PSGR
Krishnammal College for Women

DEPARTMENT OF BOTANY

CHOICE BASED CREDIT SYSTEM (CBCS) &
LEARNING OUTCOMES- BASED CURRICULUM FRAMEWORK (LOCF)

(Semester– I)

BACHELOR OF SCIENCE - BOTANY
(2025 – 2028 Batch)

PSGR
Krishnammal College for Women

BACHELOR OF SCIENCE - BOTANY
CHOICE BASED CREDIT SYSTEM (CBCS) &
LEARNING OUTCOMES- BASED CURRICULUM FRAMEWORK (LOCF)

SYLLABUS & SCHEME OF EXAMINATION
2025-2028 Batch, Semester I

Programme Learning Outcomes (PLO's)

Courses within the Botany curriculum will address goals and objectives at the appropriate level through measurable student learning outcomes developed by course instructors

PLO 1: Students will be able to remember, comprehend, apply, analyze and synthesize the core concepts in Botany, like evolution, biodiversity, structure and function, information flow, exchange and storage, pathways and transformations of energy and matter.
PLO 2: Students will develop the ability to apply and understand the defining characteristics of various processes of science and its uncertainty.
PLO 3: Students will also develop the ability to practice the skills of the scientific method. Engage in research projects and apply the quantitative skills to biological problems.
PLO 4: Students will be able to communicate and collaborate within and outside of biology and tap into the interdisciplinary nature of science.
PLO 5: Students will understand the relationship between science and society and to evaluate the impact of science as well as ethical implications of science in the society.

Programme Specific Objectives (PSO's)

At the end of the programme the student will

PSO1: Obtain strong foundation in classical botany, interdisciplinary subjects such as Bioinformatics, Biostatistics, and advance topics in Cell and Molecular biology, Biochemistry and Plant Biotechnology.
PSO2: Build capacity in Horticulture and production of cut flowers from the skill based courses offered.
PSO3: Carry out individual short-term internship and project work to acquire knowledge on research using basic and advanced instruments/equipments.
PSO4: Find opportunities for higher studies in top ranking universities.
PSO5: Gain career in teaching/research in Botany.

PSGR
Krishnammal College for Women

BACHELOR OF SCIENCE - BOTANY
CHOICE BASED CREDIT SYSTEM (CBCS) &
LEARNING OUTCOMES- BASED CURRICULUM FRAMEWORK (LOCF)

SYLLABUS & SCHEME OF EXAMINATION
2025-2028 Batch, Semester I

Sem	Part	Course Code	Title of the Course	Course Type	Instruction hours/week	Contact hours	Tutorial hours	Duration of Examination	Examination Marks			Credits
									CA	ESE	TOTAL	
I	I	TAM2501/ HIN2501/ FRE2501	Tamil Paper I/ Hindi Paper I/ French Paper I	L	6	88	2	3	25	75	100	3
	II	ENG2501	English Paper I	E	6	88	2	3	25	75	100	3
	III	PL24C01	Microbiology & Plant Diversity I	CC	6	88	2	3	25	75	100	5
	III	PL24CP1	Botany Practical I	CC	3	45	-	-	-	-	-	-
	III	CE24A01/ PS23A03	Chemistry for Biologists / Physics Paper I	GE	4	58	2	3	20	55	75€	4
	III	CE23AP1/ PS23AP1	Chemistry Practical for Biologists/ Physics Practical for Biologists	GE	3	45	-	-	-	-	-	-
	IV	NME25B1 / NME25A1	Basic Tamil I / Advanced Tamil I	AEC	2	28	2	-	100	-	100	2
		NME23ES	Introduction to Entrepreneurship	AEC	2	30	-	-	100	-	100	
I-II	VI	NM25GAW	General Awareness	AECC	SS	-	-	-	100	-	100	Gr.
		COM25SER	Community Services 30 Hours	GC	-	-	-	-	-	-	-	-
II-V	VI	24BONL 1 24BONL 2 24BONL 3	Online Course I Online Course II Online Course III	ACC	-	-	-	-	-	-	-	

L – Language **E – English** **CC – Core Courses**
GE – Generic Elective **ACC – Additional Credit Course**
AEC – Ability Enhancement Course **AECC – Ability Enhancement Compulsory Course**
CA – Continuous Assessment **ESE–End Semester Examination** **Gr. - Grade**
€ : CA conducted for 25 and converted into 20, ESE conducted for 75 and converted into

Continuous Internal Assessment Pattern
Theory
I Year UG
CIA Test : 5 marks **(conducted for 45 marks after 50 days)**
Model Exam : 7 marks **(Conducted for 75 marks after 85 days (Each Unit 15 Marks)**
Seminar/Assignment/Quiz : 5 marks
Class Participation : 5 marks
Attendance : 3 marks
Total : 25 Marks
Practical
Lab Performance : 7 marks
Regularity : 5 marks
Model Exam : 10 marks
Attendance : 3 marks
Total : 25 marks

ESE Practical Pattern
The End Semester Examination will be conducted for a maximum of 75 marks respectively witha maximum 15 marks for the record and other submissions if any.

