SHRI SHIVAJI EDUCATION SOCIETY AMRAVATI'S

SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR

UG Department of Microbiology
Skill-Based Course: Biofertilizers & Biopesticides
Session 2022-23

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 01st November 2022 to 08th March 2023. The course title was "Biofertilizers & Biopesticides". It is the complete beginner to Expert Course was perfect for anyone who wants to learn Metabolomics.

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 22 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 22 students are enrolled in the course. This course aims to provide a thorough understanding of sustainable agricultural practices, focusing on the principles, applications, and benefits of these practices. Key topics include:

1. **Biofertilizers**:
    - **Concepts**: Understanding what biofertilizers are and their various types, such as nitrogen-fixing bacteria and mycorrhizal fungi.
    - **Roles**: Learning how these biofertilizers enhance soil fertility and support plant growth.
2. **Biopesticides**:
    - **Concepts**: Exploring biopesticides, including types like microbial pesticides, plant extracts, and natural enemies.
    - **Roles**: Understanding their role in pest management, including their mechanisms and applications.
3. **Field Application**:
    - **Implementation**: Applying these sustainable practices in field settings.
    - **Evaluation**: Assessing their effectiveness and impact on agricultural productivity.

The course integrates theoretical knowledge with practical experience, equipping students with the skills to implement and evaluate sustainable agricultural methods effectively. It also encourages critical thinking about the broader environmental benefits of these practices.

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 2022-23

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY

DEPARTMENT OF LIFELONG LEARNING AND EXTENSION

Gurunanak Bhavan, University Campus, Amravati Road, Nagpur - 440 033. Phone : 2530860

E-mail : doll_rtmnu@gmail.com

No.DOLLE/448/22
Dated : 31.10.2022

To,
The Principal
SSES Amravati Science
Collage Congress Nagar,
Nagpur

Subject : Sanction for Conducting Short Term Courses under Jeevan Shikshan Abhiyan on No Grant Basis. (2022-23)

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	Certificate Course in Biofertilzers and Biopesticides	Dr. Ms. Pranita.B. Gulhane	45 hrs. T-37hrs P-8hrs	2	20	1500/-	10%

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

1. **Owing to Covid-19 situations all the norms of Central & State Government and instructions by R.T.M. Nagpur University, Nagpur should be strictly followed.**
2. **This sanction is valid for this particular Batch only.**
3. Fees for the course should be charged as per the norms prescribed.
4. Expenditure on the course should be incurred as per norms.
5. Course should be started within a Month from **the date of sanction.**
   Please communicate your acceptance within **a month and submit the Initial Report**
6. **Submit the List of Students admitted in the excel format attached herewith.**

Also send a soft copy in CD/Pen drive.

Your's faithfully,

Director

SHRI SHIVAJI EDUCATION SOCIETY AMRAVATI'S

SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR

UG Department of Microbiology

NOTICE

Date: 17/10/2022

All the students are informed that **U.G. Department of Microbiology** runs Skill-Based Course: Biofertilizers & Biopesticides for the session 2022-23. Interested students of B.Sc. are requested to provide their names to the course Coordinator Dr.Pranita B. Gulhane on or before 24/10/2019.

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 2022-23
on
Biofertilizers & 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-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

- 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: 24/10/2022

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 2022-23)

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

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

UG Department of Microbiology

Skill-Based Course: Biofertilizers & Biopesticides (Session 2022-23)

Module: The Structure of Syllabus and system of evaluation

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

Dr. Amitabh Halder
IQAC Coordinator
Internal 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.

SEAL

UG Department of Microbiology

Skill-Based Course: Biofertilizers & Biopesticides (Session 2022-23)

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 2022--23)

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

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

UG Department of Microbiology

Skill- Based Course: Biofertilizers & Biopestocides (Session 2022-23)

Time Table

w.e.f. 01/11/2022

S.E.S.A'S SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR
U.G. Department of Microbiology Time Table Session-2022-2023
Skill Based Course: Biofertilizers & Biopesticides
w.e.f. 01/11/2022

