



# **G.VENKATASWAMY NAIDU COLLEGE (Autonomous), KOVILPATTI.**

**Affiliated to Manonmaniam Sundaranar University – Tirunelveli.**

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## **Programme Outcomes - Department of Botany (PG)**

<b>GPO No.</b>	<b>Programme Outcomes</b>
PO1	Critical Thinking: Ability to engage in independent and reflective thinking in order to understand logic connections between ideas.
PO2	Effective Communication: Development of communication skills for effectively transmitting and receiving information that focuses on acquiring knowledge, problem solving, improving on arguments and theories thereby paving the way for better employability and entrepreneurship.
PO3	Social Consciousness: Acquire awareness towards gender, environment, sustainability, human values and professional ethics and understand the difference between acting, responding and reacting to various social issues.
PO4	Multidisciplinary Approach: Combining various academic disciplines and professional specializations to cross borders and redefine problems in order to explore solutions based on the new understanding of complex situations.
PO5	Subject Knowledge: Acquiring knowledge at a higher level that would help develop the necessary skills, fuel the desire to learn and contribute to the field of expertise thereby providing valuable insights into learning and professional networking with the aim of catering to the local, national and global developmental needs.
PO6	Lifelong Learning: Understanding the necessity of being a lifelong learner for personal enrichment, professional advancement and effective participation in social and political life in a rapidly changing world.



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## **Programme Specific Objective - Department of Botany (PG)**

<b>GPO No.</b>	<b>Programme Specific Objective</b>
PSO1	comprehend the core concepts of Botany at organizational (both external morphology, internal morphology), cell and molecular levels, through which the developmental and physiological functioning of plants
PSO2	exhibit proficient laboratory skills and in contemporary and advance techniques related to Life Science
PSO3	carry out a thorough analysis on various plant life forms, using specific identification key characteristic features and also at micro level



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## **Course Outcome - M. Sc., Botany**

### **First Semester**

#### **Core – 1 Plant Diversity (Algae, Fungi, Lichen, Bryophytes, Pteridophytes and Gymnosperms) ( P21BO101)**

<b>CO No.</b>	<b>Course Outcome</b>
<b>CO1</b>	Comprehend various groups of plants
<b>CO2</b>	Elucidate the phylogenetic sequence of plant groups
<b>CO3</b>	Reveal the economic significance of various plant forms
<b>CO4</b>	Scrutinize their ecological adaptations, internal organization and reproductive specialization
<b>CO5</b>	Analyze the fossil forms and the reasons for fossilization

#### **Core - 2**

#### **Biochemistry & Biophysics (P21BO102)**

<b>CO No.</b>	<b>Course Outcome</b>
<b>CO1</b>	Understand the Chemical diversity in plants
<b>CO2</b>	Impart the knowledge of forces regulating metabolism.
<b>CO3</b>	Understand about bioenergetics.
<b>CO4</b>	Understand the structure, function and metabolism of bio molecules in plants
<b>CO5</b>	Understand the various aspects of enzymes and its mechanism of action



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## Core Lab – 1 Plant Diversity (Algae, Fungi, Lichen, Bryophytes, Pteridophytes and Gymnosperms) (P21BO1P1)

CO No.	Course Outcome
CO1	Classify various groups of plants
CO2	Dissect and draw internal structures of different plant forms
CO3	Isolate fungi from different sources
CO4	explain the ecological adaptations and internal organization
CO5	Understand the various aspects of cellular and tissue level

## Core Lab -2 Biochemistry & Biophysics (P21BO1P2)

CO No.	Course Outcome
CO1	Describe the structure & function of the Bio molecules.
CO2	Understand and workout problems related to genetics
CO3	Devise methods and tests to improve basic skills and techniques related to biochemistry
CO4	Understand the structure, function and metabolism
CO5	Understand and apply the quantitative and qualitative analysis of bio chemicals

## Employability Enhancement:1 Pomology (P21BO1EEA)

CO No.	Course Outcome
CO1	Understand the importance of pomology
CO2	Explain the methods of post-harvest preservation requirements.
CO3	Classify the fruits according to scientific names.
CO4	Plan the development of orchards and its management
CO5	To formulate the new techniques of post-harvest preservation requirements.



