



**THE STANDARD FIREWORKS RAJARATNAM COLLEGE FOR WOMEN (AUTONOMOUS),
SIVAKASI – 626 123.**

(Affiliated to Madurai Kamaraj University, Re-accredited with A Grade by NAAC,
College with Potential for Excellence by UGC and Mentor Institution under UGC PARAMARSH)

DEPARTMENT OF BOTANY

UG DEGREE PROGRAMME IN BOTANY WITH SPECIALIZATION IN PLANT BIOTECHNOLOGY

PROGRAMME EDUCATIONAL OBJECTIVES

The Graduates will

PEO1.	be a productive employee in herbal industries, botanical gardens, educational institutions or pursue higher studies.
PEO2.	create novel ideas to solve economic, social and environmental issues related to Botany.
PEO3.	be competent to handle a demanding situation and involve in the collection and preparation of specimens to aspire as a successful entrepreneur.
PEO4.	adhere to the principles of ethics in the production and usage of organic food materials both in professional and personal life.

PROGRAMME SPECIFIC OUTCOMES

By the Completion of B.Sc. Botany with specialization in Plant Biotechnology programme, the learners will be able to

PSO1.	apply their botanical knowledge to identify and compare the fundamental features and processes of different groups of plants
PSO2.	critically think and apply the understanding of the subject of plant sciences in identifying the problems which can be solved through the use of plants
PSO3.	evaluate and apply the skills in Botany with the understanding of general laboratory practices.
PSO4.	articulate effectively with the use of digital resources to explain the concepts related to life sciences.
PSO5.	exhibit their caliber to work efficiently as a member /leader in teams, preferably in a multi-disciplinary setting.
PSO6.	reflect the environmental values and uses of plants and be aware of environmental implications.
PSO7.	engage in sustainable utilization of plants, land, water, forest and energy resources.

COURSE OUTCOME

Major Course	
Course Code: GLBP11	Course Title: PLANT DIVERSITY I
On successful completion of the course, the learners should be able to	
CO1	summarize the characters, classification and economic importance of lower plants.
CO2	illustrate the thallus structure and reproduction of algae.
CO3	analyze the structure and reproduction of fungi.
CO4	examine the thallus structure and reproduction of lichens.
CO5	explain the structure and reproduction of bryophytes.

COURSE OUTCOME

Major Course	
Course Code: GLBP12	Course Title: CELL BIOLOGY AND PLANT ANATOMY
On successful completion of the course, the learners should be able to	
CO1	summarize the structure and functions of different components of cell.
CO2	analyze the process of cell divisions and its significances.
CO3	identify the types of tissue and its functions.
CO4	compare the tissue composition of different parts of a plant.
CO5	explain the normal and anomalous secondary growth in plants.

COURSE OUTCOME

Allied Course	
Course Code: GLBP1A	Course Title: ANIMAL BIOTECHNOLOGY I
On successful completion of the course, the learners should be able to	
CO1	demonstrate the techniques pertaining to animal cell culture.
CO2	design and evaluate the techniques for development and maintenance of cell lines.
CO3	develop animal cell culture products.
CO4	examine the methods of transgenesis.
CO5	unravel the information pertaining to transgenesis and to relate transgenic animals with ethical issues.

COURSE OUTCOME

Major Course	
Course Code:GLBP21	Course Title:PLANT DIVERSITY II
On successful completion of the course, the learners should be able to	
CO1	recall the general characters and classification of Pteridophytes and Gymnosperms.
CO2	discuss the structure and reproduction of Pteridophytes.
CO3	analyse the morphology, anatomy, reproduction and economic importance of Gymnosperms.
CO4	explain the formation and types of fossil and their existence in various eras.
CO5	examine the structure and reproduction of fossil.

COURSE OUTCOME

Major Course	
Course Code:GLBP2L	Course Title:– PRACTICAL I
On successful completion of the course, the learners should be able to	
CO1	identify the specimens and slides.
CO2	illustrate the preparation of whole mount.
CO3	analyze the structure and functions of cell organelles.
CO4	examine the process of cell division in plants.
CO5	formulate suitable technique for the study of internal structure of a plant part.

