

Holy Cross College (Autonomous), Nagercoil
Kanyakumari District, Tamil Nadu.
Accredited with A⁺ by NAAC - IV cycle – CGPA 3.35

Affiliated to

Manonmaniam Sundaranar University, Tirunelveli



Semester I – IV

POs, PSOs & COs

DEPARTMENT OF BOTANY



2023-2026

(With effect from the academic year 2024-2025)

Programme Outcomes (POs)

POs	Upon completion of M.Sc. Botany Programme, the graduates will be able to:	Mapping with PEOs
PO1	apply their knowledge, analyze complex problems, think independently, formulate and perform quality research.	PEO1 & PEO2
PO2	carry out internship programmes and research projects to develop scientific and innovative ideas through effective communication.	PEO1, PEO2 & PEO3
PO3	develop a multidisciplinary perspective and contribute to the knowledge capital of the globe.	PEO2
PO4	develop innovative initiatives to sustain ecofriendly environment	PEO1, PEO2
PO5	through active career, team work and using managerial skills guide people to the right destination in a smooth and efficient way.	PEO2
PO6	employ appropriate analysis tools and ICT in a range of learning scenarios, demonstrating the capacity to find, assess, and apply relevant information sources.	PEO1, PEO2 & PEO3
PO7	learn independently for lifelong executing professional, social and ethical responsibilities leading to sustainable development.	PEO3

PROGRAMME SPECIFIC OUTCOMES (PSOs)

Program Specific Outcomes (PSO)	
On successful completion of the M.Sc. Botany programme, the students are expected to	
PSO1	familiarize with the fundamental, advanced and emerging concepts in Botany.
PSO2	understand the role of plants and their interactions with other organisms in various ecosystems.
PSO3	identify the potency of plant resources in contemporary research and visualize future thrust areas in Botany.

PSO4	design scientific experiments independently and to generate useful information to address various issues in Botany.
PSO5	acquire basic knowledge on principles and applications of laboratory instruments and adequate skills to handle them.
PSO6	choose and apply appropriate tools, techniques, resources, etc. to perform various experiments in Botany.
PSO7	carry out scientific experiments independently or in collaboration with interdisciplinary or multidisciplinary approaches.
PSO8	disseminate knowledge on conservation of biodiversity and protection of environment.
PSO9	awareness on the sustainable utilization of plant/microbial resources following the bioethical norms.
PSO10	demonstrate proficiency in communicating with various stakeholders like students, teachers, scientists and society.

COURSE OUTCOMES

SEMESTER – I

CORE COURSE I : PLANT DIVERSITY – I: ALGAE, FUNGI, LICHENS AND BRYOPHYTES

Course Code: BP231CC1

On the successful completion of the course, student will be able to:		
1	relate to the structural organizations of algae, fungi, lichens and bryophytes	K1
2	demonstrate both the theoretical and practical knowledge in understanding the diversity of basic life forms and their importance.	K2
3	explain life cycle patterns in algae, fungi, lichens and bryophytes	K3
4	compare and contrast the mode of reproduction in diverse groups of basic plant forms.	K4
5	discuss and develop skills for effective conservation and utilization of lower plant forms.	K5& K6

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER I

**CORE COURSE II: PLANT DIVERSITY – II: PTERIDOPHYTES,
GYMNOSPERMS AND PALEOBOTANY**

Course Code: BP231CC2

On the successful completion of the course, student will be able to:		
CO1	recall classification, recent trends in phylogenetic relationship, general characters of Pteridophytes and Gymnosperms.	K1 & K2
CO2	learn the morphological/anatomical organization, life history of major types of Pteridophytes and Gymnosperms.	K2 & K4
CO3	comprehend the economic importance of Pteridophytes, Gymnosperms and fossils.	K3 & K5
CO4	understanding the evolutionary relationship of Pteridophytes and Gymnosperms.	K4 & K6
CO5	awareness on fossil types, fossilization and fossil records of Pteridophytes and Gymnosperms.	K5 & K6

