

Q.2) Presence of which of the following elements is required for nitrogen fixation?

a) Phosphorus

b) Carbon

c) Silver

d) Oxygen

Q.3) Which of the following is not used as a biofertilizer?

a) Bacteria

b) Algae

c) Cyanobacteria
d) Fungi

Q,4) Which of the following is an aerobic nitrogen-fixing bacterium?
a) Azotobacter
b) Clostridium
c) Rhodospirillum
d) Rhodopseudomonas

Q.5) Which of the following bacteria can't fix atmospheric nitrogen?
a) Nostoc
b) Anabaena
c) Oscillatoria
d) Lactobacillus

Q.6) Pick the correct statement
a) legumes do not fix nitrogen
b) legumes fix nitrogen independent of bacteria
c) legumes fix nitrogen through bacteria in their roots
d) legumes fix nitrogen through bacteria in their leaves

Q.7) Why is there a need to switch to organic farming?
a) Increasing poverty
b) Increasing Road accidents
c) Increasing environmental pollution
d) Increasing population

Q.8) Chemical fertilizer use does not generally pollute which of the following?
a) Soil
b) Water
c) Ground
d) Air

Q.9) Rhizobium is a free-living bacterium that fixes atmospheric nitrogen.
a) True
b) False

Q.10) Which of the following is incorrectly matched?
(a) Alnus – *Frankia*
(b) Alfalfa – *Rhizobium*
(c) Nitrogen fixer – *Anabaena*
(d) Mycorrhiza – *Rhodospirrilum*

Q.11) Which nitrogen fixers are found in rice fields associated with ***Azolla***?
(a) *Tolypothrix*
(b) *Frankia*
(c) *Anabaena*
(d) *Spirulina*

Q.12) Which of the following is not a biofertilizer?
(a) Mycorrhiza
(b) *Rhizobium*
(c) *Agrobacterium*
(d) *Nostoc*

Q.13) Which of the following is used as a biofertilizer for soybean crops?
(a) *Nostoc*
(b) *Azospirillum*
(c) *Rhizobium*
(d) *Azotobacter*

Q.14) This is not used in organic farming
(a) snail
(b) earthworm
(c) *Oscillatoria*
(d) *Glomus*

Q.15) Which of the following is a nitrogen fixer in the root nodules of *Alnus***?**
(a) *Clostridium*
(b) *Bradyrhizobium*
(c) *Azorhizobium*
(d) *Frankia*

Q.16) Which of the following is a pair of biofertilizers?
(a) *Salmonella* and *E.coli*
(b) *Rhizobium* and grasses
(c) *Nostoc* and legume
(d) *Azolla* and BGA

Q.17). Vermicompost is a/an
(a) toxic material
(b) organic biofertilizer
(c) inorganic fertilizer
(d) synthetic fertilizer

Q.18). This can be the best worm for composting
(a) pink worms
(b) red wigglers
(c) maggots
(d) does not matter

Q.19). In earthworms, the trypanosome is a
(a) excretory structure
(b) a circulatory system structure
(c) fold of intestine
(d) defense mechanism

Q.20). Which nutrients are abundantly found in worm castings?
(a) Phosphorus
(b) Nitrogen
(c) Calcium and other minerals
(d) All of these Answer

Q 21) While burrowing, the anterior ends of earthworms become turgid serving as a hydraulic skeleton though they do not possess a skeleton. This is as a result of
(a) setae
(b) gut peristalsis
(c) coelomic fluid
(d) none of the above

Q.22). Which of the following statements about biological farming is false?
a) Farmers understand the webs of interaction among organisms
b) Use of biocontrol measures will increase our dependence on chemical fertilizers
c) Farmers become familiar with the various life forms that inhabit the field
d) Farmers become aware of the life cycles and feeding habits of organisms

Q.23). What are biocontrol agents, and how do they work to keep butterfly caterpillars at bay?
a) Bacillus thuringiensis
b) Lactobacillus
c) Acetobacter aceti
d) Treponema pallidum

Q.24). In India, which of the following crops has been developed by genetic engineering?
a) Bt-potato
b) Bt-pomato
c) Bt-cotton
d) Bt-jute

Q.25). Which of the following statements about Trichoderma is incorrect?
a) It is a bacterium
b) Very common in root ecosystems
c) Free-living
d) Effective biocontrol agents

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Answer key

1.a

2.b

3.d

4.a

5.d

6.c

7.c

8.d

9.a

10.d

11.c

12.c

13.c

14.d

15.d

16.c

17.b

18.b

19.c

20.d

21.c

22.b

23.a

24.c

25.a

Dr. Pranita B. Gulhane
Course- Coordinator
Skill-Based Course

UG Department of Microbiology

Skill Based Course: Biofertilizers and Biopesticides (Session 2023-24)