COURSE OUTCOME

Allied Course	
Course Code:GLBP2A	Course Title:ANIMAL BIOTECHNOLOGY II
On successful completion of the course, the learners should be able to	
CO1	analyze the concepts of Human Genome Project.
CO2	classify and characterize the methods of gene therapy.
CO3	evaluate the basics of IVF Technology in man and cattle.
CO4	Demonstrate hybridoma technology along with its therapeutic and diagnostic applications.
CO5	summarize stem cell biology and to evaluate its biomedical applications.

COURSE OUTCOME

Allied Course	
Course Code:GLBP2AL	Course Title:ALLIED PRACTICAL
On successful completion of the course, the learners should be able to	
CO1	design the animal cell culture laboratory and adopt biosafety practices.
CO2	demonstrate animal cell culture trials.
CO3	prepare animal cell culture products.
CO4	estimate the microbial load and their sensitivity to antibiotics.
CO5	handle equipments.

COURSE OUTCOME

Major Course	
Course Code:GLBP31	Course Title:EMBRYOLOGY AND PLANT TISSUE CULTURE
On successful completion of the course, the learners should be able to	
CO1	explain the stages of microsporogenesis and megasporogenesis.
CO2	analyze the process of fertilization and formation of endosperm.
CO3	discuss about the embryo, polyembryony and apomixis in angiosperms.
CO4	summarize the concepts and fundamental requirements for plant tissue culture.
CO5	examine the regeneration of plantlets various through tissue culture techniques.

COURSE OUTCOME

Major Course	
Course Code:GLBP32	Course Title:GENETICS
On successful completion of the course, the learners should be able to	
CO1	demonstrate the process of inheritance and interaction of genes in plants.
CO2	analyze about linkage and crossing over and its significances.
CO3	assess the structure, replication and role of nucleic acids.
CO4	classify and detect the basis of mutations and its effects.
CO5	apply statistical tools in life sciences.

COURSE OUTCOME

Major Course	
Course Code:GLBP41	Course Title:BIOCHEMISTRY
On successful completion of the course, the learners should be able to	
CO1	outline the structure of atoms, nature of bondings and buffers.
CO2	analyze the structure and properties of biomolecules.
CO3	illustrate the classification of biomolecules.
CO4	discuss the structure, properties, mechanism and role of enzymes.
CO5	make use of the techniques and instruments for biochemical analysis.

COURSE OUTCOME

Major Course	
Course Code:GLBP4L	Course Title:PRACTICAL II
On successful completion of the course, the learners should be able to	
CO1	demonstrate the preparation of culture medium and sterilization.
CO2	examine the germination of pollen grains and dissect out embryo.
CO3	analyze solution for a genetic problem with its cross.
CO4	interpret the role of several genes in the inheritance of character using statistical method.
CO5	make use of the biochemical techniques to detect and estimate the samples.

COURSE OUTCOME

Allied Course	
Course Code:GLBP3A	Course Title:FUNDAMENTALS OF BIOCHEMISTRY
On successful completion of the course, the learners should be able to	
CO1	explain the structure of atoms and nature of bondings and buffer.
CO2	analyze the structure and functions of biomolecules.
CO3	discuss about enzymology.
CO4	assessthe biochemical nature of nucleic acids, their role in living systems.
CO5	make use of different techniques related to biochemistry.

COURSE OUTCOME

Allied Course	
Course Code:GLBP4A	Course Title: MICROBIOLOGY AND BIOTECHNOLOGY
On successful completion of the course, the learners should be able to	
CO1	examine the contribution of microbiologists, general characteristics of microbes and their multiplication.
CO2	analyze the involvement of microbes in agriculture.
CO3	evaluate the role of microorganisms in industry.
CO4	discuss about genetic engineering and their applications.
CO5	explain the concepts and applications of plant tissue culture.

COURSE OUTCOME

Allied Course	
Course Code:GLBP4AL	Course Title:- ALLIED PRACTICAL
On successful completion of the course, the learners should be able to	
CO1	demonstrate bacterial inoculation techniques.
CO2	summarize the characterization of bacteria and their multiplication.
CO3	detect and evaluate the biomolecules using analytical techniques.
CO4	discover the ways to regenerate plantlets through tissue culture.
CO5	make use of various equipments to achieve sterilization techniques.

