

DEPARTMENT OF BOTANY
Programme: B.Sc., Botany

Vision

The Department of Botany aims to achieve high quality education and research relevant to local, regional and national needs and through knowledge sharing with leading researchers and educators across the country. We foster an exciting and intellectually stimulating atmosphere for all in a co-operative and positive environment.

Mission

To bring confidence in the lifestyle of any Botany student whose stay will ensure proficiency and competency in the subject's thought. We inculcate the habit of excellence in all the learning activities so as to ensure employability.

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

PEO1	<i>Knowledge transfer and Social responsibility</i> To groom the student admitted in the under graduate Botany Program into a socially responsible citizen.
PEO2	<i>Lifelong learning and Academic excellence</i> To impart quality education to meet the demands of higher education and research in Botany
PEO3	<i>Individual and Team Communication</i> To instill confidence by sharpening their leadership skills and soft skills among the graduate students
PEO4	<i>Employability and Entrepreneurship</i> To develop a competitive edge among the students by encouraging to take up various courses with employability skills
PEO5	<i>Professional ethics and Social responsibility</i> To inculcate the professional ethics in the students so as to produce socially responsible professionals in the field of Botany

Head of the Department


Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
Associate Professor & Head
Department of Botany
NGM College (Autonomous)
(Affiliated to Bharathiar University)
Pollachi - 642 001

Principal


Dr. R. MUTHUKUMARAN,
M.A., M.Phil., B.Ed., Ph.D.,
PRINCIPAL
N.G.M. College, Pollachi - 642 001
Coimbatore District

PROGRAMME OUTCOMES (PO)

After learning B. Sc. Botany Programme, our students are enable to

P01	<i>Lifelong learning</i> To appreciate, understand and conserve the biodiversity of cellular forms, lower plants to higher plants
P02	<i>Disciplinary Knowledge</i> To enhance the theoretical knowledge and basic concepts on Biomolecules, Microbes, Plant Structure, Function, Evolution and Environment
P03	<i>Scientific temper</i> To develop practical knowledge in the preparation of microsections, herbarium, quantifying biomolecules and other basic techniques.
P04	<i>Entrepreneurship & Enrichment of Knowledge</i> To attain entrepreneurial skills in the fields of Horticultural techniques, Landscape designing, Herbal cosmetics, Biofertilizers, Mushroom cultivation, Organic farming
P05	<i>Interdisciplinary Approach</i> To update the students with modern trends in Plant biology and introduce the interdisciplinary approach
P06	<i>Individual and Team Communication</i> To inculcate the habit of reading dailies, research articles and publications so as to groom the student's in communicating scientific reports and dissertations.
P07	<i>Professional Ethics and Mental wellness</i> To educate the students with professional ethics so as to enable them into a complete professional.
P08	<i>Employability and Social responsibility</i> To encourage the students to identify the various career options (Research & Higher studies/Competitive Exams/Consultants/Teaching/Forest Department officials/Entrepreneurs/Field Botanists/ Herbarium Technicians etc.)

PROGRAMME SPECIFIC OUTCOMES (PSO)

On successful completion of the B.Sc. Botany Degree Programme, the graduates are expected to achieve the following outcomes within five to seven years.

PSO-01	<i>Knowledge transformation</i> To transform the student into a confident individual with academic knowledge blended with leadership skills
PSO-02	<i>Lifelong learning</i> To instill confidence in the knowledge obtained in the avenues of Plant Biology in pursuing higher education or taking up appropriate jobs.


Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
Associate Professor & Head
Department of Botany
NGM College (Autonomous)
(Affiliated to Bharathiar University)
Pollachi - 642 001


Dr. R. MUTHUKUMARAN,
M.A., M.Phil., B.Ed., Ph.D.,
PRINCIPAL
N.G.M. College, Pollachi - 642 001
Coimbatore District

Programme Code	B.Sc.,	Programme Title	BOTANY
Course code	22UBY101	Course Title	2022-2025
		PLANT DIVERSITY I (PHYCOLOGY,MYCOLOGY AND BRYOLOGY)	Semester 1
Hrs/Week:5			Credits 4

Course Objective

- To understand the morphology, structure, life cycle of the selected forms of Algae, Fungi, Lichens and Bryophyte.
- To appreciate the diversity of lower plants
- To learn the evolutionary trends in the lower plants

Course Outcome (CO)

CO Number	CO Statement	Knowledge Level
C01	To differentiate lower plants like Algae, Fungi, Lichens and Bryophytes	K1
C02	To understand the morphology and life cycle of Algae, Fungi, Lichens, Bryophyte	K2
C03	To apply different classification systems to appreciate the diversity of lower plants	K3
C04	To identify the economically important Algae, Fungi, Lichens and Bryophytes	K4
C05	To appreciate the progressive evolution observed in the lower plant group	K5

Mapping

PO/PSO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2
C01	S	M	M	M	M	S	S	S	S	S
C02	S	S	M	M	M	S	S	S	S	S
C03	S	S	M	M	M	S	S	S	S	S
C04	S	S	S	L	-	S	S	S	S	S
C05	S	S	S	M	-	S	S	S	S	S

