

NALLAMUTHU GOUNDER MAHALINGAM COLLEGE (AUTONOMOUS)-POLLACHI

553	B.A.Economics	Core III Elective: Rural Economics	22UEO5E3	2022
554	B.A.Economics	Core III Elective: Urban Economics	22UEO6E3	2022
555	B.A.Economics	Core III Elective: Computer Application in Economics	22UEO6E5	2022
556	B.A.Economics	Core III Elective: Health Economics	22UEO6E6	2022
557	B.Sc. Mathematics	Core I: Classical Algebra	22UMS101	2022
558	B.Sc. Mathematics	Anicillary Mathematics for Physics I	22UPS1A1	2022
559	B.Sc. Mathematics	Anicillary Mathematics for Physics II	22UPS2A2	2022
560	B.Sc. Mathematics	Anicillary Mathematics for Chemistry I	22UCY1A1	2022
561	B.Sc. Mathematics	Anicillary Mathematics for Chemistry II	22UCY2A2	2022
562	B.Sc. Mathematics	Core III: Trigonometry, Vector Calculus and Fourier Series	22UMS203	2022
563	B.Sc. Mathematics	Core VI: Numerical Techniques	22UMS306	2022
564	B.Sc. Mathematics	Core X: Real Analysis-I	22UMS511	2022
565	B.Sc. Mathematics	Core XIV: Real Analysis-II	22UMS615	2022
566	B.Sc. Mathematics	Core Elective III: Fundamentals of Differential Geometry	22UMS6E5	2022
567	B.Sc. Mathematics	Project	22UMS6P1	2022
568	B.Sc. Physics	Optics & Spectroscopy	22UPS508	2022
569	B.Sc. Physics	Mechanics	22UPS507	2022
570	B.Sc. Physics	Core Elective II Digital Circuit Systems & Microprocessor	22UPS6E16	2022
571	B.Sc. Physics	Core Elective II: Biomedical Instrumentation	22UPS6E17	2022
572	B.Sc. Physics	Core Elective II: Nano Materials and Applications	22UPS6E18	2022
573	B.Sc. Botany	Major Paper IV- Cell Biology, Anatomy and Embryology	22UBY304	2022
574	B.Sc. Botany	Major Paper V – Biochemistry, Biophysics & Bioinstrumentation	22UBY405	2022
575	B.Sc. Botany	Non Major elective: Bioinformatics	22UBY4N22	2022
576	B.Sc. Botany	Major Paper – VII - Taxonomy of Angiosperms and Economic Botany	22UBY507	2022
577	B.Sc. Botany	Elective I– Herbal & Ethno Botany	22UBY5E2	2022



Dr. R. MUTHUKUMARAN,
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 PRINCIPAL
 N.G.M. College, Pollachi - 642 001
 Coimbatore District