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER I

**CORE LABORATORY COURSE–I:
COVERING CORE PAPERS- I AND II**

Course Code: BP231CP1

On the successful completion of the course, student will be able to:		
CO1	recall and applying the basic keys to distinguish at species level identification of important algae and fungi through its structural organizations.	K1&K4
CO2	demonstrate practical skills in thallophytes, Pteridophytes and Gymnosperms.	K2
CO3	describe the structure of algae, fungi, lichens, Bryophytes, Pteridophytes and Gymnosperms.	K3
CO4	determine the importance of structural diversity in the evolution of plant forms.	K5
CO5	formulate techniques to isolate and culture of alga and fungi as well as to understand the diversity of plant forms.	K5&K6

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER I
ELECTIVE COURSE I a)- MICROBIOLOGY, IMMUNOLOGY AND
PLANT PATHOLOGY
Course Code: BP231EC1

On the successful completion of the course, student will be able to:		
CO1	recognize the general characteristics of microbes, plant defense and immune cells.	K1
CO2	explain about the stages in disease development and various defense mechanisms in plants and humans.	K2
CO3	elucidate concepts of microbial interactions with plant and humans	K3
CO4	analyze the importance of harmful and beneficial microbes and immune system	K4
CO5	determine and interpret the detection of pathogens and appreciate their adaptive strategies.	K5 & K6

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER I
ELECTIVE COURSE-I(b) CONSERVATION OF NATURAL RESOURCES
AND POLICIES
Course Code: BP231EC2

On the successful completion of the course, student will be able to:		
CO1	understand the concept of different natural resources and their utilization.	K1
CO2	critically analyze the sustainable utilization land, water, forest and energy resources	K2 & K6
CO3	evaluate the management strategies of different natural Resources	K3
CO4	reflect upon the different national and international efforts in resource management and their conservation.	K4
CO5	state the various environmental policy passed to conserve the natural resources.	K5

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER I

ELECTIVE COURSE-I c) MUSHROOM CULTIVATION

Course Code: BP231EC3

On completion of this course the student will be able to		
CO 1	knowledge on identification of edible and toxic mushrooms belonging to ascomycota and basidiomycota.	K1, K3
CO2	outline the nutraceutical properties of edible mushrooms.	K2, K4
CO3	knowledge on cultivation techniques of edible and medicinal mushrooms.	K3, K6
CO4	understand the harvest and post-harvest techniques of mushroom crops.	K4
CO5	knowledge on the production and marketing strategies for mushrooms.	K5

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER I

ELECTIVE COURSE II: a) ETHNOBOTANY, NATUROPATHY AND TRADITIONAL HEALTH CARE

Course Code: BP231EC4

On the successful completion of the course, student will be able to:		
CO1	recall or remember concept of ethnobotany.	K1
CO 2	understand the life style and traditional practices of plants by Indian tribals.	K2& K6
CO3	highlight the role of Non-Timber Forest products for livelihood of tribal people of India	K3
CO 4	assess the methods to transform ethnobotanical knowledge into value added products	K4
CO 5	build idea to make digitization of ethnobotanical knowledge.	K5

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER I
ELECTIVE COURSE-II b) ALGAL TECHNOLOGY

Course Code: BP231EC5

On completion of this course, the students will be able to:		
CO1	understand the applied facet of botany and acquire a complete knowledge about the cultivation methods in algae.	K1& K3
CO2	realization of the commercial potential of algal products.	K5
CO3	analyze emerging areas of algal biotechnology for identifying therapeutic importance of algal products and their uses.	K2 & K4
CO4	gain more information about algae genetics.	K4
CO5	translate various algal technologies for the benefit of the ecosystem.	K3 & K6

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER I
ELECTIVE COURSE -II c) HERBAL TECHNOLOGY