CA Question Paper Pattern and distribution of marksLanguage and English
Section A 5 x 1 (No choice) : 5 Marks
Section B 4 x 5 (4 out of 6) : 20 Marks (250 words)
Section C 2 x 10 (2 out of 3) : 20 Marks (500 words)
Total : 45 Marks

CA Question from each unit comprising of
One question with a weightage of 2 Marks :2 x 3 = 6
One question with a weightage of 5 Marks (Internal Choice at the same CLO level):5 x 3 =15One question with a weightage of 8 Marks (Internal Choice at the same CLO level) :8 x 3=24
Total : 45 Marks

End Semester Examination – Question Paper Pattern and Distribution of MarksLanguage and English
Section A 10 x 1 (10 out of 12) : 10 Marks
Section B 5 x 5 (5 out of 7) : 25 Marks (250 words)
Section A 4 x 10 (4 out of 6) : 40 Marks (600 - 700 words)
Total : 75 Marks

UG - Core and Allied courses:
ESE Question Paper Pattern: 5 x 15 = 75 Marks
Question from each unit comprising of
One question with a weightage of 2 Marks : 2 x 5=10
One question with a weightage of 5 Marks (Internal Choice at the same CLO level): 5 x 5 =25
One question with a weightage of 8 Marks (Internal Choice at the same CLO level): 8 x 5 =40

ESE Question Paper Pattern:(for Accounts Paper) 5 x 15 = 75 Marks
Question from each unit comprising of
One question with a weightage of 2 Marks : 2 x 5=10

One question with a weightage of 5 Marks : 5 x 5 =25
One question with a weightage of 8 Marks (Internal Choice at the same CLO level): 8 x 5 =40

Part IV
Introduction to Entrepreneurship
Quiz: 50 marks
Assignment:
25marks
Project / Case study: 25
marks**Total: 100 Marks**

Attendance

91-100%	3Marks
81-90%	2 Marks
75-80%	1 Mark

COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CREDIT
PL24C01	Microbiology & Plant Diversity I	Theory	88	2	-	5

Preamble

To study the characteristics and life cycle of Bacteria, Virus, Algae, Fungi and Lichens.
To study various plant diseases and their control measures.
To impart knowledge on Artificial Intelligence and its types.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Understand the cellular, biochemical, and physiological aspects of mircoorganisms and recognize the similarities and differences between microbial groups (bacteria, algae, fungi, protozoa, viruses)	K1
CLO2	Acquire knowledge about the diversity of algae based on structure and reproduction	K2
CLO3	Know about the morphology, reproduction and economic importance of fungi and lichens	K3
CLO4	Identify the causes, symptoms and control measures of plant diseases	K4
CLO5	Apply the artificial intelligence to the biological science	K5

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	M	M	M
CLO2	S	S	S	M	M
CLO3	S	S	M	S	S
CLO4	S	M	S	M	M
CLO5	S	M	S	S	M

S- Strong; M-Medium

Syllabus

Unit I: Microbiology 19 hrs

History and scope of microbiology. Structure and reproduction of viruses. Bacteria: Morphology, ultra structure, growth and reproduction. Bacterial classification (Bergey, 1923). Microbial techniques - Methods of sterilization, Culture media and Pure culture techniques. Study of bacterial growth- growth curve. Gram staining.

Unit II: Algae 19 hrs

General characteristics of algae, Classification of algae (Fritsch, 1935). A detailed study on structure, reproduction and life cycle of *Anabaena* (Cyanophyceae), *Chlamydomonas & Oedogonium* (Chlorophyceae), *Ectocarpus* (Phaeophyceae) and *Polysiphonia* (Rhodophyceae) (developmental studies on sex organs not required). Economic importance of Algae.

Unit III: Fungi and Lichen 20 hrs

General characteristics of Fungi. Classification (Alexopoulos and Mims, 1972). Detailed study of morphology and reproduction of *Albugo* (Oomycetes), *Saccharomyces* (Ascomycetes), *Penicillium* (Plectomycetes), *Puccinia* (Teliomycetes), *Polyporus* (Agaricomycetes) and *Aspergillus* (Eurotiomycetes) (developmental studies on sex organs not required). Economic importance of Fungi.

Lichens: General characteristics, classification (Alexopoulos and Mims, 1979), reproduction and economic importance of Lichens. Detailed study of *Usnea*.

Unit: IV Plant Pathology 20 hrs

Classification of diseases– general symptoms. Penetration and disease development. Morphological and biochemical defense mechanisms in plants. A detailed study of the following plant diseases – Mosaic disease of tobacco, Citrus canker, Late blight of Potato, Red rot of sugarcane, Tikka disease of groundnut (causal organisms, symptoms, disease cycle and bio-control measures).

