

SANKALCHAND PATEL UNIVERSITY VISNAGAR

Faculty of Science and Humanities



Structure, Teaching Scheme and Syllabus of Bachelor of Science (Microbiology)

Program Code: SC102

With effect from: 2023-24

Graduate attributes (Generic learning outcomes)

Program Out Comes:

PO1: *Complex problem-solving*: The graduates should be able to demonstrate the capability to solve different kinds of problems in familiar and non-familiar contexts and apply the learning to real-life situations.

PO2: *Critical thinking*: The graduates should be able to demonstrate the capability to:

- apply analytic thought to a body of knowledge, including the analysis and evaluation of policies, and practices, as well as evidence, arguments, claims, beliefs, and the reliability and relevance of evidence,
- identify relevant assumptions or implications; and formulate coherent arguments,
- identify logical flaws and holes in the arguments of others,
- analyze and synthesize data from a variety of sources and draw valid conclusions and support them with evidence and examples.

PO3: *Creativity*: The graduates should be able to demonstrate the ability to:

- create, perform, or think in different and diverse ways about the same objects or scenarios,
- deal with problems and situations that do not have simple solutions,
- innovate and perform tasks in a better manner,
- view a problem or a situation from multiple perspectives,
- think ‘out of the box’ and generate solutions to complex problems in unfamiliar contexts,
- adopt innovative, imaginative, lateral thinking, interpersonal skills and emotional intelligence.

PO4: *Communication Skills*: The graduates should be able to demonstrate the skills that enable them to:

- listen carefully, read texts and research papers analytically and present complex information in a clear and concise manner to different groups/audiences,
- express thoughts and ideas effectively in writing and orally and communicate with others using appropriate media,
- confidently share views and express herself/himself,
- construct logical arguments using correct technical language related to a field of learning, work/vocation, or an area of professional practice, and convey ideas, thoughts, and arguments using language that is respectful and sensitive to gender and other minority groups.

PO5: *Analytical reasoning/thinking*: The graduates should be able to demonstrate the capability to:

- evaluate the reliability and relevance of evidence;
- identify logical flaws in the arguments of others;
- analyze and synthesize data from a variety of sources; draw valid conclusions and support them with evidence and examples, and address opposing viewpoints.

PO6: *Research-related skills*: The graduates should be able to demonstrate:

- a keen sense of observation, inquiry, and capability for asking relevant/ appropriate questions,
- the ability to problematize, synthesize, and articulate issues and design research proposals,

- the ability to define problems, formulate appropriate and relevant research questions, formulate hypotheses, test hypotheses using quantitative and qualitative data, establish hypotheses, make inferences based on the analysis and interpretation of data, and predict cause-and-effect relationships,
- the capacity to develop appropriate methodology and tools for data collection,
- the appropriate use of statistical and other analytical tools and techniques,
- the ability to plan, execute and report the results of an experiment or investigation.

PO7: *Coordinating/collaborating with others:* The graduates should be able to demonstrate the ability to:

- work effectively and respectfully with diverse teams,
- facilitate cooperative or coordinated effort on the part of a group,
- act together as a group or a team in the interests of a common cause and work efficiently as a member of a team.
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PO8: *Leadership readiness/qualities:* The graduates should be able to demonstrate the capability for:

- mapping out the tasks of a team or an organization and setting direction.
- formulating an inspiring vision and building a team that can help achieve the vision, motivating and inspiring team members to engage with that vision.
- using management skills to guide people to the right destination.

PO9: *Learning how to learn skills:* The graduates should be able to demonstrate the ability to:

- acquire new knowledge and skills, including ‘learning how to learn skills, that are necessary for pursuing learning activities throughout life, through self-paced and self-directed learning aimed at personal development, meeting economic, social, and cultural objectives, and adapting to changing trades and demands of the workplace, including adapting to the changes in work processes in the context of the fourth industrial revolution, through knowledge/ skill development/reskilling,
- work independently, identify appropriate resources required for further learning,
- acquire organizational skills and time management to set self-defined goals and targets with timelines.
- inculcate a healthy attitude to be a lifelong learner

PO10: *Digital and technological skills:* The graduates should be able to demonstrate the capability to:

- use ICT in a variety of learning and work situations,
- access, evaluate, and use a variety of relevant information sources, and use appropriate software for analysis of data

PO11: *Multicultural competence and inclusive spirit:* The graduates should be able to demonstrate:

- the acquisition of knowledge of the values and beliefs of multiple cultures and a global perspective to honour diversity,
- capability to effectively engage in a multicultural group/society and interact respectfully with diverse groups,
- capability to lead a diverse team to accomplish common group tasks and goals.
- gender sensitivity and adopting a gender-neutral approach, as also empathy for the less advantaged and the differently-abled including those with learning disabilities.