Course Code: BP231EC6

On completion of this course, the students will be able to:		
CO1	recollect the importance of herbal technology.	K1
CO2	understand the classification of crude drugs from various botanical sources.	K2
CO3	analyze on the application of secondary metabolites in modern medicine.	K3
CO4	create new drug formulations using therapeutically valuable phytochemical compounds for the healthy life of society.	K4
CO5	comprehend the current trade status and role of medicinal plants in socio economic growth.	K5 & K6

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER I

SPECIFIC VALUE ADDED COURSE

NATURAL RESOURCES AND THEIR CONSERVATION

Course Code: BP231V01

On completion of this course the student will be able to		
CO1	explain the natural resources	K1
CO2	recognize the critical role natural resources play in supporting life and ecosystems.	K2
CO3	distinguish between various natural resource categories, including energy resources, and biological resources	K3
CO4	analyze the consequences of the over-exploitation of non renewable resources.	K4
CO5	evaluate the impacts of climate change on natural resources and ecosystems	K5

K1-Remember; **K2**-Understand; **K3**-Apply; **K4** – Analyze; **K6**- Create

SEMESTER I

SPECIFIC VALUE ADDED COURSE

BIOFERTILIZERS

Course Code: BP231V02

On completion of this course the student will be able to:		
1	explain the importance and role of biofertilizers in sustainable agriculture.	K1
2	identify different types of biofertilizers, such as nitrogen-fixing, phosphate-solubilizing, and potassium-mobilizing biofertilizers.	K2
3	understand the formulation and application methods of biofertilizers for different crops and soil types.	K3
4	demonstrate skills in the proper application, storage, and management of biofertilizers.	K4
5	evaluate the economic implications of adopting biofertilizers in agricultural systems	K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** – Evaluate

SEMESTER – II
CORE COURSE III: TAXONOMY OF ANGIOSPERMS AND ECONOMIC
BOTANY

Course Code: BP232CC1

On completion of this course, the students will be able to:		
1	recollect the basic concepts of morphology of leaves, flowers. identify the types of compound leaves, inflorescence and fruits describe their characteristic features	K1, K2 K3
2	explain the principles of taxonomy. summarize the taxonomic hierarchy. define binomial nomenclature. group activity – construct key preparation	K1, K2 K5, K6
3	explain the various types of classification. distinguish its advantages and disadvantages construction of floral formula and floral diagram.	K1, K2 K3, K4
4	illustrate and explain the characteristic features and list out the economic importance of the families field trip to local botanical garden and regional botanical garden.	K1, K2 K3, K4
5	illustrate and explain the characteristic features and list out the economic importance of the families.	K1, K2 K3, K5

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER I
ELECTIVE COURSE -II c) HERBAL TECHNOLOGY
Course Code: BP231EC6

On completion of this course, the students will be able to:		
CO1	recollect the importance of herbal technology.	K1
CO2	understand the classification of crude drugs from various botanical sources.	K2
CO3	analyze on the application of secondary metabolites in modern medicine.	K3
CO4	create new drug formulations using therapeutically valuable phytochemical compounds for the healthy life of society.	K4
CO5	comprehend the current trade status and role of medicinal plants in socio economic growth.	K5 & K6

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6– Create

SEMESTER – II

**CORE COURSE IV: PLANT ANATOMY AND EMBRYOLOGY OF
ANGIOSPERMS**

Course Code: BP232CC2

On completion of this course, the students will be able to:		
CO1	learn the structures, functions and roles of apical vs lateral meristems in monocot and dicot plant growth.	K1& K2
CO2	study the function and organization of woody stems derived from secondary growth in dicot and monocot plants.	K1&K4
CO3	apply their idea on sectioning and dissection of plants to demonstrate various stages of plant development.	K2& K6
CO4	understand the various concepts of plant development and reproduction.	K3& K6
CO5	profitably manipulate the process of reproduction in plants with a professional and entrepreneurial mindset.	K5

