

B.Sc. Botany

PROGRAM OUTCOMES (PO)

PO1: Effective Communication Skills

Graduates will demonstrate proficiency in both written and spoken communication, effectively utilizing formal communication techniques necessary for professional environments. They will be adept at conveying ideas clearly and confidently in English and other relevant languages.

PO2: Critical Analysis and Interpretation

Graduates will acquire and apply critical thinking skills to analyze diverse forms of information, including literary texts, financial statements, business operations, and legal frameworks. They will be capable of interpreting and evaluating data to make informed decisions in various contexts.

PO3: Technological Proficiency

Graduates will gain practical knowledge and skills in utilizing modern technology, including software applications, programming languages, and development tools. They will be able to manage and implement technological solutions for business, research, and professional practices.

PO4: Quantitative and Analytical Skills

Graduates will develop strong quantitative and analytical skills through the study of mathematics, statistics, and business mathematics. They will apply these skills to solve complex problems, conduct research, and make data-driven decisions in professional settings.

PO5: Research and Problem-Solving

Graduates will be equipped with comprehensive research skills, including problem definition, research design, data collection, and report formulation. They will be capable of conducting independent research and presenting their findings effectively.

PO6: Financial Acumen

Graduates will have a solid foundation in accounting, financial management, and taxation. They will be proficient in preparing and analyzing financial statements, understanding cost and management accounting, and making informed financial decisions.

PO7: Management Knowledge and Application

Graduates will comprehend and apply management principles and methodologies, including decision-making processes, modern management trends, and human resource management practices. They will be prepared to handle organizational leadership and entrepreneurial ventures.

PO8: Legal and Ethical Awareness

Graduates will possess a sound understanding of business laws, corporate laws, and intellectual property rights. They will navigate legal frameworks and appreciate ethical considerations in business practices, promoting social responsibility and sustainable practices.

PO9: Cultural and Social Awareness

Graduates will develop an appreciation for cultural diversity and social issues through the study of literature, history, and intercultural communication. They will be aware of contemporary issues such as environmental sustainability and human rights, integrating these principles into their professional conduct.

PO10: Marketing and Entrepreneurship

Graduates will gain insights into marketing management, brand building, consumer behavior, and entrepreneurial skills. They will be prepared to identify market opportunities, develop marketing strategies, and manage new business ventures.

PO11: Scientific and Environmental Literacy

Graduates will understand fundamental scientific principles and their applications, including environmental impacts and sustainability. They will be aware of biodiversity conservation, ecosystem functions, and sustainable agriculture practices.

PO12: Interdisciplinary Competence

Graduates will be adept at integrating knowledge from various disciplines, fostering a comprehensive understanding of complex issues. They will be equipped to approach problems from multiple perspectives and propose innovative solutions.

PO13: Practical and Vocational Skills

Graduates will acquire practical skills relevant to their field of study, including laboratory techniques, project management, and technical proficiency. They will be prepared for hands-on roles in industry, research, and self-employment opportunities.

PO14: Socio-Cultural Consciousness and Ethical Responsibility

Graduates will develop an awareness of major contemporary issues and ethical considerations. They will internalize values that promote social justice, ethical behavior, and global citizenship, responding positively to societal challenges.

Mapping of Program Outcomes (PO)

Program Specific Outcome (PSO)	Students will be able to.....	Mapped Program Outcomes (PO)
PSO 1: Proficiency in English Communication	be able to confidently use English in both written and spoken forms for effective formal communication, aiding in their academic and professional pursuits (Related to "Fine Tune Your English" course outcomes).	PO 1
PSO 2: Analytical and Critical Thinking in Literature	develop critical thinking and communication skills through the analysis and appreciation of poetry, one-act plays, short stories, and prose, fostering a deeper understanding of social and cultural contexts (Related to "Poetry and One Act Play", "Prose and Short Stories", and "Katha Novel" course outcomes).	PO 2, PO 9
PSO 3: Competency in Biochemical Techniques and Principles	be proficient in basic biochemical laboratory techniques and possess a thorough understanding of cellular processes and molecular interactions essential for advanced studies in botany and related fields (Related to "Elementary Biochemistry" and "Biomolecules" course outcomes).	PO 3, PO 13