Unit: V Artificial Intelligence 10 hrs

Definition; Types- Weak AI or Narrow AI, General AI and Super AI. Brief introduction to solutions to real-world problems by implementing the following AI processes/ techniques: 1-Machine Learning, 2- Deep Learning, 3- Natural Language Processing and 4- Robotics. AI to reintegrate biology: Biological knowledge discovery and assembly, Behavioral ecology, Genes to phenotypes, Prediction, Evolution, and Control of infectious diseases.

Text Books

S. No.	Authors	Title of the Book	Publishers	Year & Edition
1.	Singh V, Pandae P.C. & Jain, D.K	A Text Book of Botany	Rastogi Publications,Meerut	2023 V Edn.
2.	Vashishta, B.R., Sinha, A.E and Singh, V.P	Botany for Degree Students : Algae	S Chand and Company Ltd., New Delhi	2015 I Edn
3.	Sharma O.P	Algae	Tata Mc Graw-Hill Education	2011
4.	Sharma O.P	Fungi and allied microorganisms	Tata Mc Graw-Hill Education	2024 III Edn.
5.	Purohit, S.S	Microbiology-Fundamentals & Applications	Rastogi Publications,Meerut	2017 VII Edn.
6.	Pandey, B.P	College Botany Vol I	S Chand & Company, New Delhi.	2021 V Edn.
7.	Vashishta B.R./ Sinha A.K. & Kumar Adarsh	Botany for degreestudents Fungi	S. Chand and CompanyLtd., New Delhi	2016 I Edn.

Reference Books

S. No.	Authors	Title of the Book	Publishers	Year & Edition
1.	Alexopoulos, CJ,Mims CW & Blackwell M	Introductory Mycology	John Wiley & Sons, New York	2007 IV Edn.
2.	Gangulee, HC. & KarAK	College Botany, Vol-II	New Central Book Agency Pvt. Ltd.Calcutta.	2011 IV Edn.
3.	Mehrotra, RS &Aneja, KR	An Introduction to Mycology	New Age International Private Limited, New Delhi	2015 II Edn.

Online course materials

1. https://www.researchgate.net/publication/354185787
2. https://www.edureka.co/blog/types-of-artificial-intelligence/
3. https://www.mygreatlearning.com/blog/what-is-artificial-intelligence/#WhatisArtificialIntelligence

Pedagogy

E-content, Lecture, Power point presentation, Seminar, Assignment, Quiz, Group Discussion, Video / Animation

Course Designers:

Dr. C. Krishnaveni , Dr. M. Kanchana, Dr. H. Rehana banu

COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CREDIT
PL24CP1	**Practical – I Microbiology & Plant Diversity I & II**	**Practical**	**-**	**-**	**90**	**4**

Preamble

- To observe, characterize and identify the different types of Algae, Fungi, Lichens, Bryophytes, Pteridophytes, Gymnosperms and Fossilized plants.
- To identify and differentiate the various plant diseases and the causative organism
- To isolate microorganisms from soil and establish pure cultures.
- To distinguish between Gram positive and Gram negative bacteria.

Course Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Identify the different forms of Algae, Fungi, Lichens, Bryophytes, Pteridophytes, Gymnosperms and Fossilized plants	K1
CLO2	Know the host – pathogen interactions	K2
CLO3	Prepare sterile microbial culture media and demonstrate pure culture techniques	K3
CLO4	Interpret the industrial impact of fermentation process	K3

Mapping with Programme Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	M	M	M
CLO2	S	S	M	M	M
CLO3	S	S	M	M	M
CLO4	S	S	M	M	M

S- Strong; M-Medium

Syllabus

Microbiology & Plant Diversity I **45 Hrs**

Algae - *Anabaena*, *Chlamydomonas, Oedogonium*, *Ectocarpus* and *Polysiphonia*

Fungi - *Albugo, Saccharomyces, Penicillium, Puccinia*, *Polyporus* and *Aspergillus*

Lichens -*Usnea*

Plant pathology- Mosaic disease of tobacco, Citrus canker, Late blight of potato, Red rot of sugarcane, Tikka disease of groundnut.

Microbial Techniques
Sterilization techniques
Preparation of culture media: Nutrient broth and Nutrient Agar medium
Potato Dextrose Agar Medium
Preparation of Slants
Soil dilution, Plating techniques, Enumeration of bacteria and fungi
Microscopic observation of fungi - Lactoglycerol trypan blue
Microscopic observation of bacteria - Gram staining staining
Fermentation using yeast

Plant Diversity II **45 Hrs**

(Bryophytes, Pteridophytes, Gymnosperms and Palaeobotany)

Study of the following types
Bryophyta- *Marchantia, Anthoceros* and *Funaria*
Pteridophyta-*Psilotum, Lycopodium, Equisetum* and *Marsilea*
Gymnosperms -*Cycas, Pinus* and *Gnetum*
Palaeobotany -*Rhynia, Lepidodendron, Lepidocarpan, Calamites* and *Williamsonia*

Course Designers:

1. Dr. C. Krishnaveni
2. Dr. M. Kanchana
3. Dr. K.S. Tamil Selvi
4. Dr. H. Rehana banu
5. Dr.E. Uma