

Department of Botany

Name of Programme	Program Outcome(PO)	Program Specific Outcome(PSO)	Course Outcome(CO)
B. Sc. Part- I Subject- Botany	<ul style="list-style-type: none"> •To study structural organization and economic importance of microbes including Bacteria, Viruses, Mycoplasma, Cyanobacteria. •To study the structural, developmental and economic importance of lower plants including Algae, Fungi, Bryophytes and Pteridophytes with practical knowledge. 	<p>Paper-I-General Diversity of Microbes and Cryptogams</p> <ul style="list-style-type: none"> •Understanding the basic microbial characteristics, structure, reproduction and economic importance of Bacteria, Virus, Mycoplasma and Cyanobacteria. •Know the classification, characteristic features, life history and economic importance of algae with practical knowledge. • Know the General account, classification, characteristic features, structure, life history and economic importance of fungi with practical knowledge. •Know the classification, characteristic features, structure and life cycle of Bryophytes with practical knowledge. •Know the classification, characteristic features, structure and life cycle of Pteridophytes with practical knowledge. 	<p>Upon completion of this course students will be able :</p> <ul style="list-style-type: none"> •To acquire knowledge relevant to microbes and lower plants with practical knowledge. •To make aware the application of these studies to become entrepreneur. •To become employee of related industries. •To become employee of related scientific industries such as supplier of classwork material, slides, specimen etc. •To become teacher in educational institute.
	<ul style="list-style-type: none"> •To study the structure, molecular aspects and function of plant cell including plasma membrane, cell wall, cell organelles. •To study the genetics including chromosomal organization, DNA, RNA, Gene expression, Protein synthesis, Proteins, Mutation as well as Mendel's Law 	<p>Paper-II-Cell Biology and Genetics</p> <ul style="list-style-type: none"> • Understand the basics of cell biology. • Understand the structure and function of plasma membrane, cell, and different cell organelles. • Know the chromosomal organization and variation. • Know the process of cell division with practical related to it. • Know the genetic material DNA, genetic 	<p>Upon completion of this course students will be able :</p> <ul style="list-style-type: none"> •To acquire knowledge relevant to cell biology and genetics. •To become teacher in educational institute, tutor.

		<p>code, mitochondrial and cytoplasmic DNA.</p> <ul style="list-style-type: none"> • Understand the aspects of gene regulation and expression. • Understand the process of protein synthesis with structure of protein. • Understand the knowledge of genetic variation and genetic inheritance as well as Mendel's law. 	
B. Sc. Part- II Subject- Botany	<ul style="list-style-type: none"> •To study the structural, developmental and economic aspects of Gymnosperms as well as Angiosperms. •The outcome of this programme as to identify the plants according to taxonomy. •To study the anatomical structure and development of flowering plants 	<p>Paper-I- Diversity of Seed Plants and The Systematics</p> <ul style="list-style-type: none"> •Understanding the characteristics, origin, evolution and diversity of seeded plants. •Know the classification, characteristic features, structure and life cycle of gymnosperms with practical knowledge. •Understand the principles and rules of taxonomy of angiosperms. •Knowing the salient features of classification of angiosperms. •Understanding the diversity of flowering plants of different families. 	<p>Upon completion of this course students will be able :</p> <ul style="list-style-type: none"> •To acquire knowledge relevant to gymnosperms and angiosperms with practical knowledge. •To make aware the application of these studies to become entrepreneur. •To become employee of related industries. <p>To become taxonomist.</p>
	<ul style="list-style-type: none"> •To study basic body plan of plant. •To study the shoot and root system. •To study the structure, development and reproduction in flowering plants 	<p>Paper-II- Structure, Development and Reproduction in Flowering Plants</p> <ul style="list-style-type: none"> •Understanding the basic body plan, growth and diversity in plants. •Understanding the shoot system and root system in detail with practical knowledge. •Knowing the morphological and anatomical structure of leaves according to adaptation with practical knowledge. 	<p>Upon completion of this course students will be able :</p> <ul style="list-style-type: none"> •To acquire knowledge relevant to structure, development and reproduction in flowering plants with practical knowledge. •To become employee of related scientific industries such as supplier of classwork material, slides, specimen etc.