<p>PSO 4: Foundations in Biotechnology and Microbiology</p>	<p>have a comprehensive knowledge of biotechnology principles and practices, as well as a solid understanding of microbiology, enabling them to apply this knowledge in various biological and industrial applications (Related to "Introduction to Biotechnology" and "Microbiology" course outcomes).</p>	<p>PO 3, PO 11</p>
<p>PSO 5: Mastery of Scientific Methodology and Research Skills</p>	<p>understand the universal nature of science and demonstrate the use of scientific methods. They will be equipped with skills necessary for conducting independent research, analyzing data, and preparing research reports in botany (Related to "Methodology of Science and an Introduction to Botany" and "Research Methodology, Biophysics, and Biostatistics" course outcomes).</p>	<p>PO 5, PO 12</p>
<p>PSO 6: Understanding Plant Physiology and Biochemistry</p>	<p>Graduates will learn about metabolic processes in plants, such as photosynthesis, respiration, and nutrient uptake, and understand how plants respond to environmental stresses. They will also grasp the importance of plant hormones and biomolecules (Related to "Plant Physiology and Biochemistry" course outcomes).</p>	<p>PO 2, PO 11</p>

PSO 7: Environmental Awareness and Sustainable Practices	be aware of biodiversity conservation, ecosystem functions, environmental pollution, and related laws. They will also understand sustainable agriculture practices and their significance in promoting ecological balance (Related to "Environmental Science and Human Rights" and "Agri-Based Microenterprises" course outcomes).	PO 9, PO 11, PO 14
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Course Outcomes(CO)

Course	Course Outcome (CO)	Bloom's Taxonomy	Mapped PSO
Fine Tune Your English	CO1: Confidently use English in both written and spoken forms.	Applying	PSO1
	CO2: Use English for formal communication effectively.	Applying	PSO1
	CO3: Introduce students to basics of grammar.	Understanding	PSO1
Poetry and One Act Play	CO1: Knowledge of eminent poets and their contribution to Hindi Literature.	Understanding	PSO2
	CO2: Summarise the poems of different genres in Hindi.	Understanding	PSO2
	CO3: Familiarize with the structural concepts of drama and one act play.	Understanding	PSO2
	CO4: Social and Cultural consciousness.	Understanding	PSO2

	CO5: Develop critical thinking and communication skills.	Applying	PSO2
Katha Novel	CO1: To fathom the role of short story and novel in the prose fiction.	Understanding	PSO2
	CO2: To chart subaltern, dalit and ecocritical nuances in contemporary literature.	Analyzing	PSO2
	CO3: To acquaint the students about the possibilities of exploiting them.	Applying	PSO2
	CO4: To recognize the potential of Malayalam prose.	Analyzing	PSO2
	CO5: To appreciate the historical background of prose.	Understanding	PSO2
Elementary Biochemistry	CO1: Introduction to basic biochemical laboratory techniques such as chromatography, electrophoresis, and spectrophotometry.	Applying	PSO3
	CO2: Understanding physical properties of cellular membranes and how lipid composition and protein-lipid interactions influence membrane function.	Understanding	PSO3
	CO3: Principles of cellular transport and non-covalent interactions governing molecular recognition, binding, and cellular signaling.	Understanding	PSO3
	CO4: Understanding cellular respiration in plants and how they extract energy from organic compounds to fuel their metabolic processes.	Understanding	PSO3
Introduction to Biotechnology	CO1: Describe the field of biotechnology.	Understanding	PSO4
	CO2: Explain various principles and practices in biotechnology.	Understanding	PSO4