Practical Question Paper

Subject: Biofertilizers and Biopesticides

Centre: S.S.E.S.A's Science College, Nagpur

Time: 5 hrs per day

Date: 15/07/2024

Max. Marks: 40

Q.1	To Prepare Culture Media for the Isolation of Plant Growth Promoting Bacteria.	10
Q.2	To Isolate Azotobacter Species from a given Soil Sample.	10
Q.4	Viva-Voce	10
Q.5	Practical Record	10
	Total Marks	40

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Skill-Based Course

UG Department of Microbiology

Skill-Based Course: Biofertilizers & Biopesticide (Session 2023-24)

OMR Answer Sheet

Shri Shivaji Education Society, Amravati's

SCIENCE COLLEGE

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U.G. DEPARTMENT OF MICROBIOLOGY

Skill-Based Course

Course Exam Name: Biofertilizers & Biopesticides

Name of Student: Abhilasha Mahant	INSTRUCTIONS FOR FILLING THE SHEET 1. This sheet should not be folded or crushed. 2. Use only blue/ black ball point pen to fill the circles. 3. Use of pencil is strictly prohibited. 4. Circles should be darkened completely and properly. 5. Cutting and erasing on this sheet is not allowed. 6. Do not use any stray marks on the sheet. 7. Do not use marker or white fluid to hide the mark. WRONG METHODS ⊗ ◉ ⊘ ✓ CORRECT METHOD ○ ○ ○ ●
Roll No.:	**Session: 2023-24**
Test Date: 17/07/2024	**Max. Marks: 50**
Invigilator Signature	**Obtained Marks:** 22

	A	B	C	D
1	●	○	○	○
2	○	●	○	○
3	○	○	●	○
4	●	○	○	○
5	●	○	○	○
6	●	○	○	○
7	○	○	○	●
8	●	○	○	○
9	○	○	●	○
10	●	○	○	○
11	●	○	○	○
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48	○	○	○	○
49	○	○	○	○
50	○	○	○	○

UG Department of Microbiology

Skill Based Course: Biofertilizers and Biopesticides (Session 2023-24)

Mark list

Sr. no	Name 0f Student	Marks obtained out 50 (Theory)	Marks obtained out of 40 (Practical)	Marks obtained out of 10 (Internal)	Total Marks 100	Grade
1)	**Abhilasha Chandrashekhar Mahant**	22	38	10	70	A
2)	**Ashwini Nandanwar**	AB	AB	AB	AB	AB
3)	**Anchal Bole**	18	38	10	66	B+
4)	**Astha Bhadade**	36	37	10	83	A+
5)	**Bhumika Sushil Shriwas**	30	39	10	79	A
6)	**Darshika Dindayal Nipane**	32	37	10	79	A
7)	**Divya Singh**	38	36	10	84	A+
8)	**Diksha Choube**	AB	AB	AB	AB	AB
9)	**Gungun Laxman Wasnik**	26	39	10	75	A
10)	**Gunjan Sherkar**	22	39	10	71	A
11)	**Janhvi Parbat**	AB	AB	AB	AB	AB
12)	**Komal Nibrad**	AB	AB	AB	AB	AB
13)	**Kanchan Wankhede**	34	38	10	82	A+
14)	**Kaniz Sheikh**	26	37	10	73	A
15)	**Kanika Sharma**	26	37	10	73	A
16)	**Mrunali Bhushanwar**	26	40	10	76	A
17)	**Nayan Datarkar**	32	38	10	80	A+
18)	**Neha Raut**	24	38	10	72	A
19)	**Netra Raut**	36	39	10	85	A+
20)	**Nimmi Kumbhare**	AB	AB	AB	AB	AB

