

SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI



THREE-YEAR UNDERGRADUATE PROGRAMME

Bachelor of Science (B.Sc.)

Subject: MICROBIOLOGY

FACULTY: SCIENCE AND TECHNOLOGY

(Courses effective from Academic Year 2026-2027 Under Uniform NEP 2020)

**Scheme of
Teaching-Learning-Evaluation,
Credit Distribution, Workload Calculation and Examination**

Credit Distribution

Three/Four-year UG Degree Programme (Level 4.5 to 5.5)

Vertical	Vertical Type	I	II		III	IV	V	VI	Total Credits	Grand Total
	(i) Three-year UG Degree Programme (Level 4.5.to 5.5)									
A	Major DSC (60–64) (Minimum 50% of Total Credits)	4	4	Major	6	8	8	8	38	48
				IKS	2				2	
		0	0	Elective	0	0	4	4	8	
B	Minor (from same faculty of DSC) (18–24)	4	4		4	4	4	4	24	24
C	Generic/Open Elective (OE) (Faculty-wise basket other than Major/Minor faculty) (10–12)	4	4		2	2	0	0	12	12
D(i)	Vocational Skill Courses (VSEC) corresponding to Major/Minor (8–10)	0	2		2	2	2	2	10	16
D(ii)	Skill Enhancement Courses (SEC)	2	2		0	0	2	0	6	
E(i)	Ability Enhancement Courses (AEC) (English + Modern Indian Language)	1+1	1+1		1+1	1+1	0	0	8	14
E(ii)	Indian Knowledge System (IKS) 2 Generic	2	0		0	0	0	0	2	
E(iii)	Value Education Courses (VEC) (Understanding India, EVS, Digital & Technological Solution) 4	2	2		0	0	0	0	4	
F(i)	Internship / Apprenticeship corresponding to Major 8 (OJT)	0	0		0	0	0	4	4	18
F(ii)	Field Projects / Community Engagement & Service (CEP) corresponding to Major 4-6	0	0		2	2	2	0	6	
F(iii)	Co-curricular Courses (CC) (health & wellness, yoga education, sports, fitness, cultural activities, NSS/ NCC & Fine/ Applied/ Visual/ Performing Arts 8	2	2		2	2	0	0	8	
	Total Credits per Semester	22	22		22	22	22	22	132	132

(ii) Four-year UG Degree programme (Level 6.0) Honors Degree in Major or Minor						
A. Honors Degree in Major or Minor						
	Vertical Type			Semester VII	Semester VIII	
	Major (Offered at Three-year UG Programme)	Mandatory		12-14(2*4+2*2 or 3*4+2)	12-14(2*4+2*2 or 3*4+2)	28
		Elective		4	4	8
	Research Methodology (RM)			4	0	8
	On the Job Training (OJT)			0	4	4
	Total			22	22	44
	Cumulative			(132+44) 176		
(ii) Four-year UG Degree Programme (Level 6.0)						
B. Honors with Research Degree in Major or Minor						
	Major (Offered at Three-year UG Programme)		Semester VII	Semester VIII		
		Mandatory	8-10 (24+2 or 24)	8-10 (24+2 or 24)	20	
		Elective	4	4	8	
	Research Methodology (RM)		4	0	4	
	Research Project (RP)		4	8	12	
	Total		22	22	44	
	Cumulative		(132+44) 176			

Sant Gadge Baba Amravati University, Amravati

Teaching and Learning Scheme for the Degree of Bachelor of Science

FACULTY: SCIENCE AND TECHNOLOGY

TLE Scheme for FIRST YEAR: SEMESTER – I (MICROBIOLOGY) (Level 4.5)

(As per uniform NEP Scheme)

The Vertical	Type of Course	Course Code	Course Title	Credits	Workload	Theory/Practical				Theory/Pract (Total)	
						External		Internal			
						Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks
Major / Minor	Theory	127200	Introductory Microbiology	2	2	30	9	20	6	50	20
	Lab/Practical	127201	Basic techniques and Study of microbes	2	4	25	10	25	10	50	20
Minor / Major	Theory	-	-	2	2	30	9	20	6	50	20
	Lab/Practical	-	-	2	4	25	10	25	10	50	20
GOEC	Theory	127202	Communicable diseases and their control	2	2	30	9	20	6	50	20
GOEC	Theory	127203	Food preservation and Food safety	2	2	30	9	20	6	50	20
SVSC	-	-	-	-	-	-	-	50	20	50	20
SEC	Lab/Practical	127204	Microscopy and Staining for microbes	2	4	-	-	50	20	50	20
AEC - English	Theory		Refer University basket	1	1						
AEC –MIL	Theory		Refer University basket	1	1						
IKS-Generic	Theory		Refer University basket	2	2						
VEC	Theory		Refer University basket	2	2						
CC	Outdoor		Separate SOP will be released	2	4						
TOTAL				22	30						