PO12: *Value inculcation:* The graduates should be able to demonstrate the acquisition of knowledge and attitude that are required to:

- embrace and practice constitutional, humanistic, ethical, and moral values in life, including universal human values of truth, righteous conduct, peace, love, nonviolence, scientific temper, citizenship values,
- practice responsible global citizenship required for responding to contemporary global challenges, enabling learners to become aware of and understand global issues and to become active promoters of more peaceful, tolerant, inclusive, secure, and sustainable societies,
- formulate a position/argument about an ethical issue from multiple perspectives
- identify ethical issues related to work, and follow ethical practices, including avoiding unethical behavior such as fabrication, falsification or misrepresentation of data, or committing plagiarism, and adhering to intellectual property rights,
- recognize environmental and sustainability issues, and participate in actions to promote sustainable development.
- adopt an objective, unbiased, and truthful actions in all aspects of work,
- instill integrity and identify ethical issues related to work, and follow ethical practices.

PO13: *Autonomy, responsibility, and accountability:* The graduates should be able to demonstrate the ability to:

- apply knowledge, understanding, and/or skills with an appropriate degree of independence relevant to the level of the qualification,
- work independently, identify appropriate resources required for a project, and manage a project through to completion,
- exercise responsibility and demonstrate accountability in applying knowledge and/or skills in work and/or learning contexts appropriate for the level of the qualification, including ensuring safety and security at workplaces.

PO14: *Environmental awareness and action:* The graduates should be able to demonstrate and required to take appropriate actions for:

- mitigating the effects of environmental degradation, climate change, and pollution
- effective waste management, conservation of biological diversity, management of biological resources and biodiversity, forest and wildlife conservation, and sustainable development and living.

PO15: *Community engagement and service:* The graduates should be able to demonstrate the capability to participate in community-engaged services/ activities for promoting the well-being of society.

PO16: *Empathy:* The graduates should be able to demonstrate the ability to identify with or understand the perspective, experiences, or points of view of another individual or group, and to identify and understand other people's emotions.

Program Specification Outcomes(PSOs):

PSO1: Students will develop basic as well as advance skill to observe, isolate, identify and cultivate microorganisms.

PSO2: Students will develop theoretical and practical skills of tools and techniques used to study

Program Name: Bachelor of Science (Microbiology)

Abbreviation Name: B.Sc. (Microbiology)

Semester: I

Program Code: SC102

With effect from: 2023-24

Course Code	Course Name	Type of Course	Credit	Hours per week				Theory (Marks)				Practical (Marks)				Total (Marks)
				L	T	P	Total	University Assessment		Continuous Assessment		University Assessment		Continuous Assessment		
								Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
11-MIM201-1C	Fundamental of Microbiology	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
11-MIM202-1C	Basics of Microbiology	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
11-BIE201-1C OR 11-BIE202-1C OR 11-BIE204-1C	Cell Biology OR Fundamental of Botany OR Biodiversity	MN	4	3	-	2	5	18	50	9	25	-	-	9	25	100
11-MDC223-1C OR 11-MDC224-1C	Cyber Security-I OR Reaction of Organic Chemistry-I	MD	4	3	-	2	5	18	50	9	25	-	-	9	25	100
11-AEC201-1C	Basic English-I	AEC	2	2	-	-	2	9	25	9	25	-	-	-	-	50
11-IKS101-1C	Yoga and Meditation	IKS	2	-	-	4	4	-	-	-	-	9	25	9	25	50
11-SEC201-1C OR 11-SEC202-1C OR 11-SEC205-1C	Tally Accounting OR Personality Development OR Application of Microbiology	SEC	2	2	-	-	2	9	25	9	25	-	-	-	-	50
Total			22	16	-	12	28									550

Note: if any

Faculty of Science & Humanities

Program Name: Bachelor of Science (Microbiology)

Abbreviation Name: B.Sc. (Microbiology)