	CO3: Identify various fields of biotechnology.	Remembering	PSO4
	CO4: Illustrate different applications of biotechnology.	Understanding	PSO4
Microbiology	CO1: Definition of microbiology.	Remembering	PSO4
	CO2: Recall various contributions by famous scientists in the field of microbiology.	Remembering	PSO4
	CO3: Compare different groups of microorganisms.	Analyzing	PSO4
	CO4: Explain cellular structure and reproduction in various microorganisms.	Understanding	PSO4
	CO5: Identify and explain the working principle and uses of common instruments used in a microbiology laboratory.	Understanding	PSO4
	CO6: Explain various laboratory operations in the field of microbiology.	Understanding	PSO4
Methodology of Science and an Introduction to Botany	CO1: Understand the universal nature of science.	Understanding	PSO5
	CO2: Demonstrate the use of scientific method.	Applying	PSO5
	CO3: Lay a strong foundation to the study in botany.	Understanding	PSO5
	CO4: Impart an insight into the different types of classifications in the living kingdom.	Understanding	PSO5
	CO5: Appreciate the world of organisms and its course of evolution and diversity.	Understanding	PSO5
	CO6: Develop basic skills to study botany in detail.	Applying	PSO5

Issues that Matter	CO1: Identify major issues of contemporary significance.	Analyzing	PSO7
	CO2: Respond rationally and positively to issues raised.	Applying	PSO7
	CO3: Internalise the values imparted through the excerpts.	Understanding	PSO7
	CO4: Articulate these values in error-free English.	Applying	PSO7
Prose and Short Stories	CO1: Acquire knowledge about different forms of prose.	Understanding	PSO2
	CO2: Contextualize and explain prose works.	Understanding	PSO2
	CO3: Social and Cultural consciousness.	Understanding	PSO2
	CO4: Analyze short stories with reference to the literary elements.	Analyzing	PSO2
	CO5: Develop critical thinking and communication skills.	Applying	PSO2
Kavitha Natakam	CO1: Understand the nuances of Malayalam poetry.	Understanding	PSO2
	CO2: Conceptualize the new trends in poetic beauty and poetic language.	Understanding	PSO2
	CO3: Have a cognizance of the possibilities of cyber poetry and novelty of contemporary Malayalam poetry.	Understanding	PSO2
	CO4: Have an overview of the rich cultural heritage of Kerala.	Understanding	PSO2
Complementary Course II Biomolecules	CO1: Understand the structure, properties, and functions of various biomolecules.	Understanding	PSO3

	CO2: Describe the molecular structure of carbohydrates, including monosaccharides, disaccharides, and polysaccharides.	Understanding	PSO3
	CO3: Describe the primary, secondary, tertiary, and quaternary structures of proteins.	Understanding	PSO3
	CO4: Describe the double helix structure of DNA and the components of a nucleotide.	Understanding	PSO3
	CO5: Describe the basic structure of lipids, including fatty acids, glycerol, and other lipid components.	Understanding	PSO3
	CO6: Familiarity with different classes of lipids, including triglycerides, phospholipids, sterols, and waxes.	Understanding	PSO3
Vocational Course-3 Molecular Biology	CO1: Explain the structure and function of DNA molecules inside a cell.	Understanding	PSO4
	CO2: Demonstrate basic concepts of gene, genome, and chromosome.	Understanding	PSO4
	CO3: Illustrate various aspects of gene expression.	Understanding	PSO4
	CO4: Explain molecular biology of cancer.	Understanding	PSO4
Vocational Course-4 Fundamentals of Enzymology and Radiobiology	CO1: Explain concepts of properties of water, pH, and solutions.	Understanding	PSO4
	CO2: Discuss various methods of measuring pH and pH meters.	Understanding	PSO4
	CO3: Compare and explain various groups of enzymes and their properties.	Analyzing	PSO4