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## **Employability Enhancement:1 Horticultural Post harvest- Practices**

**(P21BO1EEB)**

<b>CO No.</b>	<b>Course Outcome</b>
<b>CO1</b>	Understand the concept of different types of horticultural crops, for value addition
<b>CO2</b>	Visualize the post-harvest problems likely to be confronted
<b>CO3</b>	Critically evaluate different cultivation practices and disease management
<b>CO4</b>	Know the tricks of the trade and how to increase the longevity of the produce

## **Second Semester**

**Core-3**

**Genetics, Cyto genetics & Evolution (P21BO203)**

<b>CO No.</b>	<b>Course Outcome</b>
<b>CO1</b>	Reveal the facts related to hereditary of genes
<b>CO2</b>	Identify values of chromosomal inheritance
<b>CO3</b>	Comprehend natural and anthropogenic risks related to gene sequence
<b>CO4</b>	Perform analytical methods gene mapping
<b>CO5</b>	Adapt the concepts and Correlate the importance of gene in living world



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## **Core: 4**

### **Cell and Molecular Biology (P21BO204)**

<b>CO No.</b>	<b>Course Outcome</b>
<b>CO1</b>	Know about microscopic techniques
<b>CO2</b>	Understand the Cell signaling process
<b>CO3</b>	Recognize, compare and distinguish the processes and mechanisms involved in Transcription and Translation.
<b>CO4</b>	Understand about the basic and fundamental organization of life and genetic material
<b>CO5</b>	Correlate the structures and purpose and basic component of prokaryotic and eukaryotic cells

## **Core: 5**

### **Plant Ecology, and Conservation of Biology (P21BO205)**

<b>CO No.</b>	<b>Course Outcome</b>
<b>CO1</b>	Reveal the facts related to environmental components
<b>CO2</b>	Identify values of biodiversity and evolve conservation strategies
<b>CO3</b>	Comprehend natural and anthropogenic risks related to environment
<b>CO4</b>	Perform analytical methods in environmental management
<b>CO5</b>	Adapt the concepts of sustainable environmental management through acquired knowledge and analytical skills





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## Core Elective-1

### Ethno botany (P21BO2E1B)

CO No.	Course Outcome
CO1	Understand the importance of Ethnobotany
CO2	Classify the fruits according to scientific names.
CO3	Plan the development of orchards and its management
CO4	Explain the methods of post-harvest preservation requirements.
CO5	Apply the various methods of post-harvest techniques of medicinal value plants

## Core Elective-1

### Bio statistics tools and Techniques (P21BO2E1C)

CO No.	Course Outcome
CO1	Understand the importance of Biostatistics
CO2	Differentiate the parametric and non-parametric statistics.
CO3	Analyze Patterns of probability distribution
CO4	Estimate the methods of Correlation in biological science.
CO5	Criticize the application of computer in biology

## Core: 6

### Botany for Competitive Examinations (P21BO206)

CO No.	Course Outcome
CO1	To bring desired changes in student's attitude
CO2	Acquisition of Knowledge
CO3	To improve the learning skills of the students
CO4	To become a social and efficient member of society
CO5	To create the challenge to attain the Competitive Examinations





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## Third Semester

**Core:06**

### Plant Physiology (P20BO306)

CO No.	Course Outcome
CO1	able to Memorize the concept of plant water relation; Potential to Demonstrate mineral salt absorption
CO2	learn to Calculate Respiratory quotient of plants
CO3	categorize C3 and C4 plants based on their CO <sub>2</sub> Assimilation
CO4	summarize Glyoxylate metabolism in seed germination
CO5	invent new tolerant mechanism of plant during stress, drought

**Core:07**

### Taxonomy of Angiosperms and Economic Botany (P20BO307)

CO No.	Course Outcome
CO1	recognize the plants based on taxonomical key; Able to Paraphrase the principles of plant nomenclature
CO2	illustrate distinguish floral characters of plants
CO3	understand and explain various characters of plant families
CO4	can criticize modern trends in plant taxonomy
CO5	potential to formulate new identification key of plants

### Core Lab - 5 Plant Physiology and Taxonomy of Angiosperms and Economic Botany (P20BO3P5)

CO No.	Course Outcome
CO1	recall the physiological response of plants to various factors; Able to demonstrate photosynthetic mechanism and related events of plants.
CO2	illustrate various floral characters of plants for better identification
CO3	learn to categories plants based on their taxonomical key.
CO4	able to summarize economic importance of plants
CO5	develop the potential to prepare herbarium



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## Core Elective 1:

### Food Science (P20BO3E1A)

CO No.	Course Outcome
CO1	understand and describe food pyramid and their layers; Able to classify food types and their utilization
CO2	apply the acquired knowledge on basic minerals in life
CO3	learn to explain the vitamin usage of minerals
CO4	comprehend to assess milk and milk products in their life
CO5	able to construct the new nutritional diet for better living

## Core Elective 1:

### Bio-Economics (P20BO3E1B)

CO No.	Course Outcome
CO1	able to define different concepts related to ecological economics
CO2	apply various ecosystem services in modern world
CO3	analyze multi-disciplinary approaches related to ecological, economic and social dimensions for sustainable development
CO4	evaluate the economic explanations to and solutions for environmental problems
CO5	construct the new way on implications of increasing globalization for sustainable ecosystems