TLE Scheme for FIRST YEAR: SEMESTER – II (Level 4.5)

The Vertical	Type of the Course	Course Code	Course Title	Credits	Workload	Theory/Practical				Theory/Pract (Total)	
						External		Internal			
						Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks
Major / Minor	Theory	127205	Bacteriology and Microbial control	2	2	30	9	20	6	50	20
	Lab/Practical	127206	Techniques for culturing Bacteria	2	4	30	9	20	6	50	20
Major / Minor	Theory		-	2	2	25	10	25	10	50	20
	Lab/Practical		-	2	4	30	9	20	6	50	20
GOEC	Theory	127207	Microbes for Sustainable Agriculture	2	2	25	10	25	10	50	20
GOEC	Theory	127208	Composting and Biogas Technology	2	2	30	9	20	6	50	20
VSC	Lab/Practical	127209	Microbial Control	2	4	-	-	50	20	50	20
SEC	Lab/Practical	127210	Isolation and Morphological Characterization of Bacteria	2	4	-	-	50	20	50	20
AEC - English			Refer University basket	1	1	-	-	50	20	50	20
AEC –MIL			Refer University basket	1	1	-	-	50	20	50	20
VEC			Refer University basket	2	2						
CC			Separate SOP will be released	2	4						
TOTAL				22	32						

*** Important:**

- VSC Should be Complementary to Major/Minor
- SEC has to be selected from the Basket Provided by University, from the same Faculty/Discipline of the Major/Minor

TLE Scheme for SECOND YEAR: SEMESTER – III (Level 5.0)

The Vertical	Type of the Course	Course Code	Course Title	Credits	Workload	Theory/Practical				Theory/Pract (Total)	
						External		Internal			
						Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks
Major	Major-T	127211	Bacterial Growth and Pure Culture	2	2	30	9	20	6	50	20
Major	Major-T	127212	Fundamentals of Virology	2	2	30	9	20	6	50	20
Major	Major-P	127213	Techniques for Bacterial Growth and Pure Culture	2	2	30	9	20	6	50	20
Major	IKS-T	127214	IKS in Microbiology	2	2	30	9	20	6	50	20
Minor	Minor-T	127215	Microbial Reproduction and Bacterial Pure Culture	2	2	30	9	20	6	50	20
Minor	Minor-P	127216	Techniques of Microbial culture, Bacterial Physiology and Pure Culture	2	4	25	10	25	10	50	20
GOEC	GOEC-T	127217	Applied Microbiology for Day to Day Life	2	2	30	9	20	6	50	20
VSC	VSC-P	127218	Microbial cultivation and Culture Preservation	2	4	-	-	50	20	50	20
FP/CES	FP/CES	127219	FP/CES in Microbiology	2	4	-	-	50	20	50	20
CC	CC		Separate SOP shall be consulted from University website	2	4	-	-	50	20	50	20

Important: * VSC Should be Complementary to Major

** SEC has to be selected from the Basket Provided by University, from the same Faculty/Discipline of the Major/Minor

TLE Scheme for SECOND YEAR: SEMESTER – IV (Level 5.0)

The Vertical	Type of the Course	Course Code	Course Title	Credits	Workload	Theory/Practical				Theory/Pract (Total)	
						External		Internal		Max. Marks	Min. Marks
						Max. Marks	Min. Marks	Max. Marks	Min. Marks		
Major	Major-T	127220	Medical Microbiology	2	2	30	9	20	6	50	20
Major	Major-T	127221	Immunology & Serology	2	2	30	9	20	6	50	20
Major	Major-T*	127229	Microbiology for public health	2	2	30	9	20	6	50	20
Major	Major-P	127222	Medical Microbiology and serology	2	4	25	10	25	10	50	20
Minor	Minor-T	127223	Clinical Microbiology	2	2	30	9	20	6	50	20
Minor	Minor-P	127224	Clinical Microbiology and serology	2	4	25	10	25	10	50	20
GOEC	GOEC-T	127225	Microbiology for Human Health	2	2	30	9	20	6	50	20
VSC	VSC-P	127226	Skills for Diagnostic Microbiology	2	4	-	-	50	20	50	20
SEC	SEC-P#	127227	Blood Bank Technology	2	4	-	-	50	20	50	20
FP/CES	FP/CES	127228	FP/CES in Microbiology–II	2	4	-	-	50	20	50	20
CC	CC		Separate SOP shall be consulted from University website	2	4	-	-	50	20	50	20