		<ul style="list-style-type: none"> • Understand the structure, development of flower and reproduction in flowering plants in detail with practical knowledge. Significance of seeds. 	
B. Sc. Part- III Subject- Botany	<ul style="list-style-type: none"> • To study the physiology of plants. • To study the growth and development in plants. • To study the principles, techniques and application of genetic engineering and biotechnology. 	<p>Paper-I- Plant Physiology, Biochemistry and Biotechnology</p> <ul style="list-style-type: none"> • Know the complete physiology of plants including plant water relationship, transpiration, transport of organic substance, respiration, photosynthesis. • Understand the properties, structure and mechanism of action of enzymes. • Understand the metabolism of nitrogen and lipids. • Knowing the growth and development process in plants including knowledge of structure and function of plant hormone • Understanding the principles, techniques and application of genetic engineering and biotechnology. 	<p>Upon completion of this course students will be able :</p> <ul style="list-style-type: none"> • To acquire complete knowledge about plant physiology with practical knowledge. • To make aware the application of these studies to become entrepreneur. • To become employee of biotechnology and genetic engineering related industries.
	<ul style="list-style-type: none"> • To study plant and environment. • To study the ecology and ecosystem with the practical Knowledge. • To study the utilization of plants 	<p>Paper-II Ecology and Utilization of Plants</p> <ul style="list-style-type: none"> • Understand the environment along with water, light, soil, temperature. • Understand the morphological, anatomical and physiological changes in plants responses to environment with practical knowledge. • Knowledge of ecology, ecosystem, ecological pyramids, flow of energy with practicals. • Understand the utilization of plants as food, fibers, oils, spices, 	<p>Upon completion of this course students will be able :</p> <ul style="list-style-type: none"> • To acquire complete knowledge about environment and ecosystem. • To become entrepreneur such as supplier of medicinal herbs and spices. • To become environment conservationist. • To become teacher in educational institute. • To become laboratory technician. • To appear different competitive examination conducted at national

		medicine, beverages and rubber with practical knowledge.	
M. Sc. Semester I Botany	<ul style="list-style-type: none"> •To study structural organization of plant cell, cell wall and plasma membrane as well as cell organelles. •To study the cell division, cell cycle and. •To study the apoptosis and cytology of cancer. 	Paper-I-Cell Biology of Plants <ul style="list-style-type: none"> •Understanding structural organization of plant cell. •Understanding structural organization and function of Plasma membrane, cell wall, plasmodesmata. •Understanding structural organization and function of different cell organelles. •Know the process of cell cycle and cell division with practical knowledge. •Know the mechanism of apoptosis and cytology of cancer. 	Upon completion of this course students will be able : <ul style="list-style-type: none"> •To acquire knowledge relevant to cell biology with practical knowledge. •To become teacher of cell biology.
	<ul style="list-style-type: none"> •To study structural organization of chromosome. •To study the genetics of prokaryotes and eukaryotes. <p>To study the detail of genetic recombination and genetic mapping.</p> <ul style="list-style-type: none"> •To study the molecular basis of DNA. 	Paper-II-Cytology, Genetics and Cytogenetics <ul style="list-style-type: none"> •Understanding structural organization of chromosome. •Understanding the different types of chromosomal alteration. •Understanding the structure of gene and gene expression in prokaryotes and eukaryotes. •Knowing the detail of mutation, genetic recombination and genetic mapping. <p>Understanding the molecular basis of DNA.</p>	Upon completion of this course students will be able : <ul style="list-style-type: none"> •To acquire knowledge relevant to cytogenetics. •To become teacher, researcher, scientist in related organization
	<ul style="list-style-type: none"> •To study structural organization of DNA and RNA. •To study the molecular basis of protein synthesis. •To study the techniques related to molecular biology 	Paper-III-Molecular Biology of Plants <ul style="list-style-type: none"> •Understanding structural organization of DNA and RNA. •Understanding the process of protein synthesis in detail. •Understanding the techniques related to molecular biology. 	Upon completion of this course students will be able : <ul style="list-style-type: none"> •To acquire complete knowledge relevant to molecular biology of plants. •To become teacher, researcher, scientist in related organization.
	<ul style="list-style-type: none"> •To study structural organization and economic 	Paper-IV-Biology and Diversity of Viruses,	Upon completion of this course students will be