New Course Introduced

Bos Minutes Highlighted



NALLAMUTHU GOUNDER MAHALINGAM COLLEGE (AUTONOMOUS)-POLLACHI

578	B.Sc. Botany	Major Practical - IV (For VI Sem Theory Papers)	22UBY615	2022
579	B.Sc. Botany	Project & Viva-voce	22UBY616	2022
580	B. Sc. Zoology	Non Major Elective I Practical Skill in Human Health	22UZY3N2	2022
581	B. Sc. Zoology	Skill based Elective -II Biofarming	22UZY6S3	2022
582	B. Sc. Zoology	Advanced Learner Course-II Zoology for competitive Exams	22UZY6AL	2022
583	B. Sc. Zoology	Project	22UZY616	2022
584	M.Sc. Mathematics	Core VI: Mathematical Statistics	22PMS206	2022
585	M.Com	Business Environment	22PCO102	2022
586	M.Com	Investment Management	22PCO2N1	2022
587	M.Com	Fundamentals of Marketing	22PCO2N2	2022
588	Tamil Aided	Tamil Paper I	22UTL101	2022
589	Tamil Aided	Tamil Paper II	22UTL202	2022
590	Tamil Aided	Tamil Paper III	22UTL303	2022
591	Tamil Aided	Tamil Paper IV	22UTL404	2022
592	B.A Tamil	IKKALA ILAKKIYAM	22UTM101	2022
593	B.A Tamil	ARA ILAKKIYAM	22UTM102	2022
594	B.A Tamil	Allied - I TAMILAGA VARALARUM PANBADUM	22UTM1A1	2022
595	B.A Tamil	SITRILAKKIYAM	22UTM204	2022
596	B.A Tamil	TAMIL ILAKKIYA VARALARU	22UTM2A2	2022
597	B.A Tamil	NANNOOL SOLLATHIGARAM	21UTM305	2022
598	B.A Tamil	BAKTHI ILAKKIYAM	21UTM306	2022
599	B.A Tamil	KAAPPIYANGAL	20UTM509	2022
600	B.A Tamil	SANGA ILAKKIYAM ETTUTHOGAI	20UTM613	2022
601	B.A Tamil	SANGA ILAKKIYAM PATHUPAATTU	20UTM614	2022
602	B.Sc Computer Science	Computing Fundamentals and C Programming	22UCS101	2022
603	B.Sc Computer Science	Allied-1: Mathematics(Statistical Methodes and Linear Algebra)	22UCS1A1	2022



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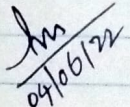
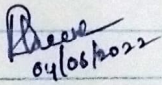
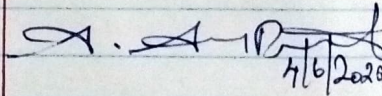
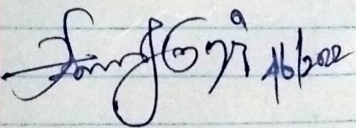
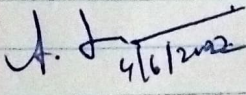
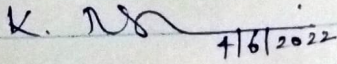
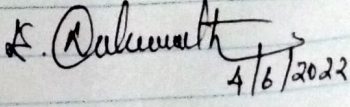
New Course Introduced

Dr. R. MUTHUKUMARAN,
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 Coimbatore District

Board of studies in Botany

Saturday - 4.06.2022 - 10:00 AM

50

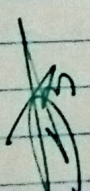
S.No.	MEMBERS	SIGNATURE
1.	Dr. R. Kannan (Chairman) Associate Professor & Head, NAME.	 04/06/22
2.	Dr. P. Ponmurugan (University nominee) Associate Professor of Botany Bharathiar University Coimbatore.	
3.	Dr. R. Premia (Subject expert) Ass. professor and Head APA College for women Palani	 04/06/2022
4.	Dr. Thenmozhi (Academic auditor) Asst. Professor and Head Kongunadu College of Arts & Science Coimbatore	
5.	Dr. A. Anunprasath (Alumni) Asst. Professor of Botany PSG college of Arts and Science Coimbatore.	 4/6/2022
6.	Mr. A. Vijaya Raguath (Industrial expert) Green Cotton Tex Tirupur	 4/6/2022
7.	Dr. A. Logamaderi (Member) Asst. Professor of Botany, NGM college	 4/6/2022
8.	Dr. K. Rajalakshmi (Member) Asst. Professor of Botany, NGMC	 4/6/2022
9.	Dr. K. Neelamathi (Member) Asst. Professor of Botany, NGMC.	 4/6/2022

MINUTES

The Board of Studies in Botany met on 04-06-2022 at 10:00 Am. in the Department of Botany under the chairmanship of Dr. R. Kannan, HOD of Botany.

