

**SCHOOL OF SCIENCE**  
**Department of Microbiology**

**CRITERIA 1**

**SUB CRITERIA 1.3.3**

**Percentage of students undertaking field  
projects / research projects / internships**

**Academic Year**

**2023-2024**

  
Dr. Omveer Singh  
REGISTRAR  
ITM University  
Gwalior (M.P.)

**SCHOOL OF SCIENCE  
Department Of Microbiology**

**Total Number of Research Projects in UG and PG**

Research Projects	Program	Total Number of students involved in research projects
	M. Sc Microbiology	05

The students undertake mini and major projects for increasing their practical knowledge and experience. Students are encouraged to do their research in the Research Institutes, hospitals and Industries to encourage the research insight in them

**Total Number of Research Projects/Internships in UG**

Internships/Research Projects	Program	Total Number of students involved in Internship
	BSc Microbiology	03

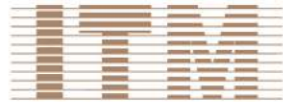
In the microbiology disciplines, there is mandatory Internship. In the curriculum design it has been incorporated into the programme and complete it as a mandatory part of final year training.

**Total Number of Field Project/Industry visits in UG and PG**

Field Project/Industry visits/Hands on Training	Program	Total Number of students involved in field projects
	BSc Microbiology	14

Field visits / Industry Visits Field/ Industrial visits during the course of any programme gives students an insight on the internal working environment of the company. Microbiology, students undertake field visits to research institutes, industries, sewage treatment plants, water treatment plants, pathologies etc. to enhance knowledge and enrich skills.

  
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**School of Sciences**

NAME OF COURSE: B. SC. MICROBIOLOGY

SESSION 2023 ONWARDS


SEMESTER: VI


SUBJECT WISE DISTRIBUTION OF MARKS AND CORRESPONDING CREDITS

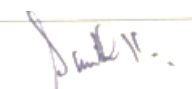
Sr. No.	Subject Code	Subject Name	Maximum Marks Allotted							Credits		Total Credits
			Theory Slot			Practical Slot			Total Marks	L	P	
			End Sem.	Mid Sem. MST (Two tests average)	Class Participation	End Sem.	Progressive Evaluation	Internal viva				
1	BSMB-601	Medical Microbiology	40	30	30	40	30	30	200	3	1	04
2	BSMB-602	Food and Dairy Microbiology	40	30	30	40	30	30	200	3	1	04
3	BSMB-603	Research Methodology	40	30	30	-	-	-	100	4	0	04
4	BSMB-604	Marine Microbiology	40	30	30	40	30	30	200	3	1	04
5	BSMB-605	Environmental Microbiology	40	30	30	-	-	-	100	2	-	02
6	BSMB 606	Open Elective 2	40	30	30	-	-	-	100	2	-	02
7	BSMB - 607	Major Project + Seminar	-	-	-	200+	-	-	300	2	-	02
8	BSMB 608	NCC*/MOOC*	40	30	30	40	30	30	200	2	1	3
<b>Total</b>									<b>1200</b>			<b>22+3</b>

\*Additional credit only for those students who opt for NCC/MOOC

List of Open Electives: 2 Subjects	BSMB 606 A: Introduction to Nanobiotechnology	BSMB 606 B: Frontiers in Biotechnology and Microbiology
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 Dr. Y.C. Goswami  
 (Chairman)

  
 Dr. Rita Sharma  
 (Coordinator & member)

  
 Dr. Santosh Kumar  
 (Exam Superintendent)

  
 Dr. Omveer Singh  
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 ITM University  
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## Syllabus (B.Sc. Microbiology)

<b>Title of the Course</b>	Major Project
<b>Course Code</b>	BSMB 607 [P]

### Part A

Year	3rd	Semester	6th	Credits	L	T	P	C	
					0	0	2	2	
<b>Course Type</b>	Lab only								
<b>Course Category</b>	Projects and Internship								
<b>Pre-Requisite/s</b>	Knowledge of Basic Biotechnology and laboratory skills			<b>Co-Requisite/s</b>					
<b>Course Outcomes &amp; Bloom's Level</b>	<b>CO1-</b> To enhance writing skills and knowledge.( <b>BL2-Understand</b> ) <b>CO2-</b> To increase their mental ability.( <b>BL3-Apply</b> ) <b>CO3-</b> To inculcate the ability to express innovative opinion and thoughts.( <b>BL4-Analyze</b> ) <b>CO4-</b> To have Dissertation works as skills development in students.( <b>BL5-Evaluate</b> )								
<b>Course Elements</b>	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professional Ethics ✗ Gender ✗ Human Values ✗ Environment ✗		<b>SDG (Goals)</b>	SDG9(Industry Innovation and Infrastructure)					

