



SARDAR BHAGWAN SINGH UNIVERSITY

(Established vide Uttarakhand Act 12 of 2018)
Balawala, Dehradun-248161, Uttarakhand, India
Managed by - Gaurav Bharti Shiksha Sansthan

COURSE & CREDIT DISTRIBUTION SCHEME OF UG PROGRAMME (With multiple entry & exit option)
NATIONAL EDUCATION POLICY 2020
B. Sc. MICROBIOLOGY- FOUR YEARS

Certificate in Applied Microbiology

Type of course	Course code	Title of the Course	L-T-P /Week	No. of Credits	University Exam	Internal assessment	Total
SEMESTER I							
Major 1	MICR-111	Introduction to Microbiology	4-0-0	4	50	50	100
Major 1 Practical	MICR-111P	Introduction to Microbiology-Practical	0-0-4	2	50	50	100
Major 2	MICR-112	Mushroom Cultivation	4-0-0	4	50	50	100
Major 3	MICR-113	Cell Biology	4-0-0	4	50	50	100
Major 3 Practical	MICR-113P	Cell Biology- Practical	0-0-4	2	50	50	100
Minor 1	CHEM-112	Molecules of Life	4-0-0	4	50	50	100
Minor 1 Practical	CHEM-112P	Molecules of Life- Practical	0-0-4	2	50	50	100
Skill Enhancement Course 1	Elective	Choose from ANNEXURE III	3-0-0	3	50	50	100
Value Added Course 1*	VAC-1	Basic Communication Skill	3-0-0	3	50	50	100
Total Credits			25				
SEMESTER II							
Major 1	MICR-121	Food & Dairy Microbiology	4-0-0	4	50	50	100
Major 1 Practical	MICR-12 P	Food & Dairy Microbiology- Practical	0-0-4	2	50	50	100
Major 2	MICR-122	Bacteriology	4-0-0	4	50	50	100
Major 2 Practical	MICR-122 P	Bacteriology- Practical	0-0-4	2	50	50	100
Major 3	MICR-123	Basic Biological Techniques	4-0-0	4	50	50	100
Major 3 Practical	MICR-123 P	Basic Biological Techniques -Practical	0-0-4	2	50	50	100
Skill Enhancement Course 2	Elective	Choose from ANNEXURE III	3-0-0	3	50	50	100
Value Added Course 2*	VAC-2	Environmental Sciences	3-0-0	3	50	50	100
Total Credits			21				
Grand Total			46				
<p><i>Exit Option with “Undergraduate Certificate” (Certificate in Applied Microbiology) after the first year or two semesters with the completion of the course equivalent to minimum 40 credits. Along with entry option to third semester after exit.</i></p>							

Diploma in Industrial Microbiology

Type of course	Course code	Title of the Course	L-T-P /Week	No. of Credits	University Exam	Internal assessment	Total
SEMESTER III							
Major 1	MICR-231	Fundamentals of Microbial Physiology & Metabolism	4-0-0	4	50	50	100
Major 1 Practical	MICR-231P	Fundamentals of Microbial Physiology & Metabolism-Practical	0-0-4	2	50	50	100
Major 2	MICR-232	Biochemistry	4-0-0	4	50	50	100
Major 2 Practical	MICR-232 P	Biochemistry-Practical	0-0-4	2	50	50	100
Major 3	CHEM-232	General Analytical Techniques	4-0-0	4	50	50	100
Major 3 Practical	CHEM-232P	General Analytical Techniques- Practical	0-0-4	2	50	50	100
Skill Enhancement Course 3	Elective	Choose from ANNEXURE III	3-0-0	3	50	50	100
Value Added Course 3*	VAC	Choose from ANNEXURE IV	3-0-0	3	50	50	100
Total Credits			21				
SEMESTER IV							
Major 1	MICR-241	Industrial Microbiology	4-0-0	4	50	50	100
Major 1 Practical	MICR-241P	Industrial Microbiology-Practical	0-0-4	2	50	50	100
Major 2	MICR-242	Fundamental Molecular Biology	4-0-0	4	50	50	100
Major 2 Practical	MICR-242P	Fundamental Molecular Biology- Practical	0-0-4	2	50	50	100
Major 3	MICR-243	Bioprocess Technology	6-0-0	6	50	50	100
Minor 1	MICR-244	Bioinformatics	4-0-0	4	50	50	100
Skill Enhancement Course 4	Elective	Choose from ANNEXURE III	3-0-0	3	50	50	100
Value Added Course 4*	VAC	Choose from ANNEXURE IV	3-0-0	3	50	50	100
Total Credits			25				
Grand Total			46				