The resolutions made in the Board are as follows:

- The Subject Cell biology may be incorporated into Anatomy and Embryology paper.
- To the paper Taxonomy of Angiosperms, Economic Botany may be added to the last unit.
- Economic and Ethnobotany paper may be changed to Ethnobotany and Pharmacognosy.
- In the Bioinformatics paper, MS-OFFICE can be added and C-Language may be replaced by 'Python'.
- The topics in Maths for Biologists may be included in Biochemistry.
- Maths for biologists may be restructured exclusively for Biostatistics, and the title may be changed to 'Bioinformatics'.
- In addition, necessary omissions and commissions are done in various papers such as Plant diversity-II, Plant Biotechnology (Biotechnology & Genetic engineering), Horticulture, Bioprospecting, Biofertilizers and Microbiology.
- The title Biotechnology & Genetic engineering may be changed to 'Plant Biotechnology'.


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NALLAMUTHU GOUNDER MAHALINGAM COLLEGE, POLLACHI.

DEPARTMENT OF BOTANY

B.Sc., BOTANY

SCHEME OF EXAMINATION (I -VI SEMESTER)

(FOR CANDIDATES ADMITTED DURING THE ACADEMIC YEAR 2022-2025)

(CBCS for under graduate programmes with language for 4 semesters)

Part No	Course Code	Course title	Lecture+ Tutorial/ Practical Hours/ week	Duration of Exam Hrs	Max. Marks			Credit Point
					Internal	End-of-Semester	Total	
	Semester I							
I	22UTL101 / 22UHN101 / 22UFR101	Tamil/Hindi/French Paper – I	6	3	50	50	100	3
II	22UEN101	English Paper – I	5	3	50	50	100	3
III	22UBY101	Major Paper I - Plant Diversity I (Phycology, Mycology and Bryology)	9 (6+3)	3	50	50	100	4
	22UBY1A1	Allied - Paper I Zoology	9 (6+3)	3	50	50	100	3
IV	22UHR101	Human Rights	1	2	-	50	50	2
	22HEC101	Human Excellence - Personal values & SKY yoga practice-I	2	2	25	25	50	1
V		Extension Activities (Annexure –I)						
	500							16
	Semester II							
I	22UTL202 / 22UHN202 / 22UFR202	Tamil/ Hindi/ FrenchPaper – II	6	3	50	50	100	3
II	22UEN202	English Paper – II	5	3	50	50	100	3
III	22UBY202	Major Paper II Plant Diversity II (Pteridophytes Gymnosperms and Palaeobotany)	6	3	50	50	100	4
	22UBY203	Major Practical I – Paper III Plant diversity I & II (Phycology, Mycology and Bryology &Pteridophytes Gymnosperms and Palaeobotany)	2	3	50	50	100	4
	22UBY2A2	Allied - Paper II Zoology	7	3	50	50	100	3
	22UBY2A3	Allied - Paper III Practical	2	3	50	50	100	4
IV	22EVS201	Environmental Studies	2	2	-	50	50	2

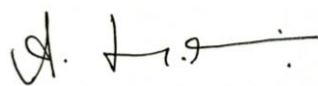
	22HEC202	Human Excellence - Family values & SKY yoga practice- II	2	2	25	25	50	1
V		Extension Activities (Annexure –I)						
	700							24
	Semester III							
I	22UTL303/ 22UHN303 / 22UFR303	Tamil/ Hindi/ French Paper – III	5	3	50	50	100	3
II	22UEN303	English Paper – III	6	3	50	50	100	3
III	22UBY304	Major Paper IV- Cell Biology, Anatomy and Embryology	9	3	50	50	100	4
	22UBY3A4	Allied Paper IV - Chemistry	8	3	50	50	100	3
IV	22UBY3N11/ 22UBY3N12	Skill based subjects (Non major electives)- Landscape designing/ Herbal cosmetics *Basic Tamil paper I	1	2	-	50	50	2
	22HEC303	Human Excellence - Professional values & SKY yoga practice- III	2	2	25	25	50	1
V		Extension Activities (Annexure –I)						
	500							16
	Semester IV							
I	22UTL404/ 22UHN404/ 22UFR404	Tamil/ Hindi/ French Paper – IV	5	3	50	50	100	3
II	22UEN404	English Paper – IV	6	3	50	50	100	3
III	22UBY405	Major Paper V – Biochemistry, Biophysics & Bioinstrumentation	6	3	50	50	100	4
	22UBY406	Major Practical II - Paper VI (Cell Biology, Anatomy & Embryology, Biochemistry, Biophysics and Bioinstrumentation)	2	3	50	50	100	4
	22UBY3A5	Allied - Paper V- Chemistry	6	3	50	50	100	3
	22UBY3A6	Allied paper VI – Chemistry Practical	2	3	50	50	100	4
IV	22UBY4N22/ 22UBY4N22	Skill based subjects (Non major electives)- (Remote sensing and natural resource management/ Bioinformatics) *Basic Tamil paper II	1	2	-	50	50	2