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER – II

**CORE COURSE V: ECOLOGY, PHYTOGEOGRAPHY, CONSERVATION
BIOLOGY & INTELLECTUAL PROPERTY RIGHTS**

Course Code: BP232CC3

On completion of this course, the students will be able to:		
CO1	understand the scope and importance of population ecology, plant communities and ecosystem ecology.	K1 & K2
CO2	understand the applied aspect of environmental botany.	K1 & K4
CO3	spot the sources and pollution and seek remedies to mitigate and rectify them.	K2 & K6
CO4	identify different plant communities, categorize plant biomes and identify threatened, endangered plant species and create awareness program in protection	K3 & K6

	of biodiversity.	
CO5	analyze insight into the vegetation types, species interaction and their importance and the factors influencing the environmental conditions.	K5

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER – II

CORE LAB COURSE-II: Core Course (III, IV & V)

Course Code: BP232CP1

On completion of this course, the students will be able to:		
CO1	to gain recent advances in plant morphological and floral characteristics.	K1
CO2	understand about different floral characteristics and artificial key preparation which employed for plant identification and conservation.	K2
CO3	recall or remember the information including basic and advanced in relation with plant anatomy and embryology.	K4 & K5
CO4	apply their idea on sectioning and dissection of plants to demonstrate various stages of plant development.	K3
CO5	know about different vegetation sampling methods.	K3

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER – II

ELECTIVE COURSE III: a) BIOSTATISTICS

Course Code: BP232EC1

On completion of this course, the students will be able to:		
CO1	create and interpret visual representations of quantitative information, such as graphs or charts.	K5 & K6
CO2	solve problems quantitatively using appropriate arithmetical, algebraic, or statistical methods	K3 & K5

CO3	know the latest version using in statistical tools and apply the tools to interpret the results	K2
CO4	develop their competence in hypothesis testing and interpretation.	K4
CO5	understand why biologists need a background in statistics.	K1

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER – II

ELECTIVE COURSE III: b) INTELLECTUAL PROPERTY RIGHTS

Course Code: BP232EC2

On completion of this course, the students will be able to:		
CO1	recall the history and foundation of Intellectual Property.	K1
CO2	understand the differences of Property and Assets and Various categories of Intellectual Creativity.	K2
CO3	apply the methods to protect the Intellectual Property.	K3
CO4	differentiate if the Said Intangible property be protected under law or protected by strategy.	K4
CO5	create a recommendation document on the methods and procedures of protecting the said IP and search documents to substantiate them.	K5 & K6

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER – II

ELECTIVE COURSE III: c) - APPLIED BIOINFORMATICS

Course Code: BP232EC2

On completion of this course, the students will be able to:		
CO1	familiarize with the tools of DNA sequence analysis.	K1 & K2
CO2	use and explain the application of bioinformatics.	K2 & K3
CO3	master the aspects of protein-protein interaction, BLAST and PSI-BLAST.	K3 & K4
CO4	describe the features of local and multiple alignments.	K3 & K4
CO5	interpret the characteristics of phylogenetic methods and bioinformatics applications.	K4 & K5

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER – II

ELECTIVE COURSE IV: a)- RESEARCH METHODOLOGY, COMPUTER APPLICATIONS & BIOINFORMATICS

Course Code: BP232EC4

On completion of this course, the students will be able to:		
CO1	realize the need of centrifuges and chromatography and their uses in research	K1 & K2
CO2	learn the principles and applications of electrophoresis	K2 & K3
CO3	construct the phylogenetic trees for similar characteristic feature of plant genomes and study <i>de novo</i> drug design through synthetic biology.	K5 & K6
CO4	understand the concept of pairwise alignment of DNA sequences using algorithms.	K3 & K4
CO5	interpret the features of local and multiple alignments.	K4 & K5