Exit Option with “Undergraduate Diploma” (Diploma in Industrial Microbiology) after the two years or four semesters with the completion of the course equivalent to minimum 80 credits. Along with entry option to fifth semester after exit.

Bachelor of Science

Type of course	Course code	Title of the Course	L-T-P /Week	No. of Credits	University Exam	Internal assessment	Total
SEMESTER V							
Major 1	MICR-351	Medical Microbiology	4-0-0	4	50	50	100
Major 1 Practical	MICR-351P	Medical Microbiology- Practical	0-0-4	2	50	50	100
Major 2	MICR-352	Immunology	4-0-0	4	50	50	100
Major 2 Practical	MICR-352P	Immunology- Practical	0-0-4	2	50	50	100
Major 3	MICR-353	Management of Human Microbial Disease	5-0-0	5	50	50	100
Major 4	MICR-354	Microbial Genetics	5-0-0	5	50	50	100
Major 5*	MICR-355	Industrial Training/Research Review/ Survey	0-0-3	3	50	50	100
Minor 1*	MICR-356	Seminars/ Presentations (Topics to be allotted by Department)	0-0-2	2	50	50	100
Value Added Course 5*	VAC	Choose from ANNEXURE IV	3-0-0	3	50	50	100
Total Credits			22				
SEMESTER VI							
Major 1	MICR-361	Pharmaceutical Microbiology	4-0-0	4	50	50	100
Major 1 Practical	MICR-361P	Pharmaceutical Microbiology- Practical	0-0-4	2	50	50	100
Major 2	MICR-362	Genetic Engineering	4-0-0	4	50	50	100
Major 2 Practical	MICR-362P	Genetic Engineering- Practical	0-0-4	2	50	50	100
Major 3	MICR-363	Microbial Diagnosis in Health Clinics	5-0-0	5	50	50	100
Major 4	MICR-364	Virology	5-0-0	5	50	50	100
Major 5*	MICR-355	Industrial Training/Research Review/ Survey	0-0-3	3	50	50	100
Value Added Course 6*	VAC	Choose from ANNEXURE IV	3-0-0	3	50	50	100
Total Credits			22				
Grand Total			44				

Exit Option with “Bachelor’s Degree (Bachelor of Science)” after the three years or six semesters with the completion of the course equivalent to minimum 120 credits. Along with entry option to fourth year or seventh semester for those students meeting a minimum CGPA of 7.5 in Bachelor’s Degree Examination (BDE).

Bachelor's Degree (Honors/Research) or Bachelor of Science in Discipline with Research