COURSE OUTCOME

Non Major Elective I (Open Option)	
Course Code:GLBP3N	Course Title:FRESHWATER AQUACULTURE
On successful completion of the course, the learners should be able to	
CO1	categorize the various types of freshwater aquaculture, cultivable species of carps and culture practices.
CO2	construct and prepare fish culture ponds.
CO3	outline nutrient management and to summarize predators, weeds and common diseases which occur in fish culture practices.
CO4	manage soil and water quality parameters.
CO5	adapt fishing crafts to harvest and evolve methodology to preserve the fishes by realizing the scope and need for aquaculture practices.

COURSE OUTCOME

Non Major Elective II (Open Option)	
Course Code:GLBP4N	Course Title:SERICULTURE
On successful completion of the course, the learners should be able to	
CO1	outline the races and biology of silkworm and to list the causes and symptoms of diseases in silkworm.
CO2	illustrate the basic design of the rearing house and to disinfect the rearing room and appliances.
CO3	demonstrate the feeding frequency of silkworm and to evaluate the optimum environmental conditions for rearing and spinning.
CO4	elaborate the strategies pertaining to harvest, sort, store, preserve, reel and market the cocoons and to relate world silk production and Central Silk Board.
CO5	demonstrate mulberry cultivation and to relate causes and symptoms of diseases in mulberry plants.

COURSE OUTCOME

Discipline Specific Course	
Course Code:GLBP4DS	Course Title:FOOD PROCESSING TECHNOLOGY
On successful completion of the course, the learners should be able to	
CO1	explain the processing of cereals and pulses.
CO2	list out the advantages and disadvantages of food processing techniques.
CO3	analyse the steps involved in vegetable and fruit processing.
CO4	discuss the stages of meat, fish and poultry processing.
CO5	list out the significance of defeathering and deheading in poultry and fish processing.

COURSE OUTCOME

MajorCourse	
Course Code:GLBP51	Course Title:TAXONOMY OF ANGIOSPERMS
On successful completion of the course, the learners should be able to	
CO1	explain the morphology of a plant in technical terms.
CO2	analyse the importance of herbarium, binomial nomenclature and rules and recommendations of ICBN.
CO3	identify the basis of systems of classification with its merits and demerits.
CO4	conclude the characters and economic importance of different angiospermic families.
CO5	compare the vegetative and floral characters of angiospermic families.

COURSE OUTCOME

Major Course	
Course Code:GLBP5L	Course Title: PRACTICAL III
On successful completion of the course, the learners should be able to	
CO1	conclude the morphological features of a plant in technical terms.
CO2	identify the plants and prepare herbarium.
CO3	demonstrate the various plant propagation techniques.
CO4	create bouquet and arrange flowers in different patterns.
CO5	examine the beauty of nature.

COURSE OUTCOME

Major Course	
Course Code:GLBP61	Course Title:PLANT PHYSIOLOGY
On successful completion of the course, the learners should be able to	
CO1	Summarize the water relation in plants with respect to various physiological process.
CO2	explain the various physiological processes in plants.
CO3	determine the physical and biological nitrogen fixation in plants.
CO4	analyze the growth of plants, role of mineral elements and effects of plant growth regulators.
CO5	discuss about photoperiodism, vernalization and phytochromes in flowering plants.

COURSE OUTCOME

Major Course	
Course Code:GLBP62	Course Title:BIOTECHNOLOGY
On successful completion of the course, the learners should be able to	
CO1	analyze the role of enzymes and vectors in gene manipulation techniques.
CO2	illustrate the aspects of DNA cloning strategies and its applications.
CO3	discuss the role of microbes in biomining and in the production of vaccines and toxoids.
CO4	examine the fermentation tools and techniques involved in the production of commercially valuable products.
CO5	explain the mass production and applications of single cell protein, biofertilizers and microbial pesticide.

COURSE OUTCOME

Major Course	
Course Code:GLBP6L2	Course Title:- PRACTICAL V
On successful completion of the course, the learners should be able to	
CO1	analyse the nature of vegetation by quadrat method.
CO2	explain the anatomy of various groups of plants.
CO3	demonstrate the preparation, sterilization and culturing of microbes.
CO4	classify the group of microorganisms based on staining.
CO5	inspect the role of plants in economy.