21]	**Nisha Khaparde**	AB	AB	AB	AB	AB
22]	**Nikita Dhole**	24	39	10	73	A
23]	**Pradhnya Wasnik**	34	38	10	82	A+
24]	**Payal Kodhwate**	36	37	10	83	A+
25]	**Pratiksha Teltumbade**	AB	AB	AB	AB	AB
26]	**Piyush Kale**	28	36	10	74	A
27]	**Radha Powar**	AB	AB	AB	AB	AB
28]	**Ritika Tandekar**	26	38	10	74	A
29]	**Ruchi Kale**	20	38	10	68	B+
30]	**Sakshi Mahalle**	40	37	10	87	A+
31]	**Sakshi Vaikar**	26	39	10	75	A
32]	**Shreya Urkude**	20	38	10	68	B+
33]	**Sejal Nilatkar**	AB	AB	AB	AB	AB
34]	**Sushma Likhare**	AB	AB	AB	AB	AB
35]	**Shivani Vikhar**	30	36	10	76	A
36]	**Sejal Nilatkar**	AB	AB	AB	AB	AB
37]	**Shreyasha Borkar**	AB	AB	AB	AB	AB
38]	**Shivani Khorgade**	34	37	10	81	A+
39]	**Shreya Jenekar**	28	36	10	74	A
40]	**Suhasini Naidu**	24	38	10	72	A
41]	**Surbhi Kakde**	20	39	10	69	B+
42]	**Vanshika Gandhre**	20	39	10	69	B+
43]	**Vaishnavi Shende**	30	37	10	77	A
44]	**Vaishnavi Panda**	36	37	10	83	A+
45]	**Vaidehi Bawankar**	34	37	10	81	A+
46]	**Vishakha Bante**	26	36	10	72	A
47]	**Yash Digrase**	36	36	10	82	A+

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Feedback form

Q.1) How would you rate the overall quality of the Certificate Course - Biofertilizers & Biopesticides?

a) Excellent

b) Good

c) Average

Q.2) How well did the Certificate Course - Biofertilizers & Biopesticides meet your expectations?

a) Exceeded expectations

b) Met expectations

c) Below expectations

Q.3) How effective were the course instructors in delivering the Certificate Course - Biofertilizers & Biopesticides?

a) Very effective

b) Effective

c) Ineffective

Q.4) How likely are you to recommend the Certificate course- Biofertilizers & Biopesticides?

a) Very likely

b) Likely

c) Unlikely

Q,5) How satisfied are you with the practical sessions of the Certificate Course - Biofertilizers & Biopesticides?