S-Strong; H-High; M-Medium; L-Low

Head of the Department


Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
 Associate Professor & Head
 Department of Botany
 NGM College (Autonomous)
 (Affiliated to Bharathiar University)
 Pollachi - 642 001

Principal


Dr. R. MUTHUKUMARAN,
 M.A., M.Phil., B.Ed., Ph.D.,
 PRINCIPAL
 N.G.M. College, Pollachi - 642 001
 Coimbatore District

Programme Code	B.Sc.,	Programme Title	BOTANY
Course code	22UBY202	Course Title	2022-2025
		PLANT DIVERSITY II (PTERIDOPHYTES, GYMNOSPERMS AND PALAEOBOTANY)	Semester 2
Hrs/Week	5		Credits 4

Course Objective

- To appreciate the diversity in lower plants
- To understand the anatomy of angiosperms
- To teach important plant diseases, causal organisms and control.

Course Outcome

CO Number	CO Statement	Knowledge Level
CO1	To recollect the existing diversity among lower plants	K1
CO2	To understand the internal structure of angiosperms	K2
CO3	To know the embryo development and fertilization in higher plants	K3
CO4	To analyze the economically important plant diseases and their control measures	K4
CO5	To obtain the skill of technically draw the plant tissues	K5

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	S	S	S	M	L	S	S	S	S	S
CO2	S	S	S	M	L	S	S	S	S	S
CO3	S	S	S	M	M	S	S	S	S	S
CO4	S	S	S	-	-	S	S	S	S	S
CO5	S	S	S	-	-	S	S	S	S	S

S-Strong; H-High; M-Medium; L-Low

Head of the Department


Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
 Associate Professor & Head
 Department of Botany
 NGM College (Autonomous)
 (Affiliated to Bharathiar University)
 Pollachi - 642 001

Principal


Dr. R. MUTHUKUMARAN,
 M.A., M.Phil., B.Ed., Ph.D.,
 PRINCIPAL
 N.G.M. College, Pollachi - 642 001
 Coimbatore District

Programme Code	B.Sc.,	Programme Title	Bachelor of Science (BOTANY)
Course code	22UBY202	Course Title	2022-2025
		PLANT DIVERSITY II: (PTERIDOPHYTES, GYMNOSPERMS AND PALAEO BOTANY)	Semester 2
Hrs/Week	5		Credits 4

Course Objective

- To study the morphology, life cycle and economic value of selected Pteridophytes, Gymnosperms
- To learn the concept of Evolution and Paleobotany
- To revisit the geological time scale with respect to the plant group

Course Outcome

CO Number	CO Statement	Knowledge Level
C01	To appreciate the morphology and lifecycle of Pteridophytes and Gymnosperms	K1
C02	To understand the concepts of evolution, Palaeobotany and evolution of land plants	K2
C03	To identify the economically important Pteridophytes and Gymnosperms	K3
C04	To study the fossil plants and their fructifications	K4
C05	To compare the evolutionary trends that exist in anatomical and reproductive Structures in Pteridophytes and Gymnosperms	K5

Mapping

PO/PSO	P01	P02	P03	P04	P05	P06	P07	P08	PS01	PS02
CO										
C01	S	S	M	L	-	S	S	S	S	S
C02	S	S	M	L	-	S	S	S	S	S
C03	S	S	S	-	-	S	S	S	S	S
C04	S	S	M	-	L	S	S	S	S	S
C05	S	S	M	-	L	S	S	S	S	S

S-Strong; M-Medium; L-Low

Head of the Department


Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
 Associate Professor & Head
 Department of Botany
 NGM College (Autonomous)
 (Affiliated to Bharathiar University)
 Pollachi - 642 001

Principal


Dr. R. MUTHUKUMARAN,
 M.A., M.Phil., B.Ed., Ph.D.,
 PRINCIPAL
 N.G.M. College, Pollachi - 642 001
 Coimbatore District

Programme Code	B.Sc.,	Programme Title	Bachelor of Science (BOTANY)
Course code	22UBY203	Course Title	2022-2025
		MAJORPRACTICAL-I(PLANTDIVERSITYI& II)	Semester2
Hrs/Week 2			Credits 4

Course Objective

- To get hands on knowledge on microbial culture techniques
- To understand the plant diversity, thallus organization of selected forms
- To learn about the fossilized plant forms and Plant evolution.