	CO4: Explain basic aspects of enzyme kinetics and enzyme inhibition, and their applications in genetic engineering, molecular biology, and medicine.	Understanding	PSO4
	CO5: Discuss various applications of common radioactive isotopes used in biology and medicine.	Understanding	PSO4
	CO6: Explain various laboratory operations in the field of biochemistry and enzymology.	Understanding	PSO4
Microbiology, Mycology and Plant Pathology	CO1: Understand the world of microbes, fungi, and lichens.	Understanding	PSO4
	CO2: Appreciate the adaptive strategies of microbes, fungi, and lichens.	Understanding	PSO4
	CO3: Study the economic and pathological importance of microorganisms.	Analyzing	PSO4
Methodology of Science and an Introduction to Botany and Microbiology, Mycology and Plant Pathology	CO1: Gain a comprehensive understanding of the scientific method, including how to design experiments, collect and analyze data, and draw conclusions based on evidence.	Understanding	PSO5
	CO2: Introduction to the world of microorganisms, including bacteria, viruses, and fungi.	Understanding	PSO5
	CO3: Identify different fungi, gram-positive and gram-negative bacteria.	Remembering	PSO5
	CO4: Identify and classify major groups of plant kingdom, algae, fungi, bryophytes, pteridophytes, gymnosperms, and angiosperms.	Remembering	PSO5

	CO5: Gain an understanding of plant diseases and their causes, including pathogens such as bacteria, viruses, and fungi.	Understanding	PSO5
Literature and/as Identity	CO1: Subtle negotiations of Indigenous and Diasporic identities within literature.	Understanding	PSO2
	CO2: Fissures, tensions, and interstices present in South Asian regional identities.	Understanding	PSO2
	CO3: Emergence of life writing and alternate/alternative/marginal identities.	Understanding	PSO2
Enzymology and Metabolism	CO1: Classify enzymes based on their functional groups and the type of reactions they catalyze.	Understanding	PSO3
	CO2: Familiarity with major metabolic pathways, including glycolysis, the citric acid cycle (Krebs cycle), and oxidative phosphorylation.	Understanding	PSO3
	CO3: Familiarity with the biosynthesis of fatty acids and beta-oxidation.	Understanding	PSO3
	CO4: Understanding pathways involved in the metabolism of amino acids, including transamination, deamination, and the urea cycle.	Understanding	PSO3
Vocational Course-5 Biotechniques and Instrumentation	CO1: Identify and describe various techniques used in the field of biotechnology.	Understanding	PSO4
	CO2: Explain principles of various techniques used in biotechnology.	Understanding	PSO4
	CO3: Discuss applications of different techniques.	Understanding	PSO4

	CO4: Demonstrate various techniques in the field of biotechnology.	Applying	PSO4
Vocational Course-6 Basics of Molecular Cloning Techniques	CO1: Identify and list various tools used for molecular cloning.	Remembering	PSO4
	CO2: Explain different types of vectors and modifying enzymes used in genetic engineering and molecular cloning.	Understanding	PSO4
	CO3: Discuss various molecular probes and nucleic acid hybridization assays used for identifying a cloned gene.	Understanding	PSO4
	CO4: Explain various methods of DNA sequencing and their significance.	Understanding	PSO4
	CO5: Explain and discuss principles, methodology, types, and applications of Polymerase Chain Reaction (PCR).	Understanding	PSO4
Phycology and Bryology	CO1: Study the evolutionary importance of algae as progenitors of land plants.	Understanding	PSO3
	CO2: Understand the unique and general features of algae and bryophytes.	Understanding	PSO3
	CO3: Study the external morphology, internal structure, and reproduction of different types of algae and bryophytes.	Understanding	PSO3
	CO4: Realize the application of phycology in different fields.	Applying	PSO3
Illuminations	CO1: Acquaint learners with different forms of inspiring and motivating literature.	Understanding	PSO7