* To be implemented w.e.f. academic session 2026-27

- Only applicable up to academic session 2025-26

Important: VSC Should be Complementary to Major and SEC has to be selected from the Basket Provided by University, from the same Faculty/Discipline of the Major/Minor

TLE Scheme for THIRD YEAR: SEMESTER – V (Level 5.5)

The Vertical	Type of the Course	Course Code	Course Title	Credits	Workload	Theory/Practical Marks				Theory/Pract (Total) Marks	
						External		Internal		Max.	Min.
						Max.	Min.	Max.	Min.		
Major	Major-T	127230	Microbial Ecology & Environmental Microbiology	2	2	30	9	20	6	50	20
Major	Major-T	127231	Biochemistry & Metabolism	2	2	30	9	20	6	50	20
Major	Major-T	127232	Fundamentals of Industrial Microbiology	2	2	30	9	20	6	50	20
Major	Major-P	127233	Biochemistry & Environmental Microbiology	2	4	25	10	25	10	50	20
Major	Major-Elective T1	127234	Fermentation Technology	2	2	30	9	20	6	50	20
Major	Major-Elective P1	127235	Fermentation Technology	2	4	25	10	25	10	50	20
OR											
Major	Major-Elective T2	127236	Agriculture Microbiology, Bioinstrumentation and Biostatistics	2	2	30	9	20	6	50	20
Major	Major-Elective P2	127237	Agriculture Microbiology, Bioinstrumentation and Biostatistics	2	4	25	10	25	10	50	20
Minor	Minor-T	127238	Environmental Microbiology and Biomolecules	2	2	30	9	20	6	50	20
Minor	Minor-P	127239	Environmental Microbiology and Biomolecules	2	4	25	10	25	10	50	20
VSC	VSC-P	127240	Water Analysis for Environmental Monitoring	2	4	-	-	50	20	50	20
SEC	SEC-P1	127241	Microbial Fermentation	2	4	-	-	50	20	50	20
FP/CEP	FP/CEP	127242	FP/ CEP in Microbiology	2	4	-	-	50	20	50	20
Non Credit	Non Credit		Foundation of Artificial Intelligence(As per notification no 241/2025 dt 24/12/2025)	NC	2			30+20	9+6	50	20

Important:

- **VSC Should be Complementary to Major**
- **SEC must be selected from the Basket Provided by University, from the same Faculty/Discipline of the Major/Minor**
- As per Sant Gadge Baba Amravati University, Amravati Extra-Ordinary Notification No. No. 241/2025 Dated 24/12/2025 “Foundation of Artificial Intelligence” is the Mandatory **Non-Credit Course** compulsory course for all the UG students in fifth semester of all undergraduate programs of all faculties in Sant Gadge Baba Amravati University, Amravati to earn their degree
- NC is Non-Credit Course
- Students must select **Any One** of the Major-Elective Courses (T1 to T4) with respective Practical Course in Semester V and **same shall be continued** for Semester VI
- Students must select **Any One** of the SEC-P (P1 to P4) Course in Semester V and Semester VI

TLE Scheme for THIRD YEAR: SEMESTER – VI (Level 5.5)

