Shobhit
Institute of Engineering & Technology
Deemed to-be-University
EDUCATION EMPOWERS

SCHEME OF TEACHING
&
SYLLABUS

For

BACHELOR OF SCIENCE (MICROBIOLOGY)
B.Sc
(Three Year, Six Semester Program)

"Based on Outcome Based Education (OBE) Framework"

(Academic Session 2026 - 27)

Shobhit Institute of Engineering & Technology

[NAAC 'A' Grade Accredited Deemed-to-be University estd u/s 3 of UGC Act, 1956]

Campus: NH - 58, Modipuram, Meerut - 250110, Delhi NCR

NAAC A GRADE ACCREDITED UNIVERSITY

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NAAC | UGC | AICTE | AIU | BCI | NCTE | SIRO | TBI | AICTE IDEA Lab | NCC

Semester	**VAC**	**CC**	**DSE**	**MDC**	**AEC**	**SEC**	**PROJECT**	**TOTAL**	**SI**
I	0	9	4	0	3	6	0	22	**0**
II	5	9	4	0	2	3	0	23	**2**
III	3	9	4	3	0	3	0	22	**0**
IV	0	9	4	3	3	3	0	22	**2**
V	0	12	4	3	0	3	0	22	**0**
VI	3	12	4	0	3	0	3	25	**0**
Total	**11**	**60**	**24**	**9**	**11**	**18**	**3**	**136**	**4**

VAC	Value added courses
CC	Core courses
DSE/Minor	Department specific elective.
MDC	Multidisciplinary Course
AEC	Ability enhancement course
SEC	Skill enhancement course
SI	Summer internship
Project: MIP/MAP	Minor Project/Major project

Teaching Scheme (B.Sc. MICROBIOLOGY)

3 Year Full time Programme

Academic Session: 2026-2027

VISION:

To be recognized as a leading institution in India and globally for academic excellence, transformative research and holistic development of students, actively contributing towards an empowered inclusive and enlightened society.

MISSION:

M1: To Provide a comprehensive multidisciplinary and interdisciplinary education in biotechnology equipping students with theoretical knowledge and practical skills**.**

M2: To cultivate a passion for specific inquiry innovation and problem-solving empowering students.

M3: To foster practical learning through innovative teaching and learning techniques and to enhance students' foundation by organizing seminars and workshops.

M4: To contribute to the sustainable development of the society improve human health and promote environmental conservation through the application of biotechnology.

Program Outcome: Bachelor of Science (B.Sc.) offers theoretical as well as practical knowledge about different subject areas. These subject areas include Physics, Chemistry, Mathematics and Biology and other fields depending on the specialization a student opts. This programme course is most beneficial for students who have a strong interest and background in Science and Mathematics. The course is also beneficial for students who wish to pursue multi and inter-disciplinary science careers in future. Following are the various programme outcomes:

PO1. Understanding fundamental principles and advanced concepts in microbiology, including microbial diversity, genetics, and ecology.

PO2. Proficiency in microbiological techniques such as culturing, isolation, identification, and characterization of microorganisms.

PO3. Ability to analyse and evaluate scientific literature, experimental data, and apply problem-solving skills in microbiological research and applications.

PO4. Effectively communicate scientific findings and concepts through written reports, oral presentations, and scientific discussions.

PO5. Understanding ethical considerations and responsibilities in microbiological research, including biosafety, biosecurity, and ethical conduct.

PO6. Preparedness for careers in various fields including healthcare, pharmaceuticals, biotechnology, environmental science, and research through practical training and theoretical knowledge.

PO7. Apply microbiological principles to solve practical problems in healthcare, agriculture, and industry.

PO8. Discuss the ethical implications of microbiological research and applications

PO9. Communicate scientific findings effectively through oral presentations and written reports.

PO10. Collaborate effectively in interdisciplinary teams to address microbiological challenges

Teaching Scheme
B.Sc. Microbiology Semester – I

Type of Subject	Subject Name	Subject Code	Credit	Hours		
				L	T	P
CC	Cell Biology	T02BSBT0101	3	2	1	0
CC	General Microbiology	T02BSMB0102	3	2	1	0
CC	Bio-Chemistry	T02BSBT0103	3	2	1	0
DSE	Developmental Biology	T02BSBT0130	4	3	1	0
AEC	Professional Communication	T05ASEN0151	3	2	1	0
SEC	Cell Biology Lab	T02BSBT0161	2	0	0	4
SEC	General Microbiology Lab.	T02BSMB0162	2	0	0	4
SEC	Bio Chemistry Lab.	T02BSBT0163	2	0	0	4
Total Credits			22	11	5	12