a) Very satisfied

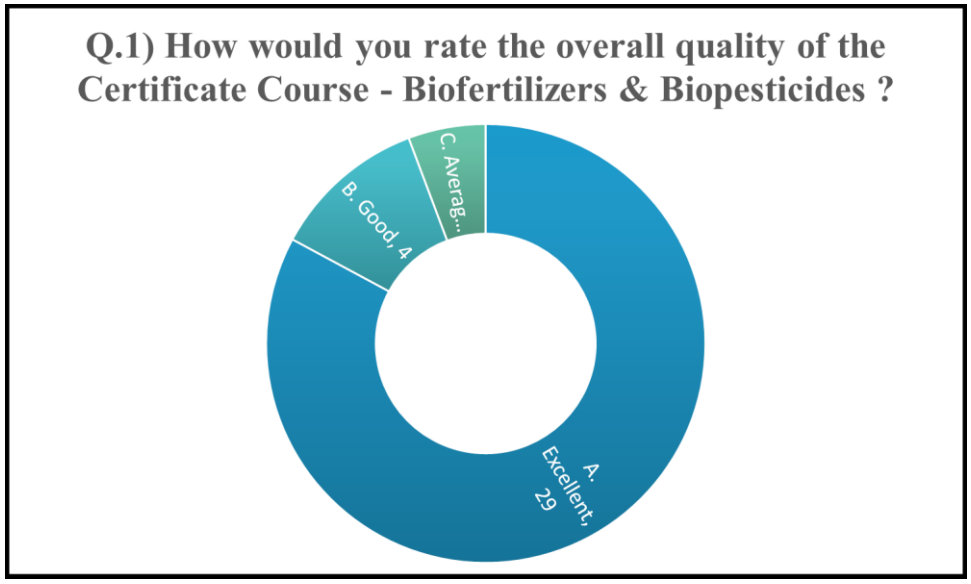
b) Satisfied

c) Dissatisfied

FEEDBACK RESPONSE

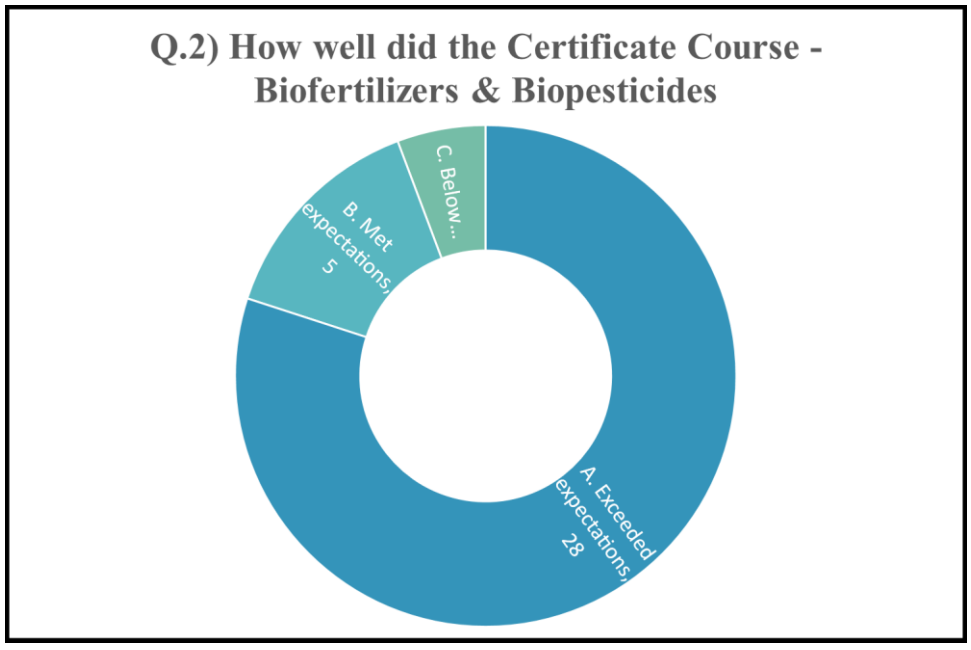
Q.1) How would you rate the overall quality of the Certificate Course - Biofertilizers & Biopesticides?

35 responses



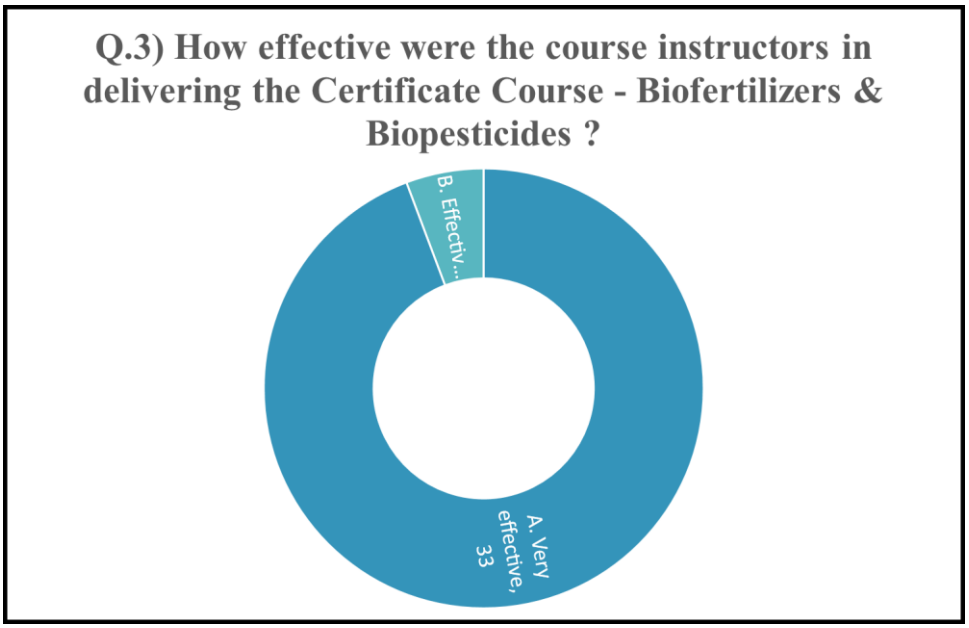
Q.2) How well did the Certificate Course - Biofertilizers & Biopesticides meet your expectations?