Course Outcome

Co number	Co statement	Knowledge level
C01	To revise the morphology and reproductive structures in Algae, Fungi, Lichens, and Bryophyte	K1
C02	To understand the internal structures and spore bearing parts of selected lower plant forms	K2
C03	To prepare microsections and to identify fossil specimen and slides	K3
C04	To compare the lifecycles of Algae, Fungi, Lichens, Bryophytes, Pteridophytes And Gymnosperms	K4
C05	To professionally draw plant sketches	K5

Mapping

PO/PSO	P01	P02	P03	P04	P05	P06	P07	P08	PS01	PS02
CO										
C01	S	S	S	M	-	S	S	S	S	S
C02	S	S	S	M	M	S	S	S	S	S
C03	S	M	S	M	M	S	S	S	S	S
C04	S	S	S	S	S	S	S	S	S	S
C05	S	S	S	-	-	S	S	S	S	S

S-Strong;H-High;M-Medium;L-Low


Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
 Associate Professor & Head
 Department of Botany
 NGM College (Autonomous)
 (Affiliated to Bharathiar University)
 Pollachi - 642 001


Dr. R. MUTHUKUMARAN,
 M.A., M.Phil., B.Ed., Ph.D.,
 PRINCIPAL
 N.G.M. College, Pollachi - 642 001
 Coimbatore District

Programme Code	B.Sc.,	Programme Title	Bachelor of Science(Zoology)
Course code	22UZY2A2	Course Title	2022-2025
		ANCILLARY BOTANY PAPER - II (TAXONOMY OF ANGIOSPERMS, PHYSIOLOGY, HORTICULTURE, PHARMACOGNOSY & PLANT BIOTECHNOLOGY)	Semester 2
Hrs/Week	6		Credits 3

Course Objective

- To know the diversity, utility and physiology flowering plants
- To learn the available horticultural techniques to raise new plantlets
- To understand the basics of plant biotechnology

Course Outcome

Co number	Co statement	Knowledge level
CO1	To appreciate the morphology and life cycle of selected Angiosperms	K1
CO2	To understand the concepts of Plant functions	K2
CO3	To identify flowering plants and medicinal plants in their habit.	K3
CO4	To explain different cutting, layering, grafting, budding methods to propagate Different plants	K4
CO5	To evaluate and learn the basic concept of Plant Biotechnology	K5

Mapping

PO/PSO	P01	P02	P03	P04	P05	P06	P07	P08	PS01	PS02
CO										
CO1	S	M	S	S	-	S	S	S	S	S
CO2	S	S	S	M	-	S	S	S	S	S
CO3	S	S	S	S	M	S	S	S	S	S
CO4	S	M	M	S	M	S	S	S	S	S
CO5	S	S	M	M	S	S	S	S	S	S

S-Strong;H-High;M-Medium;L-Low


Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
 Associate Professor & Head
 Department of Botany
 N.G.M. College (Autonomous)
 (Affiliated to Bharathiar University)
 Pollachi - 642 001


Dr. R. MUTHUKUMARAN,
 M.A., M.Phil., B.Ed., Ph.D.,
 PRINCIPAL
 N.G.M. College, Pollachi - 642 001
 Coimbatore District

Programme Code	B.Sc.,	Programme Title	Bachelor of Science(Zoology)
Course code	22UZY2A3	Course Title	2022-2025
		ANCILLARYBOTANYPRACTICAL	Semester2
Hrs/Week2			Credits4

Course Objective

- To know the diversity, morphology, anatomy and reproductive structures of selected lower plants and higher plants.
- To impart the basic plant breeding, horticultural techniques and plant diseases.
- To introduce important medicinal plants and principles of plant biotechnology

Course Outcome

Co number	Co statement	Knowledge level
C01	To identify some selected lower plants and higher plants in their habit	K1
C02	To understand the internal structure ,embryology and physiology of angiosperms	K2
C03	To illustrate the economically important plant diseases and their control measures	K3
C04	To prepare microsections and obtain the skill of drawing the plant tissues technically	K4
C05	To propagate plants using simple horticultural techniques and to introduce plant tissue culture techniques	K5

Mapping

PQ/PSO	P01	P02	P03	P04	P05	P06	P07	P08	PS01	PS02
CO										
C01	S	S	S	S	S	S	S	S	S	S
C02	S	S	S	M	S	S	S	S	S	S
C03	S	S	M	-	M	S	S	S	S	S
C04	S	S	S	-	L	S	S	S	S	S
C05	S	S	S	-	S	S	S	S	S	S

S-Strong;H-High;M-Medium;L-Low


Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
 Associate Professor & Head
 Department of Botany
 N.G.M. College (Autonomous)
 (Affiliated to Bharathiar University)
 Pollachi - 642 001


Dr. R. MUTHUKUMARAN,
 M.A., M.Phil., B.Ed., Ph.D.,
 PRINCIPAL
 N.G.M. College, Pollachi - 642 001
 Coimbatore District

Programme Code	B.Sc.,	Programme Title	Bachelor of Science (BOTANY)
Course code	21UBY304	Course Title	2021-2024
		ANATOMYANDEMBRYOLOGY	Semester 3
Hrs/Week 5			Credits 4

Course Objective

- To acquire knowledge about the entire plant growth and development.
- To know various anatomical features of flowering plants
- To comprehend the important events in embryo development and fertilization.