Days	Class B.Sc.	1	2	3	4	5	6	7	8	9	10	Skill Based Course
		07:30-08:18	08:18-09:06	09:06-09:54	10:00-10:48	10.48-11:36	11:36-12:24	12:44-01:32	01:32-02:20	02:20-03:08	3.12-5.36	5.36-6.20
Monday & Tuesday	Sem II	--------- MB(B1)------ PF					MB-C10 (B1,B2) (B5,B6) SG				Biofertilizer & Biopesticides Practical PG	
	Sem IV				--------- MB(B1,B2) SG+PF				MB-C1 (B1,B2)SS	MB-C5 (B5, B6)PRG		
	Sem VI	--------- MB(B1)------ SS+SG			MB-C1 (B5, B6) PF		MB-C9 (B1, B2) PG	---------MB (B6)--------- PRG+SG				
Wednesday & Thursday	Sem II					MB-C10 (B1,B2,B5,B6) Wed-SPD MB-C6 (B1,B2,B5,B6) Thru-VC		--------- MB(B5)--------- SVK				
	Sem IV	--------- MB(B6)--------- SSD						MB-C7 (B1, B2) WedPF+Thru-PRG MB-C5 (B5, B6) Wed-SSD+Thru-SS				
	Sem				----MB B2		PF+SG	MB-C7(B1, B2) (B5,B6)PRG				
Friday & Saturday	Sem II			MB-C1 (B1,B2) FriSG Sat--PF	MB-C7 (B5, B6) PRG			--------- MB(B2,B6)--------- PRG+SSD				Biofertilizer& Biopesticides (Thur, Fri, Sat) PG
	Sem IV							MB-C7 (B1, B2) SS	MB-C5 (B5, B6) PRG		PRC I MB B5 SSD	
	Sem VI	--------- MBB5--------- SS						MB-C1 (B1, B2) Fri-PRG+Sat-PF MB-B2(B5,B6) Fri+Sat-PRG				

Teaching Faculty: PG- Dr. Pranita Gulhane, SS- Sanchari Sarkar, SG- Shivani Gohane, PRG- Priya Gaidhane, PF- Priya Fuke, SSD- Sonali Shende

SEAL

Dr. Pranita Gulhane

Gulhane

SEAL
Science College, Congress Nagar, Nagpur

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

Class : Biofertilizer & Biopesticides
Subject: Biofertilizer & Biopesticides
Theory/Practical: Theory.

Shri Shivaji Education Society Amravati's
Science College, Nagpur
Attendance Sheet

Month Nov + Dec + Jan + F
Name of the Teacher Ms. Mayuri Bhad

Sr. No	Roll No.		Name of the Student	Total upto last Month		Periods ⇒	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total			
				Deli	Att	Date/ Contact No. ⇩	01.11.22	02.11.22	03.11.22	04.11.22	07.11.22	09.11.22	10.11.22	11.11.22	17.11.22	18.11.22	29/12/22	30.12.22	12.01.23	13.01.23	19.01.23	20.01.23	27.01.23	02.02.23	03.02.23	09.02.23	Current Month		Progressive Month	
																											Deli	Att	Deli	Att
1			Ashwini Baraskar				P	-	-	P			P	P		-	P	-	-	P	-	P	P	P	P	P				
2			Aishwarya Tinkhede				P	-	-			P		P	P	P	P	-	P	P	P	P	-	-	P	P				
3			Hemakshi Kuthe				P	P	-	P			P	-	-		P	P	-	-	-		P	P	-	-				
4			Janhvi Burade				-	P	P		P		-	-			P	P	-	P		P	P	-	P	-				
5			Kashish Jamgade				-	-	-		-	P	-	-			-	-	P	-	P	-	P	-	-	P				
6			Ketaki Chaudhari				-	P	P	-	-	-	-	-	P		-	P	-		-	P	-	P	-	-				
7			Khushi Kawade				-	-	P	-	-	P	-	P		P		-	-	P	-	-	P	-	P	P				
8			Mokshita Madan				P		-	-	-	-	P			P	P	P	P	-	-	-	-	P	P	-				
9			Monali Mahant				-	-	P	-	P	-	-	-	P	P	P	P	P	P	-	P	-	-	P	P				
10			Janhvi Pandey				P	P	-	P	-	P	P	-	-	-	-	-	-	-	-	-	P							
11			Pradnya Pawade				-	-	-	-	P	P	-	P	P	-	P	P	P	P	-	P	P	-	P	P				
12			Renuka Gokhle				P	-	-	P	-	-	-	-	P	-	P	-	-	-	P	-	-	P	P	P				
13			Sanika Zade				-	P	P	-	P	-	P	-	-	-	-	P	-	-	-	P	P	P	-	P				
14			Sakshi Paunikar				-	-	-		-		-	-	-		-	-	-	-	-	-	-	-	-	-				
15			Shrawani Kalamkar				-	P	-	P	-	P	P	P	P	-	P	P	P	P	P	P	P	-	P	-				
16			Sanskriti Ghodmare				P	-	-	P	-	-	-	-	-	P	-	P	-	-	-	-	-	-	-	P				
17			Shruti Tiwari				-	P	P	-	P	P	P	P	-	P	P	-	P	P	P	P	-	P	P	-				
18			Tanaya Deudkar				-	P	-	-	P	-	-	-	-	-	-	P	-	-	-	-	P	-	-	P				
19			Tanvi Samarth				P	-	P	-	-	-	P	-	P	-	-	-	P	-	P	P	-	-	-	-				
20			Tithi Bondre				-	P	-	-	P	-	-	-	-	-	-	P	-	-	P	P	-	-	-	P				