### Part B

Modules	Contents	Pedagogy	Hours
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### Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
Module-I	Identification of a problem and formulation of a topic of project/thesis	Internship	BL3-Apply	15 rs
Module-II	To have field work and data collection through a chosen methodology	Internship	BL4-Analyze	180 hrs
Module-III	Dissertation and Viva-Voce	Internship	BL5-Evaluate	60 hrs

  
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## Part D(Marks Distribution)

Theory					
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation
Practical					
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation
300	150	300	150	-	

## Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	3	2	-	1	-	-	-	-	-	-	1	1	1
CO2	1	1	3	1	2	-	2	-	-	-	-	-	2	2	1
CO3	2	-	2	-	2	1	1	-	-	-	-	-	2	1	2
CO4	1	1	2	-	2	2	1	-	-	-	-	-	3	2	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

  
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## Details of UG Research projects/Internship

**Name of the School: School Science, ITM University, Gwalior.**

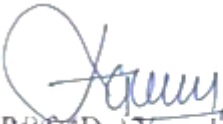
**Name of the Course and Branch: B.Sc. Microbiology**

**Session: 2022– 2023**

**Total No. of Students enrolled: 03**

**Duration: 45 Days**

S.No	Roll No	Name Of Students	Name of Industry/Institute	Topic	Supervisor
1	BSMN1MB21003	Saikat Mondal	CSIR-NBRI , Lucknow (U.P)	Bioinoculant producer for agricultural application	Dr. Puneet Singh Chauhan
2	BSMN1MB21007	Akansha Gupta	CSIR-NBRI , Lucknow (U.P)	Bioinoculant producer for agricultural application	Dr. Puneet Singh Chauhan
3	BSMN1MB21008	Gagan Awasthi	CSIR-NBRI , Lucknow (U.P)	Bioinoculant producer for agricultural application	Dr. Puneet Singh Chauhan

  
 Prof. (Dr.) Yogesh C Goswami  
 Dean  
 School of Applied Sciences  
 School of Science ITM University  
 Gwalior (M.P.)-INDIA-474001

  
 Dr. Omveer Singh  
 REGISTRAR  
 ITM University  
 Gwalior (M.P.)

**List of Students of BSc Microbiology 6<sup>th</sup> Semester**

<b>Roll No.</b>	<b>Name of Student</b>
BSMN1MB21003	Saikat Mondal
BSMN1MB21007	Akansha Gupta
BSMN1MB21008	Gagan Awasthi

  
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**MAJOR PROJECT**  
**BIOINOCULANT PRODUCER FOR AGRICULTURE**  
**APPLICATION**

Submitted in partial fulfillment for the degree of  
**BACHELOR OF SCIENCE (Hons)**  
**IN**  
**MICROBIOLOGY**

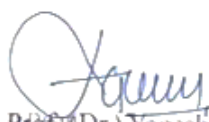


Under the guidance of  
**Prof. (Dr.) Puneet Singh Chauhan**  
Senior Scientist  
CSIR NBRI, Lucknow (UP)

Submitted By

**Gagan Awasthi**  
**BSMNMB21008**  
**B.Sc. (Hons) Microbiology**  
**School of Science**  
**ITM University, Gwalior**

---

  
Prof. (Dr.) Yogesh C Goswami  
Dean  
School of Applied Sciences  
School of Science ITM University  
Gwalior (M.P.)-INDIA-474001

  
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Dean  
School of Applied Sciences  
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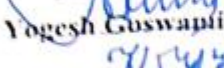
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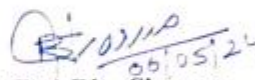
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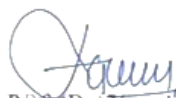


**CERTIFICATE**

This is to certify that Mr.Gagan Awasthi a student of B.Sc. (Hons) Microbiology has completed the major project entitled " BIOINOCULANT PRODUCER FOR AGRICULTURE APPLICATION under the guidance of Dr.Puneet Singh Chahuan Senior scientist CSIR-NBRI Lucknow (U.P) him training was from 5/06/23 to 30/06/23 the project report is successfully submitted to ITM university Gwalior in the partial fulfillment of the reward of the degree of B.Sc. (Hons) Microbiology.