	CO2: Maintain a positive attitude to life.	Applying	PSO7
	CO3: Evaluate and overcome setbacks based on the insights that the text provides.	Evaluating	PSO7
Nutritional and Clinical Biochemistry	CO1: Understand principles of nutrition, including classification of nutrients and their role in maintaining health and preventing nutritional deficiencies.	Understanding	PSO3
	CO2: Understand functions of essential vitamins and minerals in the body, their sources, and roles in various biochemical pathways.	Understanding	PSO3
	CO3: Understand fundamental biochemical processes involved in the development and progression of various diseases.	Understanding	PSO3
	CO4: Knowledge of biochemical markers (biomarkers) used in disease diagnosis, prognosis, and monitoring treatment responses.	Understanding	PSO3
	CO5: Understand how environmental factors, diet, and lifestyle choices influence biochemical pathways and contribute to disease risk.	Understanding	PSO3
	CO6: Describe components of blood and plasma, knowledge of the coagulation process and the role of platelets and clotting factors in stopping bleeding.	Understanding	PSO3
	CO7: Understand the role of clinical biochemistry in healthcare and its importance in diagnosing, monitoring, and managing diseases.	Understanding	PSO3
Vocational Course-7 Genetic Engineering	CO1: Outline various aspects of genetic engineering.	Understanding	PSO4

	CO2: Explain various gene cloning strategies.	Understanding	PSO4
	CO3: Discuss methods and applications of genetic transformation in plants.	Understanding	PSO4
	CO4: Explain genetically modified crops and their applications.	Understanding	PSO4
	CO5: Illustrate various aspects of gene libraries.	Understanding	PSO4
	CO6: Identify and discuss drawbacks of recombinant DNA technology.	Analyzing	PSO4
Vocational Course-8 Plant Tissue Culture	CO1: Describe basic concepts of plant tissue culture and its development as a branch of biotechnology.	Understanding	PSO4
	CO2: List various facilities required for plant tissue culture and explain various methods of sterilization and culture media.	Understanding	PSO4
	CO3: Explain methods used for sterilization and different growth regulators used in plant tissue culture.	Understanding	PSO4
	CO4: Explain importance and significance of various culture techniques in plant tissue culture.	Understanding	PSO4
	CO5: Discuss application of plant tissue culture in various fields and its role in the industrial production of secondary metabolites.	Understanding	PSO4
	CO6: Demonstrate various tissue culture techniques.	Applying	PSO4

Pteridology, Gymnosperms and Paleobotany	CO1: Comprehensive understanding of the classification, morphology, anatomy, and reproductive features of pteridophytes, gymnosperms, and extinct plants studied through paleobotany.	Understanding	PSO4
	CO2: Identify and differentiate various pteridophytes, gymnosperms, and extinct plants based on their key characteristics.	Analyzing	PSO4
	CO3: Recognize the ecological roles and economic significance of pteridophytes, gymnosperms, and extinct plants.	Understanding	PSO4
	CO4: Understand the significance of paleobotany and its application.	Understanding	PSO4
Phycology and Bryology and Pteridology, Gymnosperms and Paleobotany	CO1: Develop skills in the collection, preservation, and identification of different types of algae.	Applying	PSO3
	CO2: Gain proficiency in the use of microscopy techniques to observe and study the morphology and reproductive structures of algae, bryophytes, and pteridophytes.	Applying	PSO3
	CO3: Study the anatomical variations in vascular plants.	Understanding	PSO3
Anatomy, Reproductive Botany and Microtechnique	CO1: Insight into the internal structure and reproduction of the most evolved group of plants, the angiosperms.	Understanding	PSO6
	CO2: Understand individual cells and tissues simultaneously.	Understanding	PSO6
	CO3: Understand structural adaptations in plants growing in different environments.	Understanding	PSO6