	22HEC404	Human Excellence – Social values & SKY yoga practice-IV	2	2	25	25	50	1
V		Extension Activities (Annexure –I)			50		50	1
	750 25							
	Semester V							
III	22UBY507	Major Paper – VII - Taxonomy & Economic Botany	5	3	50	50	100	4
	22UBY508	Major Paper VIII - Genetics and Evolution	5	3	50	50	100	4
	22UBY509	Major Paper IX – Bioinformatics	5	3	50	50	100	4
	22UBY510	Major Paper X – Biostatistics	5	3	50	50	100	4
	22UBY5E1/ 22UBY5E2/ 22UBY5E3	Elective I – Microbiology and Plant pathology Elective I – Herbal & Ethno Botany Elective I –Herbal cosmetics and Cosmeceuticals	5	3	50	50	100	5
	22UBY5AL1	Advanced Learner Course - I Biological Disaster – Mitigation &Management	SS	3	50	50	100	5*
IV	22UBY5S11/ 22UBY5S12	Skill Based Electives I- Network and Information security/ Cyber Security- Ethical Hacking	1	2	-	50	50	2
	22GKL501	General Knowledge & General Awareness (SBE)	-	-	-	-	-	Grading
	22HEC505	Human Excellence - National values & SKY yoga practice-V	1	2	25	25	50	1
	600 24							
	Semester VI							
III	22UBY611	Major Paper XII – Plant Physiology	5	3	50	50	100	4
	22UBY612	Major Paper XIII – Biotechnology & Genetic Engineering	5	3	50	50	100	4
	22UBY613	Major Paper XIV - Horticulture & Plant Breeding	5	3	50	50	100	4
	22UBY6E4/ 22UBY6E5/ 22UBY6E6	Elective II – Habitat Ecology Elective II – Biodiversity and its Conservation Elective II – Environmental Biotechnology	5	3	50	50	100	5

	22UBY6E7/ 22UBY6E8/ 22UBY6E9	Elective III – Bioprospecting Elective III – Biofertilizers Elective III – Seed Technology	5	3	50	50	100	5
	22UBY614	Major Practical III – Paper XV (for V Sem theory papers)	2	3	50	50	100	4
	22UBY615	Major Practical IV (for VI Sem theory papers)	2	3	50	50	100	4
	22UBY616	Project & Viva-voce	-	-	25	25	50	2
	22UBY5AL2	Advanced Learner Course - II Bionanotechnology	SS	3	50	50	100	5*
IV	22UBY6S21 22UBY6S22	Skill Based Elective II – Forest Botany Skill based Elective II – Mushroom cultivation	1	2	-	50	50	2
	22HEC606	Human Excellence - Global values & SKY yoga practice- VI	1		25	25	50	1
	850							35
	**Grand total							3900 140

* The credits given are applicable only to the students who opt for Basic Tamil paper, Advanced learner course and the credits for Human Excellence papers cannot be given to them.

**Grand total should be equal/below 3900 (For UG Programmes); 2550 (For PG Programmes) SS – Self study, SBE – Skill Based Elective, NME–Non Major Elective.