Class : Biofertilizer & Biopesticides
Subject:
Theory/Practical: _____

Shri Shivaji Education Society Amravati's
Science College, Nagpur
Attendance Sheet

Month : Nov+Dec+Jan
Name of the Teacher : _____

Sr. No	Roll No.		Name Of the Student	Total upto last Month		Periods ⇨		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total			
				Deli	Att	Date/ Contact No. ⇨	⇩																				Current Month		Progressive Month	
																											Deli	Att	Deli	Att
21			Vaidehi Anasane				P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P				
22			Vishakha Pandey					P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P				

Teacher

Gulhane
Head of Department
Dr. Pranita Gulhane

Science College, Congress Nagar, Nagpur SEAL

Principal

Class : Biofertilizer & Biopesticides
Subject: Biofertilizer & Biopesticides
Theory/Practical: Practical

Shri Shivaji Education Society Amravati's
Science College, Nagpur
Attendance Sheet

Month Nov + Dec + Jan + Feb
Name of the Teacher M. Mayuri Bha

Sr. No	Roll No.		Name of the Student	Total upto last Month		Periods ⇨	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total			
				Deli	Att	Date/ Contact No. ⇩	05.11.22	12.11.22	19.11.22	31.12.22	14.01.23	21.01.23	28.01.23	04.02.23	11.02.23	15.02.23	25.02.23	04.03.23	09.03.23	10.03.23	11.03.23						Current Month		Progressive Month	
																											Deli	Att	Deli	Att
1			Ashwini Baraskar				P	-	-	P	P	P	P	P	P	-	P	-	P	-										
2			Aishwarya Tinkhede					P	P	-	-	-	-	-	-	-	P	P	P	P	P									
3			Hemakshi Kuthe				P	-	-	P	P	-	P	-	P	-	-	-	P	P	-									
4			Janhvi Burade				P	-	P	-	P			P	P	P	-	P	P	-	P									
5			Kashish Jamgade				-	P	-	-	-	P	P	-	P	-	P	-	-	P										
6			Ketaki Chaudhari				P	P	P	P	P		P		-	P	P			P	P									
7			Khushi Kawade				P	-	P	-	-	P		P	P	-	-	P	P	P	-									
8			Mokshita Madan				P	-	-	-	P	-	P		P	-	-	P	-	P	-									
9			Monali Mahant				-	P	P	P	-	P		P	-	P		P	P	P	-									
10			Janhvi Pandey				P	-	P		P	-	P	-	P	-	P			P	P									
11			Pradnya Pawade				P	P	-	P	P	-	-	-	-	P	P	P	P	P	P									
12			Renuka Gokhle				P	P		P	P	P	-	P	P	P	P	P	-	P	P									
13			Sanika Zade				-	P	P	-	P		P	-	P		P	P		P	-									
14			Sakshi Paunikar				-	-	-	-	-	-	-	-	-	-	-	-	-	P										
15			Shrawani Kalamkar				-	P	P	-	P	-	-	P		P	-	P	P	P	P									
16			Sanskriti Ghodmare				P	P	-	P	-	P	P		P		-	P		P	-									
17			Shruti Tiwari				P	P	P	-	-	P	P	P	P		-		P	-	P									
18			Tanaya Deudkar				-	P	P	-	-	P		P	P	P	P	P	-		P									
19			Tanvi Samarth				P			P	P		P			P	P	-	P	-	P									
20			Tithi Bondre				-	P	P		P		P		P.		-	P	-	-	P									

Class : Biofertilizer & Biopesticides
Subject:
Theory/Practical: _____

Shri Shivaji Education Society Amravati's
Science College, Nagpur
Attendance Sheet

Month : Nov+Dec+Jan
Name of the Teacher : _____

Sr. No	Roll No.		Name Of the Student	Total upto last Month		Periods ⇨	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total			
				Deli	Att	Date/ Contact No. ⇩																				Current Month		Prograssive Month	
																										Deli	Att	Deli	Att
21			Vaidehi Anasane				P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P				
22			Vishakha Pandey					P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P				