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER – II

ELECTIVE COURSE IV: b)- MEDICINAL BOTANY

Course Code: BP232EC5

On completion of this course, the students will be able to:		
CO1	recognize plants and relate to their medicinal uses	K1
CO2	explain about the phytochemistry, pharmacognosy and bioprospecting of medicinal plant extracts.	K2
CO3	apply techniques for conservation and propagation of medicinal plants.	K3
CO4	analyze and decipher the significance of various methods of harvesting, drying and storage of medicinal herbs.	K4
CO5	develop new strategies to enhance growth and quality check of medicinal herbs considering the practical issues pertinent to India.	K5 & K6

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER – II
ELECTIVE COURSE IV: c) PHYTOCHEMISTRY

Course Code: BP232EC6

On completion of this course, the students will be able to:		
CO1	understand the role of plants in the survival of human beings and other organisms.	K1
CO2	recognition of the contribution made by primitive people in exploration of plant knowledge to alleviate common diseases and development of systems of medicine.	K2
CO3	gaining knowledge on different classes of phytochemicals present in higher and lower plants species.	K3
CO4	demonstrate the various aspects of extraction, isolation and characterization of secondary metabolites.	K4 & K5
CO5	know the methods of screening of secondary metabolites for various biological properties.	K6

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER II
SKILL ENHANCEMENT COURSE
NURSERY AND GARDENING

Course Code: BP232SE1

On completion of this course, the students will be able to:		
1	recognize the basic process required for growing and maintaining plants in nurseries.	K1
2	explain the different methods of plant propagation and various gardening styles.	K2
3	apply techniques for effective hardening of plants and computer	K3 & K6

	applications for creative gardening.	
4	compare and contrast cultivation of different vegetables and growth of plants in nursery and gardening.	K4
5	develop new strategies to enhance growth and quality of nursery plants.	K5 & K6

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER I & II

LIFE SKILL TRAINING – I ETHICS

Course Code: PG23LST1

On completion of this course the student will be able to		
CO1	understand deeper insight of the meaning of their existence.	K1
CO2	recognize the philosophy of life and individual qualities	K2
CO3	acquire the skills required for a successful personal and professional life.	K3
CO4	develop as socially responsible citizens.	K4
CO5	create a peaceful, communal community and embrace unity.	K3

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER III

CORE COURSE VII: CELL AND MOLECULAR BIOLOGY

Course Code: BP233CC1

On completion of this course, the students will be able to:		
1	recall a plant cell structure and explain its function.	K1
2	illustrate and explain the structure of various cell organelles.	K2
3	explain the structure and functional significance of nucleic acid.	K3
4	compare and contrast the DNA replication (prokaryotes and eukaryotes), enzymes involved in replication, DNA repair	K4
5	discuss and develop skills for DNA/gene manipulating and enzymes	K5 &

	involved.	K6
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K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER III

CORE COURSE III: GENETICS, PLANT BREEDING & BIOSTATISTICS

Course Code: BP233CC2

On the successful completion of the course, students will be able to:		
1.	understand the Mendal’s Law of inheritance and gene interactions	K1
2.	analyse the various factors determining the heredity from one generation to another.	K2
3.	explain Gene mapping methods: Linkage maps.	K3
4.	compare and contrast the genetic basis of breeding self and cross – pollinated crops.	K4
5.	discuss and develop skills for statistical analysis of biological problems	K5 & K6

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER III

CORE LAB COURSE III: CORE COURSE VI & VII

Course Code: BP233CP1

On completion of this course, the students will be able to:		
1.	recall or remember the various aspects of cell biology, genetics, molecular biology, plant breeding and tissue culture.	K1
2.	understand various concepts of cell biology, genetics, plant breeding and tissue culture.	K2
3.	apply the theory knowledge gained into practical mode in order to acquire applied knowledge by day-to-day hands-on experiences.	K3
4.	analyze or interpret the results achieved in practical session in the context of existing theory and knowledge.	K4
5.	evaluate the theory and practical skills gained during the course.	K5 & K6