Course Outcome

Co number	Co statement	K level
C01	To introduce and enumerate the the orison plant cell, tissues and cell division	K1
C02	To summarize the anatomy of various plant parts	K2
C03	To demonstrate the internal structure and embryology of angiosperms	K3
C04	To compare the growth and developmental pattern of dicots and monocots	K4
C05	To evaluate the anatomical adaptations of xerophytes and hydrophytes	K5

Mapping

PO/PSO CO	P01	P02	P03	P04	P05	P06	P07	P08	PS01	PS02
C01	H	H	L	-	-	H	H	H	H	H
C02	H	H	H	-	-	H	H	H	H	H
C03	H	H	H	H	-	H	H	H	H	H
C04	H	H	H	-	-	H	H	H	H	H
C05	H	H	H	-	-	H	H	H	H	H

H-High;M-Medium;L-Low


Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
 Associate Professor & Head
 Department of Botany
 NGM College (Autonomous)
 (Affiliated to Bharathiar University)
 Pollachi - 642 001


Dr. R. MUTHUKUMARAN,
 M.A., M.Phil., B.Ed., Ph.D.,
 PRINCIPAL
 N.G.M. College, Pollachi - 642 001
 Coimbatore District

Programme Code	B.Sc.,	Programme Title	Bachelor of Science (BOTANY)
Course code	21UBY405	Course Title	2021-2024
		CELLBIOLOGY, BIOCHEMISTRY AND BIOPHYSICS	Semester 4
Hrs/Week5			Credits 4

Course Objective

- To know the structure of plant cell, cell organelles and biochemical molecules of life
- To understand the biophysical laws governing universe
- To analyze the biomolecules using simple separation techniques

Course Outcome

Co number	Co statements	K level
CO1	To recollect the details about Plant cell, organelles, and their functions	K1
CO2	To revisit and understand the structure and functions of biomolecules	K2
CO3	To illustrate the central dogma of molecular biology	K3
CO4	To explain the biophysical forces and laws of thermo dynamics	K4
CO5	To know-how the quantification of biomolecules using selected optical techniques	K5

Mapping

PO/PSO	P01	P02	P03	P04	P05	P06	P07	P08	PS01	PS02
CO1	H	H	M	L	M	H	H	H	H	H
CO2	H	H	M	L	H	H	H	H	H	H
CO3	H	H	M	M	H	H	H	H	H	H
CO4	H	H	H	M	H	H	H	H	H	H
CO5	H	H	H	M	H	H	H	H	H	H

H-High;M-Medium;L-Low


Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
 Associate Professor & Head
 Department of Botany
 N.G.M. College (Autonomous)
 (Affiliated to Bharathiar University)
 Pollachi - 642 001


Dr. R. MUTHUKUMARAN,
 M.A., M.Phil., B.Ed., Ph.D.,
 PRINCIPAL
 N.G.M. College, Pollachi - 642 001
 Coimbatore District

Programme Code	B.Sc.,	Programme Title	Bachelor of Science (BOTANY)
Course code	21UBY406	Course Title	2021-2024
		MAJOR PRACTICAL-II (CELL BIOLOGY, ANATOMY & EMBRYOLOGY & BIOCHEMISTRY AND BIOPHYSICS)	Semester 4
Hrs/Week	2		Credits
			4

Course Objective

- To learn various anatomical features of higher plants
- To know the structure and development of anther, ovary, embryo
- To impart training in basic separation techniques

Course Outcome

Co number	Co statements	K level
CO1	To recollect the internal structure and functions of angiospermic plants	K1
CO2	To understand the working principle of selected instruments	K2
CO3	To demonstrate the developmental details of plant embryo	K3
CO4	To prepare permanent micro sections	K4
CO5	To obtain working knowledge in biochemical techniques	K5

Mapping

PO/PSO	P01	P02	P03	P04	P05	P06	P07	P08	PS01	PS02
CO										
CO1	H	H	H	M	M	H	H	H	H	H
CO2	L	H	H	L	H	H	H	H	H	H
CO3	H	H	H	M	L	H	H	H	H	H
CO4	M	H	H	M	L	H	H	H	H	H
CO5	L	L	H	M	H	H	H	H	H	H

H-High; M-Medium; L-Low


Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
 Associate Professor & Head
 Department of Botany
 NGM College (Autonomous)
 (Affiliated to Bharathiar University)
 Pollachi - 642 001


Dr. R. MUTHUKUMARAN,
 M.A., M.Phil., B.Ed., Ph.D.,
 PRINCIPAL
 N.G.M. College, Pollachi - 642 001
 Coimbatore District

Programme Code	B.Sc.,	Programme Title	Bachelor of Science (BOTANY)
Course code	20UBY507	Course Title	2020-2023
		TAXONOMY OF ANGIOSPERMS	Semester 5
Hrs/Week 5			Credits 4

Course Objective

- To learn nomenclature systems and to identify the plants
- To introduce modern trends in taxonomy
- To know the economic uses of plants

Course Outcome

Co number	Co statement	K level
CO1	To introduce and list down the technical terms used in taxonomy	K1
CO2	To understand the principle and classification of angiosperms	K2
CO3	To create interest in identifying flowering plants in and around the campus	K3
CO4	To get hands-on training in preparing herbarium	K4
CO5	To update the Botanical nomenclature, norms and digital taxonomy	K5

Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	H	M	S
CO2	S	H	M	H	M
CO3	S	M	M	S	M
CO4	S	M	S	S	S
CO5	S	L	L	S	S

S-Strong; H-High; M-Medium; L-Low


Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
 Associate Professor & Head
 Department of Botany
 NGM College (Autonomous)
 (Affiliated to Bharathiar University)
 Pollachi - 642 001


Dr. R. MUTHUKUMARAN,
 M.A., M.Phil., B.Ed., Ph.D.,
 PRINCIPAL
 N.G.M. College, Pollachi - 642 001
 Coimbatore District

Programme Code	B.Sc.,	Programme Title	Bachelor of Science (BOTANY)
Course code	20UBY508	Course Title	2020-2023
		MICROBIOLOGY AND PLANT PATHOLOGY	Semester 5
Hrs/Week	5		Credits 4

Course Objective

- To know the microbial biodiversity
- To learn the techniques in bacteriology and immunology
- To know plant diseases and its control

Course Outcome

Co number	Co statement	K level
CO1	To appreciate the diversity of microbes	K1
CO2	To understand the basic defence mechanism and concept of Immunology	K2
CO3	To analyse the food and water samples for contamination	K3
CO4	To get hands-on training in culturing microbes	K4
CO5	To learn economically important plant disease	K5

Mapping

CO	PO	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1		S	H	H	M	H
CO2		M	S	M	M	M
CO3		M	H	H	L	M
CO4		M	M	H	L	S
CO5		M	M	M	H	H

S-Strong;H-High;M-Medium;L-Low


Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
 Associate Professor & Head
 Department of Botany
 NGM College (Autonomous)
 (Affiliated to Bharathiar University)
 Pollachi - 642 001


Dr. R. MUTHUKUMARAN,
 M.A., M.Phil., B.Ed., Ph.D.,
 PRINCIPAL
 N.G.M. College, Pollachi - 642 001
 Coimbatore District

Programme Code	B.Sc.,	Programme Title	Bachelor of Science (BOTANY)
Course code	20UBY509	Course Title	2020-2023
		GENETICS & EVOLUTION	Semester 5
Hrs/Week	5		Credits 4

Course Objective

- To learn the principles and theories of inheritance
- To know the concepts of classical and modern genetics

Course Outcome

K1	CO1	To revise the Mendelian Genetics
K2	CO2	To understand the concept of gene and molecular basis of heredity
K3	CO3	To learn the significance of Meiosis
K4	CO4	To analyse the causes of mutation and DNA repair mechanisms

Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	M	M	L
CO2	M	S	L	M	S
CO3	H	S	M	M	M
CO4	M	S	M	M	S

S-Strong;H-High;M-Medium;L-Low


Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
 Associate Professor & Head
 Department of Botany
 NGM College (Autonomous)
 (Affiliated to Bharathiar University)
 Pollachi - 642 001


Dr. R. MUTHUKUMARAN,
 M.A., M.Phil., B.Ed., Ph.D.,
 PRINCIPAL
 N.G.M. College, Pollachi - 642 001
 Coimbatore District

Programme Code	B.Sc.,	Programme Title	Bachelor of Science (BOTANY)
Course code	20UBY510	Course Title	2020-2023
		BIOTECHNOLOGY & GENETIC ENGINEERING	Semester 5
Hrs/Week	5		Credits 4

Course Objective

- To acquire knowledge on plant tissue culture
- To learn the basic principles, tools and techniques in Genetic engineering

Course Outcome

K1	CO1	To understand the concept of totipotency, micropropagation and meristem culture
K2	CO2	To learn the principle of somatic embryogenesis, haploids, synthetic seeds
K3	CO3	To revisit the molecular tools and vectors in genetic engineering
K4	CO4	To understand the principle of gene transfer, blotting techniques and markers
K5	CO5	To update the knowledge on Transgenic plants, DNA finger printing and other applications

Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	M	M	H
CO2	M	S	M	M	H
CO3	L	S	M	S	S
CO4	M	S	M	L	S
CO5	M	M	H	H	S

S-Strong;H-High;M-Medium;L-Low


Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
 Associate Professor & Head
 Department of Botany
 N.G.M. College (Autonomous)
 (Affiliated to Bharathiar University)
 Pollachi - 642 001


Dr. R. MUTHUKUMARAN,
 M.A., M.Phil., B.Ed., Ph.D.,
 PRINCIPAL
 N.G.M. College, Pollachi - 642 001
 Coimbatore District

Programme Code	B.Sc.,	Programme Title	Bachelor of Science (BOTANY)
Course code	20UBY511	Course Title	2020-2023
		ELECTIVE I - MATHEMATICS FOR BIOLOGISTS	Semester 5
Hrs/Week	5		Credits 5

Course Objective

- To acquire knowledge on basic arithmetic and biostatistical methods
- To introduce the application of computers in Biostatistics