Teacher

Head of Department
Dr. Pranita Gulhane

Science College, Congress Nagar, Nagpur SEAL

Principal

Scanned with OKEN Scanner

Class : Biofertilizer & Biopesticides
Subject: Biofertilizers & Biopesticides
Theory/Practical: Theory

Shri Shivaji Education Society Amravati's
Science College, Nagpur
Attendance Sheet

Month : Feb + Mar
Name of the Teacher : Ms Mayuri B

Sr. No	Roll No.		Name of the Student	Total upto last Month		Periods ⇒	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total			
				Deli	Att	Date/ Contact No. ⇒	10.02.23	13.02.23	14.02.23	23.02.23	24.02.23	01.03.23	02.03.23	03.03.23	06.03.23	08.03.23											Current Month		Progressive Month	
																											Deli	Att	Deli	Att
1			Ashwini Baraskar				P	A	P	P	A	P	A	P		P														
2			Aishwarya Tinkhede					P	P	P	P	A	P	A	A	P														
3			Hemakshi Kuthe				P	A	P	A	A	A	A	P																
4			Janhvi Burade				A	A	A	A		A	P			P														
5			Kashish Jamgade				P	P		P		P		P	A	A														
6			Ketaki Chaudhari					P			P	A	A	P		A														
7			Khushi Kawade				P			P		A	A			P														
8			Mokshita Madan					P	P	P	P	P		P																
9			Monali Mahant				A	A	A	P	A	A	P	A	P	P														
10			Janhvi Pandey				P	P	A		P	A	P	P	A	A														
11			Pradnya Pawade				A	A	P	P		P	P	A		P														
12			Renuka Gokhle				A	A		A	P	A	A	A	P	A														
13			Sanika Zade				P	P	P	P	A	P	A	P	A	P														
14			Sakshi Paunikar																											
15			Shrawani Kalamkar				P	A	P	A	P	A	P		P															
16			Sanskriti Ghodmare				P	P	A	P		P	A	P		P														
17			Shruti Tiwari				A	P	A	P	P	A	P	P	P	A														
18			Tanaya Deudkar				P	A	P	A		P	P	A		P														
19			Tanvi Samarth				A	P	A	A	P		P		P	A														
20			Tithi Bondre				P	A	P	A	P	A	A		A	P														

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Class : Biofertilizer & Biopesticides
Subject:
Theory/Practical: _____

Shri Shivaji Education Society Amravati's
Science College, Nagpur
Attendance Sheet

Month : Feb+Mar
Name of the Teacher : _____

Sr. No	Roll No.		Name Of the Student	Total upto last Month		Periods ⇨	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total			
				Deli	Att	Date/ Contact No. ⇩																				Current Month		Progressive Month	
																										Deli	Att	Deli	Att
21			Vaidehi Anasane				P	P	P	P	·	P	P	·	P	P													
22			Vishakha Pandey					P	P	·	P	·	·	P	-	-													

Teacher

Head of Department
Dr. Pranita Gulhane

Principal

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SHRI SHIVAJI EDUCATION SOCIETY AMRAVATI'S

SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR

UG Department of Microbiology

EXAMINATION NOTICE

Date: 28/02/2023

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 13/03/2023. 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.

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

List of the Students: Skill Based Certificate Course- Biofertilizers and Biopesticides (Session 2022-23)

Sr. No.	Name of Student	Signature
1)	Ashwini Baraskar	Baraskar
2)	Aishwarya Tinkhede	A Tinkhede.
3)	Hemakshi Kuthe	Kuthe.
4)	Janhvi Burade	J Burade
5)	Kashish Jamgade	Jamgade
6)	Ketaki Chaudhari	Chaudhari
7)	Khushi Kawade	Kawade
8)	Mokshita Madan	Madan
9)	Monali Mahant	Mahant
10)	Janhvi Pandey	Pandey
11)	Pradnya Pawade	Pawade
12)	Renuka Gokhle	Gokhale
13)	Sanika Zade	Zade
14)	Sakshi Paunikar	Paunikar
15)	Shrawani Kalamkar	Shrawani
16)	Sanskriti Ghodmare	Ghod
17)	Shruti Tiwari	Shruti
18)	Tanaya Deudkar	Deudkar
19)	Tanvi Samarth	Tanvi
20)	Tithi Bondre	Bondre
21)	Vaidehi Anasane	Vaidehi
22)	Vishakha Pandey	Pandey

Science College, Congress Nagar, Nagpur. SEAL

Dr. Pravita Gulhane
Department of Microbiology
Science College, Congress Nagar,
NAGPUR.