SEMESTER-II

	Subject Name	Subject Code	Credit	Hours		
				L	T	P
CC	**Principles of Genetics**	**T02BSBT0201**	**3**	2	1	0
CC	**Immunology**	**T02BSMB0202**	**3**	2	1	0
CC	**Bio-instrumentation**	**T02BSBT0203**	**3**	2	1	0
DSE	**Biostatistics**	**T05ASMA0230**	**4**	3	1	0
VAC	**Environment Sciences**	**T04BTAT0280**	**2**	2	0	0
VAC	**IDEA LAB**	**T06BTME0280**	**2**	0	0	4
SEC	**Principles of Genetics Lab**	**T02BSBT0261**	**1**	0	0	2
SEC	**Immunology Lab.**	**T02BSMB0262**	**1**	0	0	2
SEC	**Bio-instrumentation Lab**	**T02BSBT0263**	**1**	0	0	2
Total Credits			**20**	**11**	**5**	**10**
EXIT OPTION (UG CERTIFICATE)	**SI**	**T02BSMB0290**	**2**	0	0	4
	TOTAL		22	11	5	14

B.Sc. Microbiology Semester III

Type of Subject	Subject Name	Subject Code	Credit	Hours		
				L	T	P
CC	**Molecular Biology**	**T02BSBT0301**	**3**	2	1	0
CC	**Bacteriology**	**T02BSMB0302**	**3**	2	1	0
CC	**Virology**	**T02BSMB0303**	**3**	2	1	0
DSE	**Microbial Metabolism**	**T02BSMB0330**	**4**	3	1	0
VAC	**Scientific writing & Presentation skills**	**T02BSBT0380**	**3**	2	1	0
MDC	**Bio-computation**	T02BSBT0340	3	2	1	0
SEC	**Molecular Biology Lab**	T02BSMB0361	1	0	0	2
SEC	**Bacteriology Lab**	T02BSMB0362	1	0	0	2
SEC	**Virology Lab.**	T02BSMB0363	1	0	0	2
Total Credits			22	13	6	6

B.Sc. Microbiology Semester IV

	Subject Name	Subject Code	Credit	Hours		
				L	T	P
CC	**Plant Pathology**	**T02BSMB0401**	**3**	2	1	0
CC	**Proteomics & Genomics**	**T02BSBT0402**	**3**	2	1	0
CC	**Food & Dairy Microbiology**	**T02BSMB0403**	**3**	2	1	0
DSE	**Biophysical Techniques**	**T02BSBT0430**	**4**	3	1	0
CC	**Non-conventional Energy Resources**	**T02BSBT0440**	**3**	2	1	0
AEC	Logical Skill Building and Soft Skills	T02BSBT0450	**3**	2	1	0
SEC	**Plant Pathology lab**	**T02BSMB0461**	1	0	0	2
SEC	**Proteomics & Genomics** Lab.	**T02BSBT0462**	1	0	0	2
SEC	**Food & Dairy Microbiology** Lab	**T02BSMB0463**	1	0	0	2
		Total Credit	**22**	**13**	**6**	**6**
EXIT OPTION (UG DIPLOMA)	**SI**	**T02BSMB0490**	2	0	0	4
		Total Credit	**24**	**13**	**6**	**10**

B.Sc. Microbiology Semester V

Type of Subject	Subject Name	Subject Code	Credit	Hours		
				L	T	P
CC	**Blue Microbiology**	**T02BSMB0501**	**3**	2	1	0
CC	**Environmental Biotechnology**	**T02BSBT0502**	**3**	2	1	0
CC	**IPR in Life Science**	**T02BSBT0503**	**3**	2	1	0
CC	**Pharmaceutical Biotechnology**	**T02BSBT0504**	**3**	2	1	0
DSE	**Microbial Bio-diversity**	**T02BSMB0531**	**4**	3	1	0
MDC	**Entrepreneurship & Innovation In Biotechnology**	**T02BSBT0540**	**3**	2	1	0
SEC	**Blue Microbiology Lab**	**T02BSMB0561**	1	0	0	2
SEC	**Environmental Biotechnology Lab**	**T02BSBT0562**	1	0	0	2
SEC	**IPR Case Studies**	**T02BSBT0563**	1	0	0	2
			22	13	6	6

B.Sc. Microbiology Semester VI

	Subject Name	Subject Code	Credit	Hours		
				L	T	P
CC	**Medical Microbiology**	**T02BSMB0601**	**3**	2	1	0
CC	**Food Fermentation Techniques**	**T02BSMB0602**	**3**	2	1	0
CC	**Recombinant DNA Technology**	**T02BSBT0603**	**3**	2	1	0
DSE	**Industrial Biotechnology**	**T02BSMB0630**	**4**	3	1	0
CC	**Microbial quality control in food and Pharmaceutical Industries**	**T02BSMB0604**	**3**	2	1	0
AEC	**AI in Microbiology**	**T02BSMB0696**	**3**	2	1	0
VAC	**Seminar/Workshop/Training/Conference**	**T02BSMB0680**	3	3	0	0
SEC	**MAJOR PROJECT**	**T02BSMB0696**	3	0	0	6
		Total Credits	**25**	**16**	**6**	**6**