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER III

ELECTIVE V: a) - ENTREPRENEURIAL OPPORTUNITIES IN BOTANY

Course Code: BP233EC1

On completion of this course, the students will be able to:		
1	students can acquire knowledge about organic farming and their advantages	K1
2	analyse both the theoretical and practical knowledge in understanding various horticultural techniques.	K2
3	to develop kitchen garden or terrace garden in their living area.	K3
4	evaluate the horticultural techniques to students can develop self-employment and economical improvement.	K4
5	create and develop skills for mushroom cultivation.	K5 & K6

K1-Remember; **K2**-Understand; **K3**-Apply; **K4** – Analyse; **K6**- Create

SEMESTER III

ELECTIVE COURSE V: b) SECONDARY PLANT PRODUCTS AND FERMENTATION BIOTECHNOLOGY

Course Code: BP233EC2

On the successful completion of the course, students will be able to:		
1.	critically analyze the types of bioreactors and the fermentation process.	K1
2.	evaluate the role of microorganisms in industry.	K2
3.	analyze the types of bioreactors.	K3
4.	create to understand the significance of intrinsic and extrinsic factors on growth of microorganism.	K4
5.	evaluate the concept of downstream processing.	K5 & K6

K1-Remember; **K2**-Understand; **K3**-Apply; **K4** – Analyse; **K6**- Create

SEMESTER III

ELECTIVE COURSE V: c) APPLIED PLANT CELL & TISSUE CULTURE

Course Code: BP233EC3

On the successful completion of the course, students will be able to:		
1.	recall the principles and culture techniques of cells, callus, organs, pollen, anthers, embryos and protoplasts.	K1
2.	understand the techniques used in plant growth and regeneration under <i>in vitro</i> conditions.	K2
3.	apply the role plant tissue culture techniques in the production some secondary metabolites and planting stock in horticulture.	K3
4.	analyze the conditions that are suitable for direct and indirect plant regeneration.	K4
5.	evaluate the self-skills obtained during the course thorough internal and external assessment systems.	K5
6.	create idea to seek for suitable job in relevant industries/research centers or to become a potential entrepreneur based on knowledge achieved during the course.	K6

K1-Remember; **K2**-Understand; **K3**-Apply; **K4** – Analyze; **K6**- Create

SEMESTER III

SKILL ENHANCEMENT COURSE II: AGRICULTURE AND FOOD MICROBIOLOGY

Course Code: BP233SE1

On the successful completion of the course, students will be able to:		
1.	recognize the general characteristics of microbes and factors affecting its growth	K1
2.	explain the significance of microbes in increasing soil fertility	K2
3.	elucidate concepts of microbial interactions with plant and food.	K3
4.	analyze the impact of harmful microbes in agriculture and food Industry.	K4
5.	determine and appreciate the role of microbes in food preservation and as	K5 &

biocontrol.	K6
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K1-Remember; K2-Understand; K3-Apply; K4 – Analyze; K6- Create

**SEMESTER III
SPECIFIC VALUE ADDED COURSE
WINE MAKING
Course Code: BP233V01**

On completion of this course the student will be able to:		
1	learn different fermentation vessels and the importance of temperature control during fermentation.	K1
2	understand the history and significance of wine making, including its cultural and economic impact.	K2
3	explore various crushing techniques and equipment used in wine making.	K3
4	develop wine tasting techniques to evaluate wine quality and characteristics.	K4
5	gain skills in evaluating wine quality, aroma, taste, and appearance, to make wine.	K5

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6– Create

**SEMESTER III
SPECIFIC VALUE ADDED COURSE
FOOD PRESERVATION
Course Code: BP233V02**

On completion of this course the student will be able to:		
1	understand the fundamental concepts and importance of food preservation.	K1
2	identify various methods and techniques used in preserving different types of foods.	K2
3	gain practical knowledge in preparing jams, jellies, marmalades, squashes, cordials, pickles, sauces.	K3
4	recognize the role and control of microorganisms in food preservation.	K4
5	apply preservation techniques to ensure food safety and extend the shelf life of food products.	K5