UG Department of Microbiology

Skill-Based Course: Biofertilizers & Biopesticides (Session 2022-23)

Theory Exam Multiple Choice Questions (MCQs) Pattern

Rashtrasant Tukadoji Maharaj Nagpur University

Exam Name: Skill based Certificate Course Examination, Summer- 2023

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: 13/03/2023

Name of Student:

Year: B.Sc Group

Note: (1) Attempt any 25 questions.
(2) Each question carries 2 marks
(3) No negative marking

---

1. With our present-day lifestyles, what is a major cause of concern?
   a) Inflation
   b) Poverty
   c) Illiteracy
   d) Environmental Pollution

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

3. .Mycorrhiza is an example of

   (a) symbiosis
   (b) amensalism
   (c) parasitic
   (d) competition

4. *Rhizobium* is a---------- bacterium that fixes atmospheric nitrogen.
   a) free living
   b) halophile
   c) non symbiotic
   d) acidophillic

5. Which of the following is not a free-living Nitrogen-fixing bacteria?
   a) Azotobacter
   b) Clostridium
   c) Klebsiella
   d) Xanthomonas

6. 7. Which of the following is an aerobic nitrogen-fixing bacterium?
   a) Azotobacter
   b) Clostridium
   c) Rhodospirillum
   d) Rhodopseudomonas

7. Presence of which of the following elements is required for nitrogen fixation?
   a) Phosphorus
   b) Carbon
   c) Silver
   d) Oxygen

8. Which of the following statements is not related to mycorrhiza?
   a) Many members of genus *Glomus* forms mycorrhiza
   b) Fungal symbiont absorbs nitrogen
   c) Plants show resistance to root-borne pathogens
   d) There is an overall increase in plant growth and development

9. What is the full form of VAM?
   a) Vesicular-arbuscular mycorrhiza
   b) Venom Azolla mycorrhiza
   c) Venom-arbuscular mycorrhiza
   d) Vesicular-azollae mycorrhiza

10. What are bio-insecticides?
    a) Insects
    b) Living organisms that kill specific insects
    c) Insects that kill other big insects
    d) Fungi

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

12. Which of the following nitrogen fixers is found in rice fields associated with ***Azolla***?
(a) Tolypothrix
(b) Frankia
(c) Anabaena
(d) Spirulina

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

14. Which of the following is used as a biofertilizer for soybean crop?
(a) Nostoc
(b) Azospirillum
(c) Rhizobium
(d) Azotobacter

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

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

17. 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

18. Which of the following fern is a biofertilizer?

(a) Salvinia

(b) Azolla

(c) Pteridium

(d) Marsilea

19. Which of the following is an endomycorrhiza?

(a) Rhizobium

(b) Agaricus

(c) Glomus

(d) Nostoc

20. 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

21. Organic farming is the technique of raising crops through the usage of

(a) resistant varieties

(b) manures

(c) biofertilizers

(d) all of the above

22. Chemical fertilizer use does not generally pollute which of the following?

a) Soil

b) Water

c) Ground

d) Air

23. 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

28. 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

29. 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

30. 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

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

Answer key

1.a
2.b
3.c
4.a
5.a
6.a
7.d
8.a
9.c
10.a
11.a
12.d
13.d
14.c
15.b
16.b
17.a
18.b
19.c
20.b
21.a
22.a
23.b
24.c
25.c
26.d
27.d
28.a
29.a
30.b

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

UG Department of Microbiology

Skill Based Course: Biofertilizers and Biopesticides (Session 2022-23)

Practical Question Paper

Subject: Biofertilizers and Biopesticides

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

Time: 5 hrs per day

Date: 13/03/2023

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

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

UG Department of Microbiology

Skill-Based Course: Biofertilizers & Biopesticides

(Session 2023-24)

OMR Answer Sheet

Shri Shivaji Education Society, Amravati's

SCIENCE COLLEGE

Congress Nagar, Nagpur-12 (M.S.), India

Accredited with CGPA of 3.51 at 'A+' grade by NAAC, Bangalore
A "College with Potential for Excellence" identified by UGC New Delhi.
Institutional Member of APQN
Recognized Centre for Higher Learning and Research
Mentor College under 'PARAMARSH Scheme', UGC, New Delhi

U.G. DEPARTMENT OF MICROBIOLOGY

Skill-Based Course

Course Exam Name: Biofertilizers & Biopesticides

Name of Student: Ashwini Bavaskar

Roll No.:

