Bachelors In Science (Microbiology)

FIRST YEAR

SEMESTER I

Bachelors In Science (Microbiology)

Course Code	Course Name	COs
1111111	Life Processes	Students will be able to: 1. Describe the co-ordination of physiological processes in organisms, including the transport systems and responses to stimuli. 2. Apply detailed knowledge to explain the processes by which organisms develop, move, breathe and excrete.
1111114	Practical Based on Life Processes	Students will be able to: 1. Safely practice basic laboratory procedures and protocols inside a laboratory. 2. Acquire the skills of basic calibration and handling of instrumentation in the laboratory. 3. Appreciate the basics of life process in animals and their coordination in the animal body. 4. Acquire skills for the preparation of various solutions required in experimental research.
1121111 & 1121113	Fundamentals of Microbiology & Practical in Microbiology | Practical Techniques:Staining and Control of Microorganisms	Students will be able to: 1. Recall the advent of Microbiology as a science. 2. Comprehend science of microorganisms and their significance. 3. Apply the principles of control of microorganisms 4. Compare different types of control methods for their suitable application, different types of eucaryotic and procaryotic cells. 5. Evaluate the various sterilization and disinfection methods 6. Develop an application-based study of microorganisms.
1141113 & 1141114	Basics in physical, inorganic and organic chemistry-I & Chemistry Practical 1	Students will be able to: 1. Acquire core competency in the subject of chemistry and its allied subject areas.

		2. Acquire a fundamental understanding of physical chemistry, concepts for industrial applications. 3. Use the evidence-based comparative approach to explain the impacts on the environment. 4. Develop an insight into the fundamental reactions among elements to form the compounds. 5. Differentiate or identify organic compounds based on functional groups, physical, and chemical properties. 6. Develop the concepts of nomenclature, bonding, reaction mechanism, and stereochemistry for their applications in research and industry.
1121411	Techniques in Nutrition , Cultivation and Preservation of Microorganisms	Students will be able to: 1. Identify different microorganisms on the basis of their growth characteristics. 2.Utilise preservation methods for the storage of microorganisms. 3.Apply principles of food preservation for maintenance of food quality. 4. Evaluate different types of microbial food spoilage. 5. Prepare a range of culture media for the cultivation of different microorganisms. 6. Design an experiment for microbiological analysis of water and food.
1121412	Microbes in Human welfare	Students will be able to: 1. Enlist the microbes from various sources which are useful and harmful to mankind in different ways. 2. Understand the benefits of microbes from soil, fermented foods, commercial probiotic products and enzymes obtained from them. 3. Perform experiments to isolate and detect beneficial and pathogenic microbes from various samples. 4. Analyse the benefits of soil microbes as biofertilizers, antibiotic producers, enzyme producers as well as food microbes beneficial for human health. 5. Design the experiments to study growth patterns and detect virulence factors of selected pathogens.
2511511	Introduction to Communication Skills (B.Sc)	Students will be able to: 1. Demonstrate an understanding of essential aspects of communication skills 2. Exhibit the ability to read a variety of written text using subskills such as skimming and scanning. 3. Identify and rectify common grammatical errors in English.

		4. Show competence in delivering compelling presentations and engage in articulate and effective conversations in English across different contexts. 5. Display advanced formal writing skills in crafting job application letters, CVS, and statements of purpose.
2531511	Indian Knowledge System	Students will be able to: 1. Understand and appreciate the rich Indian Knowledge Tradition 2. Understand the contribution of Indians in various fields 3. Experience increased subject-awareness and self-esteem 4. Develop a comprehensive understanding of how all knowledge is ultimately intertwined
2541514	Fundamentals of People's Skills	Students will be able to: 1. Demonstrate ethical behaviour coupled with integrity. 2. Will generate new ideas and create a business plan. 3. Develop good listening skills which are vital for demonstrating good team qualities. 4. Will build sensitivity about social and cultural differences and illustrate good etiquettes. 5. Present themselves and their thoughts in front of others with more confidence.

SEMESTER II

Course Code	Course Name	COs
1122114 & 1122113	Microbiology Major (Ultrastructure of Cell: Eukaryotes & Prokaryotes) & Microbiology Major Course II Practical (Practical study of group of organisms: Eukaryotes & Prokaryotes)	Students will be able to: 1. Recall the advent of Microbiology as a science. 2. Comprehend science of microorganisms and their significance 3. Apply the principles of control of microorganisms 4. Compare different types of control methods for their suitable application, different types of eucaryotic and procaryotic cells. 5. Evaluate the various sterilization and disinfection methods 6. Develop an application-based study of microorganisms.
1112112	Zoology Major (Ecology & Biodiversity)	Students will be able to: 1. Describe the co-ordination of physiological processes in organisms, including transport systems and responses to stimuli 2. Apply detailed knowledge to explain the processes by which organisms develop, move, breathe and excrete.
1112114	Practical based on MJ2 (Ecology and Biodiversity)	Students will be able to: 1. Apply the concept of the origin of life and the causes behind organic evolution. 2. Correlate the animal behaviour and its cognitive aspect. 3. Identify the threats to biodiversity and its possible solution. 4. Apply the understanding of the dynamics of population density to discover the impact of population on ecology and biodiversity.
1142114 & 1142113	Chemistry Major (Basics in Physical, Organic & Inorganic Chemistry II) & Chemistry Major Practical -II	Students will be able to: 1. Acquire core competency in the subject of chemistry and its allied subject areas. 2. Acquire a fundamental understanding of physical chemistry, concepts for industrial applications.