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6– Create

SEMESTER III

SELF LEARNING COURSE: PRINCIPLES OF PLANT SCIENCE

Course Code: BP233SL1

On completion of this course, the students will be able to:		
1.	Understand principles of plant sciences including plant biology, plant development, anatomy, physiology and plant genetics	K1
2.	demonstrate competency in the application of plant sciences including agronomic techniques and pest management	K2
3.	evaluate the various contributions of plant-based systems from local to global systems.	K3
4.	learn professional skills using experience based knowledge to develop a practical skill set	K4
5.	interpret and critically evaluate scientific information as it applies to the field of Plant Sciences	K5 & K6

K1 - Remember; **K2** - Understand; **K3** – Apply; **K4** - Analyse; **K5** - Evaluate; **K6** - Create

SEMESTER IV

CORE COURSE VIII: PLANT PHYSIOLOGY AND PLANT METABOLISM

Course Code: BP234CC1

On the successful completion of the course, students will be able to:		
1.	relate understand properties and importance of water in biological system, nutrients and its translocation.	K1
2.	demonstrate the importance of light in plant growth and the harvest of energy.	K2
3.	explain the energy requirement and nitrogen metabolism.	K3
4.	compare the various growth regulators that influence plant growth.	K4
5.	discuss the senescence and plant response to environmental stress.	K5 & K6

K1-Remember; **K2**-Understand; **K3**-Apply; **K4** – Analyse; **K6**- Create

SEMESTER IV

CORE COURSE IX: BIOCHEMISTRY & APPLIED BIOTECHNOLOGY

Course Code: BP234CC2

On the successful completion of the course, students will be able to:

1.	knowledge on the fundamentals and significance of Plant Biochemistry	K1
2.	understanding on the structure and properties of plant biomolecules.	K2
3.	explain the role of enzymes in plants.	K3
4.	compare and contrast the methods of transgenic plants production and natural plants.	K4
5.	discuss and develop skills for effective utilization of microbial/plant enzymes and their role in biological cells.	K5 & K6

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER IV

CORE LAB COURSE IV: CORE COURSE VIII & IX

Course Code: BP234CP1

On the successful completion of the course, students will be able to:		
1.	perform quantitative tests for all major macro molecules and file a report of chemical profile of a plant cell.	K1
2.	analyze the structure and properties of various enzymes.	K2
3.	understand the fundamentals of water and its relation to plants.	K1 & K3
4.	understand the role of pigment in photosynthetic mechanism and related events of plants.	K4
5.	evaluate the theory and practical skills gained during the course and create idea to seek for suitable job in relevant industries.	K5 & K6

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER IV

ELECTIVE COURSE VI (a)- FORESTRY AND WOOD TECHNOLOGY

Course Code: BP234EC1

On completion of this course, the students will be able to:		
1.	knowledge on various aspects of forest botany	K1

2.	understand the importance and of different forests.	K2
3.	analyze the ecological significance of forests	K3
4.	to understand the dynamics of the forest.	K4
5.	understanding on various Indian forests laws and acts.	K5 & K6

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER IV

ELECTIVE COURSE VI (b)- ORGANIC FARMING

Course Code: BP234EC2

On completion of this course, the students will be able to:		
1 .	knowledge on various aspects of organic farming	K1
2.	understand the relevance of organic farming, its advantages.	K2
3 .	explain the short comings against conventional high input agriculture.	K3
4 .	compare the packaging methods of harvest.	K4
5 .	discuss and develop skills for post harvest management.	K5 & K6

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER IV

ELECTIVE COURSE VI :c) GENE CLONING AND GENE THERAPY

Course Code: BP234EC3

On the successful completion of the course, students will be able to:		
1.	recollect the basic concepts of gene cloning.	K1
2.	demonstrate and to identify the selection of clones.	K2
3.	acquire knowledge on the gene therapy.	K3
4.	compare and understand the concept of gene therapy.	K4
5.	discuss and develop skills for hybrid seed production and molecular farming.	K5 & K6