COURSE OUTCOME

Major Elective Course	
Course Code:GLBP5E1	Course Title:MICROBIOLOGY AND PLANT PATHOLOGY
On successful completion of the course, the learners should be able to	
CO1	recall the contribution of microbiologists.
CO2	examine the characteristics and multiplication of microbes.
CO3	acquire the knowledge of bacterial inoculation techniques.
CO4	identify plant diseases and their remediation.
CO5	analyze the microbiology of waste water and its implications.

COURSE OUTCOME

Major Elective Course	
Course Code:GLBP5E2	Course Title:HORTICULTURE
On successful completion of the course, the learners should be able to	
CO1	analyse the importance of horticulture, its tools and divisions.
CO2	explain various methods of propagation and techniques practiced in horticulture.
CO3	plan various types of garden.
CO4	summarize the role of fruit and flowers in economy.
CO5	discuss the importance of irrigation and manure.

COURSE OUTCOME

Major Elective Course	
Course Code: GLBP5E3	Course Title: NATURAL RESOURCES
On successful completion of the course, the learners should be able to	
CO1	summarize the social forestry and forest protection.
CO2	analyze about the conventional and non conventional energy resources.
CO3	explain the biomass and bioconversion technology.
CO4	elaborate the usage and over utilization of water resources.
CO5	the uses, exploitation and conservation of mineral resources.

COURSE OUTCOME

Major Elective Course	
Course Code: GLBP5E4	Course Title: HERBAL MEDICINE
On successful completion of the course, the learners should be able to	
CO1	list out the medicinal plants and their cultivation process, active principles and mode of usage.
CO2	evaluate the uses of drugs obtained from roots.
CO3	examine the usage of drugs obtained from the stem and bark.
CO4	discuss about the drugs obtained from leaves.
CO5	summarize the drugs obtained from the flowers, fruits and seed.

COURSE OUTCOME

Major Elective Course	
Course Code:GLBP6E1	Course Title: ECOLOGY AND BIODIVERSITY
On successful completion of the course, the learners should be able to	
CO1	explain the basics of ecology and ecosystem.
CO2	analyse different groups of plants and their adaptations.
CO3	discuss about major environmental pollutions.
CO4	inspect the cycling of minerals and water.
CO5	summarize biodiversity and its conservation.

COURSE OUTCOME

Major Elective Course	
Course Code:GLBP6E2	Course Title:ECONOMIC BOTANY
On successful completion of the course, the learners should be able to	
CO1	list out the economic produces with special reference to botanical name, family, morphology of the useful part and uses.
CO2	discuss the commercial uses of pulses and cereals.
CO3	analyse the core concepts of economic botany.
CO4	identify the binomials and uses of fruits and nuts.
CO5	distinguish the morphology of the useful part in the production resin, gum and tannin.

COURSE OUTCOME

Self Employment Course	
Course Code:GLSE68	Course Title:HERBAL COSMETICS
On successful completion of the course, the learners should be able to	
CO1	summarize the knowledge on herbal cosmetics.
CO2	relate the importance of skin and hair maintenance.
CO3	apply the techniques of preservation and marketing of herbal products.
CO4	analyse the effects of natural and synthetic cosmetics.
CO5	make use of herbs for common ailments.

COURSE OUTCOME

Self Employment Course	
Course Code:GLSE68L	Course Title:HERBAL COSMETICS LAB
On successful completion of the course, the learners should be able to	
CO1	recall the basic knowledge on natural products.
CO2	recognize the basic medicinal herbs with scientific knowledge.
CO3	discuss the effects of synthetic cosmetics.
CO4	modify and preserve herbal cosmetics on their own.
CO5	inspect the ways to market their own herbal products.