	CO4: Understand morphology and development of reproductive parts.	Understanding	PSO6
	CO5: Insight into fruit and seed development.	Understanding	PSO6
	CO6: Understand techniques used to preserve and study plant materials.	Understanding	PSO6
Research Methodology, Biophysics and Biostatistics	CO1: Equip students to conduct independent research and prepare research reports.	Applying	PSO5
	CO2: Acquaint students with different tools and techniques used in research work.	Understanding	PSO5
	CO3: Equip students with basic computer skills necessary for conducting research.	Applying	PSO5
	CO4: Enable students to have enough numerical skills necessary to carry out research.	Applying	PSO5
Plant Physiology and Biochemistry	CO1: Learn about various metabolic processes in plants, such as photosynthesis, respiration, nutrient uptake, plant hormones, and their roles in growth and development.	Understanding	PSO6
	CO2: Explore how plants respond and adapt to various environmental stresses, such as drought, salinity, temperature extremes, and pathogens.	Analyzing	PSO6
	CO3: Understand the role, structure, and importance of biomolecules associated with plant life.	Understanding	PSO6
Environmental Science and Human Rights	CO1: Awareness about biodiversity and importance of its conservation.	Understanding	PSO7
	CO2: Understand structure and function of ecosystems.	Understanding	PSO7

	CO3: Understand various kinds of pollution in the environment, their impacts on the ecosystem, and their control measures.	Understanding	PSO7
	CO4: Awareness about various environmental laws in India and the role of various movements in the protection of nature and natural resources.	Understanding	PSO7
Agri-Based Microenterprises	CO1: Provide basic information about business opportunities in plant sciences.	Understanding	PSO7
	CO2: Inform students about sustainable agriculture and organic farming.	Understanding	PSO7
	CO3: Inculcate enthusiasm and awareness about ornamental gardening, nursery management, and mushroom cultivation.	Applying	PSO7
Genetics, Plant Breeding and Horticulture	CO1: Insight into principles of heredity.	Understanding	PSO7
	CO2: Understand patterns of inheritance in different organisms.	Understanding	PSO7
	CO3: Understand inheritance pattern of nuclear and extra-nuclear genes.	Understanding	PSO7
	CO4: Understand methods of crop improvement.	Understanding	PSO7
	CO5: Understand importance of horticulture in human welfare.	Understanding	PSO7
	CO6: Develop skills in gardening techniques among students.	Applying	PSO7
Cell and Molecular Biology	CO1: Understand ultra-structure and functioning of cell at sub-microscopic and molecular level.	Understanding	PSO7

	CO2: Understand cytological aspects of growth and development.	Understanding	PSO7
	CO3: Understand DNA as the basis of heredity and variation.	Understanding	PSO7
Angiosperm Morphology, Taxonomy and Economic Botany	CO1: Acquaint with aims, objectives, and significance of taxonomy.	Understanding	PSO7
	CO2: Identify common species of plants growing in Kerala and their systematic position.	Applying	PSO7
	CO3: Acquaint with basic techniques in the preparation of herbarium.	Applying	PSO7
	CO4: Familiarize with plants having economic importance.	Understanding	PSO7
Biotechnology, Bioinformatics and Molecular Biology	CO1: Gain a solid understanding of fundamental principles of biotechnology, including genetic engineering, molecular biology, recombinant DNA technology, and genomics.	Understanding	PSO7
	CO2: Utilize bioinformatics tools and techniques to analyze biological data, such as DNA and protein sequences, gene expression data, and structural information.	Applying	PSO7
	CO3: Learn about application of biotechnology in various industries, such as pharmaceuticals, agriculture, environmental science, and healthcare.	Understanding	PSO7
	CO4: Introduce vast repositories of biological data knowledge.	Understanding	PSO7
	CO5: Equip to access and analyze data available in databases.	Applying	PSO7