Course Outcome

K1	CO1	To revise the basic arithmetic and number system
K2	CO2	To understand the role of mathematics in solving biological problems
K3	CO3	To introduce the statistical methods for analyzing a data
K4	CO4	To analyse and interpret a sample data using various methods
K5	CO5	To update the computer knowledge in presenting the data

Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
C01	M	M	M	M	H
C02	H	H	M	M	H
C03	H	M	L	M	S
C04	L	M	M	M	S
C05	M	M	L	H	S

S-Strong;H-High;M-Medium;L-Low


Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
 Associate Professor & Head
 Department of Botany
 NGM College (Autonomous)
 (Affiliated to Bharathiar University)
 Pollachi - 642 001


Dr. R. MUTHUKUMARAN,
 M.A., M.Phil., B.Ed., Ph.D.,
 PRINCIPAL
 N.G.M. College, Pollachi - 642 001
 Coimbatore District

Programme Code	B.Sc.,	Programme Title	Bachelor of Science (BOTANY)
Course code	20UBY5S1	Course Title	2020-2023
		SKILL BASED ELECTIVE (MAJOR) – NETWORK AND INFORMATION SECURITY	Semester 5
Hr/Week 1			Credits 2

Course Objective

- To impart knowledge of network security, Wi-Fi security, hackers, secure networking and password managers.

Course Outcome

K1	CO1	To remember the basic concepts of network
K2	CO2	To understand the network hacking techniques
K3	CO3	To deploy information and network security
K4	CO4	To interpret the common threats today in computer network.

Mapping

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	M	H	S
CO2	H	M	H	H	H
CO3	M	H	M	M	M
CO4	M	H	H	H	H

S-Strong; H-High; M-Medium; L-Low


Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
 Associate Professor & Head
 Department of Botany
 N.G.M. College (Autonomous)
 (Affiliated to Bharathiar University)
 Pollachi - 642 001


Dr. R. MUTHUKUMARAN,
 M.A., M.Phil., B.Ed., Ph.D.,
 PRINCIPAL
 N.G.M. College, Pollachi - 642 001
 Coimbatore District

Programme Code	B.Sc.,	Programme Title	Bachelor of Science (BOTANY)
Course code	20UBY5S2	Course Title	2020-2023
		SKILL BASED ELECTIVE (MAJOR) – CYBER SECURITY – ETHICAL HACKING	Semester 5
Hr/Week	1		Credits 2

Course Objective

- To understand the basics of cyber security, ethical hacking and protection.

Course Outcome

K1	CO1	To remember the basic concepts of cyber security
K2	CO2	To understand the knowledge about ethical hacking
K3	CO3	To deploy the use of hacking tools
K4	CO4	To analyze the details about internet connection.

Mapping

CO	PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1		M	S	M	H	S
CO2		H	M	H	M	H
CO3		M	H	M	M	M
CO4		M	M	H	H	H

S-Strong; H-High; M-Medium; L-Low


Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
 Associate Professor & Head
 Department of Botany
 NGM College (Autonomous)
 (Affiliated to Bharathiar University)
 Pollachi - 642 001


Dr. R. MUTHUKUMARAN,
 M.A., M.Phil., B.Ed., Ph.D.,
 PRINCIPAL
 N.G.M. College, Pollachi - 642 001
 Coimbatore District

Programme Code	B.Sc.,	Programme Title	Bachelor of Science (BOTANY)
Course code	20UBY612	Course Title	2020-2023
		PLANT PHYSIOLOGY	Semester 6
Hrs/Week	5		Credits 4

Course Objective

- To know the cellular functions of plants
- To understand the physiological functions of plants

Course Outcome

K1	CO1	To know the Plant function and Plant movements
K2	CO2	To understand the concept of water potential, water transport
K3	CO3	To analyse the role of photosynthesis and respiration in plant function
K4	CO4	To enlist various plant growth regulators
K5	CO5	To know the stress physiology of plants and

Mapping

PS0 CO	PS01	PS02	PS03	PS04	PS05
CO1	M	S	H	L	M
CO2	M	S	H	M	L
CO3	M	S	H	M	H
CO4	M	H	M	M	L
CO5	M	H	L	H	H

S-Strong;H-High;M-Medium;L-Low


Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
 Associate Professor & Head
 Department of Botany
 NGM College (Autonomous)
 (Affiliated to Bharathiar University)
 Pollachi - 642 001


Dr. R. MUTHUKUMARAN,
 M.A., M.Phil., B.Ed., Ph.D.,
 PRINCIPAL
 N.G.M. College, Pollachi - 642 001
 Coimbatore District

Programme Code	B.Sc.,	Programme Title	Bachelor of Science (BOTANY)
Course code	20UBY613	Course Title	2020-2023
		ECONOMIC AND ETHNOBOTANY	Semester 6
Hrs/Week	5		Credits 4

Course Objective

- To acquire knowledge on useful medicinal plants, cultivation methods
- To know the secondary metabolites and therapeutic potentials of plants