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DEPARTMENT OF BOTANY

PG DEGREE PROGRAMME IN BOTANY WITH SPECIALIZATION IN PLANT

BIOTECHNOLOGY

PROGRAMME EDUCATIONAL OBJECTIVES

The Graduates will

PEO1.	exhibit a mastery of skills and knowledge with ethics at a level required for plant based industry or to be an eminent research scholar.
PEO2.	pursue research of significance in Botany or an interdisciplinary or creative project to solve the problems in thrust areas.
PEO3.	enhance the productivity of several economically important products/botanicals and thereby become a successful entrepreneur
PEO4.	imbibe moral, ethical and professional values to preserve nature for a better and respectable life in the society.

PROGRAMME SPECIFIC OUTCOMES

By the Completion of M.Sc. Botany with specialization in Plant Biotechnology programme, the learners will be able to

PSO1.	demonstrate a systematic, extensive and coherent knowledge of plant sciences and its application with the use of established theories, principles and concepts of Botany.
PSO2.	apply their botanical knowledge and transferable skills to identify and analyze issues related to new/unfamiliar contexts and to solve it with well-defined solutions.
PSO3.	be competent on data collection and process of scientific documentation in areas related to specializations and current updates in the field of Botany.
PSO4.	make use of appropriate techniques, skills and modern ICT tools necessary to decipher knowledge related to life sciences.
PSO5.	demonstrate leadership and team workmanship in order to serve efficiently in institution, industry and society.
PSO6.	defend the environmental and professional issues with moral ethics.
PSO7.	involve in life-long learning and to adapt to the technological advancements in the emerging areas of Botany.

COURSE OUTCOME

Core Course	
Course Code: HLBP11	Course Title: PLANT DIVERSITY
On successful completion of the course, the learners should be able to	
CO1	recall the occurrence and structure of cryptogams and Gymnosperms.
CO2	analyse the classification and lifecycle pattern of different groups of plants.
CO3	explain the economic importance of different groups of plants.
CO4	relate the evolution of sporophyte in Pteridophytes.
CO5	identify the existence of life on earth in various eras.

COURSE OUTCOME

Core Course	
Course Code: HLBP12	Course Title: INHERITANCE BIOLOGY
On successful completion of the course, the learners should be able to	
CO1	relate the knowledge on laws of inheritance, genetic basis of loci and alleles.
CO2	compute the various steps in protein synthesis and protein modification.
CO3	analyze the chromosome structure and genome organization.
CO4	discuss the effect of linkage and crossing over.
CO5	interpret non-allelic genic interactions and population genetics.

COURSE OUTCOME

Core Course	
Course Code: HLBP13	Course Title: TAXONOMY OF ANGIOSPERMS
On successful completion of the course, the learners should be able to	
CO1	analyze different systems of classification and its historical account with its merits and demerits.
CO2	summarize the rules and recommendations of ICN, role of BSI and herbarium.
CO3	explain the use of digital resources in plant taxonomy.
CO4	demonstrate the key characters and economic importance of angiospermic families.
CO5	compare the vegetative and floral characters within and between angiospermic families.

COURSE OUTCOME

Core Course	
Course Code:HLBP1L	Course Title: PRACTICAL I
On successful completion of the course, the learners should be able to	
CO1	illustrate the preparation of whole mount and sectioning of plant materials.
CO2	analyze genetic problems.
CO3	determine the role of several genes in inheritance.
CO4	identify the family of an angiospermic plant with its taxonomical description.
CO5	construct taxonomic keys and make use of herbarium.

COURSE OUTCOME

Elective Course	
Course Code:HLBP1E1	Course Title:BIOINSTRUMENTATION
On successful completion of the course, the learners should be able to	
CO1	recall the principles and applications of microscopy.
CO2	demonstrate the preparation of gel and detection of nucleic acid by electrophoresis.
CO3	classify the various types of chromatographic techniques and its applications.
CO4	analyse the working principle and applications of colorimetry, spectrophotometer, flame photometer and NMR.
CO5	explain the stages involved in the preparation of permanent slides.

COURSE OUTCOME

Elective Course	
Course Code:HLBP1E2	Course Title:HERBAL MEDICINE
On successful completion of the course, the learners should be able to	
CO1	illustrate the basic principles and history of medicinal practices.
CO2	discuss the ways to cultivate herbs by different methods.
CO3	conclude the collection, processing and storage of herbal drugs.
CO4	justify the importance of major herbs in day today life.
CO5	identify the adulteration of drug and its evaluation through various testing methods.