	<p>importance of viruses, bacteria, cyanobacteria and phytoplasma.</p> <ul style="list-style-type: none"> •To study the classification, structure and reproduction of algae. •To study the classification, structure and reproduction of fungi. 	<p>Bacteria, Algae and Fungi</p> <ul style="list-style-type: none"> • Understanding structural organization and economic importance of viruses, bacteria, cyanobacteria and phytoplasma with practical. • Understanding classification, structural organization, reproduction and economic importance of algae in detail with practical. • Understanding classification, structural organization, reproduction and economic importance of fungi in detail with practical knowledge. 	<p>able :</p> <ul style="list-style-type: none"> •To acquire complete knowledge relevant to viruses, bacteria, algae and fungi. •To become teacher, researcher, scientist in related organization. •To become supplier of economically important algae and fungi
M. Sc. Semester II Botany	<p>To study classification, structural organization, reproduction and economic importance of Bryophytes, Pteridophytes and Gymnosperms.</p>	<p>Paper-I-Taxonomy and Diversity of Bryophytes, Pteridophytes and Gymnosperms</p> <ul style="list-style-type: none"> •Understanding classification, structural organization, reproduction and economic importance of bryophytes with practical. • Understanding classification, structural organization, reproduction and economic importance of pteridophytes with practical. • Understanding classification, structural organization, reproduction and economic importance of gymnosperms with practical. 	<p>Upon completion of this course students will be able :</p> <ul style="list-style-type: none"> • To acquire complete knowledge relevant to Bryophytes, Pteridophytes and Gymnosperms. • To become teacher, researcher, scientist in related organization. •To become supplier of economically important Bryophytes, Pteridophytes and Gymnosperms
	<ul style="list-style-type: none"> •To study classification of angiosperms. •To study the dicotyledonous families. •To study the monocotyledonous families. •To study the taxonomic evidences 	<p>Paper-II-Taxonomy and Diversity of Angiosperms</p> <ul style="list-style-type: none"> •Understanding different system classification of angiosperms. • Understanding taxonomic hierarchy, plant nomenclature and identification. •Understanding the dicot families in detail economic 	<p>Upon completion of this course students will be able :</p> <ul style="list-style-type: none"> •To acquire complete knowledge relevant to angiosperms. •To acquire complete knowledge of classification systems. •To become taxonomist. To become teacher,

		<p>importance with practical knowledge.</p> <ul style="list-style-type: none"> • Understanding the monocot families in detail with economic importance with practical knowledge. • Understanding the evidences related to taxonomy. 	<p>researcher, scientist in related organization.</p> <ul style="list-style-type: none"> • To become supplier of economically important angiosperms.
	<ul style="list-style-type: none"> • To study seed germination and seedling growth. • To study the leaf growth and differentiation. • To study the Root System and development. • To study the shoot system and development. 	<p>Paper-III-Plant Growth and Development</p> <ul style="list-style-type: none"> • Understanding the details of seed germination and seedling growth with practicals. • Understanding the detail of leaf growth and differentiation with practicals • Understanding the root system and development with practicals. • Understanding the shoot system and development with practical. 	<p>Upon completion of this course students will be able :</p> <ul style="list-style-type: none"> • To acquire complete knowledge relevant to seed germination and seedling growth. • To acquire complete knowledge of leaf, root and shoot growth and development. • To become teacher, researcher, scientist in related organization.
	<ul style="list-style-type: none"> • To study reproduction and embryology of angiosperms. • To study the seed development and fruit growth and maturation. • To study the seed dormancy, bud dormancy, senescence and programmed cell death 	<p>Paper-IV-Reproduction and embryology of Angiosperms</p> <ul style="list-style-type: none"> • Understanding the details reproduction in angiosperms with practicals. • Understanding the detail of embryology with practicals. • Understanding the seed development and fruit growth and maturation with practical knowledge. • Understanding the process of seed dormancy and bus dormancy • Understanding the knowledge of senescence and programmed cell death. 	<p>Upon completion of this course students will be able :</p> <ul style="list-style-type: none"> • To acquire complete knowledge relevant to reproduction and embryology of angiosperms. • To acquire complete knowledge of seed and bud dormancy, senescence and programme cell death. • To become teacher, researcher, scientist in related organization.
M. Sc. Semester III Botany	<ul style="list-style-type: none"> • To study ecosystem organization. • To study vegetative organization and development. 	<p>Paper-I-Plant Ecology</p> <ul style="list-style-type: none"> • Understanding the ecology and ecosystem in detail. • Understanding the detail 	<p>Upon completion of this course students will be able :</p> <ul style="list-style-type: none"> • To acquire complete knowledge relevant to

	<ul style="list-style-type: none"> • To study the ecology including climatic factors, soil, water and air • To study the biological diversity. • To study the climatic changes and ecological stability 	<p>of vegetation organization and development.</p> <ul style="list-style-type: none"> • Understanding the different biotic factors and climatic factors soil, air and water related to ecology • Understanding the biological diversity and its conservation. • Understanding the knowledge of climatic changes and ecological stability. 	<p>plant ecology including biodiversity and its conservation.</p> <ul style="list-style-type: none"> • To become environment conservationist. • To become teacher, researcher, scientist in related organization.
	<ul style="list-style-type: none"> • To study the plant diversity and sustainable development. • To study the origin, evolution cultivation of plants with their utilization. • To study the strategies of conservation. 	<p>Paper-II-Plant Utilization and Conservation</p> <ul style="list-style-type: none"> • Understanding the plant diversity and sustainable development. • Understanding the detail of origin, evolution, cultivation of plants with their utilization. • Understanding the biological diversity and its conservation techniques and agencies related to it 	<p>Upon completion of this course students will be able :</p> <ul style="list-style-type: none"> • To acquire complete knowledge relevant to Plant utilization and plant diversity with its conservation. • To become agriculturist. To become teacher, researcher, scientist in related organization. • To become environment conservationist
	<ul style="list-style-type: none"> • To study the plant physiology. • To study the stress physiology 	<p>Paper-III-Plant Physiology</p> <ul style="list-style-type: none"> • Understanding the plant physiology including translocation of water, solutes and membrane transport. • Understanding the detail of photosynthesis and carbon assimilation. • Understanding the sensory photobiology • Understanding the physiology of respiration. Knowing the stress physiology. 	<p>Upon completion of this course students will be able :</p> <ul style="list-style-type: none"> • To acquire complete knowledge relevant to plant physiology and stress physiology. • To become teacher, researcher, scientist in related organization.
	<ul style="list-style-type: none"> • To study the process of energy production. • To study the mechanism of signal transduction. • To study the biosynthesis of starch, sucrose and lipid with its metabolism. • To study the process of flowering , growth 	<p>Paper-IV-Plant Metabolism</p> <ul style="list-style-type: none"> • Understanding the process of energy production through ATP. • Understanding the detail of signal transduction and its mechanism. • Understanding the 	<p>Upon completion of this course students will be able :</p> <ul style="list-style-type: none"> • To acquire complete knowledge relevant to Plant metabolism, signal transduction, flowering regulation and growth regulators.