Session: 2022-23

Test Date: 13/03/2023

Max. Marks: 50

Invigilator Signature: Rishad

Obtained Marks: 46

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 ○ ○ ○ ●

	A	B	C	D
1	●	○	○	○
2	○	●	○	○
3	○	○	●	○
4	●	○	○	○
5	●	○	○	○
6	●	○	○	○
7	○	○	○	●
8	●	○	○	○
9	○	○	●	○
10	●	○	○	○
11	●	○	○	○
12	○	○	○	●
13	○	○	○	●
14	○	○	●	○
15	○	●	○	○
16	○	●	○	○
17	●	○	○	○
18	○	●	○	○
19	○	○	●	○
20	○	●	○	○
21	●	○	○	○
22	●	○	○	○
23	○	●	○	○
24	○	○	○	○
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37	○	○	○	○
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42	○	○	○	○
43	○	○	○	○
44	○	○	○	○
45	○	○	○	○
46	○	○	○	○
47	○	○	○	○
48	○	○	○	○
49	○	○	○	○
50	○	○	○	○

UG Department of Microbiology

Mark List: Skill-Based Course- Biofertilizers & Biopesticides (Session 2022-2023)

Exam Name: Skill-based Certificate Course Examination (Session 2022-23)

Name of Subject: Biofertilizers and Biopesticides

Centre Name: Shri Shivaji Science College Congress Nagar, Nagpur

Mark List

Sr. No.	Name of Student	Marks obtained out of 50 (Theory)	Marks obtained out of 40 (Practical)	Marks obtained out of 10 (Internal)	Total Marks 100	Grade
1)	Ashwini Baraskar	46	36	10	92	O
2)	Aishwarya Tinkhede	42	35	10	87	A+
3)	Hemakshi Kuthe	42	36	10	88	A+
4)	Janhvi Burade	46	36	10	92	O
5)	Kashish Jamgade	36	37	10	83	A+
6)	Ketaki Chaudhari	48	36	10	94	O
7)	Khushi Kawade	50	38	10	98	O
8)	Mokshita Madan	46	39	10	95	O
9)	Monali Mahant	44	35	10	89	A+
10)	Janhvi Pandey	42	34	10	86	A+
11)	Pradnya Pawade	48	35	10	93	O
12)	Renuka Gokhle	44	36	10	90	A+
13)	Sanika Zade	46	38	10	94	O
14)	Sakshi Paunikar	AB	AB	AB	AB	AB
15)	Shrawani Kalamkar	50	37	10	97	O
16)	Sanskriti Ghodmare	48	36	10	94	O
17)	Shruti Tiwari	42	35	10	87	A+
18)	Tanaya Deudkar	48	36	10	94	O
19)	Tanvi Samarth	44	35	10	89	A+
20)	Tithi Bondre	50	34	10	94	O
21)	Vaidehi Anasane	48	35	10	93	O
22)	Vishakha Pandey	42	34	10	86	A+

Science College, Congress Nagar, Nagpur. SEAL

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

स्वातंत्र्याचा अमृत महोत्सव

Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur

[Established by Government of Central Provinces Education Department by Notification No. 513 dated the 1st of August, 1923 & presently a State University governed by Maharashtra Public Universities Act, 2016(Mah. Act No. VI of 2017)]

University Skill Development Centre

(under Board of Lifelong Learning and Extension)

Certificate

No. USA/313-01

Shri/Smt./Ku. Ashwini Baraskar is awarded with Certificate on successful completion of the course titled Biofertilizers and Biopesticides in session 2022-23 under **Jeevan Shikshan Abhiyan** conducted for **45 hours** from 01/11/2022 to 08/03/2023 by the **Board of Lifelong Learning & Extension** in collaboration with Department of Botany, **S.S.E.S. Amt's Science College Congress Nagar, Nagpur, 440012.**