Head of the Department

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Programme Code	B.Sc.,	Programme Title	Bachelor of Science (BOTANY)
Course code	22UBY304	Course Title	2022-2025
		CELL BIOLOGY, ANATOMY AND EMBRYOLOGY	Semester 3
Hrs/Week	5		Credits 4

Course Objective

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

Course Outcome

K1	CO1	To introduce and enumerate the theories on plant cell, tissues and cell division
K2	CO2	To summarize the anatomy of various plant parts
K3	CO3	To demonstrate the internal structure and embryology of angiosperms
K4	CO4	To compare the growth and developmental pattern of dicots and monocots
K5	CO5	To evaluate the anatomical adaptations of xerophytes and hydrophytes

Mapping

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

Unit	Content	Hrs
Unit I	Cell biology: *Ultra structure of Plant cell. Structure and functions of cell wall – plasma membrane – chloroplast - mitochondria – endoplasmic reticulum. Structure and functions of ribosomes - dictyosomes - nucleus - nucleolus – chromosomes: giant chromosomes: polytene and lamp brush - mitosis	13
Unit II	Anatomy: Plant body – meristems - Apical meristem – Shoot and root – theories – Cambium and its functions - permanent tissues - simple and complex – Vascular bundles and its types - differentiation – dedifferentiation – redifferentiation..	13
Unit III	Primary structure of stem and root (monocot and dicot) – normal secondary growth in dicot stem and dicot root – anomalous secondary growth in dicot stem (<i>Boerhaavia</i>) and monocot stem (<i>Dracaena</i>) - dicot root (<i>Achyranthes</i>) - wood structure (sap wood & heartwood). Dendrochronology	13

Unit IV	Leaf – epidermal tissues – trichomes– stomatal types – internal structure of monocot (Grass) and dicot (<i>Tridax</i>) leaves. Anatomy of hydrophytic leaf (<i>Hydrilla</i>) and xerophytic leaf (<i>Casuarina</i>) – Nodal anatomy	13
Unit V	Embryology: Flower - structure and development –anther - microsporangium and microsporogenesis – ovules- megasporangium and megasporogenesis (<i>Polygonum</i> type) – embryosac - pollination – double fertilization –endosperm – embryo - dicot (<i>Capsella</i>) and monocot (<i>Najas</i>) – polyembryony - formation of seed – fruit – parthenocarpy.	13

**Self study topics*

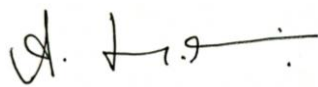
Charts, Powerpoint presentation, Seminar, Quiz, Assignment

Text Books:

1. Bhojwani S.S. and Bhatnagar, S.P., 2000. The embryology of angiosperms. 4th edition, Vikas printing houses, New Delhi.
2. Esau K. 1977. Anatomy of seed plants. 2nd edition. John Wiley & Sons, New York.
3. Vashista P.C., 1997. Plant Anatomy, S. Chand & Co., New Delhi.

Reference Books:

4. Fahn A., 1974. Plant Anatomy, 2nd edition. Pergamon Press, Oxford.
5. Pandey B.P., 1985. Plant Anatomy, S and Chand & Co., New Delhi.
6. Maheswari P., 1971. An introduction to embryology of angiosperms. Tata McGraw Hill Publishing Co., New Delhi.
7. Swamy B.G.L. and Krishnamurthy, K.V., 1980. From flower to fruit: Embryology of Angiosperms, Tata McGraw Hill Publishing Co., New Delhi.



Head of the Department

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Programme Code	B.Sc.,	Programme Title	Bachelor of Science (BOTANY)
Course code 22UBY405		Course Title BIOCHEMISTRY, BIOPHYSICS & BIOINSTRUMENTATION	2022-2025
Hrs/Week 5			Semester 4
			Credits 4

Course Objective

- To know the biomolecules of life
- To understand the biophysical laws governing universe
- To analyze the biomolecules using simple separation techniques

Course Outcome

K1	CO1	To revisit and understand the structure and functions of biomolecules	
K2	CO2	To prepare and quantify solutions, biomolecules	
K3	CO3	To illustrate the central dogma of molecular biology	
K4	CO4	To explain the biophysical forces and laws of thermodynamics	
K5	CO5	To know-how the quantification of biomolecules using selected optical techniques	