Semester: II

Program Code: SC102

With effect from: 2023-24

Course Code	Course Name	Type of Course	Credit	Hours per week				Theory (Marks)				Practical (Marks)				Total (Marks)
				L	T	P	Total	University Assessment		Continuous Assessment		University Assessment		Continuous Assessment		
								Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
12-MIM203-1C	Microbial Physiology & Metabolism	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
12-MIM204-1C	Environmental Microbiology	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
12-BIE203-1C OR 12-BIE205-1C	Metabolic Pathways of cell OR Basics of Botany	MN	4	3	-	2	5	18	50	9	25	-	-	9	25	100
12-MDC226-1C OR 12-MDC227-1C OR 12-MDC230-1C	Digital Marketing OR Cyber Security-II OR Reaction of Organic chemistry-II	MDC	4	3	-	2	5	18	50	9	25	-	-	9	25	100
12-AEC202-1C	Basic English-II	AEC	2	2	-	-	2	9	25	9	25	-	-	-	-	50
12-VAC101-1C	National Service Scheme	VAC	2	-	-	4	4	-	-	-	-	9	25	9	25	50
12-SEC206-1C OR 12-SEC207-1C OR 12-SEC208-1C	Instrumentation Measurement & Analysis OR Chemistry of Cosmetics and Hygiene Products OR Biocomputing	SEC	2	2	-	-	2	9	25	9	25	-	-	-	-	50
Total			22	16	-	12	28									550

Note: if any

Faculty of Science & Humanities

Program Name: Bachelor of Science (Microbiology)
Abbreviation Name: B.Sc. (Microbiology)
Semester: III

Program Code: SC102
With effect from: 2023-24

Course Code	Course Name	Type of Course	Credit	Hours per week				Theory (Marks)				Practical (Marks)				Total (Marks)
				L	T	P	Total	University Assessment		Continuous Assessment		University Assessment		Continuous Assessment		
								Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
13-MIM205-2C	Food and Dairy Microbiology	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
13-MIM206-2C	Molecular Biology	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
13-MIM207-2C	Inheritance Biology	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
13-MDC235-2C OR 13-MDC237-2C	Bioinstrumentation OR Fungi, Lichens and Plant Pathology	MD	4	3	-	2	5	18	50	9	25	-	-	9	25	100
13-AEC203-2C	Grammar and Communication Skill-I	AEC	2	2	-	-	2	9	25	9	25	-	-	-	-	50
13-SEC212-2C OR 13-SEC213-2C OR 13-SEC214-2C	Green Chemistry OR Food Fermentation Techniques OR DNA Damage and Repair	SEC	2	2	-	-	2	9	25	9	25	-	-	-	-	50
13-IKS102-2C	Vedic Mathematics	IKS	2	-	-	4	4	-	-	-	-	9	25	9	25	50
Total			22	16	-	12	28									550

Note: if any



Faculty of Science & Humanities

Program Name: Bachelor of Science (Microbiology)

Abbreviation Name: B.Sc. (Microbiology)

Semester: IV

Program Code: SC102

With effect from: 2023-24

Course Code	Course Name	Type of Course	Credit	Hours per week				Theory (Marks)				Practical (Marks)				Total (Marks)
				L	T	P	Total	University Assessment		Continuous Assessment		University Assessment		Continuous Assessment		
								Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
14-MIM208-2C	Microbial Diversity	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
14-MIM209-2C	Gene Transfer Techniques	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
14-MIM210-2C	Recombinant DNA Technology	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
14-BIE206-2C OR 14-BIE207-2C	Bryophytes, Pteridophytes and Gymnosperm OR Biotechnology applied to Plants	MN	4	3	-	2	5	18	50	9	25	-	-	9	25	100
14-AEC204-2C	Grammar and Communication Skill-II	AEC	2	2	-	-	2	9	25	9	25	-	-	-	-	50
14-SEC218-2C OR 14-SEC219-2C	Biofertilizers and Biopesticides OR Nanobiotechnology	SEC	2	2	-	-	2	9	25	9	25	-	-	-	-	50
14-VAC202-2C OR 14-VAC203-2C	Environmental Science OR Integrated Personality Development Course	VAC	2	2	-	-	2	9	25	9	25	-	-	-	-	50
				-	-	4	4	-	-	-	-	9	25	9	25	50
Total			22	18	-	12	30									550