Agribusiness	CO1: Impart an idea about business opportunities in the field of plant sciences.	Understanding	PSO7
	CO2: Develop an entrepreneurial mindset and stick to the core subject among botany students.	Applying	PSO7
	CO3: Provide an idea about the need for sustainable development and organic farming.	Understanding	PSO7
	CO4: Harness opportunities and potentials in the field of ecotourism, processing technology, and food sciences.	Applying	PSO7
Anatomy, Reproductive Botany and Microtechnique and Genetics, Plant Breeding and Horticulture	CO1: Recognize primary, secondary, and anomalous anatomy of stem and root.	Understanding	PSO6
	CO2: Identify different types of cell inclusions, embryos, anther types, and stomata found in plants.	Remembering	PSO6
	CO3: Solve different problems of genetics.	Applying	PSO6
	CO4: Perform budding, grafting, and layering.	Applying	PSO6
Plant Physiology and Biochemistry and Cell and Molecular Biology	CO1: Set up physiological experiments, find results and inference.	Applying	PSO6
	CO2: Recognize different stages of mitosis.	Remembering	PSO6
	CO3: Identify presence of organic compounds like proteins and carbohydrates in a solution using different reagents.	Applying	PSO6
Environmental Science and Human Rights and Biotechnology and Bioinformatics	CO1: Identify presence of dissolved CO ₂ and chlorine in a water sample using titration method.	Applying	PSO7

	CO2: Isolate DNA from a plant sample and make synthetic seeds using calcium alginate.	Applying	PSO7
	CO3: Visualize macromolecules like insulin using RasMol.	Applying	PSO7
Research Methodology, Biophysics and Biostatistics and Angiosperm Morphology, Taxonomy and Economic Botany	CO1: Identify plants.	Remembering	PSO7
	CO2: Make herbarium.	Applying	PSO7
	CO3: Prepare histogram using data.	Applying	PSO7
Seminar/Assignment	CO1: Enhance understanding and knowledge of the subject matter covered in the courses.	Understanding	PSO7
	CO2: Encourage development of critical thinking skills.	Analyzing	PSO7
	CO3: Develop problem-solving skills, including ability to identify problems, generate alternative solutions, and select most appropriate approach to solve them.	Applying	PSO7
	CO4: Develop effective communication skills, both written and verbal.	Applying	PSO7
	CO5: Learn how to prioritize tasks, meet deadlines, and manage workload effectively.	Applying	PSO7
Field Visit/Study Tour	CO1: Gain practical experience and apply theoretical knowledge in a real-world setting.	Applying	PSO7
	CO2: Develop observational and analytical skills by studying and documenting natural phenomena, cultural practices, or specific environments.	Analyzing	PSO7

	CO3: Understand interconnections between different components of an ecosystem, community, or industry.	Understanding	PSO7
	CO4: Learn about local challenges, issues, and solutions related to field of study.	Understanding	PSO7
Project	CO1: Develop ability to design rigorous research studies.	Creating	PSO7
	CO2: Critically evaluate existing research, identify gaps or limitations in the literature, and situate research within broader scholarly discourse.	Analyzing	PSO7
	CO3: Apply statistical or qualitative analysis techniques, interpret findings, and draw conclusions based on empirical evidence.	Applying	PSO7
	CO4: Apply critical thinking skills to analyze data, interpret results, and propose innovative solutions.	Analyzing	PSO7
	CO5: Develop research timelines, set realistic goals, allocate resources, and meet project milestones.	Creating	PSO7
Hands-On Training (HOT)/On the Job Training (OJT)	CO1: Provide hands-on training and develop practical skills relevant to a specific job or industry in biotechnology area.	Applying	PSO7
	CO2: Focus on imparting job-specific knowledge in the field of biotechnology that may not be covered in theoretical classroom settings.	Understanding	PSO7
	CO3: Include improved communication skills, teamwork abilities, and adaptability to work environment.	Applying	PSO7

	CO4: Contribute to professional development of trainees by providing exposure to industry practices, allowing them to learn from experienced professionals, and nurturing a growth mindset.	Understanding	PSO7
	CO5: Increased self-confidence, motivation, and sense of professionalism.	Applying	PSO7