Mapping

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

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

Unit	Content	Hrs
Unit I	Biochemistry: Introduction to biomolecules - structure, classification, properties and functions of carbohydrates, lipids, proteins and nucleic acids.	13
Unit II	Enzymes - classification, nomenclature, properties and functions – factors affecting enzyme activity - mode of action of enzymes – coenzymes- Enzyme inhibitors - irreversible and reversible inhibitors- Assay for enzymes.	13

Unit III	Biochemical techniques – basics of weights and measurements – atomic weight, molecular weight, gram molecular weight, equivalent weight, density, specific gravity, expression of solution concentration based on volume (molar, normal, w/v) and weight (molal, ppm, w/w) of the solvent. Units of measurement – SI units – problems on molarities and dilutions –Basics of exponents and logarithms - hydrogen ion concentration – calculation of pH.	13
Unit IV	Biophysics: Chemical bonds (covalent, non-covalent and ionic) vander waal's forces - laws of thermodynamics - redox potential - redox couple - energy states of atom - spin property of electrons – Pauli's exclusion principle - absorption spectrum in molecules.	13
Unit V	Bioinstrumentation: Principle, types and uses of pH meter– buffers - Colorimetry - principle and laws (Lambert's and Beer's) – Colorimeter and Spectrophotometer. Centrifugation – principle and types of centrifuges and rotors, differential and density gradient centrifugation - Chromatography (paper, column, thin layer, gas, ion-exchange and affinity) – electrophoresis (AGE & PAGE) – PCR.	13

Powerpoint presentation, Seminar, Quiz, Assignment, Demonstration

Text Books:

1. Jain J.L., 1999. Fundamentals of Biochemistry, S. Chand & Company, NewDelhi, India.
2. Subramanian P., 2005. Biophysics: Principles and techniques, MJP Publishers, Chennai.

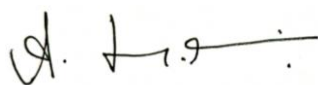
Reference Books:

3. Alberts B., Bray, D., Lewis, J. Raff, M. Roberts, K. and Watson, J.D., 1998. Molecular biology the cell. 2nd edn., Garland Pub. Inc., New Delhi.
4. Jayaraman J., 1988. Laboratory Manual in Biochemistry. Wiley Eastern Ltd., NewDelhi.
5. Lee P.J. and Leegood, R.C., 1999. Plant Biochemistry and molecular biology. John Wiley & Sons, Chichester, England.
6. Voet, D. and Voet, J.G. 2011. Biochemistry, 4th ed. John Wiley & Sons (Asia) Private Limited.
7. Mark Lorch, 2021. Biochemistry: A very Short Introduction, Oxford University Press.

Web Reference:

http://www.brainkart.com/subject/Plant-Biochemistry_257/

<https://www.scribd.com/document/378882955/Plant-Biochemistry-Lecture-Notes>



Head of the Department

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Programme Code	B.Sc.,	Programme Title	Bachelor of Science (BOTANY)
Course code 22UBY4N22		Course Title SKILL BASED ELECTIVE (NON MAJOR) -BIOINFORMATICS	2022-2025
Hr/Week 1			Credits 2

Course Objective

- To introduce classical bioinformatics theory to students
- To focus computer science techniques used in biological studies
- To explore the existing Biological databases and searching tools

Course Outcome

K1	CO1	To introduce Bioinformatics and Biological databases
K2	CO2	To comprehend the origin of life and genetic code
K3	CO3	To know-how the gene finding, protein prediction and genetic algorithm
K4	CO4	To analyze the phylogeny between species using pattern recognition and homology
K5	CO5	To encourage the students to carry out research in the field of Bioinformatics