Note: if any



Faculty of Science & Humanities

Program Name: Bachelor of Science (Microbiology)
Abbreviation Name: B.Sc. (Microbiology)
Semester: V

Program Code: SC102
With effect from: 2023-24

Course Code	Course Name	Type of Course	Credit	Hours per week				Theory (Marks)				Practical (Marks)s				Total (Marks)
				L	T	P	Total	University Assessment		Continuous Assessment		University Assessment		Continuous Assessment		
								Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
15-MIM301-3C	Medical microbiology	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
15-MIM302-3C	Fundamentals of Virus	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
15-MIM303-3C	Fundamentals of Immunology	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
15-BIE301-3C OR 15-BIE301-3O	Biotechnology applied to Animal OR Basic Course in Biomedical Research	MN	4	3	-	2	5	18	50	9	25	-	-	9	25	100
15-BIE302-3C OR 15-BIE302-3O	Anatomy and Physiology of Human OR Structural Biology	MN	4	3	-	2	5	18	50	9	25	-	-	9	25	100
15-SEC307-3C OR 15-SEC308-3C	Hematology OR Bioethics	SEC	2	2	-	-	2	9	25	9	25	-	-	-	-	50
Total			22	17		10	27									550

Note: if any



Faculty of Science & Humanities

Program Name: Bachelor of Science (Microbiology)
Abbreviation Name: B.Sc. (Microbiology)
Semester: VI

Program Code: SC102
With effect from: 2023-24

Course Code	Course Name	Type of Course	Credit	Hours per week				Theory (Marks)				Practical/ Viva Voce (Marks)				Total (Marks)
				L	T	P	Total	University Assessment		Continuous Assessment		University Assessment		Continuous Assessment		
								Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
16-MIM304-3C	Biostatistics	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
16-MIM305-3C	Microbial Bioprocesses	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
16-MIM306-3C	Industrial Microbiology	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
16-BIE304-3C OR 16-BIE304-3O	Disorders of Immune System OR Data Analysis for Biologists	MN	4	3	-	2	5	18	50	9	25	-	-	9	25	100
16-AEC301-3C	Advance English	AEC	2	2	-	0	2	9	25	9	25	-	-	-	-	50
16-MIM307-3C	Internship	Internship	4	-	-	8	8	-	-	-	-	18	50	18	50	100
Total			22	14	-	16	30									550

Note: if any



Faculty of Science & Humanities

Program Name: Bachelor of Science (Microbiology) (Honours)

Abbreviation Name: B.Sc. (Microbiology)

Semester: VII

Program Code: SC102

With effect from: 2023-24

Course Code	Course Name	Type of Course	Credit	Hours per week				Theory (Marks)				Practical/ Viva Voce (Marks)				Total (Marks)
				L	T	P	Total	University Assessment		Continuous Assessment		University Assessment		Continuous Assessment		
								Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
17-MIM401-4C	Ecology, Ecosystem and its Conservation	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
17-MIM402-4C	Metabolic Pathways and its Regulation	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
17-MIM403-4C	Bioinformatics	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
17-BIE401-4C OR 17-BIE401-4O	IPR and Biosafety OR Environmental Impact Assessment for Environmental Health	MN	4	3	-	2	5	18	50	9	25	-	-	9	25	100
17-MIM404-4C	On The Job Training	OJT	6	-	-	12	12	-	-	-	-	27	75	27	75	150
Total			22	12	-	20	32									550

Note: if any



Faculty of Science & Humanities

Program Name: Bachelor of Science (Microbiology) (Honours with Research)

Abbreviation Name: B.Sc. (Microbiology)

Semester: VII

Program Code: SC102

With effect from: 2023-24

Course Code	Course Name	Type of Course	Credit	Hours per week				Theory (Marks)				Practical/ Viva Voce (Marks)				Total (Marks)
				L	T	P	Total	University Assessment		Continuous Assessment		University Assessment		Continuous Assessment		
								Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
17-MIM401-4C	Ecology, Ecosystem and its Conservation	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
17-MIM402-4C	Metabolic Pathways and its Regulation	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
17-MIM403-4C	Bioinformatics	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
17-BIE401-4C OR 17-BIE401-4O	IPR and Biosafety OR Environmental Impact Assessment for Environmental Health	MN	4	3	-	2	5	18	50	9	25	-	-	9	25	100
17-MIM405-4C	Research Project	RP	6	-	-	12	12	-	-	-	-	27	75	27	75	150
Total			22	12		20	32									550