Course Outcome

K1	CO1	To revise the traditional system of medicine
K2	CO2	To understand the phytochemistry and medicinal principles of selected plants
K3	CO3	To analyse the distribution, cultivation, extraction and uses of economically important plants
K4	CO4	To prepare herbal formulations
K5	CO5	To create awareness in conserving medicinal plants

Mapping

PSO CO	PS01	PS02	PS03	PS04	PS05
C01	M	S	H	M	M
C02	L	S	H	H	L
C03	M	S	H	L	M
C04	L	H	M	M	L
C05	M	H	L	H	H

S-Strong;H-High;M-Medium;L-Low


Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
 Associate Professor & Head
 Department of Botany
 N.G.M. College (Autonomous)
 (Affiliated to Bharathiar University)
 Pollachi - 642 001


Dr. R. MUTHUKUMARAN,
 M.A., M.Phil., B.Ed., Ph.D.,
 PRINCIPAL
 N.G.M. College, Pollachi - 642 001
 Coimbatore District

Programme Code	B.Sc.,	Programme Title	Bachelor of Science (BOTANY)	
Course code	20UBY614	Course Title		2020-2023
		HORTICULTURE AND PLANT BREEDING		Semester 6
Hr/Week 5				Credits 4

Course Objective

- To study the basic principles of horticulture
- To learn the techniques of plant propagation
- To know the methods and practices in plant breeding

Course Outcome

K1	CO1	To know the methods of vegetative propagation
K2	CO2	To understand the principle behind plant propagation
K3	CO3	To propagate plants using simple horticultural techniques
K4	CO4	To develop interest in flower arrangement, fruit preservation and vegetables

Mapping

PSO CO	PS01	PS02	PS03	PS04	PS05
CO1	S	L	M	S	M
CO2	M	H	H	M	M
CO3	M	H	S	M	M
CO4	H	M	S	S	S

S-Strong;H-High;M-Medium;L-Low


Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
 Associate Professor & Head,
 Department of Botany
 NGM College (Autonomous)
 (Affiliated to Bharathiar University)
 Pollachi - 642 001


Dr. R. MUTHUKUMARAN,
 M.A., M.Phil., B.Ed., Ph.D.,
 PRINCIPAL
 N.G.M. College, Pollachi - 642 001
 Coimbatore District

Programme Code	B.Sc.,	Programme Title	Bachelor of Science (BOTANY)
Course code	20UBY615	Course Title	2020-2023
		ELECTIVE – II – BIOINFORMATICS	Semester 6
Hrs/Week	5		Credits 5

Course Objective

- To introduce classical bioinformatics theory to students
- To focus computer science techniques used in biological studies

Course Outcome

K1	CO1	To introduce the biological databases and computer languages
K2	CO2	To understand the sequence analysis techniques
K3	CO3	To analyse the structure of proteins with the help of computers
K4	CO4	To comprehend genomics and proteomics
K5	CO5	To know the role of computers in drug discovery

Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	M	M	H
CO2	H	H	M	M	H
CO3	H	H	M	H	H
CO4	M	H	H	H	H
CO5	L	M	H	L	H

S-Strong;H-High;M-Medium;L-Low


Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
 Associate Professor & Head
 Department of Botany
 NGM College (Autonomous)
 (Affiliated to Bharathiar University)
 Pollachi - 642 001


Dr. R. MUTHUKUMARAN,
 M.A., M.Phil., B.Ed., Ph.D.,
 PRINCIPAL
 N.G.M. College, Pollachi - 642 001
 Coimbatore District

Programme Code	B.Sc.,	Programme Title	Bachelor of Science (BOTANY)
Course code	20UBY616	Course Title	2020-2023
		ELECTIVE – III – HABITAT ECOLOGY	Semester 6
Hrs/Week	5		Credits 5

Course Objective

- To know the uniqueness of the varying habitats in the biosphere
- To acquire the knowledge about the structure and functions of different ecosystems
- To learn the techniques for environmental assessment and ecological dynamics.

Course Outcome

K1	CO1	To appreciate the various habitats and their vegetation
K2	CO2	To understand the concept of habitats and succession
K3	CO3	To analyse the components of different ecosystems
K4	CO4	To know-how the methods of Environmental audits and Environmental Impact Assessment
K5	CO5	To inventor and manage the natural resources using Remote sensing techniques.

Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	H	H
CO2	M	H	M	L	M
CO3	H	H	S	M	M
CO4	M	M	H	L	S
CO5	S	H	S	S	S

S-Strong;H-High;M-Medium;L-Low


Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
 Associate Professor & Head
 Department of Botany
 N.G.M. College (Autonomous)
 (Affiliated to Bharathiar University)
 Pollachi - 642 001


Dr. R. MUTHUKUMARAN,
 M.A., M.Phil., B.Ed., Ph.D.,
 PRINCIPAL
 N.G.M. College, Pollachi - 642 001
 Coimbatore District

Programme Code	B.Sc.,	Programme Title	Bachelor of Science (BOTANY)
Course code	20UBY617	Course Title	2020-2023
		MAJOR PRACTICAL - III (for V sem theory papers)	Semester 6
Hrs/Week	2		Credits 4