The Vertical	Type of the Course	Course Code	Course Title	Credits	Workload	Theory/Practical Marks				Theory/Pract (Total) Marks	
						External		Internal			
						Max.	Min.	Max.	Min.	Max.	Min.
Major	Major-T	127243	Molecular Biology	2	2	30	9	20	6	50	20
Major	Major-T	127244	Food & Dairy Microbiology	2	2	30	9	20	6	50	20
Major	Major-T	127245	Genetic Engineering	2	2	30	9	20	6	50	20
Major	Major-P	127246	Applied Microbiology	2	4	25	10	25	10	50	20
Major	Major-Elective T1	127247	Fundamentals of Enzymology	2	2	30	9	20	6	50	20
Major	Major-Elective P1	127248	Fundamentals of Enzymology	2	4	25	10	25	10	50	20
OR											
Major	Major-Elective T2	127249	Microbial Biotechnology And Entrepreneurship	2	2	30	9	20	6	50	20
Major	Major-Elective P2	127250	Microbial Biotechnology And Entrepreneurship	2	4	25	10	25	10	50	20
Minor	Minor-T	127251	Molecular Biology &Genetic Engineering	2	2	30	9	20	6	50	20
Minor	Minor-P	127252	Molecular Biology & Genetic Engineering	2	2	30	9	20	6	50	20
VSC	VSC-P	127253	Quality control for Food and Dairy Products	2	4	-	-	50	20	50	20
CC	Intern/Apprenticeship	127254	Internship /Apprenticeship/ OJT (On the Job Training)	4	8	-	-	50	20	50	20

Important: VSC Should be Complementary to Major and SEC has to be selected from the Basket Provided by University, from the same Faculty/Discipline of the Major/Minor

SWAYAM / NPTEL Courses under NEP 2020

Sr. No.	Semester	Course Title	Course Code*	Credits**	Institution	Agency	Enrollment Ends	Link to Enroll
1.	I	Basics of Food and Nutrition	noc26_ge100	3	NOC-IITM	NPTEL	09 Oct 2026	https://onlinecourses.nptel.ac.in/elearning/preview/noc26_ge100
2.	II	Soil fertility and fertilizers	noc26_ag21	4	IIT, Kharagpur	NPTEL	09 Oct 2026	https://onlinecourses.nptel.ac.in/elearning/preview/noc26_ag21
3.	III	Introduction to Cell Biology	noc26_bt102	3	IISER, Pune	NPTEL	09 Oct 2026	https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_bt102
4.	IV	Biomedical nanotechnology	noc26_bt97	2	IIT, Roorkee	AICTE	17 Aug 2026	https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_bt97
5.	V	Waste water treatment and recycling	noc26_ce140	4	IIT, Kharagpur	NPTEL	14 Aug 2026	https://onlinecourses.nptel.ac.in/elearning/preview/noc26_ce140
6.	V	Environmental Biotechnology	noc26_bt88	4	IIT, Kharagpur	AICTE	09 Oct 2026	https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_bt88
7.	VI	Bioreactors	noc26_bt58	2	IIT, Madras	NPTEL	27 Jul 2026	https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_bt58

* Course codes may vary according to the year and session of enrollment

** Credits will be awarded as per provisions of the SWAYAM/NPTEL at the time of actual enrollment.

Instructions for Enrollment in SWAYAM/NPTEL Courses under NEP 2020

All students of B.Sc. with Microbiology as Major or Minor of all semesters are encouraged to enroll in suitable SWAYAM/NPTEL online courses to enhance their academic knowledge, practical skills, and employability.

General Instructions

1. Students may choose any course of their interest listed in table above.
2. Before enrollment, students must ensure that they have an active Academic Bank of Credits (ABC) ID. The same ABC ID should be used while registering for the selected SWAYAM/NPTEL course so that earned credits can be deposited in the Academic Bank of Credits.
3. Students should carefully read the course details including duration, eligibility, syllabus, examination schedule, and credit structure before enrolling.
4. Merely enrolling in a course does not make a student eligible for academic credits. Students must: Complete the course requirements Appear for the proctored examination, and successfully pass the examination as per the norms prescribed by SWAYAM/NPTEL.
5. Credits will be awarded only after successful completion and certification of the course by the concerned agency.
6. Every student must submit the details of the enrolled course to the Department of Microbiology immediately after registration.
7. Submission of enrollment details to the Department is mandatory to facilitate record maintenance and compliance with University requirements regarding credit transfer and academic documentation.
8. Students are advised to preserve all course-related documents, including Enrollment confirmation, Course progress records, Examination registration receipt, Score card, Final certificate.
9. Students shall be responsible for timely registration for the examination, payment of examination fees (if applicable), and completion of all course requirements within the stipulated period.
10. The Department of Microbiology shall not be responsible for missed deadlines, incomplete registrations, examination non-appearance, or failure to satisfy the certification requirements of the concerned SWAYAM/NPTEL course.
11. After successful completion of the course, students must submit a copy of the course certificate and score card to the Department of Microbiology for further processing and reporting to the University.