Note: if any



Faculty of Science & Humanities

Program Name: Bachelor of Science (Microbiology) (Honours)

Abbreviation Name: B.Sc. (Microbiology)

Semester: VIII

Program Code: SC102

With effect from: 2023-24

Course Code	Course Name	Type of Course	Credit	Hours per week				Theory (Marks)				Practical/Viva Voce (Marks)				Total (Marks)
				L	T	P	Total	University Assessment		Continuous Assessment		University Assessment		Continuous Assessment		
								Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
18-MIM406-4C	Space Microbiology and Extremophiles	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
18-MIM407-4C	Advances in Microbiology	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
18-MIM408-4C	Pharmaceutical Microbiology	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
18-BIE402-4C OR 18-BIE402-4O	Research Methodology OR Experimental Biotechnology	MN	4	3	-	2	5	18	50	9	25	-	-	9	25	100
18-MIM409-4C	On The Job Training	OJT	6	-	-	12	12	-	-	-	-	27	75	27	75	150
Total			22	12	-	20	32									550

Note: if any



Faculty of Science & Humanities

Program Name: Bachelor of Science (Microbiology) (Honours with Research)

Abbreviation Name: B.Sc. (Microbiology)

Semester: VIII

Program Code: SC102

With effect from: 2023-24

Course Code	Course Name	Type of Course	Credit	Hours per week				Theory (Marks)				Practical/Viva Voce (Marks)				Total (Marks)
				L	T	P	Total	University Assessment		Continuous Assessment		University Assessment		Continuous Assessment		
								Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
18-MIM406-4C	Space Microbiology and Extremophiles	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
18-MIM407-4C	Advances in Microbiology	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
18-MIM408-4C	Pharmaceutical Microbiology	MJ	4	3	-	2	5	18	50	9	25	-	-	9	25	100
18-BIE402-4C OR 18-BIE402-4O	Research Methodology OR Experimental Biotechnology	MN	4	3	-	2	5	18	50	9	25	-	-	9	25	100
18-MIM410-4C	Research Project	RP	6	-	-	12	12	-	-	-	-	27	75	27	75	150
Total			22	12	-	20	32									550

Note: if any

Multiple Entry & Exit Option

Sr. No.	Semester	Option	Certificate Name	Remarks
1	After First Year (semester -2)	Exit	UG Certificate in Microbiology	Student must earn 44 Credits along with earn the 4 Credit - During Summer Vacation through Vocational Programs (8 weeks)
2	After Second Year (semester -4)	Exit	UG Diploma in Microbiology	Student must earn 88 Credits along with earn the 4 Credit - During Summer Vacation through Vocational Programs (8 weeks)
3	After Third Year (semester -6)	Exit	B.Sc. (Microbiology)	Student must earn 132 Credits as per teaching scheme
4	After Four Year (semester -8)	Exit	B.Sc. (Microbiology) Honours OR B.Sc. (Microbiology) Honours (with Research with Microbiology)	Student must earn 176 Credits as per teaching scheme

List of Major Courses

Sr. No.	Course Code	Course Name	Credit
1	11-MIM201-1C	Fundamental of Microbiology	4
2	11-MIM202-1C	Basics of Microbiology	4
3	12-MIM203-1C	Microbial Physiology and Metabolism	4
4	12-MIM204-1C	Environmental Microbiology	4
5	13-MIM205-2C	Food and Dairy Microbiology	4
6	13-MIM206-2C	Molecular Biology	4
7	13-MIM207-2C	Inheritance Biology	4
8	14-MIM208-2C	Microbial Diversity	4
9	14-MIM209-2C	Gene Transfer Techniques	4
10	14-MIM210-2C	Recombinant DNA Technology	4
11	15-MIM301-3C	Medical Microbiology	4
12	15-MIM302-3C	Fundamentals of Virus	4
13	15-MIM303-3C	Fundamentals of Immunology	4
14	16-MIM304-3C	Biostatistics	4

15	16-MIM305-3C	Microbial Bioprocess	4
16	16-MIM306-3C	Industrial Microbiology	4
17	17-MIM401-4C	Ecology, Ecosystem and its conservation	4
18	17-MIM402-4C	Regulation of Metabolism	4
19	17-MIM403-4C	Bioinformatics	4
20	18-MIM406-4C	Space Microbiology and Extremophiles	4
21	18-MIM407-4C	Advances in Microbiology	4
22	18-MIM408-4C	Pharmaceutical Microbiology	4