## Core Elective 1:

### Dendrology and Arboriculture (P20BO3E1C)

CO No.	Course Outcome
CO1	able Identify the characterization on various habitats of major trees and shrubs.
CO2	estimate the fundamental requirements of trees and shrubs, their common associates, wildlife and commercial uses.
CO3	analyse the importance of arboriculture, urban and community forest ecosystem
CO4	judge the utility of urban/community forestry and community involvement
CO5	comprehend to plan new knowledge on tree cultivation



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## Skill Enhancement 2

## Bioinformatics & Nanotechnology (P20BO3S1)

CO No.	Course Outcome
CO1	enumerate data collection and Biostatistics methods; Summarize the concept of databases and use of different public domain for DNA and proteins sequence retrieval.
CO2	demonstrate the biological significance of protein sequence
CO3	explain the structure of proteins homology modelling approach using swiss model and swiss-pdb.
CO4	assess the role of various models in molecular evolution
CO5	able to design techniques in Drug Design.

## Self Study Course

## Medicinal Botany (P20BO3SS)

CO No.	Course Outcome
CO1	recall and discuss the historical background of herbal medicines – scope of raw drugs of plant origin
CO2	construct the medicinal value of phytochemicals
CO3	point out the way on cultivation of selected medicinal plants.
CO4	decide to extract essential oil from plants
CO5	formulate the medicinal description from common plants

## Fourth Semester

## Core: 08 Plant Biotechnology, Genetic Engineering and Microbiology

## (P20BO408)

CO No.	Course Outcome
CO1	define various media, Sterilization, Totipotency and summarize Cell induction, Organogenesis.
CO2	able to apply the Techniques to develop a standard protocol for Plant Tissue Culture
CO3	explain the characters of microorganisms
CO4	evaluate various development of microbes
CO5	able to organize the plant and microbes interaction



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## **Core: 09      Genetics, Plant breeding and Biostatistics (P20B0409)**

<b>CO No.</b>	<b>Course Outcome</b>
<b>CO1</b>	recognize the principles and concept of Mendelian law; Extend the knowledge about recombination genetics
<b>CO2</b>	discover the importance of plant breeding.
<b>CO3</b>	analyse the different methods of selection (Mass, pureline and Clonal).
<b>CO4</b>	appraise the improvement on the knowledge of data collection and Biostatistics methods
<b>CO5</b>	formulate the new biostatistics principles

## **Core: Lab-6    P20B04P6 Plant Biotechnology, Genetic Engineering, Microbiology, Genetics, Plant breeding and Biostatistics**

<b>CO No.</b>	<b>Course Outcome</b>
<b>CO1</b>	define various media, sterilization, totipotency, cell induction, organogenesis; Able to extend the techniques to develop a standard protocol for Plant Tissue Culture.
<b>CO2</b>	have comprehensive knowledge on GM technology, bio-safety relations and germ plasm storage.
<b>CO3</b>	construct the basics knowledge of microbiology includes types of microbes, classification and characterization.
<b>CO4</b>	categories sufficient knowledge about the types of symptoms and their causative agents of diseases..
<b>CO5</b>	Re-arrange the principles and concept of Mendelian law.



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## Core Elective 2: Instrumentation and Research Methodology (P20BO4E2A)

CO No.	Course Outcome
CO1	Recognize and interpret the different types of microscopes and their uses of biological science laboratories.
CO2	discover the knowledge on basic research
CO3	learn to classify biological research areas
CO4	comprehend to assess the methods of research article
CO5	prepare to write their own research article

## Core Elective 2: Agronomy (P20BO4E2B)

CO No.	Course Outcome
CO1	understand the concept of agronomy and sustainable agriculture; Express their idea on farm enterprises
CO2	apply the implications integrated farming system along with production economics and farm management
CO3	analyze different aspects diversified agriculture and farm enterprises, production technology of vegetation and flowers
CO4	evaluate the IT communication and diffusion of agricultural innovation
CO5	able to substitute chemical fertilizer with bio-fertilizer

## Core Elective 2: Reproductive Biology of Angiosperms (P20BO4E2C)

CO No.	Course Outcome
CO1	recall the history of reproductive biology of angiosperms & recognize the importance of genetic and molecular aspects of flower development.
CO2	able to illustrate the special structures of Ovule
CO3	explain Self-incompatibility in Pollination and fertilization & relate between Embryo, Endosperm and Seed
CO4	comprehend to estimate the causes of Polyembryony and apomixes with its classification
CO5	generalize the parasexual hybridization



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## **Major Project & Viva (P20BO4MP)**

<b>CO No.</b>	<b>Course Outcome</b>
<b>CO1</b>	enumerate and explain the collection and analyse the scientific literature from web resources.
<b>CO2</b>	demonstrate practical skills in the use of tools, technologies and methods common to life science.
<b>CO3</b>	appraise the scientific method and hypothesis testing in the design and execution of experiments.
<b>CO4</b>	estimate a summative project or paper that draws on current research, and /or techniques in life sciences.
<b>CO5</b>	developed the confidence to write their own dissertation