He/She has passed the Examination with O Grade

Total Credits Earned : 01

Principal
SSES Amt's Science College
Congress Nagar, Nagpur-12

Course Co-ordinator
SSES Amt's Science College
Congress Nagar, Nagpur-12

Director
Board of Lifelong Learning
and Extension, RTMNU, Nagpur

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

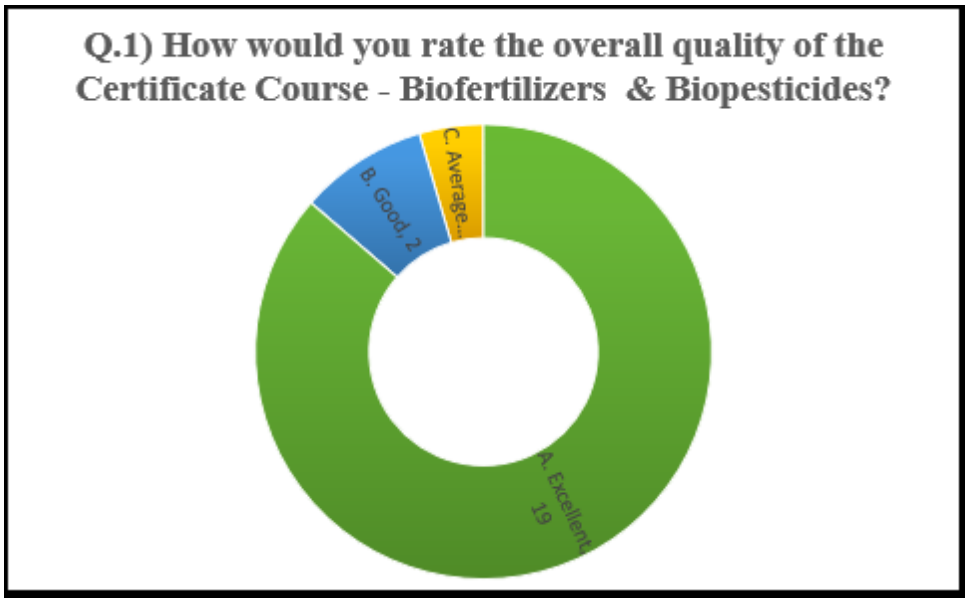
b) Satisfied

c) Dissatisfied

FEEDBACK RESPONSE

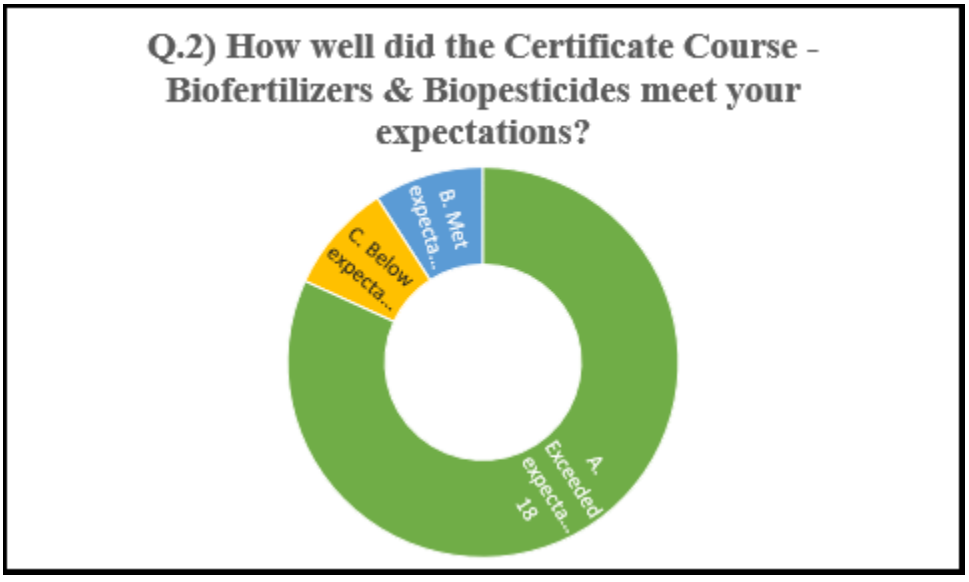
Q.1) How would you rate the overall quality of the Certificate Course - Biofertilizers & Biopesticides?

22 responses



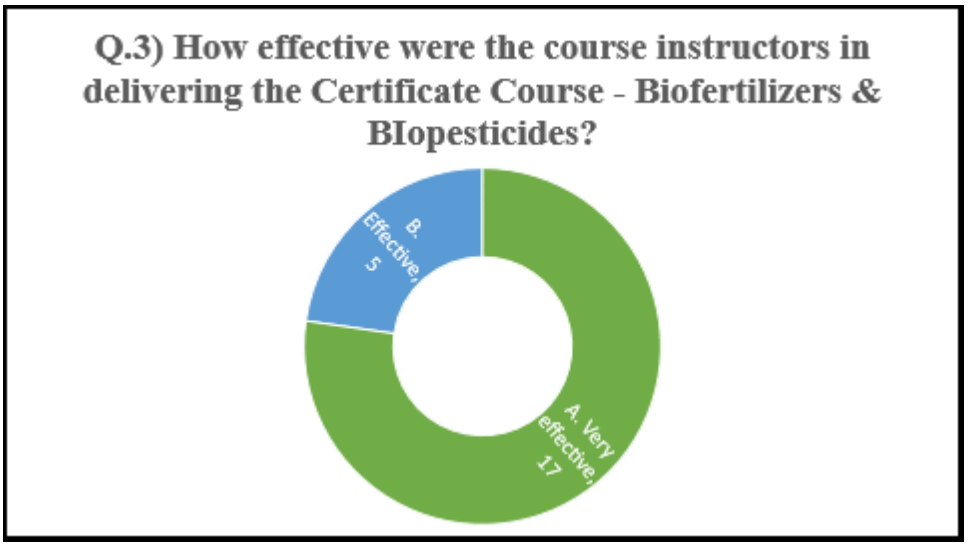
Q.2) How well did the Certificate Course - Biofertilizers & Biopesticides meet your expectations?