COURSE OUTCOME

Core Course	
Course Code:HLBP21	Course Title:PLANT ANATOMY AND EMBRYOLOGY
On successful completion of the course, the learners should be able to	
CO1	summarize about meristematic, epidermal and ground tissue systems.
CO2	explain the origin, types, structure and functions of vascular tissue system.
CO3	elaboratesporogenesis on the basis of their structure and development.
CO4	analyze the process of fertilization and sexual incompatibility.
CO5	discuss endosperm, polyembryony, embryo development, apomixis and parthenocarpy in plants.

COURSE OUTCOME

Core Course	
Course Code:HLBP22	Course Title:BIOCHEMISTRY
On successful completion of the course, the learners should be able to	
CO1	discuss the classification, properties and metabolism of carbohydrates.
CO2	elaborate the classification, structure, biosynthesis and properties of amino acids and lipids.
CO3	explain the classification, structure and properties of proteins and vitamins.
CO4	illustrate the classification, principle and mechanism of enzyme action.
CO5	analyze the structure, types, composition and biosynthesis of nucleic acids.

COURSE OUTCOME

Core Course	
Course Code:HLBP23	Course Title:MICROBIOLOGY
On successful completion of the course, the learners should be able to	
CO1	identify the characters and methods of classification of microbes.
CO2	explain the structure and multiplication of bacteria and viruses.
CO3	analyze the impact of microflora in soil, air and water.
CO4	elaborate the symptoms, transmission, diagnosis and control of microbial diseases caused to human beings.
CO5	assess the cellular and molecular basis of immune responsiveness and the ways to detect it.

COURSE OUTCOME

Core Course	
Course Code:HLBP2L	Course Title: PRACTICAL II
On successful completion of the course, the learners should be able to	
CO1	make use of maceration technique to isolate and identify cells.
CO2	identify the anomalous secondary growth and bark anatomy of plants.
CO3	examine pollen germination, embryo development and endosperm .
CO4	estimate the biomolecules qualitatively and quantitatively.
CO5	experiment the preparation of media, staining, Isolation and identification of

COURSE OUTCOME

Elective Course	
Course Code:HLBP2E	Course Title: FOOD PRESERVATION
On successful completion of the course, the learners should be able to	
CO1	outline the basic methods and techniques of food preservation.
CO2	illustrate the protocol for fruit juices and beverages.
CO3	make use of various preparation and preservation techniques.
CO4	assess the use of food additives and sweeteners.
CO5	analyze food adulteration and various forms of food packaging materials.

COURSE OUTCOME

Core Course	
Course Code:HLBP31	Course Title:CELL AND MOLECULAR BIOLOGY
On successful completion of the course, the learners should be able to	
CO1	recall the structure and functions of cell and cell cycle.
CO2	explain about the structure and functions of cell organelles.
CO3	examine the different types of genome organization and gene expression.
CO4	elaborate the steps involved in DNA cloning and DNA sequencing.
CO5	discuss the process, types and applications of PCR and its allied techniques.

COURSE OUTCOME

Core Course	
Course Code:HLBP32	Course Title: ENVIRONMENTAL MICROBIOLOGY
On successful completion of the course, the learners should be able to	
CO1	relate the microbial interaction and plant- microbe interactions.
CO2	illustratethe microbiology of air, soil and role of microbes in nutrient cycling.
CO3	analyze microbial adaptations and associations in extreme environment.
CO4	explain the various bioremediation technology.
CO5	discuss the ways to solve the problems posed by solid and liquid waste.

COURSE OUTCOME

Core Course	
Course Code:HLBP33	Course Title:PLANT PHYSIOLOGY
On successful completion of the course, the learners should be able to	
CO1	demonstrate the absorption of water in land plants.
CO2	explain the physiological process such as photosynthesis, respiration, photorespiration and circadian rhythm.
CO3	explain the metabolism of lipid and nitrogen.
CO4	analyze about plant growth regulators and seed dormancy.
CO5	discuss about the various physiological mechanisms that protect the plants from environmental stress.