Mapping

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

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

Unit	Content	Hrs
Unit I	Life - origin and evolution – biomolecules – book of life - genetic code – genomics and proteomics – Human Genome Project.	3
Unit II	Introduction to bioinformatics – biological databases and searching tools – virtual library – servers for bioinformatics – IT tools for bioinformatics.	3
Unit III	Genetic algorithm – sequence analysis –similarity search- pairwise and multiple sequence alignment – structure prediction.	2
Unit IV	Gene finding – protein prediction – tools and databases for biomolecular visualization – drug designing.	2
Unit V	Phylogenetic analysis – tools and databases for phylogenetic tree construction – homology – orthology – paralogy – analogy.	2

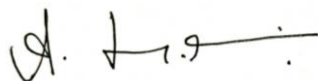
Powerpoint presentations, Quiz

Text Books:

1. Lesk A.M.2002, Introduction to Bioinformatics, Oxford University Press,Oxford.
2. Parthasarathy S., 2008. Essentials of programming in C for life sciences. Ane BooksIndia, New Delhi.
3. Sundararajan S. and R. Balaji, 2002. Introduction to Bioinformatics, HimalayaPublishing House – Mumbai.

Reference Books:

4. Chakraborty C., 2004. Bioinformatics Approaches and Application. Chawla offsetprinters – Delhi.
5. Westhead D.R., J. Parish and R.M.Twyman, 2003. Bioinformatics (instant notes)Viva books private limited – New Delhi.
6. KhanI.A.,and A. Khanum, 2002, Emerging trends in Bioinformatics, UkaazPublications.

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Programme Code	B.Sc.,	Programme Title	Bachelor of Science (BOTANY)
Course code	22UBY5E2	Course Title	2022-2025
		ELECTIVE – I HERBAL AND ETHNO BOTANY	Semester 5
Hrs/Week	5		Credits 5

Course Objective

- To understand the history, scope and importance of medicinal plants and ethnobotanical science
- To familiarize with common medicinal plants of this region
- To know herbs, herbal products, phytochemical compounds and their medicinal uses

Course Outcome

K1	CO1	To understand the usage of plants for various purposes including therapeutics
K2	CO2	To explore general, principal of Ethnobotany
K3	CO3	To obtain plant use information of indigenous people
K4	CO4	To conserve endangered and endemic plants
K5	CO5	To obtain comprehensive knowledge of various herbal plants and the medicinal values through primitive culture

Mapping

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

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

Unit	Content	Hrs
Unit I	Pharmacognosy-Definition and history – A general survey of traditional systems of medicines- Siddha- Ayurveda &Unani- Pharmacology-Bioactive substances of medicinal plants-alkaloids, glycosides, oils, resins and steroids.	13
Unit II	Drugs obtained from lower plants- (Morphology and Therapeutic uses)Chlorella, Spirulina, Claviceps, Penicillium, Actinomycetes, Lycopodium, Ginkgo and Pinus	13
Unit III	Drugs obtained from higher plants (Morphology and therapeutic uses) whole plants- <i>Eclipta alba</i> , Roots- <i>Withania somnifera</i> , Leaves- <i>Ocimum sanctum</i> , Rhizome- <i>Curcuma aromatica</i> and <i>C. longa</i> , Flowers- <i>Eugenia caryophyllata</i> , Fruits- <i>Embolia officinalis</i>	13

	Seeds- <i>Myristica fragrans</i> .	
Unit IV	Ethnobotany- History development & importance . Centers of Ethnobotanical studies in India (AICRFE & FRLHT)- The plants used in Ethnomedicine-e.g <i>Trichopus zeylanicus</i> and <i>Janakia arayalpatra</i> -Role of Ethnobotany in conservation and sustainable development –Sacred grooves.	13
Unit V	Plants used by ethnic groups for food, medicines (Ethnomedicine)- beverages, fodder, fiber, resins, oils, fragrances and other uses -NWFP (Non -Wood Forest Produces) used by Tribal and Folk Communities of India- Traditional/indigenous knowledge and its importance.	13

**Self study topics*

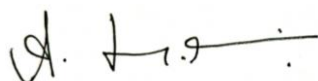
Field study, Inventory of Campus vegetation, Powerpoint presentations, Seminar, Assignment