Type of course	Course code	Title of the Course	L-T-P /Week	No. of Credits	University Exam	Internal assessment	Total
SEMESTER VII							
Major 1	MICR-471	Advances in Microbiology	4-0-0	4	50	50	100
Major 1 Practical	MICR-471P	Advances in Microbiology-Practical	0-0-4	2	50	50	100
Major 2	MICR-472	Biofertilizers & Biopesticides	4-0-0	4	50	50	100
Major 2 Practical	MICR-472P	Biofertilizers & Biopesticides-Practical	0-0-4	2	50	50	100
Major 3	MICR-473	Research Methodology & Academic Writing Skills	5-0-0	5	50	50	100
Major 4	MICR-474	Intellectual Property Rights (IPR)	5-0-0	5	50	50	100
Major 5- Research Project 1	MICR-475	Dissertation - I	4-0-0	4	50	50	100
Total Credits			26				
SEMESTER VIII							
Major 1	MICR-481	Microbial Ecology	4-0-0	4	50	50	100
Major 1 Practical	MICR-481P	Microbial Ecology- Practical	0-0-4	2	50	50	100
Major 2	MICR-482	Research Publication Ethics	4-0-0	4	100	100	200
Major 3- Research Project 2	MICR-483	Dissertation – II	0-0-20	20			
Total Credits			30				
Grand Total			56				

Bachelor's Degree (Honors/Research) or Bachelor of Science in Discipline with Research : 192 Credits

Award of Bachelor's Degree (Honors/Research) or Bachelor of Science in Discipline with Research after the four years or eight semesters with the completion of the course equivalent to minimum 160 credits.

ANNEXURE I

COURSE & CREDIT DISTRIBUTION SCHEME OF UG PROGRAMME (With multiple entry & exit option)
NATIONAL EDUCATION POLICY 2020
B. Sc. MICROBIOLOGY- FOUR YEARS
LIST OF MAJOR CORE COURSES

Type of course	Course code	Title of the Course
SEMESTER I		
Major 1	MICR-111	Introduction to Microbiology
Major 1 Practical	MICR-111P	Introduction to Microbiology-Practical
Major 2	MICR-112	Mushroom Cultivation
Major 3	MICR-113	Cell Biology
Major 3 Practical	MICR-113P	Cell Biology- Practical
SEMESTER II		
Major 1	MICR-121	Food & Dairy Microbiology
Major 1 Practical	MICR-12 P	Food & Dairy Microbiology- Practical
Major 2	MICR-122	Bacteriology
Major 2 Practical	MICR-122 P	Bacteriology- Practical
Major 3	MICR-123	Basic Biological Techniques
Major 3 Practical	MICR-123 P	Basic Biological Techniques -Practical
SEMESTER III		
Major 1	MICR-231	Fundamentals of Microbial Physiology & Metabolism
Major 1 Practical	MICR-231P	Fundamentals of Microbial Physiology & Metabolism-Practical
Major 2	MICR-232	Biochemistry
Major 2 Practical	MICR-232 P	Biochemistry-Practical
Major 3	CHEM-232	General Analytical Techniques
Major 3 Practical	CHEM-232P	General Analytical Techniques- Practical
SEMESTER IV		
Major 1	MICR-241	Industrial Microbiology
Major 1 Practical	MICR-241P	Industrial Microbiology-Practical
Major 2	MICR-242	Fundamental Molecular Biology
Major 2 Practical	MICR-242P	Fundamental Molecular Biology- Practical
Major 3	MICR-243	Bioprocess Technology

SEMESTER V		
Major 1	MICR-351	Medical Microbiology
Major 1 Practical	MICR-351P	Medical Microbiology- Practical
Major 2	MICR-352	Immunology
Major 2 Practical	MICR-352P	Immunology- Practical
Major 3	MICR-353	Management of Human Microbial Disease
Major 4	MICR-354	Microbial Genetics
Major 5*	MICR-355	Industrial Training/Research Review/ Survey
SEMESTER VI		
Major 1	MICR-361	Pharmaceutical Microbiology
Major 1 Practical	MICR-361P	Pharmaceutical Microbiology- Practical
Major 2	MICR-362	Genetic Engineering
Major 2 Practical	MICR-362P	Genetic Engineering- Practical
Major 3	MICR-363	Microbial Diagnosis in Health Clinics
Major 4	MICR-364	Virology
Major 5*	MICR-355	Industrial Training/Research Review/ Survey
SEMESTER VII		
Major 1	MICR-471	Advances in Microbiology
Major 1 Practical	MICR-471P	Advances in Microbiology-Practical
Major 2	MICR-472	Biofertilizers & Biopesticides
Major 2 Practical	MICR-472P	Biofertilizers & Biopesticides-Practical
Major 3	MICR-473	Research Methodology & Academic Writing Skills
Major 4	MICR-474	Intellectual Property Rights (IPR)
Major 5- Research Project 1	MICR-475	Dissertation - I
SEMESTER VIII		
Major 1	MICR-481	Microbial Ecology
Major 1 Practical	MICR-481P	Microbial Ecology- Practical
Major 2	MICR-482	Research Publication Ethics
Major 3- Research Project 2	MICR-483	Dissertation – II