  
Prof. (Dr.) Yogesh C Goswami  
Dean  
School of sciences  
ITM University Gwalior

  
Prof. (Dr.) Rita Sharma  
Department Coordinator  
School of sciences  
ITM University Gwalior

  
Prof. (Dr.) Yogesh C Goswami  
Dean  
School of Applied Sciences  
School of Science ITM University  
Gwalior (M.P.) (INDIA-474001)

  
Dr. Omveer Singh  
REGISTRAR  
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Gwalior (M.P.)

A major project  
On  
**“BIOINOCULANT PRODUCER FOR  
AGRICULTURAL APPLICATION”**

Submission in the partial fulfilment for the award of the degree of

**BACHELOR OF SCIENCE (Hons)**

**IN**

**MICROBIOLOGY**



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Under the guidance of

**Dr. Puneet Singh Chauhan**

Senior Scientist

CSIR – National Botanical Research Institute

Lucknow, India

Submitted By

**Akanksha Gupta**

BSMN1MB21007

B.Sc. (Hons) Microbiology

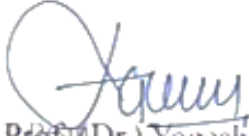
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Prof. (Dr.) Yogesh C Goswami

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Dr. Omveer Singh  
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**CERTIFICATE**

We hereby certify that the work which is being presented in this thesis entitled "Bioinoculant Producer for Agricultural Application" at, CSIR – National Botanical Research Institute, Lucknow, U.P-226001, India. Their training period was from 5 June 2023 to 30 June 2023. The project is being submitted to ITM University, Gwalior, in partial fulfilment of the award of the degree of Bachelor of Science in ~~Microbiology~~ <sup>Microbiology</sup>. No part of the report has been submitted for any other degree or diploma.

DEAN   
**Dr. Yogesh C. Goswami**  
School of Sciences  
ITM University Gwalior

  
Supervisor  
**Dr. Rita Sharma**  
Assistant prof.  
School of Sciences

  
Prof. (Dr.) Yogesh C. Goswami  
Dean  
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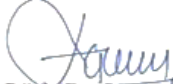


**MAJOR PROJECT**  
**BIOINOCULANT PRODUCER FOR AGRICULTURAL APPLICATIONS**

Under the guidance of,  
**Dr. Puneet Singh Chauhan,**  
Senior Scientist,  
CSIR-National Botanical Research Institute,  
Lucknow, U.P. India

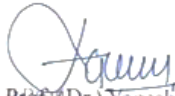
**In partial fulfilment of Bachelor of Science (Hons), Biotechnology**

Submitted by  
**Mr. Saikat Mondal (BSMN1MB21003)**  
School of Sciences,  
ITM University, Gwalior

  
Prof. (Dr.) Yogesh C Goswami  
Dean  
School of Applied Sciences  
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**Details of Industrial Visit/Hands on Training (UG/PG)  
On**


**“Basic Plant Biotechnology and Biochemistry Techniques”**

**II Year B.Sc Microbiology Brief Summary**

**Objective**

The objective of industrial visits /hands on training, provide students with the unique opportunity to witness how theoretical knowledge is applied in practical, industrial settings. Also, aware the students with the Real-world exposure. This firsthand experience enhances their understanding of concepts learned in the classroom. It helps to bridge the widening gap between theoretical learning and practical exposure by giving students first-hand exposure to identify the inputs and outputs of different business operations and processes performed at the workplace