		3.Use the evidence-based comparative approach to explain the impacts on the environment. 4. Students will develop an insight into the fundamental reactions among elements to form the compounds. 5. Differentiate or identify organic compounds based on functional groups, physical, and chemical properties. 6. Develop the concepts of nomenclature, bonding, reaction mechanism, and stereochemistry for their applications in research and industry.
1172311	Principles & Practices of Management	Students will be able to: 1. Understand the concept of management. 2. Understand Management functions.
1122411	Techniques in Food and Water Analysis	Students will be able to: 1. Identify different microorganisms on the basis of their growth characteristics. 2. Utilise preservation methods for the storage of microorganisms. 3. Apply principles of food preservation for maintenance of food quality. 4. Evaluate different types of microbial food spoilage. 5. Prepare a range of culture media for the cultivation of different microorganisms. 6. Design an experiment for microbiological analysis of water and food.
1122412	Human Microbes Interactions	Students will be able to: 1. Enlist the microbes from various sources which are useful and harmful to mankind in different ways. 2. Understand the benefits of microbes from soil, fermented foods, commercial probiotic products and enzymes obtained from them. 3. Perform experiments to isolate and detect beneficial and pathogenic microbes from various samples. 4. Analyse the benefits of soil microbes as biofertilizers, antibiotic producers, enzyme producers as well as food microbes beneficial for human health. 5. Design the experiments to study growth patterns and detect virulence factors of selected pathogens.
2512517	Hindi Bhasha - Kaushal Ke Adhar	Students will be able to: 1. विद्यार्थियों को लेखन, वाचन कौशल के ज्ञान प्राप्ति के साथ मौलिक अभिव्यक्ति में बदलाव आएगा। 2. विद्यार्थियों का लेखन, वाचन कौशल द्वारा मानसिक विकास होगा, पठन-शैली का विकास होगा। 3. विद्यार्थियों को लेखन, भाषण कौशल से भाषिक-शक्ति ,शहैलयों का सिंविान होगा हवशेषज्ञता आएगी। ।

		4.विद्यार्थियों को लेखन, वाचन, श्रवण, भाषण कौशल की विशेषताओं और उपयोगिता का ज्ञान प्राप्त होगा।
2522614	Foundation and Exploration of Performing and Fine Arts	Students will be able to: 1.Identify and trace the historical evolution of Indian performing and fine arts. 2. Analyse the transition from traditional to modern art forms in performing arts. 3. Identify and describe a range of career paths in the fine and performing arts.
2522617	National Service Scheme	Students will be able to: 1. Understand and Comprehend the foundations of the National Service Program. 2. Understand the unique camping program. 3. Learn about the regular activities of NSS. 4. Understand importance of Shramadan.
2522620	Sports, Physical literacy, Health & Fitness & Yoga	Students will be able to: 1. Participate in various games, sports and physical activities and they will also learn the technical and tactical experience of it. 2. Understand the importance and benefits of participation in any fitness activity or sports. 3. Own choice based activities that will inculcate healthy habits in the students 4. Organise, plan activities, and will develop administrative qualities through these events 5. Acquire the knowledge of Physical Education, Sports and Yoga and understand the purpose and its development. 6. Learn to plan, organise and execute sports events. 7. Learn theoretical and practical aspects of the game of his choice to apply at various levels for teaching, learning and coaching purposes efficiently. 8. Acquires the knowledge of opted games, sports and yoga and also learns the technical and tactical experience of it. 9. Learn to apply knowledge of physical fitness and exercise management to lead a better quality life.

		10. Understand and learn different dimensions of an active lifestyle.
2522621	Extension Work	Students will be able to: 1.Explain the concepts of lifelong learning and the role of extension education in community development. 2.Recognise the importance of social responsibility and active citizenship. 3.Develop communication, leadership, and teamwork skills through practical projects. 4.Gain hands-on experience in social work, research, and project management. 5.Identify and analyse social issues such as education, health, gender equality, and environmental sustainability. 6.Implement projects that address real-world community problems and promote social change. 7.Conduct surveys and research to understand community needs and propose solutions. 8. Interpret data and present findings effectively in reports and presentations. 9.Learn the basics of entrepreneurship, financial literacy, and self-employment. 10.Develop innovative ideas for social enterprises and small businesses. 11.Foster empathy, teamwork, and respect for diverse cultures and perspectives. 12.Plan, execute, and evaluate extension activities such as awareness campaigns, surveys, and training programs. 13.Collaborate with NGOs, schools, and local communities for impactful outreach..