ANNEXURE II

COURSE & CREDIT DISTRIBUTION SCHEME OF UG PROGRAMME (With multiple entry & exit option)
NATIONAL EDUCATION POLICY 2020
B. Sc. MICROBIOLOGY- FOUR YEARS
LIST OF MINOR COURSES

Type of course	Course code	Title of the Course
SEMESTER I		
Minor 1	CHEM-112	Molecules of Life
Minor 1 Practical	CHEM-112P	Molecules of Life- Practical
SEMESTER IV		
Minor 1	MICR-244	Bioinformatics
SEMESTER V		
Minor 1*	MICR-356	Seminars/ Presentations (Topics to be allotted by Department)

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ANNEXURE III

COURSE & CREDIT DISTRIBUTION SCHEME OF UG PROGRAMME (With multiple entry & exit option)
NATIONAL EDUCATION POLICY 2020
B. Sc. MICROBIOLOGY- FOUR YEARS
LIST OF VOCATIONAL/ SKILL ENHANCEMENT COURSE (MINOR)

Type of course	Course code	Title of the Course
SEMESTER I		
Vocational/ Skill Enhancement Course (Minor)	MICR-114	Aquatic Microbiology
	MICR-115	Plant Pathology
	MICR-116	Microbial Diversity
SEMESTER II		
Vocational/ Skill Enhancement Course (Minor)	MICR-123	Food Fermentation Techniques
	MICR-124	Microbial Quality Control in Food and Pharmaceutical Industries
	CHEM-02	Methods in Green Chemistry
SEMESTER III		
Vocational/ Skill Enhancement Course (Minor)	MICR-233	PreBiotics, Probiotics & PostBiotics
	MICR-234	Microbial Diversity
	BOTN-02	Herbs as Medicine
SEMESTER IV		
Vocational/ Skill Enhancement Course (Minor)	MICR-245	Microbiological Analysis of Air and Water
	MICR-246	Microbial Biotechnology
	MICR-247	Biostatistics & Computer Application

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ANNEXURE IV

COURSE & CREDIT DISTRIBUTION SCHEME OF UG PROGRAMME (With multiple entry & exit option)
NATIONAL EDUCATION POLICY 2020
B. Sc. MICROBIOLOGY- FOUR YEARS
LIST CO-CURRICULAR/ VALUE ADDED COURSES (MINOR)

Type of course	Course code	Title of the Course
SEMESTER I		
Value Added Course 1*	VAC-1	Basic Communication Skill
SEMESTER II		
Value Added Course 2*	VAC-2	Environmental Sciences
SEMESTER III		
Value Added Course 3*	VAC-3A	Management Paradigm from Bhagvad Gita
	VAC-3B	Disaster Management
SEMESTER IV		
Value Added Course 4*	VAC-4A	Vedic Sciences
	VAC-4B	Vedic Mathematics
	VAC-4C	Bio-Entrepreneurship
SEMESTER V		
Value Added Course 5*	VAC-5A	Meditation
	VAC-5B	PDP through Applied Philosophy of Ram Charit Manas
	VAC-5C	Ecology
SEMESTER VI		
Value Added Course 6*	VAC-6A	Essence of Indian Traditional Knowledge
	VAC-6B	/Vivekanandan Studies

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