22 responses



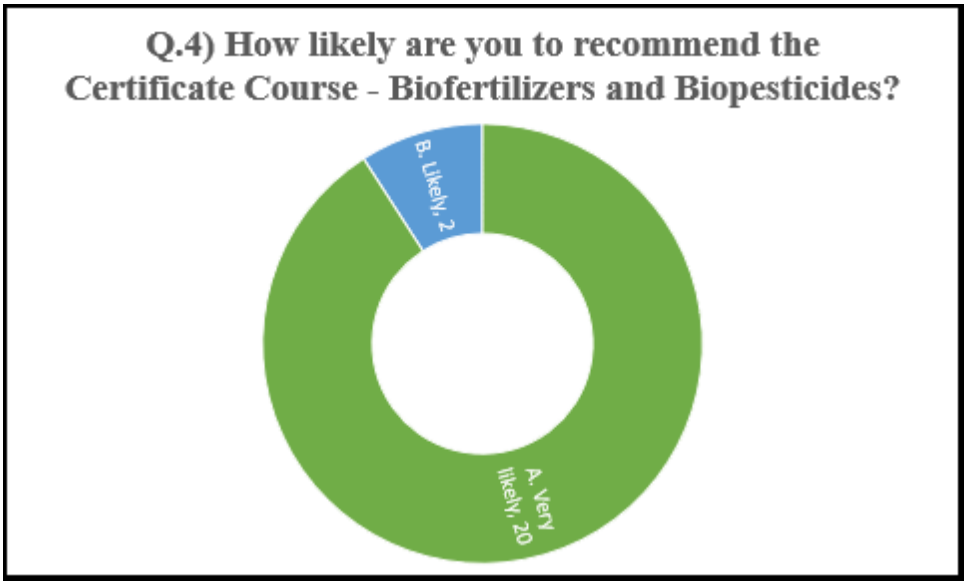
Q.3) How effective were the course instructors in delivering the Certificate Course - Biofertilizers & Biopesticides ?

22 responses



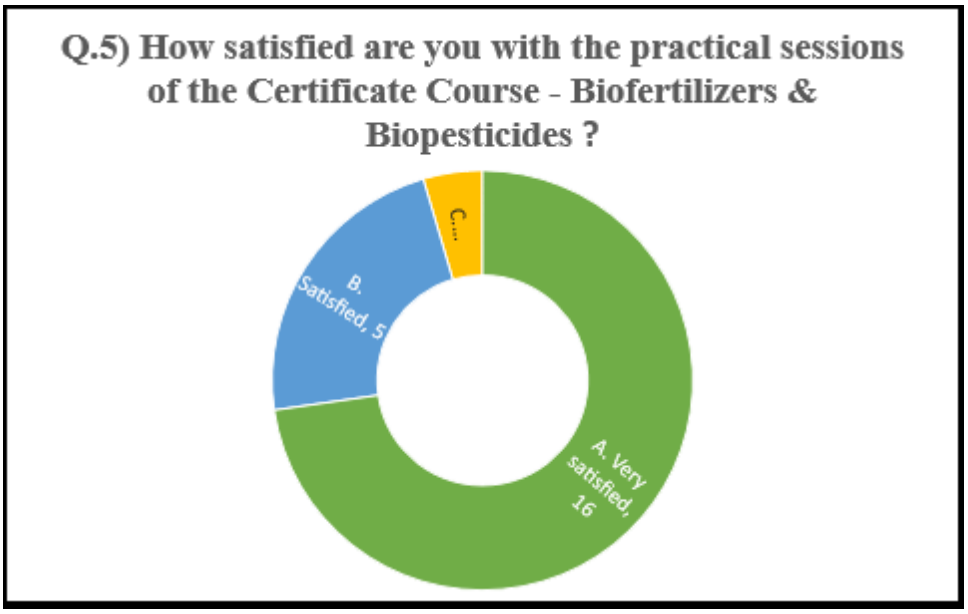
Q.4) How likely are you to recommend the Certificate course- Biofertilizers & Biopesticides?

22 responses



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

22 responses



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

Dr. Amitabh Halder
IQAC Coordinator
Internal 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.

Science College, Congress Nagar, Nagpur. SEAL