List of Minor Courses

Sr. No.	Course Code	Course Name	Credit
1	11-BIE201-1C	Cell Biology	4
2	11-BIE202-1C	Fundamental of Botany	4
3	11-BIE204-1C	Biodiversity	4
4	12-BIE203-1C	Metabolic Pathways of cell	4
5	12-BIE205-1C	Basics of Botany	4
6	14-BIE206-2C	Bryophytes, Pteridophytes and Gymnosperm	4
7	14-BIE207-2C	Biotechnology applied to Plants	4
9	15-BIE301-3C	Biotechnology applied to Animal	4
10	15-BIE301-3O	Basic Course in Biomedical Research	4
11	15-BIE302-3C	Anatomy and Physiology	4
12	15-BIE302-3O	Structural Biology	4
13	16-BIE304-3C	Disorders of Immune System	4
14	16-BIE304-3O	Data Analysis for Biologists	4
15	17-BIE401-4C	IPR and Biosafety	4
16	17-BIE401-4O	Environmental Impact Assessment for Environmental Health	4
17	18-BIE402-4C	Research Methodology	4
18	18-BIE402-4O	Experimental Biotechnology	4

List of Multidisciplinary Courses (MD)

Sr. No.	Course Code	Course Name	Credit
1	11-MDC223-1C	Cyber Security-1	2
2	11-MDC224-1C	Reaction of Organic Chemistry-I	2
3	12-MDC226-1C	Digital Marketing	2
4	12-MDC227-1C	Cyber Security-II	2

5	12-MDC230-1C	Reaction of Organic Chemistry II	2
6	13-MDC235-2C	Bioinstrumentation	2
7	13-MDC237-2C	Fungi,Lichens and Plant Pathology	2

List of Ability Enhancement Courses (AEC)

Sr. No.	Course Code	Course Name	Credit
1	11-AEC201-1C	Basic English-I	2
2	12-AEC202-1C	Basic English-II	2
3	13-AEC203-2C	Grammar and Communication Skill-I	2
4	14-AEC204-2C	Grammar and Communication Skill-II	2
5	16-AEC301-3C	Advance English	2

List of Skill Enhancement Course (SEC)

Sr. No.	Course Code	Course Name	Credit
1	11-SEC201-1C	Tally Accounting	2
2	11-SEC202-1C	Personality Development	2
3	11-SEC205-1C	Application of Microbiology	2
4	12-SEC206-1C	Instrumentation Measurement and Analysis	2
5	12-SEC207-1C	Chemistry Cosmetics and Hygiene Products	2
6	12-SEC208-1C	Biocomputing	2
7	13-SEC212-2C	Green Chemistry	2
8	13-SEC213-2C	Food Fermentation Techniques	2
9	13-SEC214-2C	DNA Damage and Repair	2
10	14-SEC218-2C	Bio-fertilizer and Biopesticides	2
11	14-SEC219-2C	Nanotechnology	2
12	15-SEC307-3C	Haematology	2
13	15-SEC308-3C	Bioethics	2

List of Value Addition Course (VAC)/IKS

Sr. No.	Course Code	Course Name	Credit
1	11-IKS101-1C	Yoga and Meditation	2
2	12-VAC101-1C	National Service Scheme	2
3	13-IKS102-2C	Vedic Mathematics	2
4	14-VAC202-2C	Environmental Science	2

5	14-VAC203-2C	Integrated Personality Development Course	2
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List of Vocational Courses

Sr. No.	Course Code	Course Name	Credit
1	CON/Q3503	Structural Steel NDT Tester (DPT/MPT/UT)	2
2	G&J/Q0403	Assayer and Hallmarker	2
3	HSS/Q6105	PradhanMantriArogyaMitra -I	4
4	HSS/Q6105	PradhanMantriArogyaMitra -II	4
5	MEP/N9991	Use Basic English for Employability – Variant- I	2
6	MEP/N9992	Use Basic English for Employability – Variant- II	4
7	MEP/N9996	Plan for Basic Entrepreneurial Activity	2
8	SGJ/Q6302	Animal Waste Manure Aggregator (Option: Biogas Plant Operator/Compost Plant Operator)	4