	regulators	biosynthesis and metabolism of starch, sucrose and lipids with practical knowledge. Knowing the process of flowering and its regulation. •Understanding the plant growth regulators with mechanism of action with practicals.	•To become teacher, researcher, scientist in related organization.
M. Sc. Semester IV Botany	•To study the Biotechnology of plants and its applications. •To study the genetic engineering of plants and its applications.	Paper-I-Biotechnology and Genetic Engineering of Plants •Understanding the concepts, principles and application of biotechnology. •Understanding the plant cell and tissue culture and its applications. •Understanding the concepts, principles and applications of plant genetic engineering.	Upon completion of this course students will be able : • To acquire complete knowledge relevant to biotechnology, plant cell and tissue culture and genetic engineering of plants with their application. •To become teacher, researcher, scientist in related organization.
	•To study the Biotechnology and genetic engineering of microbes and its applications. •To study the genetic engineering of microbes and its applications in different industries	Paper-II-Biotechnology and Genetic Engineering of Microbes •Understanding the concepts, principles and application of recombinant DNA technology and its application. •Understanding the genomics and proteomics. •Understanding the concepts, principles of microbial genetic manipulation. •Knowing the details of application of genetic improvement of industrial microbes.	Upon completion of this course students will be able : •To acquire complete knowledge relevant to biotechnology and genetic engineering of microbes with their application. •To become teacher, researcher, scientist in related organization. •To become Entrepreneur.
	•To study the plant pathology including different types of pathogens, plant diseases, pathogenesis, defense mechanism. •To study the effect of environment on diseases development,	Paper-III-Molecular Plant Pathology •Understanding the concepts and principles of plant pathology including plant and pathogen relationship. •Understanding the plant disease inciting organisms	Upon completion of this course students will be able : •To acquire complete knowledge regarding to plant pathology. •To become plant pathologist in laboratories, research laboratories,

	epidemiology and disease forecasting	<p>with practical knowledge.</p> <ul style="list-style-type: none"> •Understanding the process of pathogenesis and disease symptoms with practical knowledge •Knowing the details of defense mechanism. •Knowing the details of effect of environment of disease development, epidemiology and disease forecasting. 	<p>industries etc.</p> <ul style="list-style-type: none"> •To become teacher, researcher, scientist in related organization. •To become agricultural adviser. •To become advanced agriculturist. • To become Entrepreneur.
	<ul style="list-style-type: none"> •To study the plant diseases due to different types of pathogens. •To study the principles of plant disease control and plant quarantine. 	<p>Paper-IV-Plant Disease and Control Mechanism</p> <ul style="list-style-type: none"> •Understanding the diseases due to fungi and its control with practical knowledge. •Understanding the diseases due to bacteria and its control with practical knowledge. •Understanding the diseases due to viruses and its control with practical knowledge. •Understanding the diseases due to mycoplasma and its control with practical knowledge. •Understanding the diseases due to nematodes and its control with practical knowledge. •Understanding the non parasitic disease. • Knowing the principles of plant disease control and plant quarantines 	<p>Upon completion of this course students will be able :</p> <ul style="list-style-type: none"> •To acquire complete knowledge relevant to plant diseases and their control. •To become plant pathologist in different laboratories, research laboratories, industries etc. •To become teacher, researcher, scientist in related organization. •To become agricultural adviser. • To become advanced agriculturist. • To become Entrepreneur. • To become plant quarantine specialist for upcoming seed lots, plants at airport, ship yard from other countries. •To appear and compete different examination like UPSC, PSC, NET/SET, IFS etc conducted for Post Graduate students by taking botany as subject.