35 responses



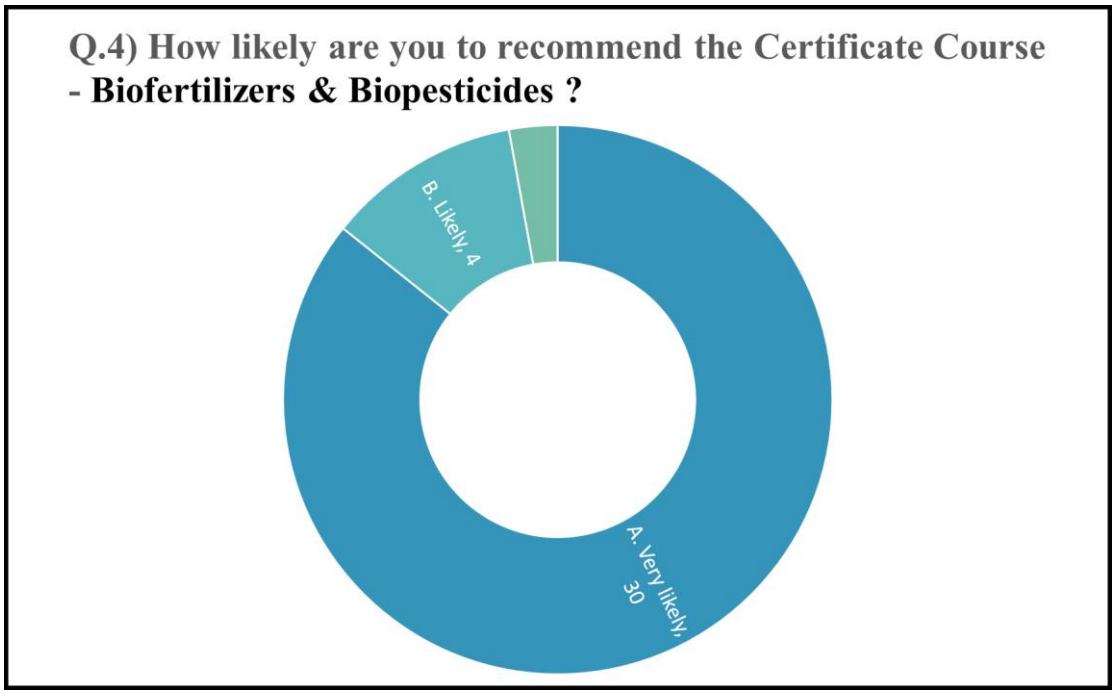
Q.3) How effective were the course instructors in delivering the Certificate Course - Biofertilizers & Biopesticides ?

35 responses



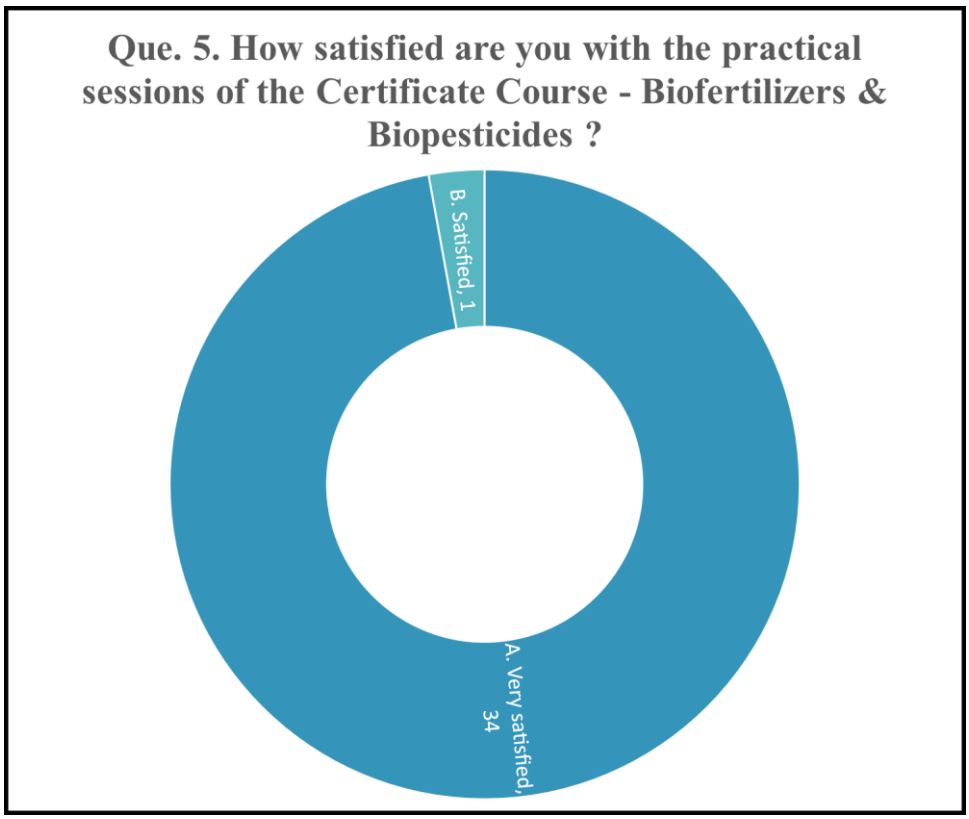
Q.4) How likely are you to recommend the Certificate course- Biofertilizers & Biopesticides?

35 responses



Q,5) How satisfied are you with the practical sessions of the Certificate Course - Biofertilizers & Biopesticides ?

35 responses



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