COURSE OUTCOME

Core Course	
Course Code: HLBP3L	Course Title: PRACTICAL III
On successful completion of the course, the learners should be able to	
CO1	demonstrate skill in squash and smear techniques.
CO2	make use of a protocol for the isolation of DNA and RNA.
CO3	analyse the quantification of primary and secondary metabolites.
CO4	evaluate the potability of water under different environmental conditions.
CO5	estimate various nutrients in soil.

COURSE OUTCOME

Elective Course	
Course Code: HLBP3E1	Course Title: CSIR UGC-NET PREPARATORY COURSE - LIFE SCIENCES
On successful completion of the course, the learners should be able to	
CO1	explain the basic principle of biochemistry and molecular biology.
CO2	analyse insights of cell functions and embryo development.
CO3	assess the importance of plant and animal physiology.
CO4	compose the genetic variations and outline the hierarchy of diversity forms.
CO5	apply and utilize the advanced techniques in the biomedical field.

COURSE OUTCOME

Elective Course	
Course Code:HLBP3E2	Course Title: ENERGY RESOURCES
On successful completion of the course, the learners should be able to	
CO1	list out the energy requirement in relation to population and industrial growth.
CO2	summarize the source and applications of non conventional energy resources.
CO3	make use of solar energy and solar gadgets for thermal conversion.
CO4	classify the basic components of wind energy generating system and management of wind forms.
CO5	analyze the production and use of bioenergy.

COURSE OUTCOME

Core Course	
Course Code:HLBP41	Course Title:PLANT ECOLOGY
On successful completion of the course, the learners should be able to	
CO1	outline the basics of ecology, concept of ecosystem and ecological succession.
CO2	analyze the biodiversity and methods of studying plant community.
CO3	discuss about environmental pollution and disaster management.
CO4	summarize about phytogeography.
CO5	explain environmental impact assessment and role of GOs and NGOs in its management.

COURSE OUTCOME

Core Course	
Course Code:HLBP42	Course Title:APPLIED BIOTECHNOLOGY
On successful completion of the course, the learners should be able to	
CO1	recall the core concepts and fundamentals of plant Biotechnology, biological nitrogen fixation and genetic engineering.
CO2	develop their ability to raise plantlets on different types of plant tissue culture.
CO3	list the different types of biofertilizers based on their mass cultivation and its importance.
CO4	compare the various types of fermentation and produce the various industrial products.
CO5	compile fundamental knowledge on bioinformatics and problems and its solution in

COURSE OUTCOME

Core Course	
Course Code:HLBP4L	Course Title: PRACTICAL IV
On successful completion of the course, the learners should be able to	
CO1	analyze the nature of vegetation.
CO2	examine the primary productivity.
CO3	evaluate the role of biofertilizers on plant growth.
CO4	demonstrate various tissue culture techniques.
CO5	compare the protein and nucleotide sequence in different plants.

COURSE OUTCOME

Elective Course	
Course Code:HLBP4E1	Course Title:BIOPHYSICS AND BIOSTATISTICS
On successful completion of the course, the learners should be able to	
CO1	Summarize bioenergetics, photobiology and concepts of biostatistics.
CO2	determine the measures of central tendency and measures of dispersion.
CO3	analyze about correlation and regression.
CO4	relate the knowledge on probability and theoretical distribution.
CO5	formulate hypothesis and test the significance with interpretation.

COURSE OUTCOME

Elective Course	
Course Code:HLBP4E2	Course Title: MICROBIAL GENETICS
On successful completion of the course, the learners should be able to	
CO1	recall the effect of mutation on gene function.
CO2	analyse about genetic recombination in T4 phage.
CO3	distinguish DNA and RNA virus genomes and its role in molecular genetics.
CO4	explain the chromosomal and extra chromosomal inheritance in yeast.
CO5	demonstrate the genetics of bacteria and bacteria phages.

COURSE OUTCOME

Core Course	
Course Code:HLBP4P	Course Title:PROJECT AND VIVA VOCE
On successful completion of the course, the learners should be able to	
CO1	develop laboratory skills and master in advanced techniques.
CO2	make use of advanced tools in analyzing data.
CO3	summarize the concept of research with ethics.
CO4	defend their research professionally.
CO5	justify valuable solutions to the betterment of society.