Course Objective

- To learn the plant systematics and herbarium techniques
- To study the physiological processes in the plant system
- To acquire practical knowledge on plant tissue culture and genetic engineering

Course Outcome

K1	CO1	To appreciate the diversity of flowering plants and their identification in their natural habit
K2	CO2	To get hands-on training in culturing bacteria
K3	CO3	To identify economically important plant diseases
K4	CO4	To solve biological problems using mathematics
K5	CO5	To create interest in learning the applications of Genetic Engineering
K6	CO6	To obtain working knowledge in creating a word document, powerpoint, excel

Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
C01	S	M	H	H	H
C02	M	M	H	M	H
C03	H	M	H	M	M
C04	H	M	H	L	S
C05	M	M	M	M	S
C06	H	M	H	L	S

S-Strong;H-High;M-Medium;L-Low


Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
 Associate Professor & Head
 Department of Botany
 NGM College (Autonomous)
 (Affiliated to Bharathiar University)
 Pollachi - 642 001


Dr. R. MUTHUKUMARAN,
 M.A., M.Phil., B.Ed., Ph.D.,
 PRINCIPAL
 N.G.M. College, Pollachi - 642 001
 Coimbatore District

Programme Code	B.Sc.,	Programme Title	Bachelor of Science (BOTANY)
Course code	20UBY618	Course Title	2020-2023
		MAJOR PRACTICAL - IV (for VI sem theory papers)	Semester 6
Hrs/Week	2		Credits 4

Course Objective

- To acquire basic knowledge in mathematics & biostatistics
- To create programs for bioinformatics
- To understand bioinformatics tools

Course Outcome

K1	CO1	To compare the physiological functions of plants under different environmental conditions
K2	CO2	To know the economically important plants and their produces
K3	CO3	To create interest in rearing plants <i>in vitro</i>
K4	CO4	To learn the bioinformatics tools to analyse the protein structure
K5	CO5	To study the vegetation using Quadrat and line transect method

Mapping

PS0	PS01	PS02	PS03	PS04	PS05
CO					
CO1	M	M	H	M	M
CO2	M	M	M	H	M
CO3	M	M	H	M	M
CO4	M	M	M	S	H
CO5	S	H	S	H	H

S-Strong;H-High;M-Medium;L-Low


Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
 Associate Professor & Head
 Department of Botany
 NGM College (Autonomous)
 (Affiliated to Bharathiar University)
 Pollachi - 642 001


Dr. R. MUTHUKUMARAN,
 M.A., M.Phil., B.Ed., Ph.D.,
 PRINCIPAL
 N.G.M. College, Pollachi - 642 001
 Coimbatore District

Programme Code	B.Sc.,	Programme Title	Bachelor of Science (BOTANY)
Course code	20UBY6S3	Course Title	2020-2023
		SKILL BASED ELECTIVE (MAJOR) – FOREST BOTANY	Semester 6
Hr/Week	1		Credits 2

Course Objective

- To impart theoretical and practical knowledge in all the areas of forestry

Course Outcome

K1	CO1	To know the history and types of forests
K2	CO2	To understand the principle behind forest laws
K3	CO3	To propagate plants and conserve soil and forests
K4	CO4	To develop interest in marketing of forest products

Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	L	M	S	M
CO2	M	H	H	M	M
CO3	M	H	S	M	M
CO4	H	M	S	S	S

S-Strong; H-High; M-Medium; L-Low


 Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
 Associate Professor & Head
 Department of Botany
 N.G.M. College (Autonomous)
 (Affiliated to Bharathiar University)
 Pollachi - 642 001


 Dr. R. MUTHUKUMARAN,
 M.A., M.Phil., B.Ed., Ph.D.,
 PRINCIPAL
 N.G.M. College, Pollachi - 642 001
 Coimbatore District

Programme Code	B.Sc.,	Programme Title	Bachelor of Science (BOTANY)
Course code	20UBY6S4	Course Title	2020-2023
		SKILL BASED ELECTIVE (MAJOR) – MUSHROOM CULTIVATION	Semester 6
Hr/Week	1		Credits 2

Course Objective

To acquire knowledge on the mushroom culture

Course Outcome

K1	CO1	To identify edible mushrooms from poisonous ones
K2	CO2	To understand the mushroom cultivation
K3	CO3	To know-how the mushroom culture techniques
K4	CO4	To create interest in preparing mushroom recipes

Mapping

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	S	M
CO2	M	H	L	S	M
CO3	M	H	S	S	M
CO4	M	H	S	S	M

S-Strong; H-High; M-Medium; L-Low


Dr. R. KANNAN, M.A., M.Sc., M.Phil., Ph.D.,
 Associate Professor & Head
 Department of Botany
 N.G.M. College (Autonomous)
 (Affiliated to Bharathiar University)
 Pollachi - 642 001


Dr. R. MUTHUKUMARAN,
 M.A., M.Phil., B.Ed., Ph.D.,
 PRINCIPAL
 N.G.M. College, Pollachi - 642 001
 Coimbatore District