Text Books:

1. S.K. Jain, Manual of Ethnobotany, Scientific Publishers, Jodhpur, 1995.
2. S.K. Jain (ed.) Glimpses of Indian. Ethnobotany, Oxford and I B H, New Delhi – 1981
3. S.K. Jain (ed.) 1989. Methods and approaches in ethnobotany. Society of ethnobotanists, Lucknow, India.
4. S.K. Jain, 1990. Contributions of Indian ethnobotany. Scientific publishers, Jodhpur.
5. Cotton C.M. 1997. Ethnobotany – Principles and applications. John Wiley and sons – Chichester
6. Rajiv K. Sinha – Ethnobotany The Renaissance of Traditional Herbal Medicine – INA – SHREE Publishers, Jaipur-1996
7. Faulks, P.J. 1958. An introduction to Ethnobotany, Moredale pub. Ltd. London
8. Gary J Martin, 2008. Ethnobotany A Methods manual, Earth scan, London.

Reference Books:

1. Traditional plant medicines as sources of new drugs. P J Houghton in Pharmacognosy Trease and Evan's. 16 Ed .2009
2. Cunningham, A. B. (2001). Applied Ethnobotany. Earthscan publishers Ltd. London & Sterling, VA, USA Cotton, C.M. (1996).



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Programme Code	B.Sc.,	Programme Title	Bachelor of Science (BOTANY)
Course code	22UBY615	Course Title	2022-2025
		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

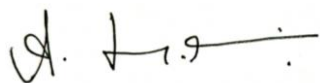
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CO1	S	S	M	M	S	S	S	S	S	S
CO2	S	S	M	M	M	S	S	S	S	S
CO3	M	S	S	L	M	S	S	S	S	S
CO4	M	M	M	M	S	S	S	S	S	S
CO5	S	M	M	M	S	S	S	S	S	S

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

Unit	Content	Hrs
Unit I	Plant physiology Individual experiments: 1. Estimation of water potential (DPD) by liquid immersion method and plasmolytic method. 2. Estimation of osmotic pressure by plasmolysis. 3. Determination of respiration by respiroscope 4. Determination of stomatal frequency and index. 5. Determination of rate of transpiration - Cobalt chloride, Ganongs potometer. 6. Determination of rate of photosynthesis under different CO₂ concentrations & different light intensities using wilmots	6

	bubbler Plant physiology demonstration experiments: 7. Light screen experiment 8. Amylase activity 9. Soil nitrification 10. Determination of respiratory quotient	
	11. Essentiality of mineral elements on plant growth – Hydroponics	
Unit II	Biotechnology & Genetic Engineering: Charts/spotters on Genetic Engineering and biotechnology Demonstration 1. Media for plant tissue culture 2. Callus induction 3. Regeneration of plantlet 4. Synthetic seeds Horticulture and Plant Breeding Charts and specimens Demonstration on propagation techniques Demonstration on fruit/vegetable preservation	5
Unit III	# Habitat Ecology 1. Vegetation study by Quadrat and Line transect method 2. Estimation of plant biomass 3. Determination of dissolved oxygen 4. Estimation of CO₂ in selected water samples 5. Determination of Total Dissolved Solids 6. Spotters and charts on Habitat ecology. # Biodiversity and its Conservation 1. Biosphere reserves 2. Hotspots 3. Sacred groves # Environmental Biotechnology 1. Bioindicators 2. Green auditing 3. Biofuels	5

	4. Remote sensing	
Unit IV	# Bioprospecting 1. Marine bioproducts 2. Microbial bioproducts 3. Anti-oxidant assay # Biofertilizers 1. Mass culture of <i>Azolla</i>, <i>Rhizobium</i> and <i>Nostoc</i> 2. Identification and isolation of microbial inoculants # Seed Technology Simple tests on seed purity, vigor, viability, germination and moisture content. Seed processing and storage methods	5
Unit V	Internship/ Project –Short term training/ mini project in the field of entrepreneurial botany and submission of a report.	5



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