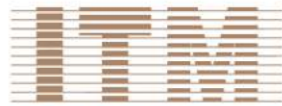
The Department of Biotechnology and Microbiology, School of Sciences, ITM University, Gwalior, has organized three days of hands-on training at the Central Agroforestry Research Institute (CAFRI-ICAR), Jhansi (U.P.), on “**Basic Plant Biotechnology and Biochemistry Techniques**” for the students of Biotechnology and Microbiology from February 01<sup>st</sup> to February 03<sup>rd</sup>, 2024. Dr. A Arunachalam (Director ICAR- CAFRI) provided this great opportunity to our students. Training session was inaugurated by chief guest Dr. R.K.Singh (Dean , College of Agriculture, RLBCAU, Jhansi). The training was headed by Dr. K. Rajarajan (Senior Scientist, Plant Genetics) along with Dr. Hirdayesh Anuragi (Scientist, Genetics and Plant Breeding) and Dr. Badre Alam (Principal Scientist, Plant Physiology). Students have learned about the standard operating protocol of laboratories and good laboratory practices (GLP). They have practiced to isolate DNA from the various samples and estimated it using several techniques like Agarose gel electrophoresis, UV spectrophotometer, PCR, RT-PCR, etc. Plant physiological techniques were also taught to the students. Students also gained knowledge of agroforestry with the help of a field visit. They have seen how the agricultural crops can be merged with the forest trees for sustainable agriculture practices. This training was highly beneficial for our student’s future research prospects. The training was organized by Dr. Rita Sharma (Assistant Professor, biotechnology) under the supervision of Dean SOS Prof. Y.C. Goswami and the complete session was reported by Dr. Rekha Vashishtha (SOS) .It has been a wonderful experience for our students.

  
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The outcomes of Hands-on Training for BSc Biotechnology students include:

- **Cognitive Knowledge:** To provide education that leads to comprehensive understanding of the principles and practices of biotechnology.
- **Enhanced Research Skills:** Students gain hands-on experience by doing experiential learning, honing their research skills and competence.
- **Increased critical thinking ability:** Provides opportunities to plan organize and engage in active learning experiences both inside and outside the classroom
- **Improved Communication and Research Skills:** Exposure to eminent and distinguished persons in different fields through talks encourages students to take on greater responsibility, fostering professional growth, and enhancing confidence in their research practice.
- **Information and Computer Literacy:** To educate and make them up to date with the current scientific literature, computer programs and web information.
- **Preparation for Future Practice:** Hands on training provides valuable experiential learning opportunities that prepare students for their future roles as competent and compassionate biotechnologists in various research organizations, industries or health care sectors.

  
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**List of Students –Attended Hands on Training  
(CAFRI-Jhansi U.P)**

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**Attendance of Students of BSc & M. Sc (BT/MB) II & IV Semester  
In Hands on Training at ICAR-CAFRI, Jhansi (U.P)  
Date: 01<sup>st</sup>- 3<sup>rd</sup> February 2024**

S No	Name	Roll No	Signature
1	Sudeshna Nag	BSBN1BT22007	
2	Shubhansi Rajawat	BSBN1BT22020	
3	Kaushiki Bhadouriya	BSBN1BT22006	
4	Sneha Choudhary	BSBN1BT22036	
5	Jhaanvi Shivhare	BSBN1BT22018	
6	Devraj Malhotra	BSBN1BT22013	
7	Ayush Kumar	BSBN1BT22030	
8	Mohit Savita	BSBN1BT22016	
9	Arvaaj Khan	BSBN1BT22023	
10	Priyanshu Gupta	BSBN1BT22010	
11	Mayank Singh	BSBN1BT22037	
12	Kartikey	BSBN1BT22029	
13	Samiksha Jain	BSMN1MB23006	
14	Nandini Soni	BSMN1MB23001	
15	Saahiba Naaz	BSMN1BT23004	
16	Riya	BSBN1MB22002	
17	Archi Chugh	BSBN1MB22003	

**Dr. Rita Sharma**  
Program coordinator  
School of Sciences

**Prof. Y.C. Goswami**  
Dean  
School of Sciences

ITM University Gwalior Campus, NH-44, Turari, Gwalior, (M.P.) - 475 001 INDIA  
mail: info@itmuniversity.ac.in, web: www.itmuniversity.ac.in

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**Students for their Hands on Training at ICAR-CAFRI, Jhansi (U.P)**



**Introductory session at ICAR-CAFRI, Jhansi (U.P)**

  
**Dr. Omveer Singh**  
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**Laboratory sessions at ICAR-CAFRI, Jhansi (U.P)**



**Students doing research practices at ICAR-CAFRI, Jhansi (U.P) under the guidance of Sr. Scientist Dr. K. Rajarajan**









Valedictory session at ICAR-CAFRI, Jhansi (U.P) with Director CAFRI Dr. A. Arunachalam



  
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Certificate distribution to the participants at ICAR-CAFRI, Jhansi (U.P) with Director CAFRI Dr. A. Arunachalam, Principal Scientist Dr. A. K. Handa