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER IV

ELECTIVE COURSE VII: a) INDUSTRIAL BOTANY

Course Code: BP234EC4

On completion of this course, the students will be able to:		
1.	understand the basics of algae in industrial applications.	K1
2.	demonstrate and to recollect the uses in fungi in industries.	K2
3.	explain bacterial role in industries.	K3
4.	compare and contrast the use of plants in industries.	K4
5.	discuss and develop skills for working in industries specializing in biomolecules.	K5 & K6

K1-Remember; **K2**-Understand; **K3**-Apply; **K4** – Analyse; **K6**- Create

SEMESTER IV

ELECTIVE COURSE VII: b) FARM SCIENCES: GREEN WEALTH

Course Code: BP234EC5

On completion of this course, the students will be able to:		
1.	to identify the importance of agronomy and its scope.	K1
2.	demonstrate both the theoretical and practical knowledge in weed management principles.	K2
3.	explain the methods of herbicide and fertilizer application.	K3
4.	compare and contrast the yield estimation and water management.	K4
5.	discuss and develop skills for effective conservation, harvesting and storage methods.	K5 & K6

K1-Remember; **K2**-Understand; **K3**-Apply; **K4** – Analyse; **K6**- Create

SEMESTER IV
ELECTIVE COURSE VII: c) BIOPESTICIDE TECHNOLOGY

Course Code: BP234EC6

On completion of this course, the students will be able to:		
1.	understand the issues in use of chemical pesticides and their harmful effects on life.	K1& K2
2.	aware the significance of biopesticides and their beneficial role in controlling insect pests, diseases, nematodes and weeds.	K1&K4
3.	knowledge on identification of promising biopesticides and their mechanisms of action against insect pests, diseases, nematodes and weeds.	K2& K6
4.	Learn the mass production and formulation technology of selected biopesticides.	K3& K6
5.	knowledge on product development for commercialization of biopesticides.	K5

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER IV
SKILL ENHANCEMENT COURSE III: PROFESSIONAL COMPETENCY IN
BIOLOGY

Course Code: BP234SE1

On completion of this course, the students will be able to:		
1.	learn about the structure of atoms, molecules, and chemical bonds.	K1
2.	demonstrate both the theoretical and practical knowledge in cell biology and molecular biology.	K2
3.	explain the methods of recombinant technology.	K3
4.	compare and contrast the physiological functions and metabolism.	K4
5.	discuss and develop skills for effective comprehension and communication.	K5 & K6

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create

SEMESTER IV
SELF LEARNING COURSE: NET/SET FOR BOTANY STUDENTS
Course Code: BP234SL1

On completion of this course, the students will be able to:		
1.	understand the principles of plant physiology, cell biology and biochemistry	K1
2.	demonstrate competency in the application of plant sciences including agronomic techniques and pest management	K2
3.	evaluate the various contributions of plant-based systems from local to global systems.	K3
4.	learn professional skills using experience based knowledge to develop a practical skill set	K4
5.	interpret and critically evaluate scientific information as it applies to the field of Plant Sciences	K5 & K6

K1 - Remember; K2 - Understand; K3 – Apply; K4 - Analyse; K5 - Evaluate; K6 - Create

SEMESTER – III & IV
LIFE SKILL TRAINING II - VALUES
Course Code: PG23LST2

n completion of this course the student will be able to		
1	recognize the perception of life and lead a positive life	K1
2	understand relationship with family, friends and the society	K2
3	develop as socially responsible citizens.	K3
4	assess goals, fix targets and value life	K4
5	create a peaceful, communal community and embrace unity.	K6

K1-Remember; K2-Understand; K3-Apply; K4